SERVICES AUTHORIZATION BETWEEN

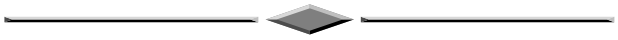
HDR ENGINEERING, INC.

AND

LOUISVILLE GAS and ELECTRIC COMPANY and KENTUCKY UTILITIES COMPANY

FOR

2027 Natural Gas Combined Cycle Feasibility Study
CONTRACT NO. 1109622



LG&E and KU Services Company
820 West Broadway
Louisville, KY 40202

EXHIBITS TO THIS SERVICES AUTHORIZATION

EXHIBIT SOW – Specification/Scope of Work
EXHIBIT RESPR – Requirements for Electronic Submittal of Project Records
EXHIBIT MCE – Master Contract

Health and Safety Requirements

- **EXHIBIT CHS - Contractor Health and Safety Program**
- **EXHIBIT HSM – Health and Safety Manual**
- **EXHIBIT JPM - Job Performance Monitoring**
- **EXHIBIT QAC - Quality Assurance Closure**

Services Authorization

For

2027 Natural Gas Combined Cycle Feasibility Study
Contract No. 1109622

This Services Authorization for 2027 Natural Gas Combined Cycle Feasibility Study (this "Services Authorization") is made and entered into as of April 8, 2022, (the "Services Contract Effective Date"), between HDR Engineering, Inc. (hereinafter referred to as "Engineer"), a corporation organized under the laws of the State of Nebraska with offices located at 401 W. Main Street, Suite 500, Louisville, KY 40202, and Louisville Gas and Electric Company and Kentucky Utilities Company(hereinafter referred to as "Buyer"), a corporation organized under the laws of the State of Kentucky, with offices located at 820 West Broadway, Louisville, KY 40202.

W I T N E S S E T H

WHEREAS, subject to Section 9 below, Engineer and LG&E and KU Services Company entered into a Master Contract for General Engineering Services on May 8, 2013 (the "**Master Contract**"). This is a Services Authorization within the meaning of the Master Contract and the execution and delivery of this Services Authorization by Buyer and Engineer creates a Services Contract as set forth in the Master Contract (this "Services Contract"). Capitalized terms used but not defined in this Services Authorization shall have the meanings assigned them in the Master Contract; and

WHERAS, Buyer desires to obtain and Engineer desires to provide the services of Engineer described hereinafter with respect to 2027 Natural Gas Combined Cycle Feasibility Study; and

WHEREAS, Engineer represents it is financially capable and technically ready, willing and able to perform such services under the terms and conditions of this Services Contract; and

NOW, THEREFORE, in consideration of the mutual promises set forth in this Services Contract, and intending to be legally bound hereby, the Parties hereby agree as follows:

1. STATEMENT OF SERVICES

The Work to be performed by Engineer with respect to this Services Contract is set forth in **Exhibit SOW** to this Services Authorization. Except as otherwise expressly provided in this Services Contract, Engineer shall supply all labor, supervision, materials, equipment, tools, and other items (and shall pay all expenses) necessary or appropriate in the performance of the Work.

2. WORK AND SAFETY RULES

Engineer shall perform Work in accordance with the health and safety requirements set forth in **Exhibits CHS, HSM, JPM, and QAC** to this Services Authorization.

2.1 **Safety Requirements.** Without limiting the provisions of the Master Contract, Engineer and its Subcontractors shall comply with all Buyer safety policies and programs, as follows in this Section 2. Safety of both Buyer employees and the employees of the Engineer is of the utmost importance to Buyer. Engineer shall at all times be solely responsible for complying with all Applicable Laws and facility rules, including without limitation those relating to health and safety, in connection with the Work and for obtaining all permits and approvals necessary to perform the Work. Engineer shall provide a workforce that is compliant trained and qualified to perform the work.

2.2 **Passport Program.** All Engineer employees and Subcontractor employees are required to attend a site specific safety orientation and be "Passport" trained as described in the **Exhibit CHS** prior to commencement of Work at or adjacent to the Job Site at Engineer's cost. Engineer is responsible for all site and safety compliance by its employees and all Subcontractors and their employees. It is the responsibility of the Engineer to have **all** of its employees on the Buyer's premises or systems trained and tested with the data verifying each employee's training entered by the Engineer into the Buyer's contractor database. The Engineer must notify the Buyer when a Subcontractor is being used on a Job Site and must insure the Subcontractor employees are also trained and tested with data verification in the Buyer's contractor database.

2.3 **Job Site Safety Plan.** Safety at Buyer is a core value that has the utmost importance to all parties. Engineer shall prepare, submit for Buyer's approval, and implement a safety plan explaining how Engineer will perform Work on or adjacent to Job Sites in a safe manner. The safety plan shall include detailed safety training programs to be provided by Engineer to all applicable employees and types of employee safety equipment required in accordance with OSHA and the contractual requirements contained herein, and shall utilize the required Hazard Analysis and Mitigation Form (**Exhibit CHS – Appendix C**); Contractor Safety Management Job Performance Monitoring Tool (**Exhibit JPM**); and Contractor Safety Management Quality Assurance Closure Form (**Exhibit QAC**). The Engineer shall submit to Buyer these foregoing documents, properly completed, at the times designated in such forms.

2.4 **Job Briefings.** Daily job briefings must be performed by Engineer in accordance with OSHA 1910-269 standards. This process shall be used to define the hazards associated with the daily job activities. If the scope of work changes, there must be an additional job briefing completed. Engineer shall complete and document job briefings and submit to Buyer.

2.5 **Safety Personnel.** Contractor shall assign at least one full-time Job Site safety officer who shall be responsible for introducing, administering, and monitoring procedures to promote safe working conditions on the Job Site (and other areas of the Generating Station Site where Work is to be performed) and compliance with Applicable Law. Contractor shall provide an appropriate medical facility at the Job Site. Throughout each shift, Contractor shall have sufficient (and in any event no less than the Required Number) of Safety Specialists on the Job Site overseeing safety of the Work. All such Safety Specialist shall be exclusively dedicated to overseeing safety throughout the shift (e.g., the Safety Specialist shall have no other managerial or other work duties) and collectively they shall have the required ability, training, and experience in each type of work conducted by On-site Personnel during that shift.

2.5.1 "**On-site Personnel**" means the aggregate number of all personnel (excluding Safety Specialists) of Contractor and Subcontractors on the Job Site during any particular shift.

2.5.2 "**Required Number**" means for a shift

(a) if the number of On-site Personnel for that shift is less than 10 -- zero (0);

(b) if the number of On-site Personnel for that shift is ten (10) or more-- the sum of one (1) plus the amount, if any, that the number of On-site Personnel for that shift exceeds ten (10) by whole multiples of fifty (50) (e.g., for 59 On-site Personnel, the Required Number is 1; for 160 On-site Personnel, the Required Number is 4, etc.).

2.5.3 "**Safety Specialist**" means an employee of Contractor that (i) has the ability, training, and experience in construction project safety reasonably satisfactory to Owner to be sufficient to competently oversee the safety of the Work at the Job Site and (ii) is exclusively dedicated to overseeing safety (e.g., the Safety Specialist shall have no other managerial or other work duties).

3. KEY PERSONNEL

Engineer's Key Personnel for this Services Contract are identified as follows:

Mark Wiitanen – Project Manager

4. REQUIREMENTS FOR ELECTRONIC SUBMITTAL OF PROJECT RECORDS

All Work under this Services Contract shall comply with Requirements for Electronic Submittal of Project Records (**Exhibit RESPR**). For purposes of this Service Contract, all references to Owner in **Exhibit RESPR** shall refer to Buyer.

5. PERFORMANCE SCHEDULE

5.1 Engineer shall commence performance of the Work on the Services Contract Effective Date and shall complete the performance of the Work on or before June 30, 2022.

5.2 Engineer shall notify Buyer of each Subcontractor to be utilized in performance of Work (such notification must include all of the information required by **Exhibit CHS**) at least forty-eight (48) hours prior to the start of that Subcontractor's Work on or about the Plant and/or premises of any LKS Party. Subcontractors will be denied access to such Plant and/or premises without the required notification.

6. COMPENSATION AND INVOICING

6.1 Subject to Section 6.3 below, compensation for the Work in this Services Contract shall be for actual hours and reimbursable expenses incurred. Compensation for the Work in this Services Contract shall be in accordance with the Master Contract at a Maximum Cost of Eighty-Three Thousand Five Hundred Dollars ($83,500).

6.2 Subject to Section 6.3 below, Engineer shall invoice Buyer monthly for actual Work performed during the previous month. Each Engineer invoice shall include the following detail: name of the Engineer employee, hours billed, hourly bill rate in accordance with the article title Compensation set forth in this Services Contract, detail of reimbursable expenses incurred with supporting receipts for all individual expense items over $25, the Maximum Cost for the Services Contract, the amount previously invoiced, and the amount of this invoice.

The aggregate amount that Engineer is entitled to invoice Buyer under this Services Contract is referred to as the "Contract Price." The Contract Price constitutes full compensation to Engineer for full and complete performance by Engineer of the Work, compliance with all terms and conditions of this Services Contract and for Engineer's payment of all obligations incurred in, or applicable to, performance of the Work shall be as set forth above in this Section 6.

Invoices shall be submitted in one original and one copy as follows:

Original: Louisville Gas & Electric Company
820 West Broadway
Louisville, KY 40202
Attn: Dianne Ware
ProjectEngineering.Invoices@lge-ku.com

Copy: Louisville Gas & Electric Company and Kentucky Utilities Company
820 West Broadway
Louisville, KY 40202
Attn: Doug Schetzel
Doug.Schetzel@lge-ku.com

6.3 Engineer shall not invoice Buyer for, and Buyer shall not be obligated to pay Engineer for, Work performed by Engineer to make corrections to drawings, manuals or other documents prepared by Engineer to the extent such corrections address (a) misspellings or other typographical errors, (b) inaccurate information included as a result of Engineer's error, (c) conflicting or inconsistent information within or between the documents or (d) errors which if left uncorrected would be inconsistent with Professional Standards.

7. BUYER DIRECTED CHANGES IN WORK

Notwithstanding anything in the Master Contract to the contrary, Buyer may at any time, and at time to time, unilaterally make deletions, additions, or changes in the Work ("Change"). Engineer's compensation and schedule for performing the Work shall be equitably adjusted to reflect the impact of such Change. At Buyer's sole discretion, the compensation adjustment shall be on a Maximum Cost basis.

8. NOTICES

In addition to the requirements concerning notices set forth in Article 34 of the Master Contract, Engineer shall email an extra copy of all notices from Engineer to Buyer related to this Services Contract to:

Copy: Louisville Gas and Electric Company and Kentucky Utilities Company
820 West Broadway
Louisville, KY 40202
Attn: Barry Elmore
Barry.Elmore@lge-ku.com

Copy: Louisville Gas and Electric Company and Kentucky Utilities Company
820 West Broadway
Louisville, KY 40202
Attn: Doug Schetzel
Doug.Schetzel@lge-ku.com

9. STATUS OF MASTER AGREEMENT.

Subsequently to entering into the Master Contract, Engineer and LG&E and KU Services Company entered into another Master Contract for General Engineering Services, dated October 20, 2020 (the "**2020 Master Contract**"). Notwithstanding provisions of the 2020 Master Contract to the contrary, it is the express intention of Engineer and Buyer that this particular Services Contract shall be governed by the Master Contract rather than the 2020 Master Contract. Engineer and Buyer agree (i) that the 2020 Master Contract is disregarded for purposes of this particular Services Contract and (ii) that this particular Services Contract has no effect on the 2020 Master Contract as applied to any Services Contract other than this particular Services Contract.

IN WITNESS WHEREOF, the Parties hereto have executed this Services Authorization as of this Services Contract Effective Date.

HDR ENGINEERING, INC.

By: DocuSigned by: Ben Edelen 4E4217EF28C9425... (Signature)

Printed Name: Ben Edelen

Title: Sr. Vice President

Date: 4/14/2022 | 2:27 PM EDT

Louisville Gas and Electric Company and Kentucky Utilities Company

By: DocuSigned by: Barry Elmore F545985EB5A24D7... (Signature)

Printed Name: Barry Elmore

Title: Manager Contracts/Major Cap. Projects - PE

Date: 4/14/2022 | 3:17 PM EDT

DS

From: Delegation of Authority [lgeproc@lge-ku.com]
To: BARRY ELMORE [BARRY.ELMORE@LGE-KU.COM], DELTRICIA SMITH [DELTRICIA.SMITH@lge-ku.com], DIANNE WARE [DIANNE.WARE@LGE-KU.COM], Delegation of Authority [DOA@lge-ku.com], DOUGLAS SCHETZEL [DOUG.SCHETZEL@LGE-KU.COM], JOHN JACOBS [JOHN.JACOBS@LGE-KU.COM], KATHLEEN REED [KATHLEEN.REED@LGE-KU.COM], LISA CURTSINGER [LISA.CURTSINGER@LGE-KU.COM], MICHELE RESTAINER [MICHELE.RESTAINER@LGE-KU.COM], PAUL MEYER [PAUL.MEYER@lge-ku.com], RUDOLPH MOELLER [RUDOLPH.MOELLER@LGE-KU.COM], STEPHANIE DOWELL [STEPHANIE.DOWELL@LGE-KU.COM], Zycus Admin [Zycus.Admin@lge-ku.com], Oracle Security [oracle@lge-ku.com], Cash Management [tradefin@lge-ku.com], CHUCK HANCE [CHUCK.HANCE@LGE-KU.COM], JOAN LIPP [JOAN.LIPP@LGE-KU.COM], DAN ARBOUGH [DAN.ARBOUGH@LGE-KU.COM], JEFF HEUN [JEFF.HEUN@LGE-KU.COM], LISA HILLERICH [LISA.HILLERICH@LGE-KU.COM], JAMES DIMAS [JIM.DIMAS@LGE-KU.COM], LANA ALLGEIER [LANA.ALLGEIER@LGE-KU.COM], AUDREY JACKSON [AUDREY.JACKSON@LGE-KU.COM], JOHN WILLIAMS [JOHN.WILLIAMS@LGE-KU.COM], STACY RITCHEY [STACY.RITCHEY@LGE-KU.COM], GARY RAQUE [GARY.RAQUE@LGE-KU.COM], JANNA SINGLETON [JANNA.SINGLETON@LGE-KU.COM], DANNY SORG [DANIEL.SORG@LGE-KU.COM], JARRETT BEACH [JARRETT.BEACH@LGE-KU.COM], AARON BOTTOMS [AARON.BOTTOMS@LGE-KU.COM], DONNA BIRD [DONNA.BIRD@LGE-KU.COM], TIMOTHY COOMER [TIMOTHY.COOMER@LGE-KU.COM], ROBIN VOLL [Robin.Voll@lge-ku.com], ELIJAH BROWN [ELIJAH.BROWN@LGE-KU.COM], ANDY HINER [ANDREW.HINER@LGE-KU.COM], JEFF OESWEIN [JEFFREY.OESWEIN@LGE-KU.COM], KELLIE WISE [KELLIE.WISE@LGE-KU.COM], JENNIFER VINCENT [JENN.VINCENT@LGE-KU.COM]
Subject: Delegation Of Authority Notification For BARRY ELMORE to KATHLEEN REED
Sent: Mon 3/28/2022 7:41 AM GMT-07:00
Importance: Normal

This delegation of authority is effective with the start of the work day 4/4/2022 through the end of the work day 4/8/2022.
The Reason for this delegation of authority is Vacation.
Delegation of Authority for
Name BARRY ELMORE
Location Broadway Office Complex-3
Department Project Engineering
Company LG&E and KU Services Company
Phone 502/627-3580
E-Mail BARRY.ELMORE@LGE-KU.COM
Cell Phone N/A
Pager N/A
Authority being delegated to
Name KATHLEEN REED
Location Broadway Office Complex-3
Department Project Engineering
Company LG&E and KU Services Company
Phone 502/627-2957
E-Mail KATHLEEN.REED@LGE-KU.COM
Cell Phone N/A
Pager N/A
Comments :

_____

PPL companies

EXHIBIT SOW

Scope of Work

2027 Natural Gas Combined Cycle Feasibility Study

March 29, 2022

Engineer shall provide the following services:

- Develop comparative cost estimates and site arrangements for 2 E.W. Brown sites (Webb Farm & U 1-2). This item shall be performed in the first 45 days.
- Refresh and refine the Work performed under PO# 1070477 as described below

- Develop Large Generator Interconnection request technical package for submittal to TranServ. The data technical includes impedance and time constants data as well as required models and curves. A conceptual one-line diagram will also be provided for each site representing site specific transmission interconnection voltage. This item to performed in the first 60 days.
- Assess generation scenarios 1x1 (GE 7HA.03, Siemens 8000H and MHPS 501JAC all having a summer rating in excess of 600 MW) and 2 F class simple cycle combustion turbines

- Provide assessment of single shaft vs. multi-shaft configurations
- Provide assessment of impact of dual fuel combustion system regarding natural gas operation (performance, emissions and life cycle cost)
- Plant Performance and Heat Balances
- Plant Emission Profiles
- Site Arrangements
- Water Balances with site specific assessment of intake/discharge
- One Line Diagrams
- Fuel Pressure Requirements
- Contracting strategy to evaluate the Owner Furnished Equipment (OFE) approach from a project execution and risk perspective.
- Project Schedules
- Top down cost estimates with spare and service agreement costs
- Cost estimate options to include; fuel oil backup storage/combustion facilities for identified configurations, SCR (if required for NSPS for site under netting analysis) and gas compression if required to meet CTG OEM gas pressure requirements
- Plant proforma for each technology and configuration
- Infrastructure assessments for application of the three configurations at the existing E.W. Brown, Mill Creek and Green River sites including Buyer capital costs for site specific interconnection, pipeline and water supply/discharge
- Meetings
    - Kick off meeting conducted via conference call
    - Weekly coordination conference calls
    - Optional site meeting(s) attended by the Engineer's Project Manager to confirm study criteria and collect applicable field data to be determined on an as-needed basis.

Engineer shall provide the following deliverables in support of this project:

- Large Generator Interconnection request technical packages for submittal to TranServ. The technical data includes impedance and time constants data as well as required models and curves. A conceptual one line diagram shall also be provided for each site for one NGCC and one Simple Cycle configuration. (Within 60 days of starting Work)
- Feasibility Report defining the site design conditions, emissions profiles, thermal performance, contracting strategy, infrastructure requirements, capital cost, O&M cost and project schedule with appendices to include the following:

- Appendix A Site Arrangements (E. W. Brown two unit NGCC, E.W. Brown single unit NGCC, E. W. Brown Simple Cycle, Mill Creek two unit NGCC, Mill Creek single unit NGCC, Mill Creek Simple Cycle)
- Appendix B Heat Balance Diagrams (GE 7HA.03, Siemens 8000H, MHPS 501JAC, Simple Cycle)
- Appendix C Water Balances (E. W. Brown two unit NGCC, E. W. Brown single unit NGCC, E.W. Brown Simple Cycle, Mill Creek two unit NGCC, Mill Creek single unit NGCC and Mill Creek Simple Cycle)
- Appendix D Single Line Diagrams (E. W. Brown two unit NGCC, E. W. Brown single unit NGCC, E. W. Brown Simple Cycle, Mill Creek two unit NGCC, Mill Creek single unit NGCC and Mill Creek Simple Cycle)
- Appendix E Project Schedule (E. W. Brown two unit NGCC, E. W. Brown single unit NGCC, E. W. Brown Simple Cycle, Mill Creek single unit NGCC, Mill Creek two unit NGCC and Mill Creek Simple Cycle)
- Appendix F Project Cost Estimates (E. W. Brown two unit NGCC, E. W. Brown single unit NGCC, E. W. Brown Simple Cycle Mill Creek single unit NGCC Mill Creek two unit NGCC and Mill Creek Simple Cycle)
- Appendix G Life Cycle Cost Analysis (E. W. Brown two unit NGCC, E. W. Brown single unit NGCC, E. W. Brown Simple Cycle Mill Creek two unit NGCC Mill Creek one unit NGCC and Mill Creek Simple Cycle)

END OF SCOPE OF WORK DOCUMENT

EXHIBIT RESPR

REQUIREMENTS FOR ELECTRONIC SUBMITTAL OF PROJECT RECORDS

1.0. Definitions

For Purposes of this Exhibit, the following terms, when capitalized, shall have the following meanings:

"**AutoCAD**" means an electronic Computer Automated Drafting program written by Autodesk, Inc. which produces a vector based drawing. The specific file format is ".dwg".

"**Contract**" means the agreement (whether designated as an agreement, contract, purchase order, or otherwise) to which these specifications are attached or otherwise referenced or incorporated into.

"**Contractor**" means each party to the Contract that is not an LKE Entity.

"**Engineered or Designed Drawings**" has the meaning set forth in Section 3.1 of this Exhibit.

"**Engineered or Designed Items**" means all Work specifically designed or built for Owner; "Engineered or Designed Items" does not include standard items of equipment produced by OEMs (i.e., items held in inventory or listed in published price lists), but does include design and other Work to incorporate such items into the project that is the subject of the Contract.

"**Excel**" means an electronic spreadsheet compatible with Microsoft Excel in the format of the specimen spreadsheet provided by Owner or otherwise requested by Owner (e.g., xlsx).

"**Existing Owner Drawings**" means drawings of Owner's facility(ies) that Contractor receives prior to or during the Work. Existing Owner Drawings may be issued as paper copies, or in electronic format such as AutoCAD, Hybrid, or PDF.

"**Hybrid**" means a single or group of electronic files containing an AutoCAD vector drawing (.dwg file) and one or more scanned raster background image format files (including ".jpg", ".gp4", ".cal", ".bmp", ".tif"). Specialized add-on software such as Autodesk Raster Design may be used with AutoCAD in order to manage and edit the background raster images.

"**LKE Entity**" means one of LG&E and KU Energy LLC, Kentucky Utilities Company, Louisville Gas and Electric Company, or a direct or indirect successor or subsidiary of any of them.

"**OEM**" means for an item of equipment, the original manufacturer of that equipment.

"**Non-AutoCAD Project Records**" means all Project Records other than Engineered or Designed Drawings

"**Owner**" means all the LKE Entities that are a party to the Contract.

"**PDF**" means portable document format compliant with PDF/A-1a or PDF/A-1b compliant. See ISO Spec 19005-1:2005 Document Management - Electronic document file format for long term preservation - Part 1.

"**Project Records**" means all drawings, instruction manuals, operation and maintenance manuals, spare parts lists, cable tabulations, and other documents required to be provided to Owner by Contractor pursuant to this Exhibit or the Contract. Project Records shall be the final Issued for Record (IFR) version which shall contain all as-built, as-manufactured, and as-commissioned modifications.

"**Work**" means all work, construction, equipment, materials, consumables, construction aids, and other goods and services performed, provided, or installed (and/or required to be performed, provided, or installed) by Contractor in accordance with the Contract.

2.0 Introduction

This Exhibit sets forth:

- Project Records, including all as-built or as-delivered modifications, that the Contractor is required to provide to the Owner upon completion of the Work, and
- Formatting and similar requirements for all Project Records.

The Contract may provide for additional and/or different requirements with respect to Project Records; provided, that unless the Contract provides otherwise explicitly, Contractor shall comply with both the Contract and this Exhibit. Please note that these requirements apply to all Work regardless of whether performed, installed, or provided directly by Contractor or through Contractor's subcontractors or other suppliers and it is Contractor's responsibility to ensure compliance in either case.

Contractor shall provide this Exhibit to the drafting group to ensure compliance.

3.0 Project Records Specific to Engineered or Designed Items

3.1 Contractor shall provide the following with respect to each Engineered or Designed Item to the extent applicable ("Engineered or Designed Drawings"):

3.1.1. Architectural - Building plans, elevations, building code summary (fire ratings, occupancy classifications), life safety plans, finish~~es~~ schedules (floors walls, ceilings, doors and windows), details, demolition, and plumbing systems.

3.1.2. Civil - Property and plot plans, concrete and foundation plans, sections and details, site improvements (excavating, roads, grading , surfacing, fencing),

construction facilities, erosion control, sanitary and storm sewers, general arrangements, underground utilities (piping, conduit and duct banks) and surveys.

3.1.3. Electrical - Electrical schematics (elementary and wiring diagrams), panel layouts, panel schedules, one or single line diagrams, three line diagrams, circuit diagrams, logic diagrams, elementary diagrams, loop diagrams, key diagrams, interconnection diagrams, equipment layouts, specs and data sheets, and plans for heat tracing, grounding, lighting, and communication. Cable tray drawings, hazardous area location drawings, instrument installation details, lightning protection, cathodic protection drawings, phasing diagrams, raceway composites, and DCS architecture drawing.

3.1.4. Mechanical - P&ID, piping plans, sections and details, flow diagrams, isometrics, instrument plans, arrangements, details, spec sheets and calibration sheets, HVAC systems, and fire protection general arrangements.

3.1.5. Structural - Structural plans, sections and details, river structures and concrete plans, sections and details. Flooring plans, sections and details (elevated slabs, grating, guardrails, stairs, and ladders), air and flue gas ductwork plans, sections and details.

3.1.6. Other drawings that are (i) customary in the applicable practices involved in the Work, (ii) required by the Contract, or (iii) requested by Owner.

3.2 So that Owner can test its ability to access and properly view the drawings, early in the project(s) development, Contractor shall send to Owner (i) one sample AutoCAD drawing for each discipline and (ii) if applicable, a sample hybrid drawing (containing a minimum of both a DWG and a raster image file).

3.3 If the Work involves any new or changed electrical cabling, Contractor shall also provide a cable tabulation compliant with Appendix 1 of this Exhibit.

4.0 Revisions to Existing Owner Drawings

4.1 Contractor shall update all Existing Owner Drawings to capture as-built conditions as a result of the Work (e.g., if an item depicted in an Existing Owner Drawing was wholly or partially demolished or removed as part of the Work, if the Work involved making interconnections with an item in the Existing Owner Drawings, if the Work involved making changes applicable to the Existing Owner Drawings, etc.).

4.2 Contractor shall make (and redline) such updates to Existing Owner Drawings using clouds/bubbles marked with the letter of the revision and submit each such update electronically in color PDF format as a sketch (SK) drawing. The drawing number shall be the letters SK followed by the existing plant drawing number. In

the event an entire Existing Owner Drawing is redlined as a result of demolition or removal from service, an SK drawing can be used to identify a drawing that is to be voided.

4.3 Notwithstanding the foregoing, if Owner requests, Contractor shall provide updates to Existing Owner Drawings in AutoCAD or Raster Hybrid AutoCAD format with redlines electronically corrected and submitted in the same format. All previous revision clouds/bubbles shall be removed.

5.0 Vector Based CAD Drawings

5.1 Except as provided in Section 6.0, below, all Project Records shall be vector based and saved in AutoCAD version 2013 format.

5.2 When using other CAD applications and performing conversions to AutoCAD, Contractor shall ensure that drawing attributes, block names, line types, line weights, font styles, dimension styles, etc. are properly converted. The converted file, when plotted, shall look substantially identical to the version created in the native CAD format. Prior to submittal of Project Records, Contractor shall provide sample electronic copies of converted files to review the conversion quality from native format to AutoCAD.

5.3 Drawings shall be bordered by a title block/border in the form provided by Owner, which shall be inserted as a **block** at the 0,0 coordinate in the "Layout1" paper space view such that the lower left hand corner of the sheet is at 0,0.

5.4 **Contractor shall not modify the Owner's title block/border in any way**. Without in any way limiting the preceding sentence, here are some examples: Contractor shall not (i) delete, revise, or add any attributes or layers to the Owner provided title block/border, (ii) explode or modify the Owner provided title block/border, (iii) insert the Owner provided title block/border using a different name, or (iv) change the Owner provided title block/border name, layer names, or modify the attribute tag names in Owner supplied title block/border**.**

5.5 The Contractor shall properly populate the title block attribute information. See Table 1 for example title block attributes and Figure 1 for samples of title blocks.

5.6 The "Title" attribute of the title block shall:

5.6.1 Match the description of the specific equipment or facilities depicted on that Engineered or Designed Drawing;

5.6.2 Use consistent and standardized abbreviations for drawing types; and

5.6.3 Not include the overall project name or project number in the title.

5.7 Contractor shall provide its company name in the "Original Source" attribute in the Owner provided title block/border. In addition, Contractor may insert its own

drawing information block, company name/logo, and/or PE stamp to the immediate left of Owner's title block as a separate AutoCAD block. This information shall not stand taller than Owner's title block. See Figure 1. **In no event may Contractor include in the title block, the Contractor's drawing information block, or anywhere else on the drawing any claim of intellectual property rights or proprietary rights with respect to (or limitations on the use of) the drawing or its contents.**

5.8 All non-dimensioned Engineered or Designed Drawings (such as electrical schematics, wiring, and connection diagrams, mechanical flow diagrams, and logic diagrams) shall be drawn at a 1 to 1 scale.

5.9 Contractor shall place a correctly oriented north arrow on each Engineered or Designed Drawing which depicts a physical/spatial arrangement.

5.10 Contractor shall provide Owner an estimated range of drawing numbers for each of the major disciplines (Architectural, Civil, Structural, Mechanical, Electrical) and by plant unit or common. Owner will provide a range of Unit-specific and/or common Owner drawing numbers to Contractor as required based on this information and Contractor shall assign drawing numbers from that range.

5.11 Engineered or Designed Drawing numbers shall be in the following format:

PLX-*-NNNNN-OOOO or SK- PLX-*-NNNNN-OOOO

Where-

***PLX** is the 3 or 4 digit plant and unit number (0=common)*

***** *is the engineering discipline (E-Electrical, C-Civil, M-Mechanical, A-Architectural, S-Structural)*

***NNNNN** is the 5-digit next available drawing number based on location AND discipline. Field must have the leading zeros padded to (5) digits such that drawing "432" would appear as "00432"*

***OOOO** is an optional Contractor-assigned 4-character alphanumeric describing a specific page or sheet number of the drawing. This field is optional but if used it shall be padded to (4) non-blank alphanumeric characters.*

***SK** used only if identifying a redlined existing plant drawing*

For example

GH3-E-12345-0001 or SK-GH3-E-12345-0001

Is drawing number 12345, with optional 0001 Contractor designation, for Ghent Unit 3 (and the second drawing number starting with SK is a redline of an Existing Owner Drawing).

5.12 Contractor shall provide its drawing number (if different than the Owner drawing number) in the "Alt_Drawing_No" attribute of the title block. Contractor may also include its drawing number in the Contractor's drawing information block (if included), however, all on-page and off-page drawing references shall utilize Owner's assigned drawing number.

5.13 Engineered or Designed Drawing number revisions shall follow the below requirements:

5.13.1 First preliminary drawings issued shall be labeled as Rev 1.

5.13.2 Subsequent drawing issued shall use revision 2, 3, 4 until drawing is issued for construction (IFC).

5.13.3 First IFC drawing shall be issued with a blank in the revision designation.

5.13.4 Subsequent revisions after IFC shall be A, B, C, D, etc. (skipping the letters "I" and "O")

5.13.5 Final submittal drawings shall have the last revision letter used after IFC.

6.0 Raster (or hybrid) Based CAD Drawings

6.1 When Contractor is modifying an Existing Owner Drawing pursuant to Section 4.2 and the Existing Owner Drawing is provided to Contractor other than in native CAD format, Contractor may employ hybrid CAD techniques to modify Existing Owner Drawings.

6.2 Contractor shall not use AutoCAD's *WIPEOUT* command to mask raster images. Contractor shall modify raster images using raster editing software such as Raster Design as provided by Autodesk.

6.3 Raster images shall be provided in a GP4 (CALs Group 4, Type 1), JPG, or TIF formats. Only one raster image per type may be inserted into a hybrid drawing.

6.4 Hybrid drawings shall be in a format that is properly viewable on Owner's system.

6.5 If an Existing Owner Drawing is provided to Contractor on paper, Contractor shall create applicable raster image by scanning at a minimum 400 DPI resolution. Higher resolutions shall be used if the drawing detail or quality warrants it.

6.6 Contractor shall remove the original raster title block. Contractor shall insert the compliant title block/border(s) in accordance with Section 5.3. The scanned image shall be visible in an AutoCAD viewport.

6.7 The provisions of Section 5 apply to Hybrid drawings.

7.0 Project Record AutoCAD Drawing Final Submittal

7.1 Contractor shall electronically submit to Owner all Engineered or Designed Drawings (in AutoCAD DWG format and back-up PDF images as produced from the native CAD application with the signed PE stamp if applicable and raster images (in the case of hybrid drawings)) with file names that match Owner drawing numbers.

7.2 Contractor may create Drawings using AutoCAD x-refs (.dwg external references) and/or links to other AutoCAD drawings but when the final drawing is submitted to Owner, all external drawing references shall be permanently bound into the drawing such that there is only one DWG file per drawing.

7.3 For Hybrid drawings, Contractor shall merge multiple insertions of the same type of raster image into a single raster image file with the same name as the DWG file except using the file extension of one of the approved raster formats.

7.4 Contractor shall embed photos, OLE objects, and AEC objects used in the creation of drawings, and explode AEC objects into basic AutoCAD objects in the final drawing submitted to Owner.

7.5 Each drawing shall be submitted under a different file name. For example, if three drawings are created using three different paper space views of the same model space, it shall be duplicated three times and only the view representative of the individual drawing shall be saved in the final file as "Layout1" in paper space. Any extraneous drawing entities in model space not pertaining to the drawing shall be deleted.

7.6 Contractor shall not use any non-standard AutoCAD fonts, textures, dimension styles, plot styles, etc. unless Contractor (i) receives Owner's prior written approval and (ii) provides a file of each such nonstandard item along with Project Record AutoCAD drawing submittal.

7.7 Contractor shall provide Owner with a CTB file for any drawings created with line weights based on color tables. Contractor shall give unique file names containing Contractor's name or initials to all non-standard support files (e.g., fonts, textures, CTB, etc.) submitted to Owner.

7.8 Contractor shall keep a backup copy of all electronic files provided to Owner until at least the end of all applicable warranty periods under the Contract.

7.9 Contractor shall provide all drawings and media under this Contract utilizing a process approved by Owner. Each such transmission shall include a drawing index in the form of the Excel spreadsheet provided by Owner.

8.0 Non-AutoCAD Project Records not required to be submitted in AutoCAD

Contractor shall submit Non-AutoCAD Project Records not required to be submitted in AutoCAD ("Non-AutoCAD Project Records") to Owner in accordance with the following minimum requirements.

8.1 Non-AutoCAD Project Records shall include, but not be limited to:

8.1.1 OEM Drawings - Component diagrams, part details, part assembly drawings, name plates, outline and arrangement details, data sheets, performance curves, procedure specifications, standard details, etc.

8.1.2 Other Documents - Instruction or operating manual, technical manual, maintenance manual, reports, parts catalog, equipment specification, photographs, aerial photographs, maps, correspondence, and all other relevant documentation.

8.2 Drawing and document numbers for Non-AutoCAD Project Records shall be assigned by the Contractor.

8.3 Non-AutoCAD Project Records shall be submitted in Adobe PDF format (or such other format and form as directed by Owner), except that photographs, aerial photos or maps, etc. shall be submitted in JPG format.

8.4 Contractor shall separate and identify Non-AutoCAD Project Records by document type (e.g., documentation, drawing, specification, manual, and map) and provide final Non-AutoCAD Project Records in electronic format or hard copy (or both) as requested by Owner.

8.5 Each Non-AutoCAD Project Record submitted in PDF format shall be a separate file with a unique filename.

8.6 Contractor shall keep a backup copy of all electronic files provided to Owner until at least the end of all applicable warranty periods under the Contract.

8.7 Contractor shall provide all drawings and media under this Contract utilizing a process approved by Owner. Each such transmission shall include an index of each file in the form of the Excel spreadsheet provided by Owner.

9.0 Timing for Submission of Final Project Records

The final version of all Project Records shall be submitted pursuant to this Exhibit and the Contract within 30 days of the completion of the Work (other than punchlist items and Work intended to be subsequently performed (such as warranty Work)).

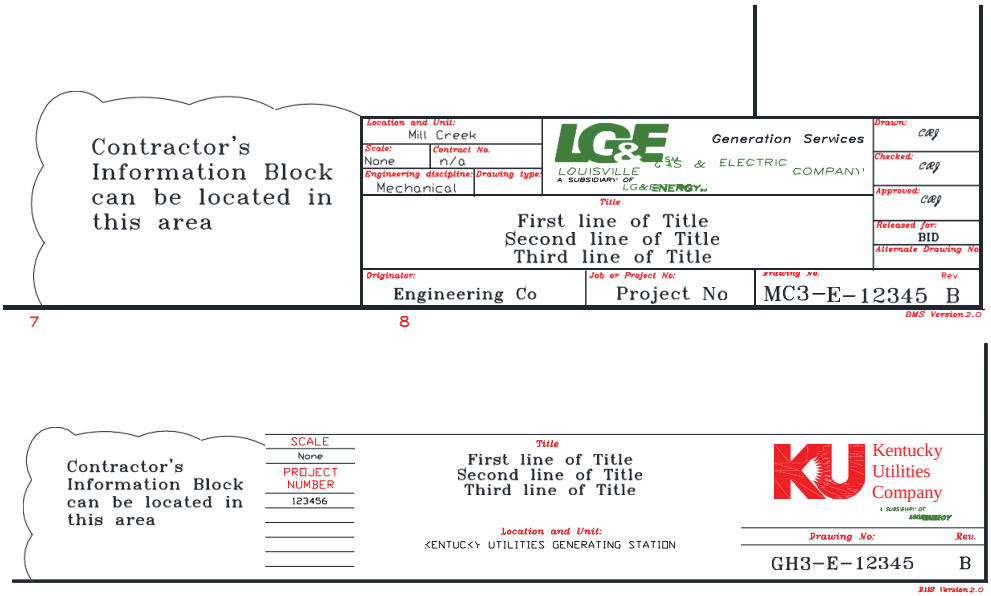
TABLES, FIGURES AND APPENDIX

TABLE 1 - Example Drawing Attribute Information for DMS Submission

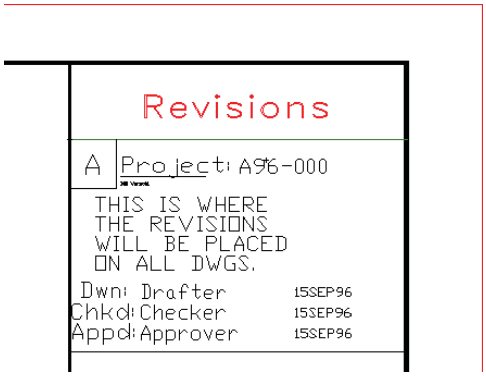
Field Name	Character Limit	Examples
Original Project Number	8	*As directed by Owner*
Drawing Number	20	*As directed by Owner*
Revision	1	Final: Nothing, then first revision: A or B or C. (skipping I and O) Preliminary or Design, 1, 2, 3
Alternate Drawing Number	20	Contractor internal drawing number (optional)
Original Source	20	Contractor Company Name
Original Creation Date	8	12/01/00
Latest Revision Date	8	12/31/00
Title	96	Descriptive title
Location	4	MC4 or TC1 or GH0 (0=common systems)
Engineering Discipline	1	E=electrical, C=civil, M=mechanical, A=architectural, S=structural
Sub Discipline	Any	wiring, schematic, flow or P&ID, logic, site plan, foundation, piping, details, steel, etc.
Drawing size	1	D or E, etc.
Scale	Any	¼"=1', none, as noted, etc.
CAD Filename	Any	File name shall match Owner drawing number and shall not contain any spaces.
Release Reason	Any	Construction, Approval, Reference, Sketch etc

FIGURE 1 - Sample Title Blocks

(Other versions and formats are available)



For Owner Title Block/borders. Contractor to recreate for revision information.



APPENDIX 1 - Electronic Submission of Cable Tabulation Records

1.0 Introduction

1.1 This data submittal would be used for custom engineered projects or systems where individual wires and cables are tracked throughout the design process. This document would typically be provided to Architects and Engineering firms. It is the responsibility of the Architect or Engineering Firm to ensure that each of their subcontractors who may be supplying cable tabulations receives and follow these submittal requirements.

1.2 LG&E / KU Generation utilizes one application for electronic storage and retrieval of cable tabulation records:

Drawing Management System (with Cable Tab Management)

1.3 Project records are to be submitted to the LG&E / KU project manager per these specifications.

1.4 Final documentation shall include the most recent revisions and up to date information, including as-builts or as-delivered modifications to be submitted within 30 days of project completion.

1.5 This document sets forth the basic guidelines for electronic cable tab records and document submittal. Since technology is constantly evolving, file formats and application versions listed in this document are subject to mutually agreeable change.

1.6 In addition to these specifications LG&E / KU has other document submittal requirements as listed below:

- LKE_DMS-Q_09.18 - Specifications for Electronic Submittal of Project Records

NOTE: Not all specifications will be applicable to all projects.

1.7 For questions concerning anything in this document please contact Generation Services - Document Management.

2.0 Drawing Management System - Cable Tab Records

2.1 This specification provides minimum requirements on how information shall be provided electronically to LG&E / KU.

2.2 Unless otherwise specified in the contract or purchase order final cable records are to be submitted in electronic format.

2.3 In addition, electronic submissions may be requested via e-mail, and hard copies may be required.

2.4 Unless otherwise specified in the contract or purchase order LG&E / KU will provide a range of LG&E/KU cable numbers to the Contractor as required for the project.

Cable numbers shall be generated using the following format:

GH3-AN-12345

Where-

***GH3** is the 3 or 4 digit plant and unit number (0=common)*
***AN** is the system code (Each plant has its onset AND will be provided)*
***12345** is the 5-digit next available cable number based on location AND system code. Field must have the leading zeros padded to (5) digits such that cable "432" would appear as "00432".*

Cable revisions shall start with the letter "A" and proceed through the alphabet skipping the letters "I" and "O".

2.5 If more than 20 records are to be submitted, the information indicated in TABLE 1 shall be provided for each cable tab number for storage into DMS. The index shall be submitted electronically in Excel or Access format.

TABLE 1 - Typical Information for Cable Tab Record Data Submission

Field Name	Character Limit	Examples
Cable Number	12	*The actual number of the cable as listed on the cable sheet. On new cables the number can be automatically assigned. Ex. GH4-SS-10000*
Location Code	3	*The location is the plant and generating unit for which the cable was created. Ex. GH1 - Ghent Unit 1*
Plant System	3	*An organization of similar equipment related to various portions of the plants. Ex. CH – Coal Handling*
Page No.	4	*The page number or tab that the cable information is on.*
Physical Status Code*	1	*The physical status code indicates the cables current status in its physical state. See chart for additional information.*
Service	125	*This is the service or function that the cable is being used for.*
Conductor Quantity	3	*The number of conductor(s) in a cable.*
CT From/To Equip Desc	100	*The equipment name and description the cable(s) runs "to" and "from".*

CT From/To Wiring Dwg	20	*The wiring drawings that the cable(s) runs "to" and "from".*
Cable Quantity	3	*The number of individual cables ran together under a single cable number.*
Cable Construction*	15	*This is an abbreviated construction description of hoe the cable is made.*
Conductor Size*	10	*The physical size of the individual wire(s) in a cable.*
Ground Conductor Size	10	*The physical size of the ground wire(s) in a cable.*
Cable Type*	10	*Is what the cable is actually being used for. (i.e. power, data, control)*
Rated Voltage*	10	*The ANSI maximum voltage rating the cable(s) or individual conductor(s) can handle.*
Insulation Type	10	*The material used to insulate the individual conductors(s) of a cable.*
Jacket Type	10	*The material used to insulate the cable and its conductor(s).*
Cable Length	4	*The length of the cable "to" and "from" equipment.*
CT From/To Physical Dwg	20	*The physical drawing that the cable(s) runs "to" and "from".*
CT Sch Dwg	20	*The schematic drawing that is associated with the cable(s).*
Raceway Type*	10	*The material used to contain and support the cable that runs in between the "to" and "from" location.*
Routing	339	*An overall description of how the cable is ran "to" and "from".*
Raceway Size*	10	*The size of the raceway type.*
CT Drawing Num	20	*The drawing number that is on the cable tab sheet where the cable exists.*
BOM Item	35	*This is the project number or what the cable was billed to or ordered under.*
Comments	120	*A general area for any additional information.*

* See TABLE 2 for valid field contents

TABLE 2 - Valid Field Contents

Cable Construction	Cable Type	Conductor Size	Insulation & Jacket	Raceway Size	Raceway Type	Rated Voltage	Physical Status Code
C CTRL	CTRL	26 awg	EPR	1/2	EMT	45V	1 Installed
C PWR	PWR	24 awg	HYP	3/4	IMT	50V	2 Demolished
C w/gnd	INST	22 awg	N	1	RAC	150V	3 Abandoned
C w/gnd ALX	DATACOM	20 awg	PVC	1 1/2	RMC	300V	4 Spare
C w/gnd STX	ND	18 awg	SIS	1 1/4	PVC	600V	5 TBD
C ALX		16 awg	THHN	2	PVC-80	800V	
PR		14 awg	THWN	2 1/2	SBT	900V	
PR E-TC		12 awg	XLPE	3	VBT	1KV	
PR J-TC		10 awg	CPE	3 1/2	LDT	2KV	
PR K-TC		9 awg	ETFE	4	CT	2.5KV	
PR CRC		8 awg	EPDM	4 1/2	TD	4KV	
TR		6 awg	FEP	5	ST	4.5KV	
C STX		4 awg	Glass	6	ND	5KV	
SHLD		2 awg	Nylon	4" tray		8KV	
C5		1 awg	PE	6" tray		12KV	
CX		1/0 awg	PFA	9" tray		15KV	
FO		2/0 awg	PTFE	12" tray		17KV	
ND Control		3/0 awg	TFE	18" tray		18KV	
ND DataCom		4/0 awg	TPE	24" tray		22KV	
ND Power		250 MCM	ZH	30" tray		23KV	
ND Instrument		300 MCM	B-Fiber	36" tray		25KV	
		350 MCM	CEFIR	ND		27KV	
		400 MCM	SR			35KV	
		500 MCM	ND			45KV	
		600 MCM				75KV	
		750 MCM				ND	
		1000 MCM					
		1250 MCM					
		1500 MCM					
		1750 MCM					
		2000 MCM					
		2500 MCM					
		3000 MCM					
		ND					

2.6 Any existing cables that are modified or deleted shall be included in the index and noted as such by usage of the Physical Status Code.

2.7 Once the final copy is released to LG&E / KU, LG&E / KU will become the proprietor of the electronic record. LG&E / KU will take full responsibility for all future modifications and their subsequent liability.

2.8 The Contractor shall keep a backup copy of all electronic data provided to LG&E / KU for a minimum of 1 year from the date sent to LG&E / KU.

MASTER CONTRACT
With
HDR Engineering, Inc.

FOR

GENERAL ENGINEERING SERVICES

CONTRACT NO.
LG&E - 881146
KU - 546322

820 West Broadway
Louisville, KY 40202

TABLE OF CONTENTS

Master Contract

For

General Engineering Services

This Master Contract for General Engineering Services is made and entered into as of the **8th day of May, 2013** (the "Effective Date"), between HDR Engineering, Inc. ("Engineer"), a corporation organized under the laws of the State of Nebraska, and LG&E and KU Services Company ("Servco"), a Kentucky corporation whose address is 820 W. Broadway, Louisville, KY 40202. Engineer, Servco, and each Servco Party may be referred to herein individually as a "Party" or collectively as the "Parties."

W I T N E S S E T H

WHEREAS, Servco and Engineer desire to set forth the general terms and conditions applicable to all professional design, engineering, consulting, and field technical services of Engineer provided to any Servco Party;

NOW, THEREFORE, in consideration of the mutual promises set forth herein, and intending to be legally bound hereby, the Parties hereby agree as follows:

ARTICLE 1 – DEFINITIONS AND STATEMENT OF SERVICES

A. DEFINITIONS

The following words and phrases shall have the following meanings for the purpose of this Master Contract for General Engineering Services:

(1) "Affiliate" as used herein shall mean with respect to a Party, an entity controlled by, controlling, or under common control with that Party.

(2) "Buyer" or "Buyers" as used herein means with respect to a Services Contract, those Servco Parties obtaining engineering services under that Services Contract.

(3) "Buyer's Authorized Representative" as used herein shall mean with respect to a Services Contract, (a) the person whose signature is affixed to the Services Authorization for Buyer, (b) Buyer Contract Administrator (as defined below), or (c) any other person to the extent authorized to act for Buyer and acting within that person's authority.

(4) "Buyer Contract Administrator" as used herein shall mean with respect to a Services Contract, the Buyer person assigned by Buyer from time to time to coordinate all commercial issues under the Services Authorization.

(5) "Buyer Project Manager" as used herein shall mean with respect to a Services Authorization, the Buyer person assigned by Buyer from time to time to coordinate all technical and schedule issues under the Services Authorization.

(6) "Contract" or "Contract Documents" as used herein shall mean this Contract, including all Exhibits attached hereto.

(7) "Engineer Personnel" as used herein shall mean all employees, officers, directors, agents, and consultants of Engineer and/or Subcontractors.

(7) "Engineer Personnel" as used herein shall mean all employees, officers, directors, agents, and consultants of Engineer and/or Subcontractors.

(8) "Maximum Cost" as used herein shall mean Engineer's guaranteed not-to-exceed cost to Buyer to perform the Work under a Services Authorization, including contingency.

(9) "Plant" as used herein shall mean the facility or facilities for which the Work is to be performed pursuant to a Services Authorization, its accompanying equipment and related facilities.

(10) "Professional Standard" shall mean and refer to the practices, methods, standards and performance of the Work in accordance with the degree of judgment and skill that is ordinarily possessed and exercised by (and generally accepted as being appropriate for) nationally recognized design, engineering and construction professionals of good standing and who are diligently and responsibly performing work for projects that are of similar scope, nature and complexity as the project as of the effective date of the relevant Services Authorization.

(11) "Project Specifications" as used herein shall mean the administrative requirements and technical specifications including the drawings and design criteria, if any, referred to in the Services Authorization, and any changes that may be made with respect thereto from time to time by Buyer.

(12) "Services Authorization" as used herein shall mean a document executed by Buyer (either manually or mechanically) (or, pursuant to Section 1.B(4), an oral direction) specifying the Work to be performed by Engineer and any Supplementary Terms.

(13) "Services Contract" as used herein shall mean the separate contract between Engineer and Buyer formed when either (i) Engineer executes and delivers a Service Authorization to Buyer or (ii) Engineer commences performance of the Work set forth in the Services Authorization. The terms of such contract shall consist of the terms of the Services Authorization along with the terms of this Contract. If there is any conflict between the terms of the Services Authorization and the terms of this Contract, the terms of this contract shall prevail unless the Services Authorization is in writing and explicitly indicates an intention to supersede the applicable term of this Contract. Engineer acknowledges and agrees that the Buyer(s) under the Services Contract shall be the only entity among Servco and its Affiliates obligated under such Services Contract.

(14) "Servco Parties" means Servco and those Affiliates of Servco listed on Exhibit G (as Exhibit G may be amended from time to time by Servco in its sole discretion), that by executing Exhibit G have agreed to be parties to this Contract.

(15) "Subcontractor" as used herein shall mean any individual, person, partnership, corporation, joint venture, or other entity, at any time employed or otherwise engaged by Engineer to perform any portion of the Work.

(16) "Supplementary Terms" as used herein shall mean any additional terms and conditions imposed on Engineer under a Services Authorization, in addition to those set forth in this Contract, including, for example, the kind of terms referred to in Exhibit E hereto.

(17) "Work" as used herein shall mean any or all of Engineer's services under a Services Contract as described in Exhibits A, B and the Services Authorization (including, without limitation, warranty work).

B. STATEMENT OF WORK

(1) Engineer shall furnish the necessary management, personnel, supervision, materials, equipment and facilities and otherwise provide all services necessary to perform the Work. Engineer shall perform the Work in accordance with the specific Services Contract. Engineer shall perform and complete all of its obligations pursuant to each Services Contract in accordance with Professional Standard.

(2) From time to time Buyer may provide Engineer with a written request for quotation for proposed Work on a specific project (a "Request for Services Quotation") including therewith a statement identifying the Work to be performed, schedule information including any required completion date(s), the name of the assigned Buyer Project Manager or Buyer Authorized Representative and any other information and/or requirements deemed pertinent to the Work sought to be performed. Within fourteen (14) calendar days, unless a longer time is specified, after receipt of any such Request for Services Quotation, Engineer shall, at no cost to Buyer, provide a realistic and reasonable written quotation to perform the Work to Buyer, which quotation shall acknowledge receipt of the Request for Services Quotation and be binding on Engineer for ninety (90) calendar days. The quotation shall set forth (a) proposed start and completion dates for Engineer Personnel based on Buyer's stated requirements, (b) a statement of man-hours by discipline/classification needed to complete the Work set forth, (c) Maximum Cost in the format provided in the Request for Services Quotation, and (d) all additional information specifically requested by Buyer via the Request for Services Quotation all in accordance with this Contract.

(3) Upon receipt by Buyer of Engineer's quotation for any such Request for Services Quotation, the Buyer Project Manager shall review Engineer's quotation. If Buyer has questions regarding Engineer's quotation, then Buyer may arrange a meeting at a location convenient to Buyer, at no cost to Servco or Buyer, with Engineer's authorized representative(s) for the purpose of discussing the Request for Services Quotation and Engineer's quotation. If Buyer and Engineer reach agreement, then Buyer shall prepare a Services Authorization memorializing such agreement.

(4) During extreme or emergency conditions, as determined by Buyer, Buyer may, in the interest of saving time, elect to issue an oral or written Services Authorization without reference to the procedures described in sections 1.B(2) and 1.B(3) above. Such Services Authorization may include a detailed Work statement, a description of the applicable quality assurance program, a description of schedule milestones, starting and completion dates, required qualifications of Engineer's project team members, the name of Buyer Project Manager, and/or any other information or requirements deemed pertinent to the Work to be performed. In the event an oral Services Authorization is issued, (i) Engineer shall commence performance of such Services Authorization as soon as reasonably possibly, (ii) Engineer shall send a written notice pursuant to Article 34 to Buyer that Engineer has commenced work under such oral Services Authorization, and (iii) a written Services Authorization shall be provided by Buyer within two (2) working days of such oral Services Authorization. Within seven (7) calendar days of issuance of an oral Services Authorization, Engineer shall furnish Buyer with all information required to be supplied by Engineer in response to a Request for Services Quotation under Section 1.B(2) in order that Buyer and Engineer may, if they determine to do so, amend the Services Authorization by execution of a Change Order pursuant to Article 15. Buyer may suspend the Work commenced under this Section 1.B(4) at any time upon notice to Engineer, and in such event Engineer shall be entitled to reimbursement for travel expenses reasonably incurred by Engineer in connection with such suspension. For the purposes of this Section 1.B(4), extreme or emergency conditions include those tasks required to place the Plant in a safer condition, tasks defined by Buyer as "around-the-clock work," or tasks required to avoid or end a Plant shutdown. These notifications may occur both within and outside the normally expected work week hours, thus requiring an "after hours response team" to be maintained by Engineer.

(5) Except as otherwise provided for in section 1.B(4) above, Engineer shall not commence performance of any Work covered by a Request for Services Quotation pursuant to this Contract until it has received from Buyer a signed written Services Authorization authorizing Work thereon.

(6) Should, in Buyer's opinion, a specific project not lend itself to the Maximum Cost concept contained in this Contract, then Engineer shall furnish pricing in the form and format requested by Buyer. In addition to the required pricing, Engineer may propose alternate pricing for any project.

(7) All agreements (other than those explicitly stating that this Contract does not apply) between Engineer and any one or more Servco Parties specifying work to be performed by Engineer shall (a) constitute a Services Contract under this Contract and (b) be governed by the terms of this Contract.

ARTICLE 2 - BUYER PROJECT MANAGER

The Buyer Project Manager shall resolve any technical and schedule questions that Engineer may have concerning Work performed or to be performed. Engineer shall contact the Buyer Project Manager if and as necessary to obtain Technical Direction (as defined in Article 4), required files, drawing formats, drawing number assignments, Bill of Material (B/M) sheet numbers, B/M item numbers or other Buyer tracings and/or other material relating to the performance of any Services Contract issued hereunder, as well as with respect to any questions and/or interpretations that may arise or be required related to technical direction in the course of performance of such Work.

ARTICLE 3 – COMPENSATION AND INVOICING

A. Compensation

Engineer shall be compensated for performance of Work in accordance with Exhibit C and the Services Contract.

B. Invoicing

(1) Invoices shall include the level of detail set forth in each Services Contract, but in no event less detail than is necessary for Buyer to identify the type, date(s), quantity, and dollar amount of Work done; and invoices shall be submitted monthly by Engineer.

(2) Engineer's work tracking and cost accounting system shall utilize electronic data processing techniques. It is Buyer's intent to provide for potential direct data transfer into Buyer's corporate and financial accounting system. Engineer shall support this program by reasonable changes in its cost tracking system for this Contract when so requested.

(3) All invoices shall be accompanied by documentation, satisfactory to Buyer, sufficient to support details as a prerequisite to payment. In those cases that do not include direct data transfer into Buyer's corporate and financial accounting system, paper invoices shall be submitted to Buyer at the address set forth in the relevant Services Contract.

(4) Buyer shall pay to Engineer the amount set forth in each correct invoice, as determined by Buyer, within thirty (30) days after Buyer's receipt thereof, subject to Section 3.D below.

(5) The costs of any overtime associated with any Work performed shall not be incurred or invoiced unless authorized as described in Article 6.

C. Buyer reserves the right to withhold payments otherwise due under a Services Contract in whole or in part for (i) any breach by Engineer of the material terms or provisions of this Contract or such Services Contract, (ii) any claim Buyer has against Engineer, or (iii) invoicing in excess of the Maximum Cost or other agreed upon pricing.

D. The balance of any amounts retained by Buyer pursuant to Section 3.C(i) above shall be due and payable to Engineer within thirty (30) calendar days subsequent to Engineer curing such breach, remedying any damage caused thereby, and providing written notice to Buyer of such cure and remedy and that the withheld amounts are due.

E. Payment to Engineer by Buyer of any amounts pursuant to this Contract shall not relieve Engineer of the responsibility for performing its Work in accordance with the Services Contract.

F. In no event shall the compensation due Engineer from Buyer with respect to a Services Contract (including, without limitation, for labor and reimbursable expenses) exceed compensation provided for in the Services Contract (including any total Maximum Cost or lump sum price established in the Services Contract), as

modified (if applicable) pursuant to Article 15. Regardless of whether Engineer's costs exceed the amount it is entitled to for compensation, Engineer shall (i) have no right to stop Work by reason of such fact, (ii) complete the Work in accordance with the Services Contract, and (iii) be responsible for all costs incurred by or on behalf or account of Engineer in connection with providing the Work.

G. The labor multiplier of 2.95 will remain in effect three years from the Effective Date. Any revision to the labor multiplier thereafter shall be subject to mutual agreement of the Parties.

H. Prior to being entitled to receive final payment from Buyer under any applicable Services Contract, Engineer shall (a) complete all authorized Work thereunder as evidenced by receipt of notification from the assigned Buyer Project Manager that no additional Work is required with respect to such Services Contract; (b) settle any claims against Buyer on account of the Services Contract and otherwise satisfy all requirements under the Services Contract; and (c) execute a release of claims pursuant to Article 27 and provide such release to Buyer and Servco.

ARTICLE 4 - TECHNICAL DIRECTION

A. At all times during performance of the Work, the Buyer Project Manager shall have the right to issue written directions to Engineer that redirect Engineer's effort, shift the emphasis between tasks, require pursuit of certain lines of inquiry, fill in details, or otherwise serve to accomplish the Work being pursued (herein referred to as "Technical Direction"). Engineer shall allow Buyer to review the Work while in progress (and shall provide Buyer with summary calculations). Buyer shall also have the right to review and accept or reject any procedures (including, without limitation, the quality assurance program) to be employed in the conduct of the Work. Nothing contained in this section 4.A shall be construed as relieving Engineer of its responsibilities under the Services Contract. All Technical Direction furnished by Buyer under this section 4.A must be in writing and within the scope of Work stated in a Services Contract.

B. Any Technical Direction having the effect of assigning additional work outside the general scope of, or constituting a change to, or materially affecting the time required for performance of, or changing substantially any of the terms, conditions, or specifications of the Work issued pursuant to this Contract must be authorized in writing by Buyer in accordance with Article 15 before Engineer proceeds with implementation thereof. Any such additional work undertaken by Engineer without such prior written approval from Buyer shall be at Engineer's risk and expense.

ARTICLE 5 – PERFORMANCE STANDARDS

A. Engineer shall perform and complete the Work in accordance with Professional Standards, Applicable Laws (as defined in Article 14), and the requirements of this Contract and each Services Contract.

B. Engineer shall at its own expense in a timely manner correct all breaches of its agreement set forth in section 5.A and be responsible for any and all damages resulting from such breaches. If Engineer fails to timely and properly correct a such a breach, Buyer, without prejudice to any other rights or remedies Buyer may have with respect to this Contract and/or the applicable Services Contract (including declaring Engineer in default, and with or without terminating this Contract and/or the applicable Services Contract) may, but shall not be obligated to, correct such breach at Engineer's expense (including Buyer's internal, general, and administrative expenses) (the "Expense") and Buyer shall have the right to (i) deduct the amount of the Expense from amounts due or to become due to Engineer and (ii) obtain reimbursement from the Engineer therfor.

C. Any direction, consent, acceptance, or other action provided by Buyer in connection with Articles 4, 5, 8, 18, 21, 22, 30, 32, Exhibit A, or a Services Contract shall not relieve Engineer of its obligations, responsibility for the quality of its Work, or for the accuracy, completeness, and sufficiency of the designs, services and other aspects of its Work under the Contract Documents or for providing Work in accordance with the applicable Services Contract.

ARTICLE 6 - OVERTIME

Except as provided otherwise in this Article 6, (a) Engineer shall not be entitled to any premium for overtime except to the extent that Buyer has given specific prior written approval, including by a Services Contract or Change Order executed by the pursuant to Article 15, and (b) Engineer shall not be entitled to compensation or premium for any overtime undertaken by Engineer Personnel except to the extent that Engineer is liable for such compensation or premium to the applicable Engineer Personnel. Nothing in this Article 6 shall be construed to prevent or delay the immediate start of critical or "around-the-clock work" based upon an oral Services Contract, as provided for in Section 1.B(4).

ARTICLE 7 - OWNERSHIP OF WORK PRODUCT

A. All reports, recommendations, design criteria, specifications, drawings, designs, bills of material, technical data, calculations, computer inputs and outputs, sketches and any information contained therein developed or furnished by Engineer in connection with its performance under this Contract, including without limitation all Work, designs, and Design Documents (collectively, "Work Product") shall become the sole property of Buyer. Engineer hereby assigns all intellectual property rights in the Work Product and, at Buyer's cost, Engineer shall cooperate with Buyer in the filing of any application for patents, copyrights or trademarks arising out of such Work Product.

B. The originals of any Work Product hereunder shall be delivered to Buyer upon the earlier of completion or termination of Engineer's Work under the relevant Services Contract.

C. Such documents are not intended or represented to be suitable for reuse by Buyer or others on extensions of the Project or any other project. Any such reuse or modification without the written verification or adaption by Engineer, as appropriate for the specific purpose intended, will be at Buyer's or Buyer's Affiliate's sole risk and without liability of legal exposure to Engineer.

ARTICLE 8 - TERM OF CONTRACT, TERMINATION AND SUSPENSION

A. TERM

This Contract shall become effective on the Effective Date and unless terminated earlier as provided for in this Article 8 shall remain in full force and effect for a period of five (5) years (the "Initial Term"). Notwithstanding the foregoing, this Contract shall automatically renew for an additional period of five (5) years (a "Renewal Term") at the end of the Initial Term and each Renewal Term unless either Servco or Engineer gives the other notice of non-renewal at least thirty (30) days prior to the expiration of the Initial Term or Renewal Term, as applicable. Any Services Contracts entered into prior to the expiration of the Initial Term (or, if applicable, any Renewal Term) and this Contract to the extent it relates to such Services Contracts, shall remain in full force and effect notwithstanding any such expiration.

B. TERMINATION

(1) Servco may terminate this Contract, and the applicable Buyer may terminate any Services Contract, or any portion of the Work to be provided under a Services Contract (a) for its convenience, without cause and without any requirement of changed circumstances related to this Contract or a Services Contract, or (b) for default by Engineer. The termination shall be effective upon written notice to Engineer; provided that if the termination is for default by Engineer, then the applicable Servco Party may not

provide such a termination notice unless it first provides written notice to Engineer describing the default and Engineer fails to either (i) cure such default within ten (10) days after receipt of such notice or (ii) if such default is not susceptible to being cured within such ten (10) day period, provides within such ten (10) day period a written plan acceptable to the applicable Servco Party to cure such default as expeditiously as practicable and thereafter continuously and diligently implements such plan and effects such cure to the satisfaction of the applicable Servco Party. Immediately upon the effective date of termination, Engineer shall stop work to the extent specified in the notice of termination, take all steps consistent with the protection of Buyer's interests with regard to any subcontract(s) then in force or pending, and assemble all Work and/or Work Product and background data for delivery to Buyer. If this Contract is terminated, any Services Contracts that are not also terminated, and this Contract to the extent it relates to such Service Contracts, shall remain in full force and effect.

(2) Upon termination of a Services Contract by Buyer pursuant to Section 8.B(1), Engineer shall be entitled to submit invoicing and receive payments as follows: (a) with respect to a time and materials based Services Contract for Work that has been completed and accepted by Buyer, Buyer shall pay Engineer the compensation at the rates set forth in the applicable Services Contract (provided, that for Services Contracts that include a Maximum Cost, such compensation shall not exceed such Maximum Cost multiplied by the percentage of the Work under the Services Contract that has been completed by Engineer determined in accordance with the percentage completion method under generally accepted accounting principles minus any amounts previously paid to Engineer under the Services Contract), or (b) with respect to a firm priced Services Contract, Buyer shall pay Engineer the firm price multiplied by the percentage of the Work under the Services Contract that has been completed by Engineer determined in accordance with the percentage completion method under generally accepted accounting principles minus any amounts previously paid to Engineer under the Services Contract; provided, however, if the termination is pursuant to Section 8.B(1)(b), Buyer shall be entitled to withhold from any such payment an amount Buyer reasonably believes is necessary to offset any loss or damage Buyer may incur as a result of Engineer's default (and, if the invoiced amount is less than such losses and damages, Engineer shall pay the shortfall to Buyer).

C. BANKRUPTCY/INSOLVENCY

In the event of Engineer's bankruptcy or insolvency, or in the event of initiation of any proceeding, voluntary or involuntary, against Engineer under the bankruptcy or insolvency laws, or in the event of Engineer's failure to meet its debts in the ordinary course of business, Servco shall have the right to terminate this Contract pursuant to the terms of Section 8.B (but without the requirement that Engineer be given an opportunity to cure), for the purpose of which such termination shall be deemed to be a termination for default by Engineer. Nothing contained in this Section 8.C shall limit the rights or remedies of Servco or Buyer at law or in equity.

D. SUSPENSION

Buyer may, at any time, issue a directive to Engineer to suspend for a period of time all or part of the Work called for by this Contract. Upon receipt of any such directive, Engineer shall forthwith comply with its terms and take all reasonable steps to minimize the incurrence of costs allocable to the Work covered by the suspension directive during the period of work stoppage. In the event that such a suspension directive is issued by Buyer, Engineer shall be entitled to recover its actual costs reasonably incurred in connection with such suspension, as well as an adjustment of the schedule for completion of the related Work. Any other deletions, additions, or changes to the Work shall be by Change Order agreed upon by Buyer and Engineer pursuant to Article 15.

ARTICLE 9 - FORCE MAJEURE AND NOTICE OF DELAY

A. For purposes of this Article 9, an "event of Force Majeure" shall mean: acts of civil or military authority (including courts and regulatory agencies), acts of God (excluding weather conditions other than hurricane, tornado, fifty-year or greater flood, and other similarly unusual and severe climactic conditions), war, riot,

terrorism, insurrection, blockades, embargoes, sabotage, epidemics, riots or strikes or other concerted acts of workers (other than those of the affected Party or its subcontractors), or any similar events.

B. Whenever either Buyer or Engineer has knowledge that any event of Force Majeure or other situation is delaying or threatens to delay the timely performance of any of its obligation called for by a Services Contract, it shall immediately give written notice thereof, including all relevant information with respect thereto, to the other, and shall exercise due diligence to mitigate the effects of the event of Force Majeure.

C. Subject to the provisions of this Article 9, the time for performance under the applicable Services Contract (including the transmittal of monies but not the obligation to pay) shall be equitably adjusted for a period of time necessary to overcome the effect of the event of Force Majeure (and such extension of time shall constitute the sole remedy of either Buyer or Engineer with respect to such event of Force Majeure), provided that:

(1) Neither Buyer nor Engineer may claim the benefit of this Section 9.C except to the extent the delay is due to causes beyond its reasonable control and without its fault or negligence;

(2) Neither Buyer nor Engineer may claim the benefit of this Section 9.C except to the extent it uses all reasonable diligence to mitigate the effects of the event of Force Majeure as quickly as practicable; and

(3) In all cases the time extension due to an event of Force Majeure shall be held to a minimum but under no circumstances shall it exceed the actual time lost.

ARTICLE 10 - INSURANCE

For the entire duration of the Contract and any Services Contract with respect to any Services Contract issued under this Contract, Engineer shall provide and maintain, and unless otherwise mutually agreed upon in writing shall require any of its Subcontractors to provide and maintain, the following insurance (and, except with regard to Workers' Compensation and Professional Liability, naming Servco and Buyer as an additional insured and waiving rights of subrogation against Buyer and Buyer's insurance carrier(s)), and Engineer shall submit evidence of such coverage(s) of Engineer to Buyer prior to the start of the Work.

A. Workers' Compensation and Employer's Liability Policy, which shall include:

(1) Workers' Compensation (Coverage A), with statutory limits, and in accordance with the laws of the state where the Work is performed;

(2) Employer's Liability (Coverage B) with limits of One Million Dollars ($1,000,000) Bodily Injury by Accident, each Accident, $1,000,000 Bodily Injury by Disease, each Employee;

(3) Thirty (30) Day Cancellation Clause; and

(4) Broad Form All States Endorsement.

B. Commercial General Liability Policy, which shall have limits of One Million Dollars ($1,000,000) each occurrence; One Million Dollars ($1,000,000) Products/Completed Operations Aggregate each occurrence; One Million Dollars ($1,000,000) Personal and Advertising Injury_each occurrence, in all cases subject to Two Million Dollars ($2,000,000) in annual aggregate for all such claims, and including:

(1) Thirty (30) Day Cancellation Clause;

(2) Blanket Written Contractual Liability to the extent covered by the policy against liability assumed by Engineer under this Contract;

(3) Broad Form Property Damage; and

(4) Insurance for liability arising out of blasting, collapse, and underground damage (deletion of X, C, U Exclusions).

C. Commercial Automobile Liability Insurance covering the use of all owned, non-owned, and hired automobiles, with a bodily injury, including death, and property damage combined single limit of One Million Dollars ($1,000,000) each accident with respect to Engineer's vehicles assigned to or used in performance of Work under this Contract.

D. Umbrella/Excess Liability Insurance with limits of Two Million Dollars ($2,000,000) per occurrence; Two Million Dollars ($2,000,000) annual aggregate, to apply to employer's liability, commercial general liability, and automobile liability.

E. To the extent applicable, if any fixed wing or rotor craft aircraft will be used by Engineer in performing the Work, Aircraft Public Liability Insurance covering such aircraft whether owned, non-owned, leased, hired or assigned with a combined single limit for bodily injury and property damage of Five Million Dollars ($5,000,000) per occurrence and in the aggregate including passenger liability coverage.

F. Professional Liability Insurance with limits of Three Million Dollars ($3,000,000) per claim, which shall have a retroactive date reasonably satisfactory to Buyer and shall be maintained at least three (3) years after the completion of all Work under all applicable Services Contracts has been completed.

G. The above policies to be provided by Engineer shall be written by insurance companies that are both licensed to do business in the state where the Work will be performed and having a Best Rating of not less than "A-". These policies shall be primary to any policies carried by Servco or any of its Affiliates and shall be reasonably acceptable by Servco. These policies shall not be materially changed or canceled except with thirty (30) days written notice to Servco from Engineer and, with respect to cancellation, the insurance carrier. Evidence of coverage and notification of cancellation or other changes shall be mailed to:

Manager, Supply Chain
LG&E and KU Services Company
P.O. Box 32020
Louisville, Kentucky 40232

H. Buyer reserves the right to request and receive any of the above policies or endorsements; however, Buyer shall not be obligated to review any of Engineer's certificates of insurance, insurance policies, or endorsements, or to advise Engineer of any deficiencies in such documents. Any receipt of such documents or their review by Buyer shall not relieve Engineer from or be deemed a waiver of Buyer's rights to insist on strict fulfillment of Engineer's obligations under this Contract.

I. Engineer shall provide notice of any accidents or claims at the Work site to, as applicable:

Manager, Risk Management
LG&E and KU Services Company
P.O. Box 32030
Louisville, Kentucky 40232

and Buyer's Authorized Representative

ARTICLE 11 - INDEMNITY

"Buyer Parties" shall mean Servco and Buyer (and all of their Affiliates), and all of their respective directors, officers, agents and employees, successors, and assignees; "Engineer Parties" shall mean Engineer, its directors, officers, agents

and employees, as well as any Subcontractors of Engineer, at any tier, and the Subcontractor's directors, officers, agents and employees, and each of them; "Claims" shall mean claims, demands, suits or causes of action, whether at law or in equity, and whether based on statute, regulation, rule, ordinance, code, or standard or on theories of contract, tort, strict liability or otherwise; and "Losses" shall mean any and all losses, liabilities, fines, fees, penalties, or damages, including the costs of settlements, judgments, and direct expenses including reasonable attorneys' fees (including reasonable attorneys' fees incurred in establishing the right to indemnity hereunder). Engineer shall indemnify, defend, and hold harmless Buyer Parties against all Losses related to Claims brought against Buyer Parties by or on behalf of:

A. Persons other than Buyer, Servco, or Engineer with respect to injuries (or death) to persons or damage to property to the extent arising from or in any manner relating to the negligent acts or omissions or willful misconduct of any of the Engineer Parties, whether arising from or relating to acts or omissions solely of Engineer Parties or arising from or relating to acts or omissions of both Engineer Parties and Buyer Parties, subject to Paragraph E below.

B. Engineer Parties' employees, or other third parties, arising from or in any manner relating to bodily injuries to or death of Engineer Parties' employees, to the extent arising from or in any manner relating to the negligent acts or omissions or willful misconduct of any of the Engineer Parties, whether arising from or relating to acts or omissions solely of Engineer Parties or arising from or relating to acts or omissions of both Engineer Parties and Buyer Parties, subject to Paragraph E below. Engineer expressly acknowledges and agrees that the indemnity provided for in this Section 11 is applicable to all Claims including those for which Engineer otherwise has or may have immunity under applicable worker compensation or similar laws and regulations (including in the Commonwealth of Pennsylvania, pursuant to Pennsylvania Workers' Compensation Act, Article III, Section 303 (also referred to as 77 P.S. § 481).

C. Third parties arising out of or in connection with any infringement or alleged infringement of any patent, copyright, trademark, service mark, trade or business secret, or other intellectual property right of such third parties in connection with Engineer's performance and/or delivery of the Work hereunder or Buyer's use thereof. In addition to the defense, indemnity, and hold harmless obligations under this Section 11.C, Engineer shall at its own expense either obtain for the Buyer a royalty-free, permanent, irrevocable, sublicensable, fully assignable, transferable license necessary to make Buyer's use non-infringing or substitute non-infringing Work, and modify at its own expense the infringing equipment, materials, Work and processes so they become non-infringing, provided that after such substitution or modification, the applicable equipment, materials, Work, and processes shall (i) equal or exceed that being modified or replaced in all material respects, (ii) meet all the requirements of and be subject to all the provisions of this Contract and the applicable Services Contract, and (iii) be subject to Buyer's reasonable approval. Nothing contained herein shall limit the rights and remedies of Buyer with respect to this Contract or the applicable Services Contracts.

D. Engineer shall also indemnify Buyer Parties for any and all Claims and Losses for violations of any Applicable Laws to the extent arising from or relating to acts or omissions of Engineer Parties, whether arising from or relating to the acts or omissions solely of Engineer Parties or arising from or relating to acts or omissions of both Engineer Parties and Buyer Parties, subject to Paragraph E below.

E. If Claim arises which is ultimately judicially determined (or determined by written agreement among the Parties) to be partially or wholly the fault of Buyer Parties, Engineer's indemnification obligation under this Article 11 shall be limited to the percentage of fault apportioned to Engineer as ultimately judicially determined (or determined by written agreement among the Parties); provided, however, that Engineer's duty to defend Buyer Parties against Claims hereunder shall not be affected unless and until it is ultimately judicially determined (or determined by written agreement among the Parties) that Engineer was not at fault.

F. Engineer's duty to defend arising under this Article 11 shall be with counsel reasonably acceptable to Buyer, and such counsel shall consult with Buyer on all major decisions relating to Claims. Buyer reserves the right to defend itself at its own expense. Engineer's monetary obligations under this Article 11 shall not be limited to the amount of insurance coverage carried or required to be carried by Engineer hereunder.

ARTICLE 12 - PROGRESS REPORTS

Engineer shall furnish schedules and such other data as required by Buyer to monitor progress, as more specifically defined in Exhibit B and the relevant Services Contract.

ARTICLE 13 - COMPLIANCE WITH EQUAL OPPORTUNITY REQUIREMENTS

Engineer shall, unless specifically exempted by law, perform its obligations under this Contract in full compliance with all applicable equal opportunity requirements including, but not limited to, those relating to equal employment opportunity and non-segregated facilities, those relating to the utilization of minority business enterprises, the Vietnam Era Readjustment Assistance Act of 1974, the Rehabilitation Act of 1973, those relating to the employment of veterans and handicapped persons, and all amendments thereto and all regulations, rules and orders issued thereunder.

ARTICLE 14 – APPLICABLE LAWS

A. Engineer represents that it is now familiar with, or prior to commencing the Work will become familiar with, all federal, state, regional and local laws (including tax laws), ordinances, regulations, codes, standards, orders, and decrees that in any manner apply to the Work and the performance of the Work (collectively, "Applicable Laws"), and Engineer agrees at all times to observe and comply therewith. Applicable Laws shall be deemed to include, without limitation, those set forth in (i) Articles 13, 18, 24, 36, and 37; (ii) any Supplementary Terms; (iii) a Services Contract; and (iv) the following:

(1) Federal and state motor carrier safety regulations, to the extent applicable to the Work; and upon written request, Engineer shall provide Buyer with written certification of driver qualifications for Engineer's employees as needed to permit Buyer to comply with such regulations.

(2) Federal, state, regional, or local laws, rules, and regulations regarding taxes, and the payment of taxes of all kinds now in effect and those becoming effective hereafter until Engineer's Work pursuant to this Contract has been completed, including, without limitation, social security, state unemployment insurance, withholding taxes, sales and use tax, gross receipts tax and income tax.

B. If Buyer provides Engineer with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, then Engineer shall not withhold or pay Kentucky sales or use taxes to the extent such exemption certificate applies to the Work (such exemption does not and shall not apply to any materials consumed by Engineer in performing the Work). Engineer agrees that it shall not rely upon Buyer's direct pay authorization in not withholding or paying Kentucky sales or use taxes. If Buyer does not provide Engineer with an exemption certificate demonstrating an exemption from sales or use taxes in Kentucky, Engineer shall be solely responsible for paying all appropriate sales, use, and other taxes and duties to (including without limitation sales or use tax with respect to materials purchased and consumed in connection with the Work), as well as filing appropriate returns with, the appropriate authorities. To the extent specifically included in the Services Contract, Engineer shall bill Buyer for and Buyer shall pay Engineer all such taxes and duties, but Buyer shall in no event be obligated for interest or penalties arising out of Engineer's failure to comply with its obligations under this Section 14.B.

ARTICLE 15 – CHANGES IN SERVICES CONTRACT

Except with respect to suspensions of all or part of the Work in accordance with Section 8.D, termination under Article 8, delays due to Force Majeure under Article 9, or suspensions for safety reasons under Section 36.F, any other deletions, additions, or changes in the Work shall be pursuant to a Change Order mutually agreed upon and executed by Buyer and Engineer in accordance with this Article 15.

A. Buyer may, from time-to-time, request that Engineer delete, change, or add to the Work (including, without limitation, adding or revising technical requirements and/or written instructions) on a project subject to a Services Contract. Within fourteen (14) calendar days unless a shorter period is specified by Buyer, Engineer shall provide a written quotation including a discussion of price, time and other performance effects that would result from complying with such request. Within fourteen (14) calendar days after receipt of Engineer's quotation, Buyer shall prepare a document encompassing such deleted, changed, or added work and the equitably adjusted price, time and other performance effects (a "Change Order") and present it to Engineer. Upon execution by Buyer and Engineer of the Change Order (or, at Buyer's option evidenced by written notice, prior to such execution), Engineer shall perform without delay the Work as set forth in and pursuant to the Change Order.

B. If a result of the Change Order is a reduction in or termination of the amount of Work originally set forth in the Services Contract, Engineer shall not be entitled to seek or receive any compensation for any loss of anticipated profits in respect such reduced or terminated Work.

C. By executing a Change Order, Engineer thereafter waives the right to assert any further claim for an increase in the Contract price or an extension of any completion date based on the subject matter of, or the claim addressed by, such Change Order; it being acknowledged and agreed by Engineer that any such Change Order shall completely address any schedule or cost impact associated with the subject matter of, or the claim addressed by, such Change Order.

D. Engineer's compensation and the manner and method of any payment by Buyer for additional Work performed pursuant to this Article 15 shall be in accordance with this Contract, including as applicable Article 3 and Exhibit C.

ARTICLE 16 - AUDIT/INSPECTION

Buyer, or its authorized representative, shall at all times have access to Engineer's records maintained pursuant to this Contract during normal business hours to review, audit, and verify information connected with this Contract pertaining to costs, schedules, Subcontractor costs and schedule information, the efficiency and effectiveness of Engineer's performance, and any and all information required by Buyer to determine project cost or Work schedules. Engineer shall establish and maintain, and shall modify from time to time as may be required, a system of accounting on a job cost basis such that all costs referred to in this Contract shall be determinable and allocable by accounting periods in accordance with generally accepted accounting principles consistently applied and appropriate to facilitate the review and audit by Buyer of Engineer's records and accounts related to this Contract including but not limited to complete files of all correspondence, vouchers, time sheets, and books of account, together with supporting data, papers, and records for all Work performed under this Contract. Engineer must retain such files for a minimum of three (3) years after completion of the Work and other obligations pursuant to each Services Contract and Buyer's right to audit shall continue for such three-year period. Buyer's audit may also include a review of Engineer's accounts and records to verify that Engineer did not make payments to or for the personal benefit of employees of Buyer, its agents and other contractors that would constitute a violation of the Servco Contractor Code of Business Conduct as referenced in Article 39. Buyer shall not have the right to audit the cost components of Engineer's firm fixed prices or fixed rates, if applicable, or non-direct compensation rates. However, Buyer shall have the right to audit any costs necessary to establish that the same cost item was not billed on both a direct and an indirect basis.

Adjustments arising from any audit performed by Buyer or its Authorized Representative may be deducted by Buyer from any payment due pursuant to an invoice from Engineer or Engineer shall pay the dollar amount of such adjustments to Buyer within thirty (30) calendar days upon receipt of written notice from Buyer requesting such payment.

ARTICLE 17 - CONTRACTUAL RELATIONSHIP

It is understood and agreed by the Parties hereto that Engineer shall at all times and for all purposes under this Contract be deemed to act as an independent contractor and not as an agent for Servco or Buyer.

ARTICLE 18 - SUBCONTRACTS

A. Engineer agrees to obtain the written consent of Buyer prior to the letting of or changes to any subcontract and to the identity of any Subcontractor. Engineer agrees to notify Buyer immediately if it is determined that any Subcontractor is failing to perform or make reasonable progress under the terms and conditions of any subcontract. No subcontract, irrespective of Buyer's consent, shall be deemed to be a novation of this Contract, nor shall it relieve Engineer of its responsibility or liability for full performance hereunder.

B. Engineer agrees to use its best efforts to assure that Small, Small Disadvantaged and Women Owned Small Business Concerns (SSDWOSBCs) are given equitable opportunity to compete for procurements resulting from this Contract. In this regard, Engineer shall comply with the requirements in 48 C.F.R. 52.219-8, which is hereby incorporated by reference. Engineer shall also agree to participate in the SSDWOSBC set aside plan required by 48 C.F.R. 52.219-9 that has been established by Buyer.

If the total aggregate commitment under this Contract exceeds $500,000, then Engineer (unless Engineer is itself a small business concern) shall adopt a plan similar to the plan required in 48 C.F.R. 52.219-9, and establish and conduct, or maintain, a program that enables SSDWOSBCs to have equitable opportunities to compete as Subcontractors or suppliers for procurements resulting from this Contract. In this regard, Engineer shall assure that known SSDWOSBCs are given equitable opportunity to compete for subcontracts, particularly by arranging solicitations for bids and delivery schedules so as to facilitate participation by those enterprises, maintain records showing procedures that have been adopted to comply with the provisions of this clause, and prepare periodic reports and cooperate in surveys as may be required by the General Services Administration or the Small Business Administration. Engineer agrees to submit reports on Standard Forms 294 or 295 to Buyer annually with respect to its plan and to provide other certifications and documentation deemed reasonably necessary by Buyer to show evidence of Engineer's compliance with all State and Federal rules and regulations relating to the use of SSDWOSBCs, in accordance with applicable laws and regulations.

Engineer (except small business concerns) shall insert in any subcontract hereunder that may exceed $500,000, provisions that conform substantially to the language of this clause.

ARTICLE 19 - REFERENCE CHECKS

Engineer hereby authorizes Buyer to conduct such reference checks and make such other background inquiries as Buyer may deem necessary or desirable in connection with the performance, qualifications, and/or capability of Engineer, its Subcontractors, and/or individuals now or hereafter employed by Engineer in connection with performance of this Contract. Engineer hereby agrees to indemnify, save, defend, and hold harmless Buyer, its officers, directors, employees, and agents from and against any and all claims, demands, liabilities, damages, suits, or proceedings at law or in equity, fees including but not limited to legal fees, and any other costs and/or expenses of whatsoever kind or nature arising out of, resulting from, or connected with the conduct by Buyer of reference checks and/or background inquiries undertaken by Buyer pursuant to this Article 19.

ARTICLE 20 - THIRD PARTY RIGHTS

Nothing contained in this Contract shall be construed or interpreted in any manner whatsoever as conferring any rights of any nature upon any person or entity not a party to this Contract other than Servco's Affiliates.

ARTICLE 21 - ASSIGNMENTS

Engineer shall not assign its rights or delegate its duties hereunder to any third party without the prior written consent of Buyer.

ARTICLE 22 - KEY PERSONNEL

The named personnel identified within each Services Contract as "Key Personnel," are considered to be essential to the Work being performed hereunder:

With respect to and for the duration of the Work to be performed by Engineer under each applicable Services Contract, Engineer agrees not to remove, replace, or reassign these individuals without the prior written consent of Buyer. If these individuals become unavailable for reasons beyond Engineer's control for assignment for Work under the applicable Services Contract, Engineer shall promptly notify Buyer and shall submit a written impact statement (including proposed Key Personnel substitutions) in sufficient detail to permit evaluation of the impact of this situation on the Work to be performed. Prior to substitution of Key Personnel, Engineer shall obtain the written consent of Buyer as to the acceptability of replacement personnel. Additionally, Buyer has the right to request removal of any Engineer Personnel, including without limitation Key Personnel, for a reasonable cause.

ARTICLE 23 - DISCLOSURE

Engineer agrees that it shall disclose no information nor shall it make any news release or other public statement or create any marketing materials regarding its Work hereunder or the processes, models, data, or other information involved without the prior written consent of Buyer.

ARTICLE 24 - JURY WAIVER; GOVERNING LAW; FORUM

This Contract and each Services Contract is governed by, and construed in accordance with, the laws of the Commonwealth of Kentucky without reference to the conflict of laws rules thereof. Any legal proceedings which may arise out of or relating to this Contract or any Services Contract or under any of the other documents entered into in connection therewith shall be brought in the United States District Court for the Western District of Kentucky, located in Louisville (and if such court does not have jurisdiction over a matter at controversy between the Parties, any state court located in Louisville, Kentucky). Accordingly, Engineer, Servco and each Servco Party hereby submits to the jurisdiction of the United States District Court for the Western District of Kentucky, located in Louisville (and if such court does not have jurisdiction over a matter in controversy between the Parties, any state court located in Louisville, Kentucky) for purposes of all legal proceedings that may arise out of or relating to this Contract or any Services Contract or under any of the other documents entered into in connection therewith. Each of Engineer, Servco and each Servco Party (i) irrevocably waives, to the fullest extent permitted by Applicable Law, any objection which it may have or hereafter have to the personal jurisdiction of such court or the laying of the venue of any such proceeding brought in such a court and any claim that any such proceeding brought in such a court has been brought in an inconvenient forum; (ii) agrees, to the fullest extent permitted by federal law, not to raise any objection (other than in respect of subject matter jurisdiction) to the removal or transfer to the United States District Court for the Western District of Kentucky of any such proceeding that is initially brought in any other court; and (iii) agrees that it will not file any motion or assert any defense in any such proceeding that is inconsistent with the foregoing waivers and consent. EACH OF ENGINEER, SERVCO AND EACH SERVCO PARTY HEREBY KNOWINGLY, VOLUNTARILY, AND INTENTIONALLY WAIVES ANY RIGHTS IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY LITIGATION OR ARISING OUT OF, UNDER, OR IN CONNECTION WITH THIS CONTRACT OR ANY SERVICES CONTRACT OR ANY OTHER DOCUMENTS ENTERED INTO IN CONNECTION HEREWITH.

ARTICLE 25 - DATA FURNISHED BY BUYER

Buyer may provide to Engineer certain data, drawings, or other information regarding the site of the Work and local conditions at such site. Any such data, drawings, or information are (a) made without representation or warranty of any nature by Buyer, (b) not guaranteed by Buyer, and (c) furnished solely for the convenience of Engineer. Engineer shall not be liable for defects in the Work solely and directly attributable to Engineer's reliance upon or use of such data, drawings or information (unless Engineer knew or should have known that such data, drawings or

information are inaccurate or materially deficient) with respect to a Service Authorization that explicitly provides that Engineer need not validate the accuracy of such data, drawings or information.

ARTICLE 26 - ENGINEER REPRESENTATION

Engineer represents that it is financially responsible, licensed and competent to perform the work covered by this Contract, and that, notwithstanding anything in the Contract or any statements or information made or furnished by Buyer or its representatives, Engineer will complete the Work for the compensation and within the schedule stated in this Contract. Buyer requires professional engineer ("PE") stamps in accordance with Professional Standards and Applicable Laws and where required by permitting agencies prior to releasing work for construction or for occupancy.

ARTICLE 27 - RELEASE

If Buyer requests, Engineer shall execute a release of claims, substantially in the form contained in Exhibit D, upon completion of the Work and as a condition to final payment for such Work by Buyer.

Engineer hereby releases and/or waives for itself and its successors in interest, and for all Subcontractors and their successors in interest, any and all claims or right of mechanics or any other type of lien to assert and/or file upon Buyer's or any other party's property, the Work, or any part thereof as a result of performing the Work. Engineer shall execute and deliver to Buyer such documents as may be required by Applicable Laws (e.g., partial and/or final waivers of liens and/or affidavits of indemnification) to make this release effective and shall give all required notices to Subcontractors with respect to ensuring the effectiveness of the foregoing releases against those parties. Engineer shall secure the removal of any lien that Engineer has agreed to release in this Article 27 within five (5) working days of receipt of written notice from Buyer to remove such lien. If not timely removed, Buyer may remove the lien and charge all costs and expenses including legal fees (for inside and/or outside legal counsel) to Engineer including, without limitation, the costs of bonding off such lien. Buyer, in its sole discretion, expressly reserves the right to off-set and/or retain any reasonable amount due to Engineer from payment of any one or more of Engineer's invoices upon Buyer having actual knowledge of any threatened and/or filed liens and/or encumbrances that may be asserted and/or filed by any Subcontractor, materialman, independent contractor and/or third party with respect to the Work, with final payment being made by Buyer only upon verification that such threatened and/or filed liens and/or encumbrances have been irrevocably satisfied, settled, resolved and/or released (as applicable), and/or that any known payment disputes concerning the Work involving Engineer and any of its Subcontractors, agents and/or representatives have been resolved so that no actions, liens and/or encumbrances of any kind or nature will be filed against Buyer and/or Buyer's property.

ARTICLE 28 - NON-WAIVER OF DEFAULTS

Any failure by Servco, Buyer, or Engineer at any time to enforce or require the strict keeping and performing of any of the terms or conditions of this Contract or a Services Contract shall not constitute a waiver of, and shall not affect or impair, such terms or conditions in any way or its right at any time to avail itself of such remedies at law or in equity as it may have for any breach or breaches of such terms and conditions.

ARTICLE 29 - SEVERABILITY

The provisions of this Contract are severable, and if any provision shall be determined to be illegal or unenforceable, such determination shall in no manner affect any other provision hereof, and the remainder of this Contract shall remain in full force and effect without regard to the fact that one or several provisions of this Contract may be determined from time-to-time to be illegal or unenforceable; provided, however, that the intention and essence of this Contract may still be accomplished and satisfied. If there is more than one Buyer under a Services Contract, any and all liabilities of each such Buyer under the Services Contract shall be several but not joint.

ARTICLE 30 - DRAWING & DESIGN RESPONSIBILITIES

A. As described in Exhibit A, Engineer shall exercise its responsibilities for preparation, independent review and approval of design documents.

B. The Work shall be performed (i) with care and diligence, (ii) in accordance with the Professional Standard, and (iii) as expeditiously and economically as is consistent with the best interests of Buyer.

C. Engineer will design the Work to accomplish the purpose set forth in the applicable Services Contract.

D. Engineer has the responsibility for furnishing reports, recommendations, test programs, design criteria, specifications, drawings, technical data, calculations, sketches, designs, and revisions to all of the foregoing (collectively, "Design Documents"), equipment and materials that comply with the requirements of the Services Contract and this Article 30. Buyer has the right to accept or reject Design Documents produced by Engineer in accordance with Article 30.E; provided, however, that the acceptance of Design Documents by Buyer shall not be construed as relieving Engineer of its responsibility hereunder or of its responsibility for errors in shop drawings, schedules or details.

E. Buyer shall have the right and the authority to reject any and all Work and/or Work Product that is defective, deficient, or otherwise does not conform to the Contract Documents. In such event, Engineer is solely responsible for all costs to correct such Work and/or Work Product without any adjustment in schedule.

F. Engineer represents and agrees that the individuals and entities who will perform or be in charge of professional architectural, design and engineering services for the Work shall have experience with the type of Work being undertaken and shall be duly licensed to practice under the Laws of the jurisdiction in which the Work is located.

ARTICLE 31 - PERMITS, FEES, AND NOTICES

Where Applicable Laws require permits and approvals related to design and installation of a system, building or facility, if so defined in the Services Contract if and to the extent requested, Engineer will be responsible for assisting Buyer in securing the permits and approvals. Requisite permit fees or charges necessary for obtaining said permits shall be reimbursed in accordance with Article 3 if paid by Engineer.

ARTICLE 32 - EQUIPMENT, MATERIALS, AND WORKMANSHIP

A. Engineer, in performance of the Work set forth in this Contract, shall conform to all of Buyer's applicable standards and specifications and, in the absence of such standards, with standards applicable in the United States for the type of Work to be performed. Furthermore, Engineer shall specify equipment, material, and workmanship furnished from qualified and Buyer-approved sources where available. When Engineer has determined by inquiry to Buyer that no Buyer-approved source exists, Engineer shall recommend a qualified source consistent with the aforesaid Buyer standards and specifications. The Buyer Project Manager shall be the Buyer contact for determination of Buyer-approved sources.

B. All equipment, materials, and workmanship recommended for use or used directly or indirectly with, on, or in any systems, buildings or facilities shall comply with and conform to the requirements of all Applicable Laws. Furthermore, the type, grade, and quality of said equipment, materials, and workmanship shall be equal to or better than recognized U.S. industry standards of the applicable industry within the requirements of the particular application if a Buyer standard is not provided.

C. Any deviation from or waiver of the provisions outlined in Sections 32.A and 32.B must have prior written approval of Buyer.

ARTICLE 33 - ENGINEER'S PROJECT MANAGER

Engineer shall designate one individual, hereinafter known as "Engineer's Project Manager," to serve as primary contact for Buyer for the duration of the Work as set forth in each Services Contract. Engineer's Project Manager shall be deemed Key Personnel, as defined in Article 22. Engineer's Project Manager shall plan, organize, direct, control and supervise Engineer's efforts under each Services Contract, as well as review and report on the performance of all activities associated with the Work. Engineer's Project Manager shall take such steps as may be necessary to assure access (telephone and visits) by any assigned Buyer personnel to Engineer Personnel assigned to Work being performed hereunder. Engineer's Project Manager shall be considered an authorized representative of Engineer for all intents and purposes under a Services Contract.

ARTICLE 34 - NOTICES

Any notice provided for in this Contract shall be in writing sent by electronic or overnight mail or overnight courier or otherwise delivered, addressed as follows:

A. If to: Servco or Buyer

LG&E and KU Services Company
Attn: Tony Ruckriegel
Manager of Contracts, Major Capital Projects
Project Engineering
820 West Broadway
Louisville, KY 40202
Telephone No.: (502) 627-4690
Email: Tony.Ruckriegel@lge-ku.com

With copies to:

220 W. Main St.
Louisville, KY 40232
Attn: General Counsel
Telephone: 502-627-3297
E-mail: Gerald.Reynolds@lge-ku.com

And to:

Buyer, at the address specified in the Services Contract

B. If to: Engineer
HDR Engineering, Inc.
8404 Indian Hills Drive
Omaha, NE 68114
Attn: Legal Department
Fax number: 402-399-1238

With copies to:

HDR Michigan, Inc.
5405 Data Court
Ann Arbor, MI 48108
Attention: William H. Damon III
Fax number: 734-761-9881

Either Party hereto may designate new notice information for purposes of this Article 34 by notifying the other Party hereto in writing of such new information. Notice sent by electronic mail shall be deemed to have been received at the close of the business day on which it was transmitted (or if transmitted after the close of a business day, at the close of the next business day) or such earlier time as is confirmed by the receiving Party. Notice by overnight mail or overnight courier properly addressed shall be deemed to have been received the next business day after it was sent.

ARTICLE 35 - SEPARATE CONTRACTS

A. Buyer reserves the right to award other contracts in connection with other portions of any project awarded via Services Contract. Engineer shall afford other parties reasonable opportunity for introduction of their material and the execution of their work, and shall properly connect and coordinate Engineer's Work with such parties.

B. If any part of the Work depends, for proper execution or results, upon the work of any other party, Engineer shall inspect and promptly report to Buyer any apparent discrepancies or defects in such work that render it unsuitable for such proper execution and results. Engineer's failure to inspect and report any deficiencies within fourteen (14) calendar days of receipt of work from such other party shall constitute an acceptance by Engineer of the other party's work as fit and proper.

ARTICLE 36 - WORK AND SAFETY RULES

The provisions below represent work and safety standards Engineer must satisfy. Each Services Contract may contain additional requirements.

A. Engineer's work practices, equipment, materials and services covered by this Contract shall meet or exceed all applicable safety standards and regulations including those established and promulgated by the Federal Occupational Safety and Health Administration. For Work to be performed in Pennsylvania under a Services Contract, Engineer shall coordinate with the Pennsylvania Department of Labor and Industry and indicate active continuous comprehensive safety programs for the Work as may be applicable. Engineer shall give all notices and comply with all Applicable Laws bearing on the safety of persons and property for their protection from damage, injury or loss in connection with the conduct of the Work.

B. Engineer shall ensure that all tools, machinery, equipment, rigging and scaffolding used by Engineer in performance of the Work shall be safe, efficient, serviceable, in good condition, and fit for the intended purpose in accordance with Applicable Laws and Professional Standards. Engineer agrees to replace any such tool, machinery, equipment, rigging, or scaffolding that in the judgment of Buyer is unsafe or incapable of satisfactorily performing the Work.

C. Engineer shall be responsible for complying with any applicable Department of Homeland Security ("DHS") Chemical Facility Anti-Terrorism Standards ("CFATS") requirements, codified at 6 C.F.R. Part 27, related to a Buyer property and/or facility. The DHS CFATS program regulates certain chemicals of interest ("COI") identified in Appendix A to CFATS, 6 C.F.R. Part 27, and imposes certain requirements on facilities that possess a COI. Engineer must notify Buyer at least thirty (30) days in advance of any plans to bring any COI onto the relevant Buyer property and/or facility, and must obtain Buyer's written approval prior to bringing any COI onto the relevant Buyer property and/or facility. If providing such notice and obtaining such approval is not possible within this timeframe, Engineer shall notify Buyer as soon as reasonably possible, and in any event must have Buyer's written approval prior to bringing any COI onto the relevant Buyer property and/or facility.

D. Engineer shall have a safety program and work and safety rules for the Work and shall comply with and enforce them for all Work performed. Engineer shall ensure that all Engineer Personnel receive, read and sign a copy of the work and safety rules. Proof of compliance will be retained and made available to Buyer upon request. Engineer shall designate a safety contact person for all matters concerning Engineer's work and safety programs.

E. Engineer shall take all necessary precautions for the safety of, and shall continuously provide and maintain reasonable protection to prevent damage, injury or loss to (i) all personnel engaged in the Work or who may be affected by the Work; (ii) the Work and all equipment, machinery, and materials used to provide or incorporated therein, whether in storage on or off the Work site, under care, custody or control of Engineer or its Subcontractors; and (iii) other property at the Work site or adjacent thereto, including the property of Buyer and others, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of the Work. Engineer shall use such adequate protective devices, warning signs, crossover points and barriers as may be reasonably required under the circumstances. Engineer shall promptly remedy damage and loss to property referred to herein to the extent caused by Engineer, its Subcontractors or by anyone for whose acts they may be liable.

F. Buyer shall have the right, from time to time, to undertake a safety performance audit of Engineer's services, work practices, tools, equipment and materials. Buyer may, at any time, and in its sole discretion, suspend all or a portion of the Work for safety-related reasons. Engineer shall take immediate, appropriate corrective action. Notwithstanding any other provisions of the Contract, neither the suspension of Engineer's Work nor any corrective action taken will result in any increase in the Services Contract price or extension of the schedule for the Work.

G. It shall be the duty and responsibility of Engineer or any Subcontractor performing any cutting or welding to comply with the safety provisions of the National Fire Protection Association's "National Fire codes" and Factory Mutual Engineer's cutting and welding procedures.

H. Whenever working on Buyer's property, Engineer shall, at no additional cost to Buyer, ensure that Buyer's safety requirements are met including, but not limited to, the following: all personnel shall wear ANSI Class 75 steel toe safety shoes, hard hats, safety glasses, and hearing protection, to the extent required by Buyer.

I. Engineer shall at all times enforce strict discipline and good order among Engineer Personnel and shall not employ on the Work any unfit person or anyone not skilled in the work assigned. Buyer shall have the right to request the removal of any such individual from the work site either with or without cause. Engineer further agrees that it will comply with such requests at no additional cost to Buyer.

J. Firearms, illegal drugs and alcohol use or possession on Buyer property is prohibited and any individual who is under the influence of or in possession of any shall be removed from Buyer's property by Engineer.

K. In any emergency affecting the safety of persons or property, Engineer shall (i) act reasonably and as required to prevent threatened damage, loss or injury and (ii) as directed by Buyer personnel.

L. The purpose of this Article 36 is to define Engineer's safety responsibility under this Contract while performing Work on Buyer's property. Although Buyer may monitor Engineer's safety performance, review safety performance with Engineer's safety contact person, and/or suspend the Work for safety-related reasons, these actions are for the primary purpose of protecting Buyer personnel and property. Engineer shall remain solely responsible for the safe performance of the Work under this Contract. The provisions of this Article 36 shall be interpreted and construed in a manner consistent with Engineer's status as an independent contractor.

M. Engineer will comply with Servco's safety requirements including those attached hereto as Exhibit H (as Servco may amend it from time to time) and any additional Buyer's safety rules as may be reflected in a Services Contract.

ARTICLE 37 - ENVIRONMENTAL REQUIREMENTS

A. As required under the OSHA Hazard Communication Standard (29 CFR 1910.1200), the Pennsylvania Workers and Community Right-To-Know Act of 1984, as amended from time to time, and certain other Applicable Laws, Engineer or its Subcontractors shall provide Material Safety Data Sheets ("MSDS") covering any hazardous substances and materials furnished under or otherwise associated with the Work under this Contract. Engineer and its Subcontractors shall provide Buyer with either copies of the applicable MSDS or copies of a document certifying that no MSDS are required under any Applicable Laws in effect at the worksite. One (1) copy of each MSDS shall be submitted to the Buyer field representative and two (2) copies shall be submitted to Buyer, Safety Operations (WALO), Two North Ninth Street, Allentown, PA 18101-1179, at least thirty (30) days prior to use or storage of any chemical product at the Work site. Engineer shall specify at which locations the chemical is to be used and the intended use of the chemical. **No asbestos or lead containing materials shall be incorporated into any Work performed by Engineer without the prior written approval of Buyer.** Engineer and its Subcontractors shall be solely responsible for determining if any chemical or material furnished, used, applied, or stored or Work performed under this Contract is subject to any Applicable Laws and for complying with such Applicable Laws. Unless specified elsewhere herein, Engineer shall remove all chemicals from the work site prior to completion of the Work

B. Engineer and its Subcontractors shall label hazardous substances and materials and train their employees in the safe usage and handling of such substances and materials as required under any Applicable Laws.

C. Engineer and its Subcontractors shall be solely responsible for the management of any petroleum or hazardous substances and materials brought onto the Work site by Engineer and its Subcontractors and shall prevent the release of petroleum or hazardous substances and materials into the environment. All petroleum or hazardous substances and materials shall be handled and stored according to Engineer's written Spill Prevention Control and Countermeasures Plan or Best Management Practices Plan as defined under the provisions of the Clean Water Act, as amended, if either such Plan must be maintained pursuant to Applicable Laws. Engineer shall provide secondary containment for the storage of petroleum or hazardous substances and materials. The prompt and proper clean-up of any spills, leaks, or other releases of petroleum or hazardous substances and materials resulting from the performance of the Work under this Contract and the proper disposal of any residues shall be Engineer's sole responsibility, but Engineer shall give Buyer immediate notice of any such spills, leaks, or other releases. Engineer shall be solely responsible for the storage, removal, and disposal of any excess or unused quantities of chemicals and materials that Engineer causes to be brought to the work site.

D. Unless Buyer and Engineer expressly agree otherwise in writing, Engineer and its Subcontractors shall be solely responsible for any wastes generated in the course of the Work, and Engineer shall handle, store, and dispose of such wastes in accordance with any Applicable Laws.

E. "Pre-existing Contamination" is any hazardous or toxic substance, material, or condition present at the site or sites that was not brought onto such site or sites by any of the Engineer Parties. Anything herein to the contrary notwithstanding, title to, ownership of, and legal responsibility and liability for any and all Pre-existing Contamination shall at all times remain with Buyer except Engineer shall be liable for Pre-existing Contamination if, and then only to the extent, a cost or liability with respect to Pre-existing Contamination arises or is exacerbated by the negligence or willful misconduct of any of the Engineer Parties.

ARTICLE 38 – ORDER OF PRECEDENCE

This Contract, the Exhibits, and any Services Contracts issued hereunder shall, insofar as possible, be interpreted consistently. In case of conflict the order of precedence shall be as follows:

A. The main body of this Contract;

B. All Exhibits to this Contract;

C. The contents of any Services Contract; provided, however, that if the Services Contract clearly identifies the provision(s) of the Contract Articles or Exhibit(s) to be superseded by the Services Contract, then in that event and only to the extent clearly identified, the Services Contract shall prevail.

D. The contents of any Request for Services Quotation.

ARTICLE 39 - CODE OF CONDUCT

The Servco Contractor Code of Business Conduct (as it may be amended from time to time by Servco) also forms an integral part of this Contract and each Services Contract. A copy of the current version of the Servco Contractor Code of Business Conduct is attached to this Contract as Exhibit F. Servco shall promptly provide notification of any applicable amendments.

ARTICLE 40 - CONFIDENTIAL INFORMATION

A. As used in this Contract, "Confidential Information" means information or material, whether tangible or intangible and in whatever form provided, that is provided by Buyer or Engineer (the "Disclosing Party") to the other (the "Receiving Party") in connection with this Contract before or after the effective date and that should reasonably have been understood to be confidential or proprietary to the Disclosing Party because of legends or other markings, the circumstances of disclosure or the nature of the information itself, and includes information or materials that contain, reflect or are derived from the Confidential Information.

B. The Receiving Party agrees it will: (i) use the Confidential Information solely in connection with and pursuant to this Contract; (ii) use reasonable precautions and exercise due care to maintain the confidentiality of the Confidential Information; and (iii) not disclose the Confidential Information except with the Disclosing Party's prior written consent or as otherwise permitted in this Contract. The Receiving Party may disclose the Disclosing Party's Confidential Information to its employees and the Receiving Party's subcontractors only to the extent they need the Confidential Information in connection with the Receiving Party's performance of its obligations hereunder and are bound by confidentiality obligations no less protective of the Disclosing Party than those in this Contract. The Receiving Party will be liable for any use or disclosure of the Disclosing Party's Confidential Information by the Receiving Party's subcontractors in violation of this Contract.

C. Upon request, the Receiving Party will promptly return or, at the Disclosing Party's request, destroy all copies of the Disclosing Party's Confidential Information other than those retained solely for archival or administrative purposes.

D. The restrictions on use and disclosure of Confidential Information in this Article 40 will not apply to any information or materials to the extent: (i) already known to the Receiving Party (and not subject to a duty of confidentiality) before receipt from the Disclosing Party; (ii) it is or becomes publicly available other than through the acts of the Receiving Party; (iii) it is received by the Receiving Party from a third party who, to the Receiving Party's knowledge, is not prohibited from disclosing the information to the Receiving Party by a contractual, fiduciary or other duty; (iv) developed or derived by the Receiving Party without the aid, application or use of the Confidential Information; (v) authorized for disclosure in writing by the Disclosing Party, to the extent of such authorization; or (vi) the Receiving Party is advised by legal counsel that it is required to disclose by law or legal process, provided, however, that prior to any such disclosure, the Receiving Party will give the Disclosing Party as much advance notice of the requirement as is practical and legally permissible, will cooperate with the Disclosing Party at the Disclosing Party's expense to protect against disclosure, and if disclosure is still required, then disclose only such part of the Confidential Information that its legal counsel advises it must disclose and only to the extent of its compliance with such law or legal process.

E. In the event that Buyer provides Engineer with access to any non-public personal information of Buyer employees or customers ("Personal Information") in connection with the performance of this Contract, Engineer will comply with all Buyer procedures and practices for protecting the confidentiality, security and integrity of Personal Information, in addition to the requirements of this Article 40, and the exceptions to the use or disclosure of Confidential Information in Section 40.D, above shall not apply to Personal Information. In addition to the obligations under this Article 40, Engineer may not make any public statement or other announcement (including issuing a press release or pre-briefing any member of the press or other third party) relating to the Work or the terms or existence of this Contract without the prior written approval of Buyer at its sole discretion.

ARTICLE 41 - LIMITATION OF LIABILITY

A. For the purposes of this Article 41:

"Services Contract Value" shall mean with respect to a Services Contract, the greater of (a) the target price, firm fixed price, maximum cost, or intended final price under other pricing approaches under the Services Contract and (b) the final total amount payable to Engineer under the Services Contract.

"Liability Limitation" shall mean with respect to a Services Contract, the Services Contract Value.

B. Irrespective of the legal theory (including negligence; breach of warranty; breach of contract; or other act, error or omission; or from strict or absolute liability in tort; or from any other cause whatsoever; or any combination of the foregoing) pursued by Buyer, Engineer's total liability to Buyer under any Services Contract (a) for any failure of Engineer to perform or complete the Work in accordance with the provisions of such Services Contract, or (b) arising out of Engineer's performance of the Work under such Services Contract, shall be limited to the Liability Limitation for that Services Contract.

C. Notwithstanding anything to the contrary in the foregoing, no Liability Limitation shall apply to, and no credit shall be issued against, such Liability Limitation

(1) for liabilities arising out of Engineer's indemnification obligations under this Contract and the applicable Services Contract,

(2) for Engineer's payment of up to $2,500,000 per occurrence for damage to Buyer's property caused by Engineer or its Work,

(3) in the case of gross negligence or willful misconduct by Engineer or any of its Subcontractors,

(4) for occurrences against which Engineer is required to insure pursuant to Article 10 to the extent of the applicable policy limit as set forth in Article 10, and

(5) Engineer's cost to perform Work or issue a refund to Buyer with respect to correcting defective or nonconforming Work, both as set forth in Article 5.

D. In no event shall either Buyer or Engineer be liable to the other for the other's special, indirect, incidental, punitive or consequential damages of any nature (regardless of whether such damages are alleged to have risen from negligence; breach of warranty; breach of contract; or other act, error or omission; or from strict or absolute liability in tort; or from any other cause whatsoever; or any combination of the foregoing) including, but not limited to: damages arising from the use or loss of use of any facility; loss of anticipated profits or revenues; costs of replacement services, goods and utilities; damages arising from delay; claims of customers; or interest.

ARTICLE 42 - DISPUTE RESOLUTION

A. In the event of a dispute arising under this Contract or a Services Contract, the parties to the dispute shall work together in good faith to resolve such dispute. If the parties are unable to resolve such dispute between themselves within ten (10) business days of notification by one party to the other of the existence of such dispute, they shall immediately refer such matter to their internal management for resolution. If the management of the parties is unable to resolve the dispute within ten (10) business days after the matter is brought to their level for review, they shall, in good faith, attempt to agree on a process for alternative dispute resolution. If the parties fail to agree on an alternative dispute resolution process within ten (10) business days, the party seeking redress shall have the right to bring a claim or action to seek any redress available at law or in equity. Each party to such a dispute shall pay its own attorney's fees, costs and expenses, except that if the prevailing party is required to initiate proceedings to enforce the award or confirm judgment, the prevailing party shall be entitled to recover its attorney's fees, costs and expenses associated with such action.

B. Notwithstanding the dispute resolution process provided in this Article 41, there shall be no obligation to use such dispute resolution process prior to seeking equitable relief in court or where the dispute involves a breach of confidentiality or a claim of infringement of intellectual property rights, for which immediate redress in court may be sought.

C. During the pendency of any dispute resolution (including any litigation), Servco, Engineer and Buyer shall continue to perform under this Contract and all Services Contracts pursuant to the terms thereof.

ARTICLE 43 - NERC RELIABILITY STANDARDS

All Work performed by Engineer shall comply with the Servco Security Protocols as may be in effect from time to time. If Servco modifies the Servco Security Protocols after a Services Contract has been entered into, and such modification increases Engineer's costs for Work under that Services Contract that is subject to a lump sum price or a Maximum Cost, or adversely affects Engineer's ability to meet the time schedule, Engineer shall be entitled to an equitable adjustment in the lump sum price or Maximum Cost and/or schedule to complete the Work as applicable. The Servco Security Protocols implement, among other things, certain requirements of NERC's Reliability Standard for Bulk electric Systems of North America (collectively, the NERC Standards) as in effect from time to time. PENALTIES FOR NON-COMPLIANCE WITH NERC STANDARDS CAN BE UP TO $1 MILLION PER DAY AND ENGINEER SHALL BE LIABLE TO REIMBURSE BUYER FOR SUCH PENALTIES TO THE EXTENT CAUSED BY ENGINEER'S FAILURE TO COMPLY WITH THE SERVCO SECRITY PROTOCOLS. The Servco Security Protocols are expected to address the following matters, among others:

A. In performing any design Work, Engineer shall do so in a way that (i) minimizes the need to establish any additional "physical security perimeters" at any facility of the Buyer to the maximum extent practicable and (ii) is compliant with all announced NERC Standards (even if those standards are not yet in effect when the Work is performed).

B. Information Protection. Without compromising the confidentiality provision in Article 40, Engineer shall at all times comply with the Buyer's information protection program(s). Among the information protected by this program are: (i) all operational procedures; (ii) lists of critical cyber assets; (iii) network topology or similar diagrams; (iv) floor plans of computing centers that contain critical cyber assets; (v) equipment layouts of critical cyber assets; (iv) disaster recovery plans; (vii) incident response plans; and (viii) security configuration information. Engineer shall protect this protected information from disclosure consistent with the program.

B. Access Revocation. Engineer shall immediately advise appropriate Buyer's management if any Engineer's personnel who have key card access to a restricted area or electronic access to a protected system no longer require such access.

C. Training. If any Engineer personnel require key card access to a restricted area or electronic access to a protected system, Engineer shall ensure that such personnel complete, and retake as requested, all necessary NERC training as requested by Buyer.

D. Personnel Risk Assessment. If any Engineer personnel require key card access to a restricted area or electronic access to a protected system, Engineer shall ensure that Buyer receives necessary waivers and information from Engineer's personnel to complete, and repeat as necessary, such background checks as requested by Buyer.

E. Continuing Obligations. Engineer further acknowledges that its compliance with the NERC Standards is a continuing obligation during and after the Term. Upon written notice to Engineer, Buyer shall have the absolute right to audit and inspect any and all information regarding Engineer's compliance with this Article 43, and/or to require confirmation of the destruction of any documentation received from or regarding Buyer. Engineer is encouraged to contact Buyer's Compliance Department pursuant to Subsection F below to ensure Engineer understands and complies with this Article 43.

F. Office of Compliance. The Buyer has an Office of Compliance. Should Engineer have actual knowledge of violations of any of the herein stated policies of conduct in this Article 43, or have a reasonable basis to believe that such violations will occur in the future, whether by its own employees, agents, representatives or subcontractors, or by another vendor and/or supplier of the Buyer and its employees, agents, representatives or subcontractors, or by any employee, agent and/or representative of Buyer, Engineer has an affirmative obligation to immediately report any such known, perceived and/or anticipated violations to the Buyer's Office of Compliance in care of Director, Compliance and Ethics, LG&E Center, 220 West Main Street, Louisville, Kentucky 40202.

ARTICLE 44 - DRUG AND ALCOHOL

No person will perform any of the Work while under the influence of drugs or alcohol. No alcohol may be consumed within four (4) hours of the start of any person's performance of the Work or anytime during the workday. A person will be deemed under the influence of alcohol if a level of .02 percent blood alcohol or greater is found. In addition to the requirements of the drug testing program, as set forth in Buyer's rules and regulations, all persons who will perform any of the Work at a Buyer's site will be subject to drug and alcohol testing under either of the following circumstances: (i) where the person's performance either contributed to an accident or cannot be completely discounted as a contributing factor to an accident which involves off-site medical treatment of any person; and (ii) where Buyer determines in its sole discretion that there is reasonable cause to believe such person is using drugs or alcohol or may otherwise be unfit for duty. Such persons will not be permitted to perform any Work until the test results are established. Engineer shall be solely responsible for administering and conducting drug and alcohol testing, as set forth herein, at Engineer's sole expense. As applicable, and in addition to any other requirements under this Agreement, Engineer shall develop and strictly comply with any and all drug testing requirements as required by Applicable Laws.

ARTICLE 45 – GENERAL

A. This Contract shall be binding on the Parties hereto, their successors in interests and assigns.

B. No understanding, promise or representation, and no waiver, alteration, or modification of any provision hereof shall be binding, unless in writing and signed by the Parties hereto.

C. This Contract contains the complete agreement between the Parties with respect to the subject matter hereof. Any and all previous and/or collateral contracts or agreements, representations, warranties, promises, and/or conditions relating to the subject matter of this Contract are hereby superseded. Any existing understanding, promise, representation, warranty, or condition not incorporated in this Contract shall not be binding on either Party hereto.

D. Notwithstanding any expiration or termination of this Contract, the rights and obligations arising under any Articles, Sections, or provisions of this Contract that by their nature should be deemed to survive the expiration or termination of this Contract will survive such expiration or termination. Those portions of the Contract that shall survive termination or expiration include, but are not limited to: (i) Articles 1, 3, 5, 7, 8, 10, 11, 16, 17, 20, 21, 23, 24, 27, 28, 29, 34, 37, 38, 40, 41, 42, 43, 44, 45 and (ii) any provisions that contain an indemnity obligation.

IN WITNESS WHEREOF, the Parties hereto have executed this Contract as of the Effective Date.

(ENGINEER)

(Engineer)

By: 3-14-13

(Signature)

Printed Name: William H. Damon III, PE

Title: Sr. Vice President, Consulting & Development Services Lead

LG&E AND KU SERVICES COMPANY

(Servco)

By: 05/14/2013

(Signature)

Printed Name: ANTHONY L. RUCKRIEGEL

Title: MANAGER, CONTRACTS

EXHIBIT A
CONTRACT SPECIFICATIONS

1.0 SCOPE

General requirements applicable to Servco Engineering Services are described below. Specific Requirements will be detailed in each Services Authorization.

This document defines the Contract minimum technical requirements.

2.0 PURPOSE

Availability of qualified professional engineering resources is required for support of tasks and projects and for achieving design and operational excellence objectives of Servco. This Contract will be used primarily for the production of design packages and defined task related activities in an efficient and cost effective manner.

3.0 DESCRIPTION

Engineer Personnel under this contract shall:

- consist of a subset of Engineer's organization
- work under Engineer's supervision and management
- work to Servco's procedures and programs
- maintain an effective relationship with user group clients
- be located near Servco or in Engineer's home office as determined by economic evaluation

3.1 Function

Provide engineering services focused on production of specifically defined tasks.

Provide production documents such as: Work Scopes; Design inputs; Safety Assessments; Evaluations; Analyses; Calculations; Equipment Specifications; Bills of Material; Drawings, Change Notices; Installation Instructions; Construction Work Packages; Test Procedures; Test Reports; etc. Also provide general drafting services for preparing record drawings after installation.

Provide work management documents such as plans, schedules, performance indicators, and periodic reports, as defined in Exhibit B.

3.2 Organization

3.2.1 Management
Engineer's Project Manager shall be located at the primary work location office.

3.2.2 Staff Components
Major engineering disciplines normally required for Power Plant and T&D work shall be permanently assigned to staff. Specialists (seismic, EQ, etc.) shall be provided as needed. Key personnel requirements apply.

3.3 Work Release Mechanisms

Services Authorizations shall be issued against the Contract.
The following mechanisms are defined:

3.3.1 Small Engineering Tasks

a. Services Authorizations may be awarded to Engineer for a fixed man-hour limit. The Service Authorization package will identify the problem

requiring resolution and may provide a preferred direction in which a solution may be developed. The deliverable products expected from Engineer are a detailed Work scope package with preliminary schedule and cost estimate for engineering services. This package will serve Servco as a basis on which to make a judgment to proceed or seek other alternatives. Servco may bypass this step and use a Request for Services Quotation ("RFQ") as described in (b).

b. Servco will transmit a Work Scope package to Engineer with an RFQ for a firm cost estimate based on the Exhibit C multiplier(s) to do the engineering, and a firm schedule. Engineer's costs for preparing this quotation will be to its own account. The Work Scope may have been prepared by Engineer, by Servco, or others. RFQs may be requested from multiple potential suppliers.

c. If Engineer's response to the RFQ is accepted by Servco, a Services Authorization is released to Engineer to do the Work. Hold points requiring concurrence to proceed may be defined in the Services Authorization.

3.3.2 Large Engineering Projects

Large engineering jobs frequently require multiple stages of activity and funding approval within Servco. For these reasons, Engineer may be assigned Work by use of graduated and time sequenced Services Authorizations. The deliverable products will be specified in the releasing mechanisms. The following principles will be applied to these releases: Engineer's costs required for problem definition, identification of potential solutions, selection of a solution, and actual engineering of the solution will be billed to and payable by Servco when any of these activities have been requested by Servco. Engineer's costs incurred in responding to a Servco RFQ will be at Engineer's sole cost and expense.

3.3.3 Cost proposals shall be provided in Maximum Cost estimates unless otherwise instructed.

4.0 DESIGN RESPONSIBILITY

4.1 Design Packages.

4.1.1 Design packages in Servco's format shall be prepared, reviewed, and approved by Engineer's staff.

4.1.2 Servco's process includes frequent interfaces between preparer and user groups for review, concurrence, status and progress toward plans, material availability, installation requirements, etc. It is Engineer's responsibility to establish interface teams, document meetings, and incorporate information obtained therein into its Work Product.

4.1.3 After agreement on proposed work scope in each Services Authorization, Engineer shall be accountable for the correctness, completeness, suitability, and overall quality level of the design packages. Revisions required for correction of errors and omissions, or lack of suitability shall be to Engineer's account.

4.1.4 Servco participation in the review process shall not negate Engineer's accountability for the Work.

EXHIBIT A

4.1.5 Engineer shall follow Servco procedure for indicating changes on any existing Servco or manufacturer's drawings revised during performance of any Work and shall circle all revised areas on all drawings so revised on the reverse side thereof with an erasable line. Engineer shall adhere to the applicable provisions of Servco's drafting procedures and standards as well as all revisions that may occur from time-to-time which contents are incorporated herein by reference, is the preparation and revision of all drawings.

4.2 Non Modification Engineering Products

4.2.1 Products requiring independent design verification and approval under Servco's procedures shall be prepared, reviewed, and approved by Engineer's staff.

4.2.3 Interface review points with Servco staff will be defined for each engineering product. Final acceptance of the finished product by Servco Project Manager is required.

5.0 SUPPORTING SERVICES

5.1 Information systems, terminal stations, all hardware, firmware, and software required for accessing that are necessary for the performance of the Work will be provided and maintained by the Engineer at all Engineer component locations needing these facilities for Work under this Contract (with the specific exception of work at Servco's Susquehanna Nuclear Plant.)

5.2 Project Quality Plan ("PQP")

A PQP shall be provided and maintained by the Engineer for Work covered under the Contract.

The Engineer may be provided with a Controlled Copy of all required Servco Engineering Procedures thus permitting Engineer's PQP to reference those documents as appropriate. Whether referenced or repeated, work processes and procedures shall reflect the corresponding Servco system. Output documents that are deliverables to Servco under a Services Authorization shall use a format identical to the Servco format.

5.3 Project Controls Requirements

For all Work, Engineer shall maintain a planning and scheduling system to track Work in progress, provide forecasts, trending, performance indicators, and forecasts for resource loading and costs as further defined in Exhibit B. The system shall be updated continually. Output reports shall be provided on a periodic basis, and whenever requested by Servco.

EXHIBIT B
PROJECT CONTROLS AND SCHEDULE

NOTE: The requirements below are for major engineering projects and are required unless otherwise stated in a Services Authorization. Lesser engineering tasks will require a lesser degree of tracking.

1.0 WORK SCHEDULE REQUIREMENTS

1.1 General

1.1.1 Engineer in all cases shall prepare and maintain a complete and comprehensive engineering/design and procurement project schedule. This project schedule shall be the Engineer's working schedule and shall be used by Engineer to plan, organize, coordinate, and execute the work; record and report actual performance and progress; and demonstrate methods the Engineer plans to complete the work remaining at all times, including interfacing activities of Subcontractors, equipment vendors, suppliers and Engineers of the project.

1.1.2 Within thirty (30) days of the execution of the Services Authorization, Engineer shall submit for Servco's review and approval a detailed project schedule (the "Baseline Project Schedule") using agreed upon software (Primavera Project Planner, Microsoft, etc.). The detailed Baseline Project Schedule will include all detailed activities required to complete the Work. The Baseline Project Schedule shall be organized by an agreeable work breakdown schedule such as discipline, areas, and engineering work package's. This critical path method schedule shall include allowances for normal delays and difficulties that may be encountered during the course of the work which includes, but is not limited to holidays, and coordination with others. At a minimum, the detailed Baseline Project Schedule shall be based on the milestone dates set in the Services Authorization and provide a logical sequence of resource loaded activities (man-hour) required to achieve completion of the Work. Individual activity durations shall not be longer than 25 working days, except for level of effort for activities that require Servco's approval. With this Baseline Project Schedule, Engineer shall also provide engineering/design manpower curves per engineering discipline, derived from the man-loaded project schedule and staffing curves that include the estimated number of personnel per month for each major phase of the Work.

1.1.3 Engineer shall incorporate Servco's comments, if any, and re-submit the Baseline Project Schedule. Servco shall review the revised detailed Baseline Project Schedule. Upon approval by Servco, the detailed Baseline Project Schedule shall become the approved Work schedule for the project. Baseline dates shall not change without the express written consent of Servco.

1.1.4 Engineer shall submit to Servco the approved Baseline Project Schedule in agreed upon format, such as PDF bar chart format and Microsoft Project or Primavera Data files.

1.1.5 Servco reserves its rights to revise schedule priorities in order to meet project conditions.

1.2 Engineering Work Schedule Monthly Updates (Minimum Requirement)

1.2.1 The engineering Work schedule shall be updated monthly to reflect progress achieved through the designated reporting period. The engineering monthly updated Work schedule shall reflect the "float" and the "percent complete" value for each activity and any variances to the original Baseline Project Schedule.

1.2.2 The monthly updated Work schedule shall be clear, legible and reproducible.

1.2.3 The monthly updated Work schedule shall be organized by major engineering/design disciplines or geographical areas or work packages or by plant subsystems as defined by Servco.

1.2.4 Approved changes in scope shall be incorporated into the monthly updated Work schedule.

1.2.5 Engineer shall submit to Servco the monthly updated Work schedule in agreed upon format, such as PDF bar chart format and Microsoft Project or Primavera data files. This will be issued to Servco monthly and discussed and reviewed in the weekly coordination meetings.

1.2.6 When Engineer is updating the monthly Work schedule, each individual activity "percent complete" and "remaining duration" shall be updated reflecting the true estimated completion date. The "Progress Over-Ride" function in Primavera shall not be used.

1.3 Engineering and Design Status (Minimum Requirement)

1.3.1 The engineering and design progress and status of work will be tracked by using actual engineering work products such as drawings, specifications, studies and calculations. These work products will be scheduled over time in the project schedule and then as time progresses, compared to the Baseline Project Schedule. These work products shall be provided in the Baseline Project Schedule or in spreadsheet format and will be broken down into civil/ structural, architectural, process, mechanical, piping, electrical, instrument and control. Each engineering discipline will be graphically illustrated from the project schedule or spreadsheet data and will show planned vs. actual progress on a monthly basis.

1.3.2 To establish a means for progress measurement/tracking, each engineering activity that is input to the Work schedule or spreadsheet will be "weighted" with "progress units" based on budgeted man-hours. The Primavera software will use these progress units to generate "planned progress curves" for each selected level of the disciplines or by work areas or work packages. If Primavera is not used, the "weighted" values will be distributed over time and calculated using the spreadsheet.

- As work on the project proceeds, the physical progress accomplished against each completed or in-progress activity is reported and input into the Microsoft Project or Primavera system. Using this input, the weighted value earned as a result of work accomplished is calculated by the computer and "actual progress curves" are generated. The planned and actual progress curves are then compared. If the comparison indicates negative variances between planned and actual progress, an analysis of the cause with emphasis on critical path activities is made and corrective action recommended.

- Approved changes in services scope shall also be included in the progress curve.

1.3.3 A monthly engineering/design labor histogram by discipline shall be prepared and based upon Engineer's Baseline Project Schedule or spreadsheet. The engineering/design labor histogram shall include direct labor planned, actual direct labor expended and the forecast for remaining direct labor. This histogram shall be prepared and issued with each Work schedule update. Engineer shall also use this information to develop the look-ahead schedule.

1.3.4 Details of tracking of the engineering open items and issues shall be tracked and monitored at the weekly coordination meetings

1.4 Procurement Status – Component and Bulk Material Schedule (Special sort of engineer's schedule)

1.4.1 The component/bulk material schedule is a detailed listing for all major engineered items and supplied material items. This schedule shows planned, actual and forecast dates for the significant engineering activities leading to the purchase and delivery of vendor services and major equipment. This schedule also identifies the construction field need dates.

2.0 MONTHLY PROGRESS REPORT

2.1 General

2.1.1 Following the execution of each Services Authorization, Engineer shall submit a Monthly Progress Report on or before the fifth (5th) day of each month. This report shall be inclusive of the Engineer's total scope of Work and shall not segregate the work of Subcontractors. The Monthly Progress Report shall be submitted in hard copy and electronic forms. The electronic form may be in a PDF format and submitted to Servco by email. The Monthly Progress Report shall include but not be limited to the following:

- An executive summary – A brief description of work activities accomplished during the reporting period for all phases of the work.
- Milestones achieved.
- Engineer shall provide a "look-ahead schedule" in a format acceptable to Servco. Engineer shall prepare these "look-ahead schedules" for discussion at the monthly meetings.
- Contract status/change control.
- Status of documents and drawings for Servco approval.
- Quality assurance/quality control.
- Project safety statistics and concerns/ security.
- Schedule update and analysis; critical path analysis; significant variance to Work schedule analysis.

- Major concerns, risks and potential remediation with cost and Work schedule impacts.
- Major equipment and POs issued. (By Servco)
- Material delivery status report. (Option)
- Monthly planned & actual manpower histogram(s).
- Delays and mitigation.

3.0 SCHEDULE MEETINGS

3.1 Pre-engineering Meeting

A pre-engineering meeting will be held with Engineer after Servco has issued the formal Notice to Proceed.

3.2 Regular Project Meetings

3.2.1 A Weekly coordination meeting will be conducted between the Engineer and Servco, generally via teleconference.

3.2.2 The meeting shall cover such topics as engineering deliverables. Equipment and major material status, Submittals, Engineering issues, Schedule review, Quality Assurance, schedule progress, engineering resource requirements, design changes, etc.

3.2.3 A portion of the weekly meeting will be devoted to reviewing the engineering progress. Analysis shall be provided by the Engineer to substantiate their progress to date and any mitigating issues that require resolution.

3.2.4 A monthly face-to-face progress meeting will be held to discuss the Engineer's Monthly Progress Report. The meeting will alternate between the Engineer's and Servco's office.

EXHIBIT C – COMPENSATION

To maintain the confidentiality of Engineer's rates and multipliers, Exhibit C is omitted and kept on file by Buyer.

EXHIBIT D
LIEN RELEASE

Owner: _____ ("Servco")

Engineer:_____

Service Authorization/Contract No.:_____

KNOWN ALL MEN BY THESE PRESENTS, that Engineer, for and in consideration of $_____ representing final payment under the Services Authorization/Contract, as applicable, hereby:

1. waives and releases any and all lien or claim of or right to lien with respect to the premises of any of the Released Parties in connection with or on account of work, labor, services, equipment and materials furnished at or for such premises under the Service Authorization/ Contract referenced above;

2. represents and warrants that, except as listed below (if none, write "None"), it has paid in full or has otherwise satisfied all obligations to any persons, subcontractors or suppliers of any tier in connection with or on account of work, labor, services, equipment and materials furnished at or for the premises of any of the Released Parties under the Service Authorization/Contract referenced above; and

3. agrees to defend, indemnify and hold harmless the Released Parties from and against any losses, costs and expenses (including attorneys' fees) arising out of claims of any persons, subcontractors or suppliers of any tier in connection with or on account of the waivers, releases, and representations described herein.

IN WITNESS WHEREOF, Engineer has duly executed this Release on the date set forth below.

Engineer: _____

By:_____

Name:_____

Title:_____

STATE OF _____

COUNTY OF _____

being duly sworn deposes and says that he is _____ of the Engineer named above; that he is duly authorized to execute the foregoing Release; and that the representations and statements made in the foregoing Release are true to his own knowledge.

SUBSCRIBED AND
SWORN TO BEFORE ME
THIS
_____ DAY OF _____, 201_

NOTARY PUBLIC

EXHIBIT E
SUPPLEMENTARY TERMS

Additional requirements may be added due to the specific requirements of Servco under a Services Authorization. These will be included as an attachment to the specific Services Authorization. The following are cited as examples:

- Susquehanna SES Supplementary Terms and Conditions
- LG&E/KY NERC CIP Requirements
- LG&E/KY Passport Program (Safety)

Exhibit F

Contractor Code of Business Conduct

This LG&E and KU Services Company (a Kentucky corporation) Contractor Code of Business Conduct ("Code") is incorporated by reference into the General Service Agreement or other agreement between you as the contractor ("Contractor") and LG&E and KU Services Company and/or one of its affiliates Kentucky Utilities Company, and Louisville Gas and Electric Company (collectively the "Company"). This Code sets minimum standards for Contractor's conduct in the areas addressed. Contracts between Company and Contractor may provide for standards exceeding the standards of this code.

Observance of Laws
Contractor shall fully comply with the provisions of all federal, state and local laws, regulations and ordinances applicable to its activities performed for the Company or any goods or services provided to or on behalf of the Company, including without limitation, all applicable laws, regulations and ordinances pertaining to occupational health and safety and environmental protection.

Bribes and Kickbacks
Contractor may not under any circumstances accept or pay bribes, kickbacks or other similar compensation or consideration in any way relating to the Company or any activity for or on behalf of the Company.

Dishonest and Fraudulent Activity
Contractor shall not engage in or allow its employees to engage in dishonest acts or fraudulent activity in connection with or in association with the Company's business. For purposes of this policy, the definition of a dishonest act or fraudulent activity includes but is not limited to:

1. An intentional or deliberate act to deprive the Company or any person of something of value, or to gain an unfair benefit using deception, false suggestions, suppression of truth, or other unfair means which are believed and relied upon.
2. A dishonest act or fraudulent activity may be, but is not limited to, an intentional act or activity that is unethical, improper, or illegal such as:
    a. Embezzlement;
    b. Misappropriation, misapplication, destruction, removal, or concealment of property;
    c. Alteration or falsification of paper or electronic documents, including the inappropriate destruction of paper or electronic documents;
    d. False claims and/or misrepresentation of facts;
    e. Theft of an asset, including, but not limited to, money, tangible property, trade secrets or intellectual property;

Harassment
Contractor shall not permit sexual advances, actions, comments, or any other conduct that creates an intimidating or otherwise offensive work environment on Company property or any site where Contractor is performing activity for or on behalf of Company. Further, Contractor shall not permit the use of racial and religious slurs, or any other conduct that breeds an offensive work environment, on Company property or any site where Contractor is performing activity for or on behalf of Company.

Drugs and Alcohol
Contractor shall not allow any employee to perform services for or on behalf of Company while under the influence of drugs or alcohol. Contractor shall maintain a drug and alcohol testing program meeting all applicable

federal, state and local laws, regulations and ordinances and meeting or exceeding any and all standards stated in any contract with Company or any document incorporated in such a contract.

Misuse of Company Assets
No funds or assets of the Company may be used or paid for any unlawful or improper purpose. A Contractor's employees shall not have access to any Company computers unless the contract between such Contractor and the Company expressly provides for such access in writing.

Reporting of Violations
In the event Contractor learns of any violation of this Code, Contractor shall immediately report such violation to Company's Director, Compliance and Ethics at (502) 627-2648.

Exhibit G
Servco Parties

The following Affiliates of Servco hereby agree to be parties to the Contract as Servco Parties.

Kentucky Utilities Company
Manager, Major Contracts
Tony Ruckriegel

Signature: Anthony L. Ruckriegel

Title: MANAGER, CONTRACTS

Date: 05/14/2013

Louisville Gas & Electric Company
Manager, Major Contracts
Tony Ruckriegel

Signature: Anthony L. Ruckriegel

Title: MANAGER, CONTRACTS

Date: 05/14/2013

EXHIBIT H

HEALTH AND SAFETY DOCUMENTS
Table of Contents

Where applicable within this Exhibit H Contractor means Engineer.

LG&E and KU Services Company
Contractor / Subcontractor Safety Policy

PURCHASE ORDER #: TBD upon contract award CONTRACT JOB #: TBD upon contract award

NAME OF CONTRACTOR: HDR Engineering, Inc.

SCOPE OF WORK: Owner's Engineer Services for Natural Gas Combined Cycle Project at E.W. Brown Generating Station

WORK LOCATION: Plant Site - Harrodsburg, Kentucky Services performed in Ann Arbor, Michigan

CONTACT NAME: William H. Damon III, P.E. WORK ORDER #: TBD
(AUTHORIZED CONTRACTOR/SUBCONTRACTOR REPRESENTATIVE)

1. Contractor / Subcontractor Safety Policy

General

LG&E and KU Services Company, is committed to safety excellence and in providing a safe and healthful work environment for anyone working on our property. The personal safety and health of each employee, contractor and the safety of the general public are of primary importance to LG&E and KU Services Company. Accordingly, there is no job so important that safety policies and procedures or legal obligations are compromised.

This Policy does not replace the Contractor's/subcontractor's ("Contractor") existing safety and health program(s), provided that their program(s) meet or exceed these and any additional site specific minimum requirements. Contractor's employees not following this Policy will be subject to removal from the job site.

The Contractor is required to comply with all federal and state safety laws and all provisions of the LG&E and KU Services Company, Health & Safety Manual. The Contractor is responsible for conducting its work and activities safely. LG&E and KU Services Company expect and require that you continuously update your employees with respect to safety issues relevant to the work and to take immediate corrective action when your employees violate safety rules or procedures.

It is the responsibility of Contractors' construction managers, superintendents, safety representatives and foremen/supervisors to ensure workers under their supervision maintain safe work areas and perform their tasks in a safe manner. It is also the responsibility of each worker to follow every precaution and LG&E and KU Services Company safety rule and Policy to protect them and their fellow workers.

Contractors are responsible for ensuring that any subcontractors working under their purview are held to the same performance expectations, and therefore this Policy, as the contractor themselves.

2. Scope

General

This Policy applies to all construction activities performed for LG&E and KU Services Company by Contractor's employees or employees of the Contractor's subcontractors. Construction activities may originate from construction contracts, service contracts, purchase orders, or in-house work orders. This Policy is in addition to the requirements of the General Services Agreement or other contract under which the Contractor is performing construction activities.

3. General Safety Requirements

1. Contractors will comply with all applicable federal and state regulations and the LG&E and KU Services Company safety rules and programs relevant to the work performed.
2. Contractors will ensure that any and all subcontractors working under their purview comply with all applicable federal and state regulations and the LG&E and KU Services Company safety rules and programs relevant to the work performed.
3. Contractors are responsible for their employees and any and all subcontractors working for them. Contractors are responsible for ensuring that the subcontractors follow all provisions of this document. Contractors are responsible for providing their employees, and subcontractors with all information provided by LG&E and KU Services Company regarding:
    * Occupational health and safety;
    * Federal, state and local environmental regulations including LG&E and KU Services Company environmental compliance policies and procedures;
    * Exposure to atmospheric health, serious physical or chemical hazards; and
    * Precautionary measures and procedures for performing the work.
4. All Contractors' employees, and any subcontractor employees, shall receive training under the LG&E and KU Services Company Contractor Health and Safety Passport Program.
5. The LG&E and KU Services Company Policy prohibits the Contractor's employees, agents or representatives from:
    * Consuming or possessing alcohol while on the LG&E and KU Services Company job sites, including the parking lots;
    * Reporting to perform work on the LG&E and KU Services Company job sites with unauthorized drugs on his/her person or while under the influence of drugs or alcohol;
    * Intentionally dumping unauthorized chemicals/materials into a sewer, waterway or on the ground;
    * Mishandling LG&E and KU Services Company waste;
    * Allowing employees to perform work that involves operating heavy equipment or working at elevations when using prescribed medication that can cause drowsiness or otherwise impair the employee's ability to perform the work in a safe manner.
6. The following conduct is prohibited by the Contractor at and about LG&E and KU Services Company property:
    * Theft, horseplay, gambling, sabotage or attempted sabotage.
    * Threatening, intimidating or abusing employees, customers, vendors or guests of LG&E and KU Services Company.
    * Fighting, creating, or inciting a disturbance.
7. LG&E and KU Services Company have a smoke-free policy in all buildings and vehicles.
8. Attendance at job site safety meetings is required of the Contractor at the discretion of the LG&E and KU Services Company authorized representative. At least one representative of the Contractor will attend such job safety meetings.
9. Any Contractor's employee, who appears sick, extremely tired, or otherwise unable to perform his/her job in a safe manner will be reported to the Contractor's supervision for evaluation and possible removal from the job site.

10. Contractors are responsible for establishing control measures to protect their employees, subcontractors or workers under their control, from exposure to hazards (chemical, atmospheric health and physical) present at the job site.
11. The Contractor must provide electrical ground fault protection for employees using construction power (temporary branch circuits to include extension cords) through the use of approved ground fault circuit interrupters (GFCI). Additionally, Contractors must provide ground fault protection when using permanent facility power and using cord and plug equipment in wet or damp locations. Applies to 120-volt single phase 15 and 20-ampere receptacle outlets.
12. Contractor employees will work in full pants and shirts appropriate for the task being performed and in compliance with appropriate regulations. Shorts and tank tops are not allowed unless otherwise specified. (Some jobs will require wearing long sleeve shirts.)
13. Contractors shall not transport employees in the cargo bed of a truck or trailer.
14. All Contractors must receive authorization from the LG&E and KU Services Company authorized representative, before performing work in areas posted as **"DANGEROUS OR HAZARDOUS."**
15. Employees of Resident Contractors, defined as those Contractors with an annual contract and who provide day-to-day services for LG&E and KU Services Company, shall be required to have a negative drug pre-test when hired and before reporting to work at an LG&E and KU Services Company site. All contract employees will be required by the Contractor to participate in a drug and alcohol testing program that randomly tests 5% of their employees monthly, while working on an LG&E and KU Services Company site.
16. If a Contractor brings "transient" workers on site for "plant outages", "project work" or "major construction", the transient workers shall be required to have a negative drug pre-test when hired and within 7 days before reporting to work at an LG&E and KU Services Company site. If a contractor sends one of their workers to another LG&E and KU Services Company site with no interruption of service, no pre-work drug test is required. If a worker reports to another LG&E and KU Services Company site with an interruption in service of thirty days or more, the worker shall be required to have a negative drug test before reporting to work at that site. All transient contractors are to be placed in random testing pool and tested at a 10% monthly rate for the duration of the assignment.

4. Specific Safety Requirements

Contractor Safety Qualification

Contractor selection and ultimate certification shall include an evaluation of the Contractor's prior safety performance, current written safety programs, safety training, and qualifications of key Health & Safety (H&S) personnel to assure LG&E and KU Services Company that the Contractor is capable of meeting its safety performance goals. Employees of certified Contractors and any subcontractor employees shall undergo "Passport Training" for those designated as Industrial Workers prior to performing work at an LG&E and KU Services Company facility. This by no means will replace regulated compliance training for the work the contractor employee will be performing.

Subcontractor Safety Qualifications

Subject only to the specific exception stated below, any and all subcontractors used by a Contractor to perform work for LG&E and KU Services Company shall meet or exceed the following criteria:

a) The subcontractor's incident rates for the three (3) most recent calendar years do not exceed, in any one (1) year, the industry average, based on NAISC (or SIC), as published by the Bureau of Labor Statistics;
b) The subcontractor has not experienced any employee fatality identified within any of the three (3) most recent calendar years' statistics.
c) The subcontractor has not received any citation, from OSHA, the Kentucky Public Service Commission or any other state agency regulating utilities in the most recent three (3) calendar years; and
d) The subcontractor has a current Workers Compensation Insurance Experience Modification Rate (EMR) less than or equal to 1.0.

LG&E and KU Services Company may, at the sole option of such company, provided written authorization for the use of a subcontractor not meeting the above criteria; provided that such authorization must specifically identify how the subcontractor fails to meet the criteria and state additional protective measures the Contractor shall put in place in order to use such subcontractor. Such authorization may be withdrawn at any time for any reason.

The criteria stated above are minimum standards and Contractors using subcontractors shall seek out subcontractors with the highest safety performance available.

Contractor On-site Health and Safety Representative

The Contractor shall appoint a qualified on-site Health and Safety Representative, accepted by the LG&E and KU Services Company authorized representative, with the authority to enforce all of the safety requirements of this Policy, including implementation of the Contractor's Injury and Illness Prevention Program.

LG&E and KU Services Company authorized representative and H&S will make a risk-based decision as to the qualification level of the Contractor H&S representative. Requirements may range from a full-time on-site safety professional (Certified Safety Professional) to a craft supervisor or "person in charge" with competency as measured by experience training.

Whenever the Contractor has any employees or subcontractors on the job site, the Contractor must have a designated representative on the construction worksite that is knowledgeable of the project's hazards and has full authority to act on behalf of the Contractor. The Contractor's designated representative must make periodic observations of the construction worksite to identify and correct any instances of noncompliance with the project health and safety requirements.

Qualification Evaluation

Based on the level of H&S qualification determined necessary by LG&E and KU Services Company, the Contractor shall submit documentation, for review and acceptance by LG&E and KU Services Company in support of the proposed designated representative. Suggested qualifications may include, but are not limited to:

- Professional certifications (CSP, CIH, ASP, etc.).
- Curriculum detailing work experience and EH&S responsibilities on projects of similar scope for the previous five years, at a minimum.
- Evidence of construction safety training such as the 10-hour or 30-hour OSHA training.
- Proof of "Competent Person" (as defined below) or "Qualified Person" (as defined below) status attained by the proposed on-site H&S representative.

Contractor Health and Safety Representative Responsibilities

The Contractor H&S Representative shall:

- ❖ Assist in the development of the contractor's safety plan and job site management system.
- ❖ Support training of contractor personnel.
- ❖ Evaluate the Contractor's safety process continuously.
- ❖ Attend any pre-job meetings to discuss their site-specific safety plan.
- ❖ Conduct and formally document job briefings.
- ❖ Assist in the identification of jobs requiring a hazard analysis.
- ❖ Assist in evaluating potential subcontractors in accordance with this Policy.

Competent Person

Each Contractor shall provide to LG&E and KU Services Company a written list of those persons designated as a Competent Person, who shall be available at the work site and capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them. Persons shall be responsible for conducting periodic observations of the job sites, materials and equipment, and shall maintain the accident prevention program. Contractor shall ensure that each Competent Person listed has been trained in the following areas as applicable:

- Asbestos
- Cranes
- Confined Space
- Demolition
- Excavations
- Fall Protection
- Industrial Trucks
- Ladders
- Scaffold
- Steel Erection

- Tower Climbing

5. Health and Safety Management Plan

Prior to commencement of contract work, the Contractor shall develop and submit to the LG&E and KU Services Company authorized representative a written Health & Safety (H&S) Management Plan on how the contract work will be completed without endangering the health and safety of those performing the work or anyone else working in the general area. The H&S Management Plan will be developed for the following higher risk contracts, including projects:

- All construction projects (new site and refurbishment)
- Contracts with an estimated value of $250,000 and over
- Long term contracts (12 months and over)
- Contracts for which the Contractor will use subcontractors.
- Contracts that provide a service by performing **high risk*** activities.
- Any other contracts at the discretion of the contract manager.

**High risk activities include but are not limited to:*

- *Electrical work requiring an Electrical Work Permit*
- *Asbestos removal*
- *Cooling tower maintenance*
- *Demolition*
- *Hot work in hazardous area*
- *Permit Required Confined Spaces*
- *Scaffolding*
- *Tank cleaning or testing*
- *Welding in hazardous areas*
- *Working at heights*
- *Work on telecommunications towers*
- *Work involving excavations to a depth of more than 4 feet*
- *Work involving the use of explosives*
- *Work on or near pressurized gas pipes*
- *Work over or adjacent to water*
- *Work involving diving*

The Health and Safety Management Plan shall contain at a minimum:

- The name of the On-site Health and Safety representative who is responsible for the implementation of their safety plan.
- LG&E and KU Services Company policy on environment, safety and health.
- LG&E and KU Services Company policy on substance abuse and testing policies if applicable.
- How and when each Contractor will conduct their job briefings.
- Provisions for conducting and documenting weekly job site safety audit/inspections by manager/supervisor level personnel.
- Training methods used to meet OSHA training requirements, and to ensure that safety program requirements are communicated to all Contractor personnel.
- Incident reporting, first aid, and emergency procedures.
- List of all Competent Persons overseeing those tasks in which OSHA requires such person(s), such as excavation, asbestos abatement and scaffolding.

Subcontractors shall be held to the same level of performance as the Contractor's written H&S Management Plan. The Contractor shall submit written documentation for its subcontractors that demonstrates how their subcontractors shall meet compliance with the site safety plan.

6. Hazard Analysis

Contractor shall complete a "Contractor Safety Management / Project Specific Hazard Analysis" * and a "Contractor Hazard Mitigation Plan"*. These documents shall be submitted to the LG&E and KU Services Company authorized representative prior to the initiation of any work. In addition, a "Quality Assurance Closure Form for Contractors"* shall be completed and submitted to the LG&E and KU Services Company authorized representative at the completion of the project.

* *The Hazard Analysis, Mitigation Plan and Closure Form is presented during the Contractor Passport Train-the-Trainer session.*

All Contractor and subcontractor personnel scheduled to work in the activities identified, shall receive safety training in those activities prior to working on them. (A safety toolbox meeting would be an acceptable forum to meet this requirement). The Contractor shall maintain proof of employee training, and shall make available such proof upon request. Note: This by no means shall replace their regulatory compliance training.

Hazard Analysis Requirements

A hazard analysis shall be written based on the following conditions:

- All major outage work
- Special Projects
- Jobs with the highest injury or illness rates
- Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents
- Jobs complex enough to require written instructions

- At the discretion of the LG&E and KU Services Company authorized representative

7. Engineered Protective Systems

The Contractor shall submit for review to the LG&E and KU Services Company authorized representative such safety system that is required by regulation to be designed by a registered professional engineer. This review is solely to verify that the Contractor has had the required protective systems prepared and stamped by a registered professional engineer.

LG&E and KU Services Company review of any documents showing the design or construction of protective systems for worker and property protections shall not relieve the Contractor of its obligations to comply with applicable laws and standards for the design and construction of such protective work. Contractor shall indemnify and hold harmless LG&E and KU Services Company and their engineering personnel from any and all claims, liability, costs, actions and causes of action arising out of or related to the failure of such protective systems. The Contractor shall defend LG&E and KU Services Company, its officers, employees and agents including without limitation engineer personnel, in any litigation or proceeding brought with respect to the failure of such protective systems.

The cost of required safety engineering services required for safety and protective systems shall be borne solely by the Contractor and shall be deemed to have been included in the amount bid for the work as stated in the contract.

8. Safety Training and Education

Contractor shall ensure that its workforce is compliant trained and qualified to perform the work. Contractor shall ensure that all subcontractor employees demonstrate the same level of competence.

Site Orientation

All Contractors / subcontractors shall undergo an LG&E and KU Services Company "site specific" training/orientation prior to engaging in work activities at a generating station. In addition, Contractors that conduct work at LG&E and KU Services Company generation facilities that process ammonia shall also undergo an ammonia awareness training/orientation prior to conducting work.

Contractor employees conducting work in a substation must first complete a Substation Entry training program.

Contractors Pre-job Orientation

Contractor shall require and administer a pre-job orientation to its employees and all subcontractor employees prior to engaging in work activities. Contractor shall maintain on the work site a detailed outline of the orientation and a signed and dated roster of all employees who have completed the orientation. The orientation shall address the following elements at a minimum:

- Employee rights and responsibilities
- Authority and responsibility to issue Stop Work Order
- Alcohol and drug abuse policy
- Contractor's disciplinary procedures
- First aid and medical facilities
- Hazard recognition and procedures for reporting or correcting unsafe conditions or practices
- Procedures for reporting accidents and incidents
- Hazard Communication Program
- Access to employee exposure monitoring data and medical records
- Protection of the environment, including air, water, and storm drains from construction pollutants
- Location of and access to reviewed Health & Safety Management Plan, Project Specific Hazard Analysis, and Hazard Mitigation Plan.
- Location and contents of required postings

Daily Job Briefings

Contractors shall ensure that all of their personnel (employees and sub-contractors) on the job site receive the daily Job Briefing before they start each job. Job Briefings shall discuss, at a minimum, the hazards associated with the job; work procedures involved; special precautions; energy source controls; and personal protection equipment requirements. This job briefing shall be conducted by the contractor's person in charge. Should the scope of the work change, than another job briefing shall be conducted.

9. Emergency Procedures

An emergency is any situation that poses an immediate threat to life or property. Each Contractor shall maintain one person currently qualified in CPR and First Aid on site at all times. Refer to the site orientation, or the LG&E and KU Services Company authorized representative for specific information for handling of a life threatening or other serious injury, fire, etc. Following the occurrence of an emergency, the contractor shall ensure that all proper incident reports are completed and distributed, and that the LG&E and KU Services Company authorized representative is notified immediately.

Incident Reporting
In the event a job site accident occurs, the Contractor shall immediately implement controls and restrictions on the accident site to ensure the site remains undisturbed until released by the LG&E and KU Services Company authorized representative. All accidents shall be reported to the LG&E and KU Services Company authorized representative immediately after the site is secured. A written incident report shall be furnished within the same day of the incident. A job site accident would include, but not be limited to a fire, explosion, equipment failure, release or exposure to toxic liquids, fumes or vapors, etc.

Near Miss / Injury-free Event
It is the responsibility of the Contractor, to complete all near miss investigations, and to report these occurrences with recommendations / implementation of corrective actions. The report is to be submitted to the LG&E and KU Services Company authorized representative within 24 hours.

Medical Treatment Event
The Contractor shall report all accidents (either occupational injury or illness) requiring medical treatment, as soon as possible, but no later then the end of the work shift, to the LG&E and KU Services Company authorized representative along with a copy of the first report of the injury. Serious injuries (defined as an injury that would require off site medical attention) shall be reported within 15 minutes, even during off shifts. (Review project specific emergency notification procedures.)

Fatality
It is the responsibility of the Contractor to immediately notify LG&E and KU Services Company should a fatality occur. It is the responsibility of the Contractor to notify the Kentucky Occupational Safety & Health, Division of Compliance within the appropriate Kentucky notification periods.

Stop Work Order
A stop work order must be given when imminent danger is identified or where significant damage to equipment or property or environmental degradation could occur if the operation continued. Any employee of a Contractor that observes an imminent-danger situation is responsible for stopping the work and reporting it to their supervisor. When a stop work order is issued, only those areas of a construction project immediately involved in the identified hazardous situation are to be included in the order.

Immediately after stopping work, the person issuing the order, or their supervisor, must report to the LG&E and KU Services Company authorized representative of their action. Work shall not resume until the LG&E and KU Services Company authorized representative has agreed that the imminent danger has been eliminated.

10. Hazard Specific Requirements

The Contractor will ensure that their employees (and all subcontractor employees) are properly equipped and trained to comply with the LG&E and KU Services Company standards and federal and state regulations; including but not limited to the following:

Asbestos

Blasting and the use of explosives

Chemical Safety/Hazard Communication

Commercial Diving Operations

Confined Space Entry

Control of Energy Sources (Lockout/Tagout)

Crane Operations, including rigging

Electrical

Fall Management (personal fall arrest systems, scaffolding, walking & work surfaces, ladders and floor & wall openings)

Hazardous Waste and Chemical Spills

Hot Work

Personal Protective Equipment (PPE)

Powered Industrial Trucks

Trenching

11. Enforcement

The Contractor is responsible for the health and safety of its employees and any subcontractor employees under their control. Enforcement of this Policy, as well as other recognized safety requirements, is the responsibility of the Contractor. The evaluation does not constitute acceptance of the Contractor's safety programs or work practices nor, in any way relieve a Contractor of full responsibility for meeting all appropriate OSHA regulations to ensure the safety of its employees.

Whenever there is a jurisdictional question of which standard will apply, the most stringent safety practice will take precedence. The Contractor must document exceptions and attach them to this form. Contractors and their employees who do not follow this Policy are subject to removal from the worksite as well as being banned from future LG&E and KU Services Company projects/contracts.

LG&E and KU Services Company reserve the right to evaluate the safety of Contractor's work practices to determine if they meet LG&E and KU Services Company standards and state/ federal regulations. In addition to the audit rights under the applicable contract LG&E and KU Services Company reserve the right to audit any and all documents (job briefings, audits, etc.) at anytime during the course of the work.

12. LG&E and KU Services Company Safety and Health Issues

Contract work may involve use, handling, storage, or work in vicinity of *hazardous chemicals or materials*. (Concerns are Hazard Communication…spill prevention/response).

Contractor may perform work (operation, maintenance or emergency response function) as necessary.

Contractor may perform *hot work* (e.g. welding, torch cutting, brazing, etc.)

Contract may require Contractor to work in or near *confined spaces*.

Contract work may require using/working under clearance procedures for the control of hazardous energy (*lockout/tagout*).

Contract may involve work on an uncontrolled hazardous substance site, Superfund site, or other contaminated site that could trigger Hazardous Waste Operations and Emergency Response (*HAZWOPER*) planning and training requirements. (Ref: CERCLIS List)

Contract work may involve application, handling or disturbance of *lead, cadmium* and/or *zinc chromate containing materials*. An example would be the removal of *toxic surface coatings* (i.e. paint).

Contract work may involve handling, disturbance, abatement or work around *asbestos containing materials* (ACM).

Contract work may involve application of *pesticides, herbicides, etc.*

13. Hazardous Chemical Communication

The following is a list of Hazardous Chemicals and atmospheric contamination that may be encountered at LG&E and KU Services Company sites. It should in no way be deemed as the only contamination that could be encountered at LG&E and KU Services Company sites. Always be aware of the contamination that could be encountered and become familiar with their Material Safety Data Sheets.

Chemical Name	Formula	Trade Name	Description/ Target Organ
Anhydrous Ammonia	NH3 (99-100%)	Liquid	colorless gas or compressed liquid with extremely pungent odor. Targets eyes, skin and respiratory system.
Arsenic	AS	Organic Arsenic	Targets skin, kidneys, liver and resp. system.
Asbestos		Hydrated Mineral	Fibers found in insulation, gaskets, packing, vinyl asbestos flooring, roofing, and other materials. Targets respiratory system. Can cause lung cancer.
Carbon Dioxide	CO_2	Carbonic Acid Gas Dry ice	Targets respiratory system and cardiovascular system
Carbon Monoxide	CO	Flue gas/Monoxide	Colorless, odorless gas. Targets lungs, blood, can be immediately fatal.
Chromium Hexavalent	Cr(VI)	Hexavalent Chromium	Metal that targets the respiratory tract, skin and eyes. Irritant.
Hydrogen Sulfide	H_2S	Sewer gas Hydrosulfuric Acid	Colorless gas with strong rotten egg odor, quick loss of sense of smell, can

			be immediately fatal.
Hydrogen	H_2	Liquid Gas	Colorless, odorless, targets eyes, skin respiratory system
Lead	Pb	Lead metal	Heavy soft gray metal. Targets eyes, kidneys and blood.
Ozone	O_3	Triatomic Oxygen	Colorless, targets eyes and respiratory sys.
Sulfur Dioxide	SO_2	Sulfuric Acid	Targets eyes, skin, and respiratory sys.

14. Definitions

Competent Person: means one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them.

Qualified Person: is one who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to subject matter, the work, or the project.

I have read the LG&E and KU Services Company Contractor Safety Policy as outlined above and I understand and agree to abide by the requirements set forth therein; and confirm this by signing below.

CONTRACTOR SENIOR MANAGER: _____
William H. Damon III, P.E.

TITLE: SENIOR VICE PRESIDENT

DATE: March 14, 2013

Exhibit

CONTRACTOR/SUBCONTRACTOR SAFETY AND HEALTH QUESTIONNAIRE AND CHECKLIST

THIS QUESTIONNAIRE IS REQUIRED FOR ALL CONTRACTORS AND SUBCONTRACTORS PRIOR TO STARTING WORK

The Company is committed to providing a safe and healthy workplace for employees and Contractors/Subcontractors. To qualify to perform work the Contractor/Subcontractor shall provide the following information and agree to obtain the following information from all subcontractors utilized.

Contractor/Subcontractor Name: HDR Engineering, Inc. (Insert) Date: March 13. 2013

Contracted Activity (please describe) : Owner's Engineer Services

Contractor/Subcontractor Representative: Bill Damon, PE (Insert) Phone: 734.332.6400 (Insert)

Please provide a brief description of the work activities and Location(s) undertaken by your company:
Owner's Engineer Services for E.W. Brown Generating Station Natural Gas Combined Cycle Project

The following information must be from the facilities providing labor. We are not interested in overall statistics at a national or international level. Describe the area this questionnaire applies. Michigan/Chicago and National. The data noted is for all of HDR Engineering, Inc. Individual site information is not available.

In the table below provide the three most recent full years of history for the area or region this questionnaire applies. **In addition, attach copies of applicable OSHA 300 Logs (showing the actual injuries, etc. – not the summaries) and verification of your EMR/discount rate information.**

ITEM	DESCRIPTION	2012	2011	2010
A	Interstate Experience Modification Rate (EMR)	0.67	0.64	0.69
	Using the OSHA 300 Logs from the facilities providing labor, please document the following:			
B	Recordable Incident Rate (RIR)	0.64	0.59	0.77
C	Lost Time Incident Case Rate (LTICR)(only incidents that resulted in days away from work)	0.19	0.19	0.25
D	Lost Workday Injury and Illness Case Rate (LWDCR)(includes days away from work, job transfers and job restrictions)	0.23	0.19	0.37
E	Number of Injuries and Illnesses (Total Line Entries of 300 Log)	31	28	37
F	Number of Lost Work Day Cases (Column H of 300 Log)	9	9	12
G	Number of Job Transfer or Restriction Cases (Column I of 300 Log)	2	0	6
H	Number of Injury Related Fatalities (Column G of 300 Log)	0	0	0

Exhibit

I	Employee Hours Worked/Year (If unknown use # of employees x 2080)	9,684,181	9,461,535	9,600,703
J	Total Number of Employees	5,185	4,909	5,253
K	NAISC or Standard Industrial Classification (SIC)	54133	54133	54133

(B) Rate = E x 200,000 ÷Hours (C) Rate = F x 200,000 ÷ Hours (D) Rate = (F + G) x 200,000 ÷ Hours

	Question	Y / N	Comments
1.	Does your company have a written safety and health program? Please attach a copy with this submission.	Y	
2.	Does your company have a written Hazard Communication Program?	Y	
3.	Does your company have a written environmental compliance assurance program? Does your company have a written DOT Operator Qualification Plan? Please attach a copy with this submission for review. Note: Plan must meet or exceed LG&E AND KU SERVICES COMPANY Gas Distribution Operator Qualification Plan.	Y N	Environmental Policy Statement Attached We do not have Operators
4.	Does your company use subcontractors? (This Questionnaire is required for all Subcontractors) If you do use sub-contractors, do you qualify subcontractors based on their ability to address safety, health and environmental requirements? Do you verify that subcontractors meet regulatory requirements? Does your subcontractor have a DOT Operator Qualification Plan or are they qualified under your plan. If they have their own plan then please submit a copy for review	N	As an engineering firm, we use sub-consultants rather than contractors. We do not anticipate using any sub-contractors for this project.
5.	Are all documents, pertaining to this questionnaire, available for auditing? If no, please explain	Y	
6.	Who in your company is responsible for coordinating your safety and health program? Name/Job Title:___Jim Woolcott, Director of Corporate Safety_____ Phone # (402) 399-4823_____ Is safety and health a full time responsibility for this position? YES	N	We have a department of full-time Health and Safety employees in our Omaha headquarters who coordinate the HDR safety program and to whom our OSC reports.

Exhibit

7.	Has your company received any citations from a regulatory agency during the last three years? If yes, describe citation(s)	Y	OSHA conducted a compliance inspection at the HDR Mahwah, New Jersey laboratory on March 3, 2011. This inspection was in response to an odor complaint received by OSHA alleging odors had emanated from the laboratory. This lab is designed to tests and produce bacteriophages, used in testing the efficacy of ultraviolet sterilization systems in public water treatment systems. These bacteriophages are categorized as a biosafety level 1 organism, can only infect bacteria, and are non-harmful to humans, animals or plants. As a result of the complete laboratory inspection, OSHA issued HDR one ***Other-Than-Serious*** citation, with no monetary penalty, for one violation of 29 CFR 1910.151(c). Specifically, our eyewash was located through a doorway from where our corrosive lab chemicals were maintained. In response, HDR immediately installed an additional eyewash at the point of chemical usage. The case was settled July 13, 2011. HDR has not received any other OSHA citations in the past 5 years.
8.	Does your company perform safety audits/review? If yes, are safety audits documented?	Y Y	
9.	Who reviews the safety audit/review and how often? Job Title:_____		Office audits are performed monthly. Other project-specific audits are project-specific. Self audits are done daily. Safety program audits are done annually.

Exhibit

10.	Does your company provide/require the following? Eye Protection (ANSI-Z41.1)(29 CFR 1910.133) Fall Protection (ANSI-Z41.1)(29 CFR 1926.501 or 1910.66) Foot Protection (ANSI-Z41.1)(29 CFR 1910.136) Hand Protection (ANSI-Z41.1)(29 CFR 1910.138) Hard Hats (ANSI-Z89.1)(29 CFR 1910.135 Hearing Protection (ANSI-Z41.1)(29 CFR 1910.95) Respiratory Protection (ANSI-Z41.1)(29 CFR 1910.134	Y Y Y Y Y Y Y	As required by specific proje sites.
11.	In addition to regulatory required Personal Protective Equipment, what other PPE is required or supplied? If any, please describe or list:_____		For high-traffic project sites.
12.	Describe how you will meet the requirements for first aid and medical provision under this contract.		Our staff regularly works from our professional office rather than on project sites. We have regularly trained First Responders for CPR and First Aid in our office.
13.	Does your company have scheduled, documented employee safety meetings? If yes, how often?_____	Y	Local Safety Committee = monthly Project Safety Meetings = (per project needs
14.	Who conducts the safety meetings? Job Titles:_____		Office Safety Coordinator, Project Manager, based on purpose
15.	What managers/supervisors participate in the safety meetings? Job Titles:_____		All managers and supervisors have at least basic safety training and are involved in additional based on project needs.
16.	Are meetings reviewed and critiqued by managers/supervisors?	Y	
17.	Does your company hold on-site (tailgate/toolbox) safety meetings? If yes, how often?_____ Who conducts these safety meetings? Job Titles:_____ Is documentation available?	Y	Varies Per project/site requirements Supervisors Project Managers, Field Managers (All Engineering) Yes, in most cases

Exhibit

18.	Does your company have a written policy regarding drug screening or testing of your employees? If Yes Please provide a copy of your plan to The Company representative.	Y	Attached
19.	Does your drug testing program conform to DOT requirements? Comments:_____ If yes, which set of DOT regulations is your drug testing program designed to satisfy? Pipeline and Hazardous Material Safety Administration PAHMSA Federal Motor Carrier Safety Administration FMCSA	N/A	Neither of these are applicable to the types of services we provide.
20.	Does your company have policy requiring written accident/incident reports (spills, injuries, property damage, etc.)?	Y	
21.	Does your company conduct accident/incident investigating? If yes, please attach a brief outline of procedures	Y	Accident/Incident procedure is attached.
22.	Does your company document, investigate and discuss near miss accidents? If yes, is documentation available?	Y Y	
23.	Are accident/incident reports reviewed by managers/supervisors?	Y	
24.	Indicate the circumstances in which your company's employees may be subject to drug screening. Employment Random Probable Cause Post Accident Periodic Other	 Y Y Y Y Y Y	 Per project/client requirements

PLEASE RESPOND TO ALL ITEMS WITH "YES, NO, OR NA." (ESTIMATED PERCENTAGE OF EMPLOYEES SHOULD REFLECT THE PERCENTAGE OF EMPLOYEES PROVIDING LABOR WHO HAVE RECEIVED TRAINING).

PROGRAMS/TRAINING	REFERENCE SOURCE	PROGRAM DOCUMENTED AND WRITTEN Y/N/NA	EST. %	FREQUENCY OF TRAINING FOR INDIVIDUAL EMPLOYEES
Asbestos Class IV (Awareness)	OSHA 29 CFR 1926.1101	N		
Asbestos Class III	OSHA 29 CFR 1926.1101	N		
Asbestos Class I and II	OSHA 29 CFR 1926.1101	N		
Confined Space Entry	OSHA 29 CFR 1910.146(g)	Y		See note below
Cranes	OSHA 29 CFR 1926.550	Y		See note below

Exhibit

Natural Gas Operations	DOT 49 CFR 192, Subpart N	N		
DOT HM-126\f Hazmat Employee	DOT 49 CFR 172.704	N		
Generation, Transmission, and Distribution Standard	OSHA 29 CFR 1910.269	N		
Electrical Safety	OSHA 29 CFR 1910.332	Y		
Emergency Evacuation	OSHA 29 CFR 1910.38(a)	Y		
Excavations	OSHA 29 CFR 1926.651	Y		
Fall Protection	OSHA 29 CFR 1926.500	Y		
First Aid/CPR	OSHA 29 CFR 1910.151(b)	Y		
Forklifts	OSHA 29 CFR 1910.178(l)	N		
Hazard Communications	OSHA 29 CFR 1910.1200(h)	Y		
Hazwoper - Awareness Level	OSHA 29 CFR 1910.120	Y		
Hazwoper 8 Hour	OSHA 29 CFR 1910.120	Y		
Hazwoper 24 Hour	OSHA 29 CFR 1910.120	N		
Hazwoper 40 Hour	OSHA 29 CFR 1910.120	Y		
Hazwoper Supervisor 8 Hour	OSHA 29 CFR 1910.120	Y		
Hearing Conservation	OSHA 29 CFR 1910.95	Y		
Incipient Fire Fighting	OSHA 29 CFR 1910.157(g)	N		
Lead Worker	OSHA 29 CFR 1926.62(l)	N		
Lead Supervisor	See Above	N		
Lockout/Tagout Authorized Person	OSHA 29 CFR 1910.147(c)(7)	Y		
Lockout/Tagout Affected Person	See Above	Y		
New Employee Orientation	OSHA 29 CFR 1910.119(g)	Y		
Personal Protective Equipment	OSHA 29 CFR 1910.132(f)	Y		
Process Safety Management	OSHA 29 CFR 1910.119	N		
Respiratory Protection	OSHA 29 CFR 1910.134	Y		
Scaffolding	OSHA 29 CFR 1926.454	N		
Substance Abuse	DOT 46 CFR 16.401 & 391.119	N		

Safety courses noted here are available via HDR's Health and Safety Department. Safety training is provided to employees as needed based on the project(s) to which each employee is assigned. Additional details are available upon request.

Signature _____(Signature Required)

Name (Print): William H. Damon III, PE

Title Sr. VP, Consulting & Development Services Lead

Date: March 14, 2013

Exhibit H

Date: _____

3.0 Overview of Passport Program

LG&E AND KU SERVICES COMPANY
OVERVIEW OF PASSPORT PROGRAM

Purpose

Safety is a core value at LG&E and KU Services Company. To enhance the welfare of all who work in and around LG&E and KU Services Company facilities, an enhanced contractor safety program has been developed. Building on internal and external best practices, a cross functional team has developed improvements to the existing "Passport Program." The Passport Program is designed to cover industrial workers. For purposes of this overview, "LG&E and KU Services Company" refers to LG&E and KU. The key components of the program are outlined below.

Process Steps

STEP 1 – CERTIFICATION
All contractors working for LG&E and KU Services Company must be certified prior to entering company work sites or performing any work for the company. This process is administered by Supply Chain Support or as part of the specific project competitive bid process.

As part of the certification process, prime contractors (contractors entering into contracts directly with the company must identify any and all sub-contractors they plan on utilizing in work for the company. Each prime contractor is responsible for ensuring that those identified sub-contractors complete the same information and meet the same performance criteria as the prime contractor is expected to meet. In the event not all subcontractors have been identified prior to certification, the contractor shall notify LG&E and KU Services Company before engaging any subcontractor.

STEP 2 – PASSPORT TRAINING
All industrial workers employed by a certified contractor must complete a training program designed to inform them of the importance of safety and the hazards associated with working in an industrial environment. This training will also identify additional specific OSHA, EPA and DOT compliance training that may be needed in certain situations. Passport training, however, does not take the place of any of the compliance training required by the above listed agencies. **It is the responsibility of the contractor to provide any compliance training required for their employees.**

There are two options available to contractors with regard to the Passport Training:

Option 1 – Train-the-Trainer
LG&E and KU Services Company will provide a curriculum and conduct train-the-trainer sessions at appropriate intervals for the contractor's key safety/training personnel. For those contractors choosing this option, a resume for each prospective trainer must be submitted and must include the following information:

- Training delivery and development experience
- Knowledge of OSHA, DOT, and EPA Standards applicable to the work for which Contractor will be performing

- Health and safety knowledge and experience in managing a health and safety program

By virtue of their attendance and ability to pass a written examination, these key personnel would then be approved to provide training to the contractor's employees to meet the requirements of a "Passport."

NOTE: LG&E and KU Services Company reserves the right to reject any contractor employee as a potential trainer if:

- The above referenced information regarding experience and qualifications is not submitted
- The information submitted does not adequately indicate the prospective trainer's ability to perform the duties of a trainer for the Passport program.
- The prospective trainer does not complete the required train-the-trainer session, including successfully passing the final examination.

Option 2 – External Provider
External providers of the LG&E and KU Services Company Passport safety training program will also be assessed and certified by a representative from the Business Unit Training group in accordance with Option 1. This will allow certified contractors to seek Passport training for their employees from an external provider at their expense. A list of currently approved external providers is included in your certification packet.

STEP 3 – ATTESTATION FORM
Contractors will be required to attest to the fact that each employee, including subcontractors working on any LG&E and KU Services Company job site or performing any work on LG&E AND KU Services Company project, has received the required Passport training before starting work. The contractor will also attest that all employees are current on all required compliance training for the work that employee will be performing. Although LG&E and KU Services Company will be looking for confirmation that compliance training has been completed, it is not a requirement that the contractor provide training records for all individuals, and LG&E and KU Services Company will not monitor compliance training delivered by contractors to their employees. However, site compliance audits will be routinely performed to ensure the adequacy of the training provided. If an incident occurs, LG&E and KU Services Company will require the contractor involved to provide individual training records as part of the incident investigation process.

Upon successful completion of the required Passport safety training by a contractor's employee, the contractor will enter that employee's name, date of birth and training information into the LG&E and KU Services Company Contractor Health & Safety Data Base @ www.lge-ku.com. An electronic notification will be sent to the appropriate LG&E and KU Services Company representative for Passport authorization. Upon approval (on-line), the contractor will be notified electronically that the Passport has been approved and that the contractor can print and issue a Passport card to the newly entered worker. The card will have an identification number that will associate the worker with his or her records in the database. The contractor's employee must carry this card and valid government issued photo ID at all times while on LG&E and KU Services Company property or job sites.

The Passport does not serve as security clearance for an employee. The Passport merely attests to the fact that the contractor employee has completed all required training. Site access will be handled in accordance with local site access procedures. For long-term contractors, a photo ID with a magnetic strip may also be issued to a contractor's employee for security purposes. For all other employees of contractors, a sign-in sheet may be utilized to track individuals on site.

STEP 4 – SITE SPECIFIC ORIENTATION

Exhibit H

Each employee of a contractor working on LG&E and KU Services Company property or job sites must attend a site specific orientation training identifying parking directions, security procedures, site map, emergency evacuation procedures, emergency contact names, medical facility locations, specific alarms, and site-specific hazardous materials. A separate orientation will be required for each generation site at which a contractor's employee works. This orientation will normally occur on the first day of work on the job site.

STEP 5 - HIRING SUBCONTRACTORS

Prime contractors are responsible for ensuring that any subcontractors working for them in any capacity directly or indirectly are held to the same safety performance expectations as the prime contractor itself. The primary contractor shall request and review safety data prior to hiring any subcontractors to assure they meet the standards for favorable under the following safety criteria (LG&E and KU Services Company emphasizes that these criteria are minimum standards):

Safety Criteria – INCIDENT RATES*

Favorable: The three most recent years recordable Incident Rates will be compared to the related industry average in such years for the subcontractors' NAISC (or SIC) classification (as published by the Bureau of Labor Statistics). Subcontractors' Incident Rate shall not exceed the industry average in any related year.

Unfavorable: A single fatality identified within any of the three most recent year's statistics.

Safety Criteria – EMR**

Favorable: Workers Compensation Insurance Experience Modification Rate at or better than the average EMR rating for their industry.

Unfavorable: EMR greater than the industry average for their industry.

Note: Contact the LG&E and KU Services Company safety representative for direction in situations where a particular subcontractor does not meet the criteria due to extremely unique circumstances.

STEP 6 – CONTRACTOR REPORTING REQUIREMENTS

All accidents, injuries, dangerous occurrences and near misses shall be reported as soon as possible to the LG&E and KU Services Company Safety contact for the work site. A soon as possible means as soon as communications can be made without jeopardizing the life or health of any person. LG&E and KU Services Company is subject to various regulatory requirements requiring prompt investigation and reporting of certain events making it essential for all contractors to provide information without delay.

Contractors shall also report statistical information to LG&E and KU Services Company on a monthly basis. The information required is:

- Number of hours worked at each LG&E and KU Services Company job site
- Number of fatalities, Lost Workday Cases and OSHA Recordable Injuries for each job site.

The preceding month's statistical information shall be entered into the LG&E and KU Services Company Contractor Health & Safety Database by the Contractor by Noon on the 5th working day of the month.

All reporting requirements will include any subcontractors working for the prime contractor.

Exhibit H

Administration

- **All personnel working for contractors and subcontractors on LG&E and KU Services Company property or job sites must have a Passport.**
- The passport is valid for 12 months or until revoked by LG&E and KU Services Company, whichever is earlier. Refresher training options will be developed and provided annually
- The expenses of training will be the responsibility of the contractor.
- The contractor is responsible for ensuring that all of the above requirements are met for every individual worker utilized in work on LG&E and KU Services Company property or job sites. This includes all subcontractors utilized directly or indirectly by a prime contractor. The prime contractor will be responsible for ensuring that each subcontractor has met all of the requirements regarding issuance of a Passport and for ensuring that all reporting requirements outlined in Step 5, above, are fulfilled.
- LG&E and KU Services Company reserves the right to revoke any individual's Passport. See Passport Revocation and Reinstatement Guidelines below.
- Site audits will be routinely performed to assess effectiveness of and compliance with the information communicated during the Passport Program. These audits will be conducted by Site Safety, Site Contract Proponents, and Managers.
- Corporate Health & Safety will audit contractors for appropriate drug & alcohol, compliance and Passport training documents.

Passport Revocation and Reinstatement Guidelines

LG&E and KU Services Company reserves the right to revoke any individual's Passport. Passports can be revoked for:

- Failure to comply with safety rules, procedures or programs;
- Failure to comply with drug and alcohol rules or testing requirements;
- Creation of an unsafe condition that has potential to result in death or serious injury; or
- Any reason not violating applicable Federal, state or local law deemed appropriate by the responsible site manager.

If a contractor wishes to request that LG&E and KU Services Company reconsider a revocation decision, the request may in writing to the responsible site manager. LG&E and KU Services Company is not obligated to consider such requests.

A Passport may be reinstated in the sole discretion of LG&E and KU Services Company if the contractor has satisfied the responsible manager that the reason for revocation has been corrected.

If an individual's Passport is revoked for a second time, the individual will not be allowed to reapply for an LG&E and KU Services Company passport.

**** Incident Rates***

Incident rates can be used to show the relative level of injuries and illnesses among different industries, firms, or operations within a single firm. Rates are computed from the following formula:
# of injuries or illnesses X 200,000 / employee hours worked.

Exhibit H

***Experience Modification Rates for Workers' Compensation Insurance*

The Experience Modification Rate is a widely used indicator of past safety performance. The insurance industry has developed experience rating systems as an equitable means of determining premiums for workers' compensation insurance. These rating systems consider the average workers' compensation losses for a given firm's type of work and amount of payroll and predict the dollar amount of expected losses to be paid by that employer in a designated rating period, usually three years. Rating is based on comparison of firms doing similar types of work, and the employer is rated against the average expected performance in each work classification. Losses incurred by the employer for the rating period are then compared to the expected losses to develop an experience rating.

Workers' compensation insurance premiums for a contractor are adjusted by this rate, which is called the experience modification rate (EMR). Lower rates, meaning that fewer or less severe accidents had occurred than were expected, result in lower insurance costs. The EMR is adjusted annually by using the rate for the first three of the last four years.

Exhibit H

4.0 Contractor Safety Management Project Specific Hazard Analysis

LG&E AND KU SERVICES COMPANY
Contractor Safety Management
Project Specific Hazard Analysis

This Hazard Analysis form and the required subsequent Hazard Mitigation Plan shall be completed by the contractor's designee and shall be submitted to The Company's authorized representative and forwarded to the facility's Health and Safety Specialist prior to the initiation of any work.

Work description and location:

LG&E AND KU SERVICES COMPANY Proponent:

Estimated Total Work Days: Estimated Work Force #:

Equipment Related Compliance and Safety
Will the contractor use any of the following or be exposed to its use by another group:

	Will use it? /May be exposed to its use? /Will work directly with it?		
Abrasive Wheel Machinery	Yes ☐ No ☐		Yes ☐ No ☐
Aerial Work Platform Operation	Yes ☐ No ☐		Yes ☐ No ☐
Barricades	Yes ☐ No ☐		Yes ☐ No ☐
Excavation Equipment	Yes ☐ No ☐		Yes ☐ No ☐
Cranes: overhead ☐ mobile ☐	Yes ☐ No ☐		Yes ☐ No ☐
Forklift Operation	Yes ☐ No ☐		Yes ☐ No ☐
Ground Fault Protection (GFI's/GFCI's)	Yes ☐ No ☐		
Grounding devices and processes (static)	Yes ☐ No ☐		Yes ☐ No ☐
Hand Tools / Power Tools	Yes ☐ No ☐		Yes ☐ No ☐

Specific Hazardous Substances Compliance and Safety

Anhydrous Ammonia	Yes ☐ No ☐		Yes ☐ No ☐
Arsenic	Yes ☐ No ☐		Yes ☐ No ☐
Asbestos	Yes ☐ No ☐		Yes ☐ No ☐
Bloodborne Pathogens (Applies to all)	Yes ☐		
DOT Hazardous Materials	Yes ☐ No ☐		Yes ☐ No ☐

Exhibit H

EPA Hazardous Waste	Yes ☐ No ☐		Yes ☐ No ☐
Explosive Gasses, Vapors, or dusts	Yes ☐ No ☐		Yes ☐ No ☐
Hazard Communication (Applies to all)	Yes ☐		
Hexavalent Chromium (Hot Work)	Yes ☐ No ☐	**(Mandatory contact with station H&SS)**	
MSDS's supplied on all materials	Yes ☐ No ☐		
Ionizing Radiation	Yes ☐ No ☐		Yes ☐ No ☐
Lead or other toxic metal concerns	Yes ☐ No ☐		Yes ☐ No ☐
Other / Specify	Yes ☐ No ☐		Yes ☐ No ☐

Personal Protective Hazard

Which of the following PPE will be required?

Electrical protective equipment	Yes ☐ No ☐
Low voltage gloves (Class 0, 50-600 volts)	Yes ☐ No ☐
Boundary Distances Established and Enforced	Yes ☐ No ☐
Arc Flash PPE	Yes ☐ No ☐
Class 2 600 -15kv gloves/sleeves	Yes ☐ No ☐
Rubber insulated blankets/hoses	Yes ☐ No ☐
What will the exposed voltage level be?	
Eye Protection with side shields (at all times)	Yes ☐
Goggles: directly vented ☐ indirectly vented ☐	Yes ☐ No ☐
Face Shield	Yes ☐ No ☐
Fall Protection or Prevention	Yes ☐ No ☐
Gloves (Appropriate to the specific task)	Yes ☐ No ☐
Life lines (horizontal or vertical)	Yes ☐ No ☐
Foot Wear: steel toes ☐ electrical hazard rated ☐	Yes ☐ No ☐
Hard Hats (Applies to all)	Yes ☐ No ☐
Hearing Protection (Reduction to <85db. required)	Yes ☐ No ☐
PFD (personal flotation device)	Yes ☐ No ☐
Respiratory Protection	Yes ☐ No ☐
Portable ventilation equipment	Yes ☐ No ☐

Identify the respiratory hazard

Will the contractor have exposure to:

Total dust	Yes ☐	No ☐
Silica	Yes ☐	No ☐
Arsenic / Flyash	Yes ☐	No ☐
Asbestos	Yes ☐	No ☐
Hexavalent Chromium	Yes ☐	No ☐
Lead	Yes ☐	No ☐
SO_2	Yes ☐	No ☐
Others / specify	Yes ☐	No ☐

Has air monitoring been arranged? Yes ☐ No ☐

Has air monitoring been discussed with the facility's Health & Safety Specialist? Yes ☐ No ☐

Work/Safety Procedural Requirements	*Work directly with it:*	*May be exposed to its use by others:*
Bulk Chemical Unloading	Yes ☐ No ☐	Yes ☐ No ☐
Compressed Gas Cylinders	Yes ☐ No ☐	Yes ☐ No ☐
Confined Space Entry	Yes ☐ No ☐	Yes ☐ No ☐
Specify:		
CPR & First Aid (under 1910.269, > 50 volts)	Yes ☐ No ☐	
Mobile Crane Operator Physicals (3 yr req)	Yes ☐ No ☐	
DOT Commercial Driver's License	Yes ☐ No ☐	
Excavation / Trenching and Shoring	Yes ☐ No ☐	Yes ☐ No ☐

Exhibit H

Explosion Hazard (Deslagging / Blasting)	Yes ☐	No ☐	Yes ☐	No ☐
Fire Protection (Hot work, welding & alike)	Yes ☐	No ☐	Yes ☐	No ☐

Work/Safety Procedural Requirements ***(continued)***	*Work directly with it?*		*May be exposed to* **its use by others?**	
Lifting and Rigging	Yes ☐	No ☐	Yes ☐	No ☐
Lockout/Tagout	Yes ☐	No ☐		
Grounding Procedures	Yes ☐	No ☐		

Equipment required to be isolated (list):

Marine Standard	Yes ☐	No ☐		
Scaffold Competent Builder	Yes ☐	No ☐	Yes ☐	No ☐
Scaffold Competent User	Yes ☐	No ☐	Yes ☐	No ☐
Suspended Seaffolding	Yes ☐	No ☐	Yes ☐	No ☐
Work Zone Traffic Safety	Yes ☐	No ☐	Yes ☐	No ☐

Permits

Are there any permits indicated with outside agencies? Yes ☐ No ☐
Asbestos removal, building permits, work zones, RR crossing, environmental impact, etc.)
Detail:

Are there any OSHA related permits? Yes ☐ No ☐
(Permit Required Confined Space Entry, Dig permits and alike)
Detail:

Work Area Lighting

Additional lighting devices will be needed Yes ☐ No ☐

Further instructions:

Exhibit H

For each Yes box checked, a Hazard Mitigation Plan must be submitted along with this Hazard Analysis prior to the initiation of any work.

Name of the contracted firm:

Name of the contractor's Health & Safety designee completing this Hazard Analysis:

Date

Phone number

Exhibit H

5.0 Contractor Safety Management Hazard Mitigation Plan

LG&E and KU SERVICES COMPANY
Contractor Safety Management
Hazard Mitigation Plan

This Hazard Mitigation Plan shall be filled in by the contractor's designee and must be submitted to The Company's authorized representative or their designee and forwarded to the facility's Health and Safety Specialist prior to the initiation of any work.

Description of the general job activity (e.g.: replacing duct work, building SCR):

Contractor's site supervisor:

Contractor's site Health and Safety Representative:

Date:

What is the work, what are the hazards, and how will we specifically protect our employees?

Work Task Sequence Identify the principal steps and the sequence of work activities. (e.g.: Entry into an excavation)	**Identify and Analyze the Hazards** Analyze each step for hazards. (e.g.: cave in, falls, confined space entry)	**Hazard Controls** Develop specific controls for each hazard identified. (e.g.: bench or slope or shore, air monitor, barrier, PPE. Be specific)

Work Task Sequence Identify the principal steps and the sequence of work activities.	**Identify and Analyze the Hazards** Analyze each step for hazards.	**Hazard Controls** Develop specific controls for each hazard identified.

Exhibit H

EXHIBIT I
WAGE RATES + MULTIPLIERS SPREADSHEETS
(See Tony Ruckriegel)

Exhibit CHS

CONTRACTOR HEALTH

& SAFETY PROGRAM

LG&E AND KU
220 WEST MAIN ST.
LOUISVILLE, KY 40202

Revision 1
5/28/2021

TABLE OF CONTENTS

I. PURPOSE

As part of our continued commitment to deliver a world-class health and safety program, LG&E and KU (as defined in Section IV below) is dedicated to ensuring the same performance standards and expectations are made of Contractors (as defined in Section IV below) as we make of employees. This commitment has been shared by LG&E and KU with the regulatory agencies that govern our business.

II. SCOPE

This Contractor Health and Safety Program ("Program") applies to Contractors performing construction, maintenance, engineering or similar services on LG&E and KU or customer property or in an LG&E and KU easement or right-of-way, which are typically provided under the following agreements: General Commercial Agreement (GCA); Master Contract for General Engineering Services; Engineering, Procurement and Construction (EPC) Agreement; Procurement and Construction (PC) Agreement, Abatement and Demolition (Ab/Demo) Agreement, or Equipment Purchase Agreement (EqPA). This program does not apply to Contractors performing only professional or administrative services such as accounting, medical, legal, clerical, and certain IT related services, which are typically provided under an Administrative Services Agreement (ASA).

As part of our commitment to improving Contractor health and safety performance, all LG&E and KU businesses operating within LG&E and KU's service territories have implemented a "Safety Passport Program" ("Passport") The basic elements of the program are a required awareness program and the attestation from each Prime Contractor that all workers have received appropriate skills and safety training.

This Program ensures that any worker performing work for a Contractor at an LG&E and KU site or customer's property has received Passport training and is fully aware of LG&E and KU's commitment to an uncompromised safe working environment. All workers are made aware they are required to stop any job for which they have not been trained or is a danger to a person(s), equipment, or the environment.

Contractor safety performance and Passport attestations are managed through a web-based database in Avetta. The Avetta system tracks the Contractor's overall safety performance, an individual's Passport training and also lagging indicators of performance in terms of OSHA recordable injuries, drug and alcohol testing, and hours worked.

III. LEGAL REQUIREMENTS

This Program does not replace a Contractor's existing safety and health program(s), provided that their program(s) meets or exceeds the requirements of this Program and any additional site-specific minimum requirements. Employees of a Contractor not following this Program will be subject to removal from the job site. Refer to **Appendix E (Red List)**.

All Contractors are required to comply with all federal and state safety laws and all applicable provisions of the LG&E and KU Health & Safety Manual, which is incorporated in this Program by reference. Each Contractor is responsible for conducting its work and activities safely. LG&E and KU expects and requires that each Contractor continuously update employees with respect to safety issues relevant to the work and to take immediate corrective action when employees violate safety rules or procedures.

Each Prime Contractor is responsible for ensuring that any and all Sub-Contractors working under their purview are held to the same performance expectations, and therefore this Program, as the Prime Contractor itself.

IV. DEFINITIONS

Competent Person – An individual who is capable of identifying existing and predictable hazards in the surroundings or working conditions, which are unsanitary, hazardous, or dangerous to workers, and who has authorization to take prompt corrective measures to eliminate them.

Contractor – Any Prime Contractor or Sub-Contractor (as such terms are defined below).

Contractor's Representative – A competent representative of a Contractor whom the Contractor designates to carry out Contractor's supervisory, statutory, and contractual obligations, and to represent the Contractor at the work site. The person designated by the Contractor to effectively manage health and safety issues that relate to the work site. This person may be referred to as the "Contract Supervisor" or other title.

Hazard Analysis – A comprehensive review of the tasks, hazards, and mitigation measures associated with a Contractor's planned work. Refer to **Appendix C (Hazard Analysis and Mitigation Form)**.

LG&E and KU – means (i) Louisville Gas and Electric Company, (ii) Kentucky Utilities Company, and (iii) LG&E and KU Services Company. As used in this Program, "LG&E and KU" refers to those three companies collectively, except in instances where this Program applies to work under a specific contract, in which case "LG&E and KU" refers only to those of such three companies as are party to that contract.

Prime Contractor – A person, whether an individual, company, partnership, corporation, or other entity, that has contracted directly with LG&E and KU to perform work.

Proponent – A competent LG&E and KU manager's representative designated to carry out LG&E and KU's supervisory, statutory, and contractual obligations, and to

represent LG&E and KU related to a Contractor.

Qualified Person – An individual who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to subject matter, the work, or the project.

Red List – The revoking of a Passport certification and access to LG&E and KU property. Refer to **Appendix E (Red List)**.

Site – The place at which the work is to be carried out.

Safety Specialist – An employee of the LG&E and KU Safety & Technical Training department, Power Generation Safety Specialist, or Project Engineering Safety Specialist.

Sub-Contractor – Any person, whether an individual, company, partnership, corporation, or other entity, that has contracted directly or indirectly with a Prime Contractor to perform work that such Prime Contractor has agreed to provide to LG&E and KU under a contract.

V. RESPONSIBILITIES

Contractor

- Prepare Hazard Analysis based on tasks to be performed and maintain copy for 12 months
- Review Hazard Analysis with their employees
- Update Hazard Analysis as conditions change
- Make Hazard Analysis readily accessible to their employees and LG&E and KU
- Ensure all employees of the Prime Contractor and its Sub-Contractors receive appropriate Passport training(s) prior to coming on LG&E KU property
- Maintain employee training and access records as appropriate
- Submit monthly work hours, drug and alcohol testing, and any incidents by the **fifth working day of the following month** for any month that work was performed for LG&E and KU by the Prime Contractor and/or its Sub-Contractors.

Proponents

- Facilitate the Contractor's safe execution of work. This may include:
    - Job Set-Up and Preparation Duties:
        - Provide relevant job and safety information to Contractor
        - Review, revise and accept Hazard Analysis
        - Ensure Contractor is green (fully compliant) or yellow-flagged (compliant with conditions) in the Avetta database prior to starting work
        - Ensure yellow-flagged Contractor works within any conditions set for them
        - Confirm all Contractor employees have received appropriate Passport training(s) prior to coming on LG&E and KU work sites
        - Coordinate safety kickoff meeting, as applicable.
    - Job Initiation:
        - Confirm daily job briefings are performed.
        - Confirm tasks performed in accordance with accepted Hazard Analysis

- Confirm hours and D&A information gets entered.
- Manage Contractor employee physical access

Safety Specialist

- Assists Proponent with facilitating and monitoring the Contractor ’s safe execution of work. This may include reviewing hazard analysis and providing comments to the Proponent.
- Utilize the Red Flag Review process when a Contractor ’s safety performance does not meet LG&E and KU’s approved performance standards within Avetta.
- Provide oversight for the Contractor safety approval process
- Conduct manual safety reviews in circumstances not captured by the Avetta database, such as warranty or emergency work.

VI. CONTRACTOR SAFETY APPROVAL

Prime Contractors are required to be onboarded as part of the LG&E and KU procurement process, which will include additional requirements prior to any work beginning. During the onboarding process, Contractors shall complete **Appendix A (Contractor Health and Safety Attestation)** and submit to LG&E and KU sourcing professional. Prime Contractor safety approval is a critical component of onboarding which involves a review of Prime Contractor safety performance and programs. Prime Contractor safety performance metrics and programs will be submitted to Avetta, which is a web-based application developed to assist in tracking Prime Contractor safety performance and administration of the Passport program. Examples of collected data include hours worked, drug and alcohol testing, and injuries sustained while working on LG&E and KU work sites. In the event a Prime Contractor uses Sub-Contractors, the Prime Contractor for the job is required to enter all hours worked, including Sub-Contractor(s) hours, into the Avetta Database. Sub-Contractors are responsible for reporting hours worked to the Prime Contractor, who has the direct business relationship with LG&E and KU for the job, and the Prime Contractor is responsible for ensuring each Sub-Contractor completes such reporting. The Prime Contractor is responsible for completing the data entry. If data entry is not completed, LG&E and KU representatives will communicate with the Prime Contractor involved.

Contractor Safety Approval Outside of Avetta

A Contractor exception process can be utilized in lieu of Avetta in the event of warranty work or response to emergencies and significant outage events on the Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU) systems. Under critical circumstances, it is paramount to bring in off system resources to assist with restoration efforts.

Significant outages caused by, but not limited to, severe weather, flooding, civil disturbances, cyber, fire or explosion or other major disruption to LG&E and KU for which management personnel determines the need to deviate from the normal safety approval and Passport process for restoration of service.

NOTE: This exception does not supersede any process currently in place by business units as defined in their Emergency Response and Preparedness Plans.

Proponent must provide the Contractor with a copy of this LG&E and KU Contractor Health & Safety Program. The Contactor must complete and submit to the Proponent the following documents from the Program.

- LG&E and KU Contractor / Sub-Contractor Health and Safety Questionnaire (Refer to **Appendix B (*Contractor Health and Safety Questionnaire*)** for additional information)
- Job Hazard Analysis & Hazard Mitigation Plan (Refer to **Appendix C (*Hazard Analysis and Mitigation Form*)** for a sample)

The above documents will be reviewed by the Safety Specialist. After approval, the Proponent shall coordinate with Safety Specialist to ensure the appropriate Passport training is provided to any Contractor employees before starting work.

The Prime Contractor is responsible for attesting that any employee, including employees of Sub-Contractors if applicable, completes Passport training prior to working on any LG&E and KU work site.

VII. CONTRACTOR HEALTH AND SAFETY PASSPORT PROGRAM

The Passport program is designed to reinforce LG&E and KU's commitment to effective health and safety management, raise awareness of commonly encountered hazards and reinforce the behavior expected of Contractor employees at the worksite. The Passport program is intended to support existing programs, compliance training and complement local orientation training sessions. Refer to **Appendix D (*Contractor Safety Passport Overview*)** for the specific requirements of the Passport program.

VIII. DRUG AND ALCOHOL PROGRAM

Contractors shall not allow any employee to perform services for or on behalf of LG&E and KU while under the influence of drugs or alcohol. Contractors shall maintain a drug and alcohol (D&A) testing program meeting all applicable federal, state and local laws, regulations, and ordinances and meeting or exceeding the standards stated in the attached **Appendix F (*Drug and Alcohol Requirements*).** which is incorporated by reference, and any and all standards stated in any contract with LG&E and KU. Contractors shall enter D&A testing information monthly into the Avetta system.

IX. HAZARD ANALYSIS

Prime Contractor shall complete and submit, or require its Sub-Contractors to complete

and submit, a Hazard Analysis to the Proponent prior to the initiation of any work. A sample form is available at **Appendix C (*Hazard Analysis and Mitigation Form*).** The Hazard Analysis shall be reviewed by all Contractor personnel scheduled to work in the activities identified prior to working on them. The Prime Contractor shall maintain proof that all personnel have reviewed the Hazard Analysis and shall make available such proof upon request. Note: This by no means shall replace their regulatory compliance training.

Refer to **Appendix G (*Hazardous Chemical Communication*)** for a list of hazardous chemicals that may be present on LG&E and KU work sites, which shall be addressed in the Hazard Analysis, as appropriate. This list should in no way be deemed as the only hazards that could be encountered at LG&E and KU.

Job Briefings

Prime Contractor shall ensure that its employees and any Sub-Contractor employees under its control on the job site perform a job briefing. The job briefing shall be performed prior to the start of each job. Refer to **Appendix H (*Job Briefing Guidance*)** for additional information.

Stop Work Authority

All employees of any Contractor and all employees of LG&E and KU have the authority and responsibility to stop work for any condition or behavioral action that poses a danger to a person(s), equipment, or the environment without fear of repercussion. The work shall be immediately stopped, and the incident shall be reported to supervision.

Immediately after notifying supervisor, the individual, or their supervisor, must report the incident to the LG&E and KU Proponent and Safety Specialist. Work shall not resume until the LG&E and KU Proponent and Safety Specialist have agreed that the hazard has been eliminated and the area is safe.

X. INCIDENT MANAGEMENT

An emergency is any situation that poses an immediate threat to life or property. Refer to the site orientation, or the LG&E and KU Proponent for specific information for handling of a life threatening or other serious injury, fire, etc. Following the occurrence of an emergency, the Prime Contractor shall ensure that all proper incident reports are completed and distributed, and that the LG&E and KU Proponent and Safety Specialist are notified immediately.

Incident Reporting

In the event a job site incident occurs, the Prime Contractor shall immediately implement controls and restrictions on the incident site to ensure the site remains undisturbed until released by the LG&E and KU Proponent and Safety Specialist. All incidents and injuries shall

be reported to the LG&E and KU Proponent and Safety Specialist immediately after the site is secured. A written incident report shall be furnished by the end of the same work shift during which the incident occurred. A job site incident would include, but not be limited to a fire, explosion, equipment failure, release or exposure to toxic liquids, fumes or vapors, employee injury, vehicle incident, etc.

Near Miss/Injury-free Event

It is the responsibility of the Prime Contractor, to complete all near miss investigations, and to report these occurrences with recommendations/implementation of corrective actions. The report is to be submitted to the LG&E and KU Proponent and Safety Specialist within 24 hours or a mutually agreed upon time by the Prime Contractor and Proponent.

Fatality

It is the responsibility of the Prime Contractor to immediately notify LG&E and KU should a fatality occur. It is the responsibility of the Prime Contractor to notify, or to ensure its Sub-Contractor notifies, the Federal and/or State Occupational Safety & Health, Division of Compliance within the appropriate notification periods.

XI. ENFORCEMENT

The Prime Contractor is responsible for the health and safety of its employees and any Sub-Contractor employees under its control. Enforcement of this Program, as well as other recognized safety requirements, is the responsibility of the Prime Contractor. The evaluation does not constitute acceptance of the Contractor ’s safety programs or work practices nor, in any way relieve a Contractor of full responsibility for meeting all appropriate OSHA regulations to ensure the safety of its employees.

Whenever there is a jurisdictional question of which standard will apply, the most stringent safety practice will take precedence. Contractors and their employees who do not follow this Program are subject to removal from the worksite as well as being banned from future LG&E and KU projects/contracts.

LG&E and KU reserve the right to evaluate the safety of Contractor’s work practices to determine if they meet LG&E and KU standards and state/federal regulations. In addition to the audit rights under the applicable contract, LG&E and KU reserve the right to audit any and all documents (e.g. job briefings, audits, etc.) at any time during the course of the work.

APPENDIX A

LG&E and KU Services Company Contractor Health & Safety Attestation

As an authorized representative for the company named below, I affirm that same company has been provided copies of both the LG&E and KU Health & Safety Manual (dated April 2017) and Contractor Health & Safety Program (dated May 28, 2021) and I understand and agree that same company will abide by the requirements set forth therein and ensure its Sub-Contractors will also abide by the applicable requirements set forth therein; and confirm this by signing below.

Contractor Company Name: HDR Engineering, Inc.
Contractor Representative (sign): [signature]
Contractor Representative (print): Nathan Duvall
Title: Sr. Project Manager
Date: 4/7/2022

Complete and submit this form to your LG&E and KU sourcing professional.

APPENDIX B
CONTRACTOR HEALTH AND SAFETY QUESTIONNAIRE

THIS QUESTIONNAIRE IS REQUIRED FOR ALL CONTRACTORS AND SUBCONTRACTORS PRIOR TO STARTING WORK

The Company is committed to providing a safe and healthy workplace for employees and Contractors/Subcontractors. To qualify to perform work, the Contractor/Subcontractor shall provide the following information and agree to obtain the following information from all subcontractors utilized.

Contractor/Subcontractor Name: HDR Engineering, Inc. Date: ___4/7/2022_____

Contracted Activity (please describe):__2027 NGCC Feasibility Study

Contractor/Subcontractor Representative: Nathan Duvall Phone:(859) 629-4888

Please provide a brief description of the work activities and location(s) undertaken by your company: ____Engineering services for Natural Gas Combined Cycle feasibility.

The following information must be from the facilities providing labor. We are not interested in overall statistics at a national or international level. Describe the area to which this questionnaire applies. United States

ITEM	DESCRIPTION	onnaire applies. In addition, attach copies of applicable OSHA 300 Logs (showing the actual injuries, etc. – not the summaries) and verification of you EMR/discount rate information. 2021	2020	2019
A	Interstate Experience Modification Rate (EMR)	.61	.61	.72
	Using the OSHA 300 Logs from the facilities providing labor, please document the following:			
B	Recordable Incident Rate (RIR)	.21	.21	.33
C	Lost Time Incident Case Rate (LTICR)(only incidents that resulted in days away from work)	.03	.09	.05
D	Lost Workday Injury and Illness Case Rate (LWDCR)(includes days away from work, job transfers and job restrictions)	.12	.11	.10
E	Number of Injuries and Illnesses (Total Line Entries of 300 Log)	25	26	40
F	Number of Lost Work Day Cases (Column H of 300 Log)	4	11	6
G	Number of Job Transfer or Restriction Cases (Column I of 300 Log)	10	2	6
H	Number of Injury Related Fatalities (Column G of 300 Log)	0	0	0
I	Employee Hours Worked/Year (If unknown use # of employees x 2080)	23,839,192	24,224,388	24,399,775
J	Total Number of Employees	9,907	9,891	9,880
K	NAISC or Standard Industrial Classification (SIC)	5413	5413	5413

(B) Rate = E x 200,000 ÷Hours (C) Rate = F x 200,000 ÷ Hours (D) Rate = (F + G) x 200,000 ÷ Hours

	Question	Y / N	Comments
1.	Does your company have a written safety and health program? Please attach a copy with this submission.	Y	
2.	Does your company have a written Hazard Communication Program?	Y	
3.	Does your company have a written environmental compliance assurance program? Does your company have a written DOT Operator Qualification Plan? Please attach a copy with this submission for review. Note: Plan must meet or exceed LG&E and KU Services Company Gas Distribution Operator Qualification Plan.	Y	
4.	Does your company use subcontractors? (This Questionnaire is required for all Subcontractors) If you do use sub-contractors, do you qualify subcontractors based on their ability to address safety, health, and environmental requirements? Do you verify that subcontractors meet regulatory requirements? Does your subcontractor have a DOT Operator Qualification Plan or are they qualified under your plan. If they have their own plan then please submit a copy for review	Y	
5.	Are all documents, pertaining to this questionnaire, available for auditing? If no, please explain	Y	
6.	Who in your company is responsible for coordinating your safety and health program? Name/Job Title: Jeff Kleinfelter / Director of SH&E Phone # (760) 450-6497 Is safety and health a full time responsibility for this position?	Y	
7.	Has your company received any citations from a regulatory agency during the last three years? If yes, describe citation(s)	N	
8.	Does your company perform safety audits/review? If yes, are safety audits documented?	Y	
9.	Who reviews the safety audit/review and how often? Job Title: Ross Guffey / Local SH&E Representative		

10.	Does your company provide/require the following? Eye Protection (ANSI-Z41.1)(29 CFR 1910.133) Fall Protection (ANSI-Z41.1)(29 CFR 1926.501 or 1910.66) Foot Protection (ANSI-Z41.1)(29 CFR 1910.136) Hand Protection (ANSI-Z41.1)(29 CFR 1910.138) Hard Hats (ANSI-Z89.1)(29 CFR 1910.135 Hearing Protection (ANSI-Z41.1)(29 CFR 1910.95) Respiratory Protection (ANSI-Z41.1)(29 CFR 1910.134	Y Y Y Y Y Y Y	
11.	In addition to regulatory required Personal Protective Equipment, what other PPE is required or supplied? If any, please describe or list:_____	N/A	Steel toe shoes, hard hat, safety glasses and vest will be provided by HDR if site visits are required.
12.	Describe how you will meet the requirements for first aid and medical provision under this contract.	N/A	
13.	Does your company have scheduled, documented employee safety meetings? If yes, how often? At least once daily	Y	
14.	Who conducts the safety meetings? Job Titles: PM or Onsite CM		
15.	What managers/supervisors participate in the safety meetings? Job Titles: CM and/or PM		
16.	Are meetings reviewed and critiqued by managers/supervisors?	Y	
17.	Does your company hold on-site (tailgate/toolbox) safety meetings? If yes, how often? Daily or if work changes Who conducts these safety meetings? Job Titles: CM and/or PM Is documentation available?	Y	
18.	Does your company have a written policy regarding drug screening or testing of your employees? If Yes, please provide a copy of your plan to The Company representative.	Y	
19.	Does your drug-testing program conform to DOT requirements? Comments: Yes, for DOT required work If yes, which set of DOT regulations does your drug-testing program designed to satisfy? Pipeline and Hazardous Material Safety Administration PHMSA Federal Motor Carrier Safety Administration FMCSA	Y	

20.	Does your company have policy requiring written accident/incident reports (spills, injuries, property damage, etc.)?	Y	
21.	Does your company conduct accident/incident investigating? If yes, please attach a brief outline of procedures	Y	
22.	Does your company document, investigate and discuss near miss accidents? If yes, is documentation available?	Y	
23.	Are accident/incident reports reviewed by managers/supervisors?	Y	
24.	Indicate the circumstances in which your company's employees may be subject to drug screening. Employment – Yes, job specific Random – Yes, job specific Probable Cause - Yes Post Accident - Yes Periodic – Yes, job specific Other		

PLEASE RESPOND TO ALL ITEMS WITH "YES, NO, OR NA." (ESTIMATED PERCENTAGE OF EMPLOYEES SHOULD REFLECT THE PERCENTAGE OF EMPLOYEES PROVIDING LABOR WHO HAVE RECEIVED TRAINING).

PROGRAMS/TRAINING	REFERENCE SOURCE	PROGRAM DOCUMENTED AND WRITTEN Y/ N/ NA	EST. %	FREQUENCY OF TRAINING FOR INDIVIDUAL EMPLOYEES
Asbestos Class IV (Awareness)	OSHA 29 CFR 1926.1101	NA		
Asbestos Class III	OSHA 29 CFR 1926.1101	NA		
Asbestos Class I and II	OSHA 29 CFR 1926.1101	NA		
Confined Space Entry	OSHA 29 CFR 1910.146(g)	NA		
Cranes	OSHA 29 CFR 1926 Subpart CC	NA		
Natural Gas Operations	DOT 49 CFR 192, Subpart N	NA		
DOT HM-126\f Hazmat Employee	DOT 49 CFR 172.704	NA		
Generation, Transmission, and Distribution Standard	OSHA 29 CFR 1910.269	NA		
Electrical Safety	OSHA 29 CFR 1910.332	NA		
Emergency Evacuation	OSHA 29 CFR 1910.38(a)	Y	100%	Annual
Excavations	OSHA 29 CFR 1926.651	NA		
Fall Protection	OSHA 29 CFR 1926.500	Y	18%	As needed
First Aid/CPR	OSHA 29 CFR 1910.151(b)	Y	32%	Every 2 years
Forklifts	OSHA 29 CFR 1910.178(l)	NA		
Hazard Communications	OSHA 29 CFR 11910.1200(h)	NA		
Hazwoper - Awareness Level	OSHA 29 CFR 1910.120	NA		
Hazwoper 8 Hour	OSHA 29 CFR 1910.120	NA		
Hazwoper 24 Hour	OSHA 29 CFR 1910.120	NA		
Hazwoper 40 Hour	OSHA 29 CFR 1910.120	NA		
Hazwoper Supervisor 8 Hour	OSHA 29 CFR 1910.120	NA		
Hearing Conservation	OSHA 29 CFR 1910.95	NA		
Incipient Fire Fighting	OSHA 29 CFR 1910.157(g)	NA		
Lead Worker	OSHA 29 CFR 1926.62(l)	NA		
Lead Supervisor	See Above	NA		
Lockout/Tag out Authorized Person	OSHA 29 CFR 1910.147(c)(7)	NA		
Lockout/Tag out Affected Person	See Above	NA		
New Employee Orientation	OSHA 29 CFR 1910.119(g)	Y	100%	Upon hire
Personal Protective Equipment	OSHA 29 CFR 1910.132(f)	NA		
Process Safety Management	OSHA 29 CFR 1910.119	NA		
Respiratory Protection	OSHA 29 CFR 1910.134	NA		
Scaffolding	OSHA 29 CFR 1926.454	NA		
Substance Abuse	DOT 46 CFR 16.401 & 391.119	NA		

Signature __Nathan Duvall_____

Title_Sr. Project Manager_____

Date: _4/7/2022_____

APPENDIX C

HAZARD ANALYSIS AND MITIGATION FORM

This sample Hazard Analysis and the required subsequent Hazard Mitigation Plan, or an accepted alternate form, shall be completed by the Contractor 's Representative once work has been awarded. It shall be submitted to the LG&E and KU Proponent and reviewed with their safety specialist/consultant prior to the initiation of any work. It is an expectation that the Contractor will identify specific hazards related to the scope of work.

Work description and location:

LG&E and KU Services Company Proponent:

Estimated Total Work Days: Estimated Work Force #:

Equipment Related Compliance and Safety
Will the Contractor use any of the following or be exposed to its use?

	Will use it or be exposed to its use?	
Abrasive Wheel Machinery	Yes ☐	No ☐
Aerial Work Platform Operation	Yes ☐	No ☐
Barricades	Yes ☐	No ☐
Excavation Equipment	Yes ☐	No ☐
Cranes: Overhead ☐ Mobile ☐	Yes ☐	No ☐
Overhead Power Lines?	Yes ☐	No ☐
If yes specify voltage:		
Forklift Operation	Yes ☐	No ☐
Ground Fault Protection (GFI's/GFCI's)	Yes ☐	No ☐
Grounding devices and processes (static)	Yes ☐	No ☐
Hand Tools / Power Tools	Yes ☐	No ☐

Specific Hazardous Substances Compliance and Safety

Anhydrous Ammonia	Yes ☐	No ☐	
Arsenic	Yes ☐	No ☐	
Asbestos	Yes ☐	No ☐	
Bloodborne Pathogens (Applies to all)	Yes ☐		
DOT Hazardous Materials	Yes ☐	No ☐	
EPA Hazardous Waste	Yes ☐	No ☐	
Explosive Gasses, Vapors, or dusts	Yes ☐	No ☐	
Hazard Communication (Applies to all)	Yes ☐		
Hexavalent Chromium (Hot Work)	Yes ☐	No ☐	**(Mandatory contact with H&S Rep.)**
MSDS's supplied on all materials	Yes ☐	No ☐	
Radiation	Yes ☐	No ☐	
Lead or other toxic metal concerns	Yes ☐	No ☐	
Natural Gas	Yes ☐	No ☐	
Hydrogen Sulfide	Yes ☐	No ☐	
Other / Specify	Yes ☐	No ☐	

Personal Protective Hazard
Which of the following PPE will be required?

Electrical protective equipment	Yes ☐	No ☐
Low voltage gloves (Class 0, 50-600 volts)	Yes ☐	No ☐
Boundary Distances Established and Enforced	Yes ☐	No ☐
Arc Flash PPE	Yes ☐	No ☐
Class 2 600 -15kv gloves/sleeves	Yes ☐	No ☐
Rubber insulated blankets/hoses	Yes ☐	No ☐
What will the exposed voltage level be?		
Eye Protection with side shields (at all times)	Yes ☐	
Goggles: directly vented ☐ indirectly vented ☐ Cutting ☐	Yes ☐	No ☐
Welding Hood	Yes ☐	No ☐
Face Shield	Yes ☐	No ☐
Fall Protection or Prevention	Yes ☐	No ☐
Gloves (Appropriate to the specific task)	Yes ☐	No ☐
Life lines (horizontal or vertical)	Yes ☐	No ☐
Foot Wear: steel toes ☐ electrical hazard rated ☐	Yes ☐	No ☐
Hard Hats (Applies to all)	Yes ☐	No ☐
Hearing Protection (Reduction to <85db. required)	Yes ☐	No ☐
Natural Gas Exposure PPE		
Fire Suit	Yes ☐	No ☐
Positive Pressure Respirator	Yes ☐	No ☐
Hood	Yes ☐	No ☐
Harness	Yes ☐	No ☐
Life Line	Yes ☐	No ☐
Gloves	Yes ☐	No ☐
PFD (personal flotation device)	Yes ☐	No ☐
Traffic Vest	Yes ☐	No ☐
Respiratory Protection	Yes ☐	No ☐
Portable ventilation equipment	Yes ☐	No ☐

Identify the respiratory hazard
Will the Contractor have exposure to:

Total dust	Yes ☐	No ☐
Silica	Yes ☐	No ☐
Flyash	Yes ☐	No ☐
Asbestos	Yes ☐	No ☐
Cr(VI)	Yes ☐	No ☐
Flamm Atm	Yes ☐	No ☐
Lead	Yes ☐	No ☐
O_2 deficient	Yes ☐	No ☐
SO_2	Yes ☐	No ☐
Others?	Yes ☐	No ☐

Has air monitoring been arranged? Yes ☐ No ☐

Has air monitoring been discussed with the H & S Specialist/Consultant? Yes ☐ No ☐

Work/Safety Procedural Requirements	**Will use it or be exposed to its use?**	
Bulk Chemical Unloading	Yes ☐	No ☐
Compressed Gas Cylinders	Yes ☐	No ☐
Confined Space Entry	Yes ☐	No ☐
Specify:		
CPR & First Aid (per 1910.269)	Yes ☐	No ☐
CPR & First Aid qualified person on site	Yes ☐	
Mobile Crane Operator Physicals (3 yr req)	Yes ☐	No ☐
DOT Commercial Driver's License	Yes ☐	No ☐
Excavation / Trenching and Shoring	Yes ☐	No ☐
Explosion Hazard (Deslagging / Blasting)	Yes ☐	No ☐
Fire Protection (Hot work, welding & alike)	Yes ☐	No ☐
Gas Repair Procedures	Yes ☐	No ☐
Lifting and Rigging	Yes ☐	No ☐
Lockout/Tagout	Yes ☐	No ☐
Grounding Procedures	Yes ☐	No ☐
Equipment required to be isolated (list):		
Marine Standard	Yes ☐	No ☐
Scaffold Competent Builder	Yes ☐	No ☐
Scaffold Competent User	Yes ☐	No ☐
Suspended Scaffolding	Yes ☐	No ☐
Work Zone Traffic Safety	Yes ☐	No ☐
Others / specify	Yes ☐	No ☐

Permits

Are there any permits indicated with outside agencies? Yes ☐ No ☐
Asbestos removal, building permits, work zones, RR crossing, environmental impact, etc.)
Detail:

Are there any OSHA related permits? Yes ☐ No ☐
(Permit Required Confined Space Entry, Dig permits and alike)
Detail:

Work Area Lighting

Additional lighting devices will be needed Yes ☐ No ☐
Type of lighting:

Specify Additional Hazards:

Further instructions:

For each Yes box checked or additional hazards identified, a Hazard Mitigation Plan must be submitted along with this Hazard Analysis prior to the initiation of any work.

Name of the contracted firm:

Name of the Contractor ’s Health & Safety designee completing this Hazard Analysis:

Date:

Phone number:

The Hazard Mitigation Plan shall be completed by the Contractor ’s designee and submitted to LG&E and KU’s authorized representative or their designee and forwarded to the Safety Specialist/Consultant prior to the initiation of any work. Note: All items identified on the Hazard Analysis (checked “Yes”) must be listed with the appropriate mitigation steps on the Hazard Mitigation Plan. In addition, other hazards related to the work that are not listed on the Hazard Analysis must also be identified and mitigated on the Hazard Mitigation Plan.

Description of the general job activity:

Contractor ’s site supervisor:

Contractor ’s site Health and Safety:

Date:

Contractor ’s Hazard Mitigation Plan

List all “Yes” Identified Items	**Identify and Analyze the Hazards**	**Hazard Controls** Develop specific controls for each hazard identified.

APPENDIX D

CONTRACTOR SAFETY PASSPORT OVERVIEW

Purpose

Safety is a core value at LG&E and KU. As part of our commitment to improving Contractor health and safety performance, LG&E and KU businesses operating within our service territories have implemented a "Safety Passport Program." The basic elements of the program are a required awareness program and the attestation from the Contractor that all workers have received appropriate skills and safety training.

This program ensures that any contract worker performing work at an LG&E and KU facility or customer property and covered by LG&E and KU's Contractor Health and Safety Program has received Passport training and is fully aware of LG&E and KU's commitment to an uncompromised safe working environment. The key components of the program are outlined below.

Administration

- All personnel working for Prime Contractors and Sub-Contractors on LG&E and KU property or job sites must have a Passport.
- The Passport is valid for 12 months or until revoked by LG&E and KU, whichever is earlier. Refresher training options will be developed and provided annually
- The expenses of training will be the responsibility of the Contractor.
- The Contractor is responsible for ensuring that all the above requirements are met for every individual worker utilized in work on LG&E and KU property or job sites. This includes all Sub-Contractors utilized directly or indirectly by a prime Contractor.
- The Prime Contractor will be responsible for ensuring that each Sub-Contractor has met all of the requirements regarding issuance of a Passport and for ensuring that all reporting requirements outlined in Step 5, below, are fulfilled.
- LG&E and KU reserves the right to revoke any individual's Passport. Refer to **Appendix E (Red List).**
- LG&E and KU may monitor, audit, and request records or training and certifications required by regulations or company policy at any time.

Process Steps

STEP 1 – COMMERCIAL ONBOARDING

All Contractors working for LG&E and KU on LG&E and KU work sites must be commercially onboarded prior to entering such work sites. This process is administered by the Supply Chain and Commercial Operations groups or as part of the specific project competitive bid process.

As part of the certification process, Prime Contractors (Contractors entering into contracts directly with the LG&E and KU) must identify any and all Sub-Contractors they plan on utilizing in work for LG&E and KU. Each Prime Contractor is responsible for ensuring that those identified sub-Contractors complete the same information and meet the same performance criteria as the Prime Contractor is expected to meet. In the event not all Sub-Contractors have been identified prior to certification, the Prime Contractor shall notify LG&E and KU before engaging any Sub-Contractor.

STEP 2 – PASSPORT TRAINING

Employees of Contractors must complete Passport training prior to performing work for LG&E and KU. The Passport training program is designed to inform them of the importance of safety and the hazards associated with working in an industrial environment. This training will also identify additional OSHA, EPA and DOT compliance training that may be needed in certain situations.

Passport training, however, does not take the place of any of the compliance training required by the above listed agencies. It is the responsibility of the Contractor to provide any compliance training required for their employees.

There are two options available to Contractors for Passport Training:

- **Option 1 - Computer-Based Training**
  - Contractor employees should complete Passport training requirements through Avetta's Worker Management web-based platform. These training modules include both General Passport and site-specific training.

- **Option 2 – In-Person Training**
  - Any deviation from the Avetta computer-based training must be approved by Safety.

STEP 3 – PASSPORT ATTESTATION FORM

Contractors will be required to attest to the fact that each employee, including Sub-Contractors working on any LG&E and KU job site or performing any work on LG&E and KU project, has received the required Passport training prior to starting work. The Contractor will also attest that all employees are current on all required compliance training for the work that employee will be performing. LG&E and KU may monitor, audit, and request records or training and certifications required by regulations or company policy at any time.

Upon successful completion of the required Passport safety training by a Contractor ’s employee, the Contractor will ensure the employee’s training information is visible within the Avetta Worker Management database.

The Passport does not serve as security clearance for an employee. The Passport merely attests to the fact that the Contractor employee has completed all required training. Site access will be handled in accordance with local site access procedures. For long-term Contractor s, a photo ID with a magnetic strip may also be issued to a Contractor ’s employee for security purposes. For all other employees of Contractor s, a sign-in sheet may be utilized to track individuals on site.

STEP 4 – SITE SPECIFIC ORIENTATION

Employees of a Contractor working on certain LG&E and KU property or job sites must complete a site-specific orientation training identifying conditions such as parking directions, security procedures, site map, emergency evacuation procedures, emergency contact names, medical facility locations, specific alarms, and site-specific hazardous materials.

STEP 5 - HIRING SUB-CONTRACTORS

Prime Contractor s are responsible for ensuring that any Sub-Contractors working for them in any capacity directly or indirectly are held to the same safety performance expectations as the Prime Contractor itself. The Prime Contractor shall request and review safety data prior to hiring any Sub-Contractors to assure they meet the standards for favorable under the following safety criteria (LG&E and KU emphasizes that these criteria are minimum standards):

- Safety Criteria – INCIDENT RATES

  Favorable: The three most recent years recordable Incident Rates will be compared to the related industry average in such years for the Sub-Contractors' NAISC (or SIC) classification (as published by the Bureau of Labor Statistics). Sub-Contractors' Incident Rate shall not exceed the industry average in any related year.

  Unfavorable: A single fatality identified within any of the three most recent year's statistics.

- Safety Criteria – EMR

  Favorable: Workers Compensation Insurance Experience Modification Rate less than or equal to one (1.0).

  Unfavorable: EMR greater than one (1.0)

Note: Contact LG&E and KU Safety for direction in situations where a particular Sub-Contractor does not meet the criteria due to extremely unique circumstances.

APPENDIX E

RED LIST

Passport Process
Contractor Red Listing Guidelines

LG&E and KU reserves the right to revoke an individual's Passport or discontinue doing business with a company as a result of the failure to comply with company health and safety rules and regulations or the existence of unresolved serious health and safety issues. Within the Passport process, the revoking of a Passport and the Passport privilege is called "Red Listing".

A. Reasons for Red Listing Contract Individuals

Individuals may be Red Listed for any of the following reasons:

1. Failure to comply with company rules, procedures or programs, including safety.
2. Failure to comply with either LG&E and KU's or the Contractor employer's drug and alcohol rules or testing requirements.
3. Creation of an unsafe condition that has the potential to result in serious injury, death or equipment damage. Including but not limited to: LOTO violation, failure to properly use fall protection or failure of competent person duties.
4. Failure to cooperate with LG&E and KU personnel in the course of an investigation resulting in serious injury, death or equipment damage.
5. Defacing company property.
6. Theft of company property.
7. Fighting or other acts of aggression.
8. Any action or behavior which displays a disregard for personal safety or the safety of others as determined by LG&E and KU.

B. Reasons for Red Listing Contract Company

A contract company "Contractor" may be Red Listed for any of the above reasons plus:

1. Failure of a Contractor to establish and maintain a safety culture that will enable their employees to follow LG&E and KU's safety rules, policies and procedures and regulatory standards as required by contract.
2. Failure of the Contractor to cooperate with LG&E and KU personnel to ensure the health and safety of their employees, LG&E and KU employees or others.
3. Failure of the Contractor to cooperate with LG&E and KU personnel in the course of an investigation.
4. Failure of the Contractor to satisfactorily meet all post incident health and safety corrective requirements as determined by the investigation.
5. Withholding of pertinent information related to an incident investigation from LG&E and KU representatives.

C. Procedure for Red Listing an Individual

1. Upon red listing, the individual will be notified of the infraction and LG&E and KU's intent to revoke Passport card by their employer.
2. Absent an emergency, the individual will be removed from premises or job site by their employer. LG&E and KU will notify appropriate personnel to prohibit the individual from reentering the premises.
3. Safety will immediately change the individual's status to "Red List" and place appropriate comment information in the Avetta Database.

D. Procedure for Red Listing a Contract Company

1. A contract company may be Red Listed for any of the reasons listed in Sections A or B of these Guidelines.
2. A Line-of-Business Director shall lead a review the Red Listing event(s) and determine the appropriate course of action up to and including red listing of the contract company. If Red Listing of the company is decided:
   a. The Line-of-Business Director will initiate a letter to the contract company of LG&E and KU's decision that the contract company will not be used for future work.
   b. Once the letter has been issued and receipt verified, Safety will follow up with Supply Chain to ensure that the contract company's certification is removed in system and appropriate documentation is made in the Avetta Database.

LG&E and KU Safety may be contacted for additional Red Listing guidance on a case-by-case basis.

LG&E and KU reserves the right to revoke any individual's Passport for any reason that does not violate applicable Federal, state or local law.

If a Contractor wishes to request that LG&E and KU reconsider a revocation decision, the request may be submitted in writing to the Contractor Proponent or Safety. LG&E and KU is not obligated to consider such requests.

A Passport may be reinstated at the discretion of LG&E and KU if the Contractor has satisfied the Proponent and Safety the reason for revocation has been corrected.

If an individual's Passport is revoked for a second time, the individual will not be allowed to reapply for an LG&E and KU Passport.

APPENDIX F

DRUG AND ALCOHOL REQUIREMENTS

LG&E and KU Contractor Drug and Alcohol Testing Requirements

Drug and Alcohol Testing of all Contractor Employees are required as follows:

1. For all contracts awarded before October 1, 2017, all required Drug and Alcohol Testing must at a minimum be 5-panel tests.

   For all contracts awarded on or after October 1, 2017, all required Drug and Alcohol Testing must at a minimum be 9-panel tests.

2. Supplemental Work is work provided by a Contractor through its employees[1] (Supplemental Work Employees) to perform maintenance or operations tasks on one or more LG&E and KU[2] sites[3], necessary to support day to day business operations on a regular and recurring schedule.
   - Contractors shall provide evidence that 100% of its Supplemental Work Employees have passed a Drug and Alcohol Test within seven days prior to starting work at an LKE site.
   - Contractors shall randomly Drug and Alcohol Test 5% of their total Supplemental Work Employee workforce working at all LKE sites each month.

3. Transient Work is work provided by a Contractor through its employees (Transient Work Employees) to perform limited duration or ad-hoc specialized tasks, at one or more LKE sites. If an employee is to be at one or more LKE sites on a regular basis or has a regular work schedule at or across one or more LKE sites (other than for limited duration or ad-hoc specialized tasks), that employee will be treated as a Supplemental Work Employee and not a Transient Work Employee.
   - All (100%) of Transient Work Employees will be Drug and Alcohol Tested within seven days prior to starting work at an LKE site.
   - Contractors shall randomly Drug and Alcohol Test 10% of their total Transient Work Employee- workforce working at all LKE sites each month.
   - Transmission and Distribution Transient Work Employees performing work during system restoration events (i.e. storms.) will be exempt from LG&E and KU Drug and Alcohol Testing requirements.
   - If Transient Work Employees are moving from LKE site to LKE site in work assignments, another pre-work Drug and Alcohol Test is not required. These employees will remain in the 10% per month random-testing pool of that Contractor, while working at LKE sites.
   - If a Transient Work Employee leaves all LKE sites, but returns to an LKE site within 30 days, another pre-work Drug and Alcohol Test is not required. These Transient Work Employees will remain in the 10% per month random-testing pool of that Contractor.

[1] As used in this document, the term "employees" means all individuals who perform work on behalf of a Contractor at one or more LG&E and KU sites, including, without limitation, employees of Contractor , independent Contractor s, leased employees, etc.
[2] As used in this document, the term "LKE" means Louisville Gas and Electric Company and/or Kentucky Utilities Company.
[3] As used in this document, the term "LKE site" means any property owned or leased by LKE, any property on which LG&E and/or KU has an easement, license, or other right to enter or use or on which LG&E and/or KU has any facilities or equipment, and any property in the immediate vicinity of any of the foregoing.

4. Employees that fall under federal regulatory testing requirements dictated by the Department of Transportation (DOT), Federal Motor Carrier Safety Administration (FMCSA), or Department of Pipeline Hazardous Material and Safety Administration (PHMSA) will be subject to those requirements and will not be subject to the LG&E and KU Drug and Alcohol Testing requirements.

5. Contractor shall promptly perform a Drug and Alcohol test on each Supplemental Work Employee and each Transient Work Employee (i) who contributes to an incident or dangerous condition or cannot be completely discounted as a contributing factor to an incident or dangerous condition which involves actual or undue risk of death or off-site medical treatment of any individual or material property damage (ii) or for which there is reasonable suspicion or probable cause of use or impairment.

6. Pre-employment testing and the testing referred to in paragraphs 4 and 5, above will NOT be included in calculating the random testing percentages required above.

7. To determine the number of employees subject to random testing each month, the number of applicable employees will be multiplied by the applicable percentage and the result will be **rounded up** to the next whole employee. For example, if the result of the multiplication is 4.3, the Contractor should round up that number to 5 employees. Further examples: assume that a Contractor has 75 Supplemental Work Employees working on LKE sites in a given month. Contractor is required that month to randomly select and Drug and Alcohol Test 4 employees (5% x 75 = 3.75 rounds up to 4) of its Supplemental Work Employees and provide evidence of the results of the test for each. Assume that in the following month that same Contractor has 90 Supplemental Work Employees working on LKE sites. The number for that month will be 5 employees (5% x 90=4.5 rounds up to 5).

8. The Contractor is responsible for all testing and administration costs associated with LKE's Drug and Alcohol Testing requirements; provided, that for Supplemental Work Employees only, Contractor may bill LKE for the reasonable straight times hours for the time that such employee is away from scheduled duties to participate in a random Drug and Alcohol Test (Contractor may not bill Company any overtime hours associated with such test).

9. For Contractors with five or fewer Supplemental Work Employees or five or fewer Transient Work Employees, Contractor may seek a limited waiver for random testing requirements by consulting its LKE Safety Specialist.

10. Contractor shall submit evidence of compliance with these requirements in the Avetta Database (i) monthly for all random tests and (ii) prior to the employee entering (or re-entering) any LKE site for any other test.

APPENDIX G

HAZARDOUS CHEMICAL COMMUNICATION

Hazard Chemical Communication

The following is a list of Hazardous Chemicals and atmospheric contamination that may be encountered at LG&E and KU sites. It should in no way be deemed as the only contamination that could be encountered at LG&E and KU. Always be aware of the contamination that could be encountered and become familiar with their Safety Data Sheets (SDS).

Chemical Name	Formula	Trade Name	Description
Anhydrous Ammonia	NH3 (99-100%)	Ammonia, Anhydrous	Liquid colorless gas or compressed liquid with extremely pungent odor. Targets eyes, skin, and respiratory system.
Arsenic	AS	Organic Arsenic	Targets skin, kidneys, liver, and resp. system.
Asbestos		Hydrated Mineral	Fibers found in insulation, gaskets, packing, vinyl asbestos flooring, roofing, and other materials. Targets respiratory system. May cause lung cancer.
Carbon Dioxide	CO2	Carbonic Acid Gas Dry Ice	Targets respiratory system and cardiovascular system
Carbon Monoxide	CO	Flue gas/ Monoxide	Colorless, odorless gas. Targets lungs, blood, can be immediately fatal.
Chromium Hexavalent	Cr(VI)	Hexavalent Chromium	Metal that targets the respiratory tract, skin, and eyes. Irritant.
Hydrogen Sulfide	H2S	Sewer gas Hydrosulfuric Acid	Colorless gas with strong rotten egg odor, quick loss of sense of smell, can be immediately fatal.
Hydrogen	H2	Liquid Gas	Colorless, odorless, targets eyes, skin respiratory system
Lead	Pb	Lead metal	Heavy soft gray metal. Targets eyes, kidneys, and blood.
Ozone	O3	Triatomic Oxygen	Colorless, targets eyes and respiratory sys.
Sulfur Dioxide	SO2	Sulfuric Acid	Targets eyes, skin, and respiratory sys.

APPENDIX H
JOB BRIEFING GUIDANCE

1. **Tasks - work procedures involved** – Identify the task that is to be performed and who will be performing the task including sufficient details.

2. **Hazards associated with job** – Identify the hazards associated with the task. (Ex. Line of fire, uneven/slippery working surfaces, working aloft in proximity of energized conductor, cold temperatures, driving vehicles etc.)

3. **Hazard control procedures** – Identify ways to mitigate each risk identified for the task. (Ex. Don't work under bucket while working aloft, be aware of slips and trips, ensure appropriate cover/MAD followed, appropriate speed for road and conditions, following distance for type of vehicle, eliminate distractions, cover exposed skin, take warm up breaks etc.)

4. **Personal Protective Equipment (PPE)** – Identify the proper PPE for the work procedures used to perform the task. (Ex. Hardhat, safety glasses, steel toe shoes, gloves/sleeves, overshoes, fall protection, cutting chaps, ear plugs, face shield etc.)

5. **Special precautions** – Identify any special precautions associated with the task. (Ex. Working with capacitors/regulators, traffic control, new equipment/tools, etc.)

6. **Energy source control** – Identify the circuit for the work being performed and explain the procedure to control the energy (Ex. Circuit # - Location, Caution #, Clearance # etc**.)**

Other tips to remember:

1. Provide job briefing to additional crew members and any visitors joining your job.

2. Re-brief if the job scope changes or if additional hazards are discovered during the course of the work.

Health & Safety Manual

LG&E KU
PPL companies

Contents

Contents

Contents

Contents

LG&E and KU
Health and Safety Vision:

To be recognized as a world-class leader in health and safety, supported by management leadership, employee participation and mutual responsibility.

At LG&E and KU, the health, safety and wellness of our employees, customers, contractors and business partners are our number one priority. Health and safety excellence is the core requirement of all business activities. There are "no compromises" for unsafe work practices or behaviors.

LG&E and KU
Health and Safety Policy

Health and safety are our first concerns and responsibilities. The company is committed to health and safety excellence and providing a healthful and safe work environment for all employees. Employees are responsible for their personal health and safety as well as for that of their co-workers and the general public. Accordingly, there is no job so important that health and safety policies and procedures or legal obligations are compromised.

An employee has the authority to stop any work practices he or she considers unsafe.

Scope

This policy applies to all LG&E and KU and subsidiary (company) employees, temporary workers and contractors (employees) while on work time or break time, on or off company property, or after hours.

General requirements

The company will ensure that its operations comply with company health and safety policies, established health and safety rules and procedures and applicable federal, state, and local regulations.

All facilities will be planned, designed, built, maintained, and operated to minimize the risk of employee injuries and property damage.

Employees shall report to their supervisor, manager or health and safety specialist instances in which a company business or employee may not be in compliance with health and safety regulations, rules, policies or procedures.

Employees shall immediately report to their supervisors hazards and unsafe work conditions in connection with their work.

Officers and senior managers will:

- ensure that health and safety are given consideration in the strategic plan;
- respect and advocate the humanitarian aspect of employees' health and safety concerns and provide prompt responses;
- provide necessary budget and human resources commitment; and
- provide appropriate emphasis on health and safety in the performance measurement system.

Managers will:

- establish health and safety goals and monitor and communicate progress;
- ensure Occupational Safety and Health Administration (OSHA) standards and requirements to maintain healthful and safe working conditions are met;

- actively encourage suggestions through health and safety committees, internal reviews and audits;
- ensure training guidelines are followed;
- promote off-the-job health and safety awareness;
- lead by example; and
- include safety engineering and planning as an integral part of the facility or equipment design and a necessary part for project or installation approval.

Supervisors will:

- ensure that employees are properly trained and policies and procedures are followed;
- lead by example;
- correct non-healthful and unsafe acts and conditions promptly;
- elicit employee participation in and encourage suggestions to improve the work environment through tailgate sessions, health and safety committees and focus groups;
- evaluate and implement suggestions for improvements when appropriate; and
- investigate all employee injuries, occupational illnesses, and property damage incidents.

Employees will:

- perform their work in accordance with established health and safety rules and procedures;
- be alert to hazards for themselves, their co-workers, and the general public;
- take an active part in company education and training programs to enhance their knowledge of healthful and safe work practices; and
- actively support and participate in company health and safety programs and initiatives.

Penalties for noncompliance

Employees who improperly or carelessly endanger themselves , other employees, the general public, or other parties will be subject to disciplinary action, up to and including discharge.

Definitions

The following terms and definitions of terms are applicable to these safety rules.

Aerial Device: Any piece of equipment utilizing a bucket or platform to place the worker(s) at an elevated worksite.

Affected Employee: An employee whose jobs requires him or her to operate or use a machine or equipment on which servicing or maintenance is being performed under lockout or tagout, or whose job requires him or her to work in an area in which such servicing or maintenance is being performed.

Alive or ***Live:*** Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term "live" is sometimes used in place of the term "current-carrying," where the intent is clear, to avoid repetition of the longer term.

Anchorage: A secure means of attachment for lifelines, lanyards, and straps.

ANSI: American National Standard Institute.

Approved: The term "approved," when used in connection with methods, tools, or equipment, refers to those methods, tools or equipment approved by the company.

Attendant: An employee assigned to remain immediately outside the entrance to an enclosed or other space to render assistance as needed to employees inside the space.

Authorized Person: One who has the authority to perform specific duties under certain conditions, or who is carrying out orders from responsible authority.

Automatic Circuit Recloser or ***Recloser:*** A self-controlled device for automatically interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold closed, or lockout operation.

Barrier: A physical obstruction which is intended to prevent access to energized lines, equipment or other hazardous conditions.

Barricade: A physical obstruction, such as tapes, screens, or cones intended to warn and limit access to a hazardous area.

Body Harness: Straps that are secured about an employee in a manner that distributes the arresting forces over at least the thighs, shoulders, and pelvis with provisions for attaching a lanyard, lifeline, or deceleration device.

Bond: The electrical interconnection of conductive parts designed to maintain a common electric potential.

Bonding Cable (bonding jumpers): A cable connecting two conductive parts to bond the parts together.

Cluster bar: A terminal temporarily attached to a structure that provides a means for the attachment and bonding of grounding and bonding cables to the structure.

Equipotential Zone: Temporary protective grounds shall be placed at such locations and arranged in such a manner that the employer can demonstrate will prevent each employee from being exposed to hazardous differences in electric potential.

Bus: A conductor or a group of conductors that serve as a common connection for two or more circuits.

Bushing: An insulating structure, including a through conductor or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

Cable: A conductor with insulation, or a standard conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).

Cable Sheath: A conductive protective covering applied to cables.

Catastrophic Release: A major uncontrolled emission, fire, or explosion involving one or more highly hazardous chemicals that present serious danger to employees in the workplace.

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Clearance — For Working: Certification by the proper authority that a specified line or piece of equipment is de-energized, drained, purged, depressurized or whatever is necessary to make equipment safe to work on or in, and that the line or equipment is being turned over to the qualified person.

Clearance — From Hazard: Adequate separation or protection by the use of devices to prevent accidental contact by persons or objects on approach to a point of danger.

Clearance — Hot Line: An assurance that the automatic reclosing features of a circuit have been made inoperative.

Clear Hot Stick Distance: The minimum distance for the use of live-line tools held by line technician when performing live-line work.

Company: The employer. The entity having jurisdiction and control over the operation of the utility.

Communication Lines: The conductors and their supporting or containing structures that are used for public or private signal or communication services.

Competent Person: One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Conductor: A material, usually in the form of a wire, cable, or bus bar suitable for carrying an electric current.

Confined Space: A place that: 1) is large enough and configured so an employee can enter bodily and perform assigned work; 2) has limited or restricted means for entry or exit (examples include: tanks, vessels, silos, storage bins, hoppers, vaults, pits and dike areas); and 3) is not designed for continuous employee occupancy.

Covered Conductor: A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.

Current-Carrying Part: A conducting part intended to be connected in a electric circuit to a source of voltage. Non-current-carrying parts are those not intended to be connected.

De-energized: Free from any electrical connection from a source of potential difference and from electric charge; not having a potential different from that of the earth.

Designated Person: See *Authorized Person*.

Disciplinary Action: Administrative action taken by the employer against the employee. May vary from verbal reprimand to dismissal.

Disconnected: Disconnected from any electrical source of supply.

Effectively Grounded: Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltage which may result in undue hazard to connected equipment or to persons.

Electric Line Truck: A truck used to transport personnel, tools, and material for electric supply line work.

Electric Supply Equipment: Equipment that produces, modifies, regulates, controls or safeguards a supply of electrical equipment.

Electric Supply Lines: Conductors used to transmit electrical energy and their necessary supporting or containing structures. Signal lines of more than 400 volts are always supply lines within this section, and those with less than 400 volts are considered as supply lines if so run and operated throughout.

Emergency: An emergency occurs when an unusual condition exist that endangers life and/or property.

Employee: Any person employed by the company on either the permanent or temporary payroll.

Employer: See *Company*.

Enclosed: Surrounded by a case, cage, or fence, which will protect the contained equipment and prevent a person's accidental contact with live parts.

Enclosed Space: A working space such as a manhole, vault, tunnel, or shaft that has a limited means of egress or entry; that is designed for periodic employee entry under normal operating conditions; and that under normal conditions does not contain a hazardous atmosphere but may contain a hazardous atmosphere under abnormal conditions.

Energized (also ***Alive*** or ***Live):*** Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment.

Energy Isolating Device: A physical device that prevents the transmission or release of energy, including but not limited to, the following: a manually operated electric circuit breaker, a disconnect switch , a manually operated switch, a slide gate, a slip blind, a line valve, blocks and any other similar device with the visible indication of the position of the device (push buttons, selector switches, and other control circuit-type devices are not energy isolating devices).

Energy Source: Any electrical, mechanical, hydraulic, pneumatic, chemical, nuclear, thermal or other energy source that could cause injury to personnel.

Equipment: A general term which includes fittings, devices, appliances, fixtures, apparatus, and the like, used as part of, or in connection with, an electrical power transmission and distribution system, or communication systems.

Excavations: Any opening made in the ground, street or sidewalk in connection with company work, such as holes, trenches, ditches, and tunnels.

Exposed: Exposed circuits or lines are those in a position that in case of failure of supports or insulation, contact with another circuit or line may result. Exposed equipment is an object or device that can be

inadvertently touched or approached nearer than a safe distance by any person. The term is applied to objects not suitably guarded or isolated.

Fall Arrest System (fall from one level to another)***:*** The assemblage of equipment such as line-worker's body belt or full body harness in conjunction with a deceleration device and anchorage to limit the forces a worker experiences during a fall from one elevation to another.

Fall Protection Program: A program intended to protect workers from injury due to falls when working at elevations.

Fall Prevention System (prevents fall from one level to another)***:*** A system intended to prevent a worker from falling from one elevation to another. Such systems include positioning devices, guardrail, barriers, and restraint systems.

Fall Protection System (hardware)***:*** Consists of either a fall prevention system or fall arrest system.

Fell: The process of severing a tree from the stump so that it falls to the ground. "Feller" is the person who fells the tree.

Flammable Liquid: Any liquid having a flash point less than 100 degrees F. and having a vapor pressure not exceeding 40 pounds per square inch (absolute) at 100 degrees F.

Flares: Flares, torches, fuses, red lanterns, reflectors or any other equipment that is adaptable for use as a visible warning.

Free Fall: The act of falling before the personal fall protection system begins to arrest the fall.

Governmental: Any type of political agency having control over an area. Included are federal, state, county, township, city, etc.

Ground: A conducting connection between an electric circuit or equipment and the earth, or to some body that serves in place of the earth.

Grounding Cable: A cable connected between a DE energized part and ground. Note that grounding cables carry fault current and bonding cables generally do not.

Grounding Electrode (Ground Electrode): A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it, and for dissipating into the earth current conducted to it.

Grounding Mat: A temporarily or permanently installed metallic mat or grating that establishes an equipotential surface and provides connection points for attaching grounds.

Grounded System: A system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

Guarded: Protected by personnel, covered, fenced, or enclosed by means of suitable casings, barrier rails, screens, mats, platforms, or other suitable devices in accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or objects. *(Note: Wires, which are insulated but not otherwise protected, are not considered as guarded).*

Hazard Communication Program: Utility-developed program to ensure that information concerning hazardous chemicals (materials) is transmitted to employees through the use of warnings, procedures, material safety data sheets, and employee training.

Hazardous Atmosphere: An atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue (escape unaided from an enclosed space), injury or acute illness from one or more of the following causes: 1. Flammable gas, vapor or mist in excess of 10% of its lower flammable level (LFL); 2. Airborne combustible dust at a concentration that meets or exceeds its LFL; 3. Atmospheric oxygen concentration below 19.5% or above 23.5 %; 4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z, Toxic and Hazardous Substances, and which could result in employee exposure in excess of its dose or PEL; or 5. Any other atmospheric condition that is immediately dangerous to life or health.

Hazardous Material (Substances)***:*** Any substance that is a physical hazard or health hazard. A substance is a physical hazard when there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, organic peroxide, an oxidizer, pyrophoric, unstable (reactive), or water reactive. The substance is a health hazard when it is considered to be a carcinogen, a toxic or highly toxic agent, a reproductive toxin, irritant, corrosive, sensitizer, hepatotoxin, nephrotoxic, neurotoxin, an agent that acts on the hematopoietic system, or an agent that damages the lungs, skin, eyes or mucous membrane.

Highly Hazardous Chemical: A substance possessing toxic, reactive, flammable, or explosive properties that are listed in OSHA standard 29 CFR 1910.119.

High-Current Test: Test in which fault currents, load currents and line-dropping currents are used to test equipment, either at the equipment's rated voltage or at lower voltages.

High-Voltage Test: Test in which voltages of approximately 1000 volts are used as a practical minimum and in which the voltage source has sufficient energy to cause injury.

Hold Cards (also called *Red Tags*)***:*** A card or tag-type device, usually having a predominant color of red which warns against the operation of a particular switch, device, valve, circuit, tool or machine. These tags must be respected; equipment or items so tagged must not be activated or used without full and proper authority from the responsible person. (Refer to *Company Lockout/Tagout Procedures*.)

Hotline Tools and Ropes: Those tools and ropes which are especially designed for work on energized high voltage lines and equipment. Insulated aerial equipment especially designed for work on energized high voltage lines and equipment shall be considered hot line.

Immediately Dangerous to Life or Health (IDLH): Any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects that would interfere with an individual's ability to escape unaided from a permit space.

Insulated: Separated from other conducting services by a dielectric substance (including air space) permanently offering high resistance to the passage of current and to disruptive discharge through the substance or space.

Isolated: An object that is not readily accessible to persons unless special means of access are used.

Job Briefing: A short discussion of the work to be accomplished that shall cover at least the following topics: Hazards associated with the job, work procedures involved, special precautions, energy source controls and personal protective equipment requirements.

Job Site: The assembly point at the structure or equipment where the workers, tools, and vehicles are assembled to perform the climbing to the work site.

Lanyard (Strap): A flexible line used to secure a body belt or body harness to a lifeline or directly to a point of anchorage.

Lead Person or Supervisor: Used in a general sense to indicate any person, regardless of classification, who is directly in charge of a specific job or jobs.

Lifeline: A line provided for direct or indirect attachment to a worker's body belt, body harness, lanyard, or deceleration device. Such lifelines may be horizontal or vertical in application.

Line-Clearance Tree Trimmer: An employee who, through related training or on-the-job experience or both, is familiar with the special techniques and hazards involved in line clearance.

Line-Clearance Tree Trimming: The pruning, trimming, repairing, maintaining, removing or clearing of trees or the cutting of brush that is within 10 feet (305 cm) of electric supply lines and equipment.

Load Dispatcher, Power Dispatcher, System Operator: Person designated by the employer as having authority over switching and clearances of high voltage lines and station equipment.

Manhole: A subsurface enclosure which personnel may enter. It is used when installing, operating, and maintaining underground equipment or cable.

Manhole Opening: An opening through which persons may enter into a confined or restricted space.

Material Safety Data Sheet: A document provided by manufacturers and importers of chemicals to convey information to the users of their products. The information includes data on physical characteristics, fire and explosion hazards, reactivity, health hazards, special precautions, and fire and spill procedures.

Minimum Approach Distance: The closest distance an employee is permitted to approach an energized or ungrounded object.

Near Miss: An unintended, unplanned, and unexpected event that could have, but did not result in personnel injury or property damage.

Occupational Safety and Health Act (OSHA) of 1970: Requires employers to provide to employees a work place free from recognized hazards and to comply with safety and health standards established by the act. The act also charges each employee with a legal duty to comply with the act's safety and health standards. The federal act pertains to most employers but specifically excludes federal, state, and local government employees. Numerous states, however have developed safety and health standards that require compliance by all government entities.

Pad Mount: Equipment or device which is surface mounted and normally worked from the ground level.

PCBs (Polychlorinated Biphenyls): A hazardous nonconductive and noncombustible substance used in some transformers and capacitors. It has several trade names — Pyranol, Askarel, Inerteen, etc.

Positioning Device: A body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface such as a wall or pole and to work with both hands free.

Protective System: A method of protecting employees from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide the necessary protection.

Primary Compartment: A compartment containing current carrying devices above 600 volts.

Primary Voltage: An electrical circuit that normally operates at more than 600 volts.

Public: Any individual not an employee or representative of the company.

Reduced Visibility: Times when normal visibility is reduced because of adverse weather conditions such as fog, heavy rainfall, snow, dawn or dusk.

Road: The paved or unpaved surface of a roadway upon which vehicles are intended to travel.

Roadway: The road and the areas immediately adjacent, such as the shoulder of the road or the parking strip.

Rope Grab: A device that attaches to a lifeline as a anchoring point to provide a means for arresting a fall.

Safety Can: An approved closed container of not more than five-gallon capacity having a flash-arresting screen, spring-closing lid and spout cover and designed so that it will safely relieve internal pressure when subjected to fire.

Safety Rule: A positive rule requiring compliance by all employees. Deviation from safety rules is not permitted and may be subject to disciplinary action.

Secondary Compartment: A compartment containing current-carrying devices below 600 volts.

Secondary Voltage: Any supply voltage less than 600 volts.

Shall: When the word "shall" appears in the wording of a rule, the rule is to be obeyed as written.

Shield (Shield System): A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees within the structure. Shield structures can be permanent or portable and moved along as work progresses.

Shoring (Shoring System): A structure such as a metal hydraulic, mechanical, or timber shoring system that supports the sides of an excavation and which is designated to prevent cave-ins.

Should: When the word "should" appears in the wording of a rule, the rule is recommended but is not compulsory.

Sloping (Sloping System): A method of protecting employees from cave-ins by excavating to form sides of excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline required to prevent a cave-in varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

Snap-Hook: A self-closing device with a keeper, latch, or other similar arrangement that will remain closed until manually opened. Such devices include self-closing, single-action, double-action, or double-locking snap-hooks.

Stable Rock: Natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed. Unstable rock is considered to be stable when the rock material on the side or sides of the excavation is secured against caving in or movement by rock bolts or by another protective system that has been designed by a registered professional engineer.

Step Bolt: A bolt or rung attached at intervals along a structural member and used for foot placement during climbing or standing.

Switch: A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

System Operator: A qualified person designated to operate the system or its parts.

Transferring: The act of moving from one distinct object to another.

Transitioning: The act of moving from one location to another on equipment or a structure while going around or over an object.

Underground Residential Distribution (URD): The facilities necessary to furnish underground service, generally to residential and commercial-type customers, usually through directly buried cable.

Unsafe Conditions: Dangerous, hazardous, defective, or unusual conditions which could cause incidents.

Vault: An enclosure above or below ground which personnel may enter. It is used for installing, operating, and maintaining equipment or cable.

Vented Vault: A vault that has provision for air changes using exhaust flue stacks and low level air intakes operating on differentials of pressure and temperature providing for air flow which precludes a hazardous atmosphere from developing.

Voltage: The effective (RMS) potential difference between any two conductors or between a conductor and ground. The voltage specified in this manual shall mean the maximum effective voltage to which the personnel or protective equipment may be subjected. *Low voltage* includes voltages up to 600 volts. *High voltage* shall mean voltages in excess of 600 volts.

Voltage of an Effectively Grounded Circuit: The voltage between any conductor and ground, unless otherwise indicated.

Warning Signs: For the purpose of these rules, a warning sign is any sign or similar means of alerting an employee or the public of an actual or possible hazard. Included are "Danger" signs, "Caution" signs, traffic control signs, instructional signs and informational signs.

Work Site: The location on the structure or equipment where, after the worker has completed climbing (horizontally and vertically), the worker is in position to perform the assigned work or task.

A. General Rules

A.1 *Application of Safety Rules*

A.1.1. These safety rules are designed to provide safety protection for all company employees. Retaining the safety rules book is the responsibility of the employee throughout his/her employment.

A.1.2 Every employee shall carefully study and comply with (not merely read) the safety rules applicable to their assigned duties. Compliance with these safety rules is mandatory and is considered a requirement for employment. Violations will be considered sufficient grounds for disciplinary action.

A.1.3 These rules represent minimum requirements, and are intended only to cover normal work conditions. Since it is impracticable to cover all conditions and emergencies, the earnest cooperation of all employees with their supervisors is required in meeting conditions not covered in these rules.

A.1.4 The use of intoxicating or illegal substances on the job is prohibited. Employees shall not report to work while under the influence of such substances (see the Corporate Drug and Alcohol Policy).

A.2 *Individual Responsibility*

A.2.1 It is the responsibility of each employee to perform assigned duties to assure:

- **a.** Safety to himself or herself.
- **b.** Safety to fellow employees.
- **c.** Protection of the public.
- **d.** Protection of company property.

A.2.2 If an employee is called upon to perform work that could be considered hazardous and proper protection is not provided, the matter should be brought to the attention of the supervisor before starting to work. If questions arise, interpretation rests finally with the supervisor.

A.2.3 Practical joking or horseplay while on the job is prohibited.

A.2.4 Employees are expected, as part of their job, to take an active part in the company's Safety Program and apply it in their everyday work.

A.2.5 An employee who is unable to perform his or her job duties because of illness, the effects of medicines or prescription drugs, or other disabilities shall promptly report that condition to the supervisor.

A.2.6 Exposed rings, loop or dangling earrings, necklaces, chains, bracelets, watches, or other jewelry shall not be worn by workers while climbing on or off structures or vehicles, or while performing any task where jewelry might be caught

under or snagged by a projecting item. Exposed jewelry and/or wristwatches with a metal case and watchbands are not to be worn while work is being performed on or near energized equipment or lines.

A.2.7 When working with rotating machinery, employees are not to wear loose clothing (shirttails are to be tucked into pants), gloves or jewelry (especially bracelets and chains) that can become entangled in moving machinery.

A.2.8 An employee who has been exposed to hazardous conditions, such as communicable diseases, infectious dog bites or radioactive poisoning, is to report those conditions to the supervisor.

A.2.9 Before commencing any work that may be hazardous, care shall be taken to establish a safe procedure. Where more than one employee is engaged in the same job, all employees concerned shall understand the procedures to be followed (job briefings). Under no circumstances shall safety be sacrificed for speed.

A.2.10 Employees are always expected to place themselves in a safe and secure position. The care exercised by others is not to be relied upon for one's own protection.

A.3 *Supervisors' Responsibility for Safety*

A.3.1 Supervisors shall be responsible for the safety of the employees working under their direction and for the safety of the general public in connection with their work. The authority and responsibility for the action necessary to prevent accidents is an integral part of the supervisors' job.

A.3.2 A job briefing/tailgate discussion shall be held prior to starting each job. The job briefing shall include at least the following subjects:

- **a.** Hazards associated with the job.
- **b.** Work procedures involved.
- **c.** Special precautions.
- **d.** Energy source controls.
- **e.** Personal Protective Equipment requirements.

A.3.3 The supervisor will issue such instructions as may be required to safely meet local conditions for which rules are not provided in this safety manual.

A.3.4 The supervisor shall be responsible for seeing that employees have the proper instruction, training and safety equipment for performing their required job duties.

A.3.5 If a difference of opinion arises with regard to the meaning or applications of any of these rules, or as to the means necessary to carry them out, the decision of the employee's supervisor shall be followed.

A.4 *Reporting Employee Injuries*

A.4.1 Injuries, no matter how slight, shall be properly treated and reported to the person in charge as soon as it is practical to do so; they are to be reported no later than the end of the employee's work shift.

A.4.2 When professional medical services are necessary, a health care provider designated by the company should be used whenever possible. Such injuries shall be reported to management and the appropriate safety specialist immediately.

A.4.3 Near misses (close calls) shall be reported.

A.5 *General Precautions — Safeguarding the Public*

A.5.1 Before engaging in work that may endanger the public, warning signs or traffic control devices shall be placed conspicuously to approaching traffic. Where further protection is needed, suitable barricades shall be erected. Where the nature of the work and traffic requires it, an employee shall be stationed to warn traffic while the hazard exists.

A.5.2 The public shall be kept away from locations where work activity presents hazards.

A.5.3 Whenever openings or obstructions in the street, sidewalk, walkways or anywhere on private property are being worked on or left unattended during the day, danger signals such as warning signs and flags shall be effectively displayed. Under the same conditions at night, warning lights shall be prominently displayed and excavations shall be enclosed with suitable barriers.

A.5.4 When working on customers' premises or public property, reasonable effort shall be made to avoid creating hazards to persons or causing unnecessary property damage. Signs, barricades, tools, equipment and excess materials shall be removed from the site when the job is completed and good housekeeping shall be maintained while work is being performed.

A.5.5 When it is necessary to leave cable reels, poles, equipment or other obstructions on a roadway overnight, the following precautions shall be taken.

- **a.** They shall not be left adjacent to fire hydrants or directly in front of entrances to areas or buildings, such as parks, playgrounds, churches, houses or schools.
- **b.** They shall be locked, blocked or otherwise secured.
- **c.** Adequate approved warning devices shall be placed where needed.

A.5.6 Employees are not to permit the public to assist in the

performance of their work except in those emergencies when life is endangered.

A.5.7 When working along streets or highways, employees shall exercise care to keep handlines, cables, other equipment or material from blowing or falling into the line of traffic.

A.6 *Fire Prevention and Protection*

A.6.1 Work locations, vehicles and the inside and outside of buildings shall be kept clean and orderly at all times.

a. Combustible materials, such as oil-soaked rags, shall be kept in approved metal containers with metal lids.

b. Containers shall be emptied as soon as it is practical to do so.

A.6.2 Grease and combustible waste are not allowed to accumulate in service pits, including elevator service pits, vehicle service pits and equipment vaults.

A.6.3 Dumpsters and similar waste containers shall be maintained at a minimum spacing of 10 feet from combustible portions of buildings.

A.6.4 Flammable liquids shall be properly stored in approved, marked containers.

A.6.5 A minimum 36-inch clearance shall be maintained between heating equipment and storage of flammable or combustible materials.

A.6.6 Inside storage shall be maintained in an orderly fashion and not closer than two feet from the ceiling.

A.6.7 A minimum clearance of 18 inches is to be maintained between the top of storage and the bottom of sprinklers.

A.6.8 Outside storage is limited to 20 feet in height and is to be kept in an orderly fashion.

A.6.9 Weeds and other growth are to be controlled in or around ground structures, yards, buildings, tanks or storage areas. A regular procedure shall provide for periodic inspection and clean up of these areas.

A.7 *Housekeeping*

A.7.1 Good housekeeping is to be maintained in shops, yards, buildings and job sites. Supervisors are responsible for proper housekeeping in and around the work they are supervising.

A.7.2 Walks, aisles, stairways, fire escapes, elevators and other passageways are to be kept clear of obstructions and tripping hazards.

A.7.3 Tools and materials are not to be placed where they may cause tripping or stumbling hazards, or where they may fall and strike anyone below.

A.7.4 Materials stored inside buildings under construction are not to be placed within six feet of hoisting or floor openings, nor within 10 feet of an exterior wall which does not extend above the top of the materials stored.

A.7.5 All cleaning agents, chemicals and solvents are to be kept in approved, properly labeled containers.

A.7.6 Spills of oil, paint, water, etc., are to be cleaned up promptly. Absorbent material should be used as a clean-up aid when needed. Until such time that repairs can be made and/or spills can be cleaned up, the area shall be properly guarded (see *Environmental Procedures Manual*).

A.7.7 Nails in boards such as those removed from scaffolds, forms and packing boxes are to be removed, and the boards carefully stacked or stored if they are to be reused. If such boards are added to a scrap pile, nails should be bent over or removed.

A.7.8 Nails that have been driven into barrels, kegs, packing boxes or crates to secure the head or lid are to be removed when the head or lid is removed.

A.7.9 Scrap containers or scrap bins, where practical, shall be provided where needed for storage of materials such as broken glass, insulators, sheet metal scraps, aerosol spray cans, fluorescent light tubes, etc.

A.7.10 Dirty and oily waste rags, shop towels, trash and other waste materials shall be deposited in approved containers and be disposed of as soon as practicable in accordance with proper procedures.

A.7.11 Employees shall cooperate in keeping restrooms, drinking fountains, equipment, locker rooms, eating or vending areas and other facilities in a clean and sanitary condition.

A.7.12 Employees shall not spit inside buildings, vehicles, elevators, equipment or other areas where another employee may be expected to work.

A.8 *Exits and Egress*

A.8.1 Exit and fire doors, including hardware, shall be maintained in proper working order.

A.8.2 Manual hold-open devices shall not be used on fire/smoke separation doors.

A.8.3 Drapes, decorations, mirrors or other material shall not obstruct access to doors used for egress.

A.8.4 All required exits are to be kept unlocked and unobstructed during occupancy hours.

A.8.5 Corridor walls shall provide for an effective smoke barrier during occupancy hours.

A.8.6 Adequate lighting shall be maintained for all means of egress when a building is occupied.

A.8.7 Emergency lighting shall be provided to illuminate primary means of egress when a building is occupied during periods of darkness (night).

A.8.8 Exit signs shall be provided over all exits. When the building is occupied during periods of darkness, exit signs shall be illuminated.

A.8.9 In areas where access to exits is not easily visible, directional signs shall be provided.

A.8.10 Exit and directional signs shall be kept free of obstructions.

A.9 *Electrical*

A.9.1 A minimum 36-inch clearance shall be maintained around electrical equipment.

A.9.2 All electric covers — including those for outlets or junction or panel boxes — shall be maintained unbroken and in place.

A.9.3 All wiring — both permanent wiring and temporary extension cords — shall be protected from physical damage.

A.9.4 Electrical equipment and motors shall be maintained free from accumulations of oil, waste, debris and other combustibles.

A.9.5 Extension cords or temporary flexible cords shall not be used as permanent wiring.

A.9.6 Defective or inadequate electric wiring shall be repaired, removed or replaced. Oversized fuses or oversized circuit breakers shall not be used. Fuse and circuit breaker boxes shall be kept closed except during maintenance or testing. Circuits shall be properly identified in breaker boxes to allow for emergency shutoff of circuit.

A.10 *Ignition Sources and Fuels*

A.10.1 When pumping or filtering oil or flammable liquids from one container to another, metallic contact shall be maintained or an electrical bonding jumper shall be connected between the containers to minimize the possibility of static spark ignition.

A.10.2 Smoking, open flames or other possible ignition sources shall not be permitted in areas where dangerous gases might be present; for example, when working around faulted transformer oil, oil rooms, hydrogen areas, acetylene storage or similar areas. Smoking is not permitted in storerooms, battery rooms, locations where flammable liquids are stored and used or in other areas where quantities of combustible materials are kept. Absence of "No Smoking" signs shall not excuse smoking in dangerous places. ***Note:*** *Smoking shall also be in accordance with the company's smoking policy.*

A.10.3 Matches, cigars, cigarettes and pipe tobacco shall be disposed of in suitable containers or in a safe manner.

A.10.4 Flammable liquids such as gasoline, naphtha and lacquer thinner are not to be used for cleaning purposes.

A.10.5 Proper precautions shall be used in the presence of material in the form of dust or powder to prevent an explosion.

A.10.6 When temporary combustion-type heating devices are used:

- **a.** Adequate fresh air shall be available. Where it is inadequate, mechanical ventilation shall be provided.
- **b.** They shall not be set directly upon wood floors or other combustible materials unless designed for that purpose.
- **c.** They shall be located at least 10 feet from the vicinity of combustible tarpaulins, canvas, plastic film coverings, etc.
- **d.** They shall be set horizontally level, unless otherwise permitted by the manufacturer's markings, and shall be securely placed to prevent overturning and the spillage of fuel.

A.10.7 Electrical tools shall not be used where there is a hazard of combustible vapors, gases or dust, unless the tools are designed for this application.

A.11 *Fire Equipment*

A.11.1 Portable fire protection equipment shall be provided and maintained.

A.11.2 Fire extinguishers must not be locked or hidden behind material or machines. All fire extinguishers shall be conspicuously marked and shall be located close to the fire hazard, but not so close that they would be damaged or cut off by the fire.

A.11.3 Fire protection equipment shall be inspected by qualified personnel at least once each month to be sure that it is in good operating condition. A written record of the inspections shall be maintained.

A.11.4 Fire hoses, fire extinguishers, axes, lifelines, etc., shall not be tampered with or removed from their designated locations for purposes other than firefighting or emergency operations.

A.11.5 Only employees trained in the proper use of fire protection equipment shall attempt its use during an emergency.

A.11.6 Fixed fire protection equipment shall not be taken out of service for other than maintenance or emergency conditions unless approved by proper authority.

A.12 *Fire Suppression and Emergency Response*

A.12.1 When properly trained, an employee may attempt to extinguish small "incipient" fires.

A.12.2 Incipient fires should be handled by using the "C.A.R.E." system:

- **a. C**ontain the fire by closing doors or partitions.

b. **A**lert the necessary agencies and company personnel to initiate emergency procedures.
c. **R**espond within the limits of your training to suppress the fire using available portable equipment.
d. **E**vacuate if the fire expands beyond the incipient level or if imminent danger exists.

A.12.3 Fires beyond the incipient stage, or fires involving the structure, can be handled only by personnel properly trained in structural fire suppression and response procedures. The company, at its discretion, may train and maintain emergency response teams of individual response personnel to handle emergency situations.

A.13 *Personal Protective and Lifesaving Equipment*

A.13.1 Employees shall use the personal protective equipment, protective devices and special tools provided for their work. Before starting work, the employee shall inspect these items to be sure that they are in safe operating condition.

A.13.2 All safety equipment provided by the company shall not be changed or modified without proper authority.

A.13.3 All employees subjected to a hazardous work condition that could result in an eye injury shall wear suitable approved industrial eye protection while performing their job function on any company property or work site.

A.13.4 Appropriate and approved eye protection or eye and face protection shall be worn when an employee is engaged in the following work activities.

a. Drilling or chipping stone, brick, concrete, paint, pipe coatings or metal.
b. Power grinding, buffing or wire brushing.
c. Welding, cutting or burning. (Approved colored lenses shall be used.)
d. Hand-drilling or sawing of overhead objects.
e. Use of powered tools such as drills, saws or sanders.
f. Dust or flying particles. (Compressed air used for cleaning purposes must be less than 30 p.s.i., and then effective chip guarding and personal protection must be used.)
g. Gunniting, pouring hot lead or hot compounds or using other hot or injurious substances.
h. Handling acids, caustics, chlorines, ammonia or other similar liquids or gases, except when approved complete head coverings are worn. (Chemical goggles are necessary.)
i. Brush chippers.
j. Thermite (cadweld) type welders.
k. Flying particles caused by other workers, if employee is within the range of such particles. (A suitable screen around the work may be used instead.)
l. While using powder-actuated tools.
m. Any time there is a possibility of electrical flash.
n. Any other danger of injury to eyes, or at the direction of a supervisor or other person in charge, or as directed by the company's policy.
o. At a minimum, safety glasses with fixed side shields shall be worn on power plant properties, with the exception of administrative areas, break rooms, locker rooms and company vehicles.

A13.5 Eye protection, foot protection and other protective devices shall be worn where there is a reasonable probability that injury can be prevented by such equipment.

A.14 *Eye Protection*

Table A-1 — Eye And Face Protection Selection

Source	Assessment of hazard	Protection
Impact — Chipping, grinding, machining, masonry work, woodworking, sawing, drilling, chiseling, powered, fastening, riveting, and sanding.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Spectacles with side protection, goggles, face shields.[1,3,5,6] For severe exposure, use face shield.
Impact — Operating stationary or portable wire brush, grinders, drill press or drilling overhead.	Flying fragments, objects, large chips, particles, sand, dirt, etc.	Face shield worn over goggles or spectacles with side shields.[3]
Heat — Furnace operations, pouring, casting, hot dipping and welding.	Hot sparks	Face shields, goggles, spectacles with side protection. For severe exposure, use face shield.[1,2,3]
	Splash from molten metals	Face shields worn over goggles.[1,2,3]
	High temperature exposure	Screen face shields, reflective face shields.[1,2,3]
Chemicals — Acid and chemicals handling, degreasing and plating.	Splash	Goggles (eyecup and cover types). For severe exposure, use face shield.[3,10]
	Irritating mists	Special-purpose goggles.
Dust — Woodworking, buffing and general dusty conditions.	Nuisance dust	Goggles (eyecup and cover types).[8]
Light and/or radiation — Welding (electric arc).	Optical radiation	Welding helmets, or welding shields. Typical shades: 10-14.[9,11]
Light and/or radiation — Welding (gas).	Optical radiation	Welding goggles or welding face shield. Typical shades: gas welding, 4–8; cutting, 3–6; brazing, 3–4.[3,9]
Light and/or radiation — Welding (cutting, torch brazing, torch soldering).	Optical radiation	Spectacles or welding face shield. Typical shades: 1.5–3.[3,9]
Glare	Poor vision	Spectacles with shaded or special-purpose lenses, as suitable.[9]

1) Care should be taken to recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards should be provided. Protection devices do not provide unlimited protection.
2) Operations involving heat may also involve light radiation. As required by the standard, protection from both hazards must be provided.
3) Face shields should only be worn over primary eye protection (spectacles or goggles).
4) As required by the standard, filter lenses are not filter lenses, unless they are marked or identified as such.
5) As required by the standard, persons whose vision requires the use of prescription lenses must wear either protective devices fitted with prescription lenses or protective devices designed to be worn over regular prescription eyewear.
6) Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers.
7) Caution should be exercised in the use of metal-frame protective devices in electrical hazard areas.
8) Atmospheric conditions and the restricted ventilation of the protector can cause lenses to fog. Frequent cleansing may be necessary.
9) Welding helmets or face shields should be used only over primary eye protection (spectacles or goggles).
10) Ventilation should be adequate, but well protected from splash entry. Eye and face protection should be designed and used so that it provides both adequate ventilation and protects the wearer from splash entry.
11) Protection from light radiation is directly related to filter lens density. See note (4). Select the darkest shade that allows task performance.

A.15 *Head Protection*

A.15.1 In areas designated for hard hats, approved protective headgear shall be worn. This headgear shall have the headband properly adjusted to prevent the hat from falling off. It should be worn with the bill forward for optimum protection. If necessary, a chinstrap should be used to keep the hard hat in place.

A.15.2 Safety headgear or headband assembly shall not be defaced or altered in any manner without approval.

A.15.3 In order that maximum protection be obtained by company employees through the use of hard hats, and to comply with the Occupational Safety and Health Act, the following compulsory safety rules shall be observed, and hard hats shall be worn:

- **a.** by all employees when in or near construction work of any kind.
- **b.** by all employees while within the boundaries of a substation.
- **c.** by all employees while working on or around electrical equipment.
- **d.** by all employees while climbing or working on poles.
- **e.** by all employees while working under or around poles or structures.
- **f.** by all employees while working in or around cranes, derricks, aerial lifts, industrial trucks or other material handling equipment.
- **g.** by all employees while working under or near any type of maintenance or repair work both overhead and underground work.
- **h.** by all employees while engaged in handling explosives and blasting.
- **i.** by all employees while engaged in supervising, inspecting or observing tree trimming or right-of-way clearing.
- **j.** by all power plant employees at all times, except in the offices areas, control rooms, break rooms, locker rooms and company vehicles.
- **k.** by all employees while working in storage areas where material could fall from overhead racks or storage compartments.
- **l.** within the boundaries of a compressor station by employees at all times, except in the offices areas, control rooms, break rooms, locker rooms, parking lots and company vehicles.

A.15.4 If in question about where a hard hat should be worn, ask the supervisor.

A.16 *Hand Protection*

A.16.1 Each employee shall wear gloves suitable for the work being performed. Rubber glove protectors shall not be used as work gloves.

A.17 *Shoes*

A.17.1 All workers except those working in an office environment shall wear shoes which meet the following standards.

- **a.** They should have leather upper or leather-type outer construction.
- **b.** They should have a stiff, non-skid sole and raised heel.
- **c.** Must be mid- or high-cut (six inches or above).
- **d.** They must be secured to the foot in a snug manner (shoelace, buckle or Velcro strap) unless the footwear is a partial- or full-ankle boot.
- **e.** Where the work environment dictates, more stringent requirements may be mandated at the discretion of the management.

A.17.2 The following types of footwear are unacceptable:

- **a.** Tennis or other athletic shoes.
- **b.** Canvas, cloth or thin-soled shoes.
- **c.** Open-toe shoes or sandals.

A.17.3 The above shoe policy applies to office personnel when they are working in or around an operating facility and/or job site.

A.18 *Hearing Conservation*

Table A-2 — Permissible Noise Exposure Levels

Duration per day, hours	Sound Level dBA Slow Response
8	85.0
7	86.25
6	87.5
5	88.75
4	90.0
3.5	91.25
3	92.5
2.5	93.75
2	95.0
1	100.0
0.5	105.0
0.25 or less	110.0

Note: For further information, reference the Hearing Conservation Program.

A.18.1 Ear protection must be worn when there is a possibility of hearing damage, which can occur during continuous exposure to sound levels that exceed those shown in Table A-2 or exposure to loud impact noise.

A.18.2 Specific areas where the noise levels are greater than 85 dbA shall be identified. Employees shall wear proper protective devices when exposed beyond allowable levels. In situations where the hearing protection does not reduce the noise to an acceptable level, double protection — such earplugs and ear muffs — must be worn.

A.18.3 Proper ear protection may consist of any of the following: ear muffs, earplugs, molded ear protectors or wax-type ear plugs. Plain cotton is not acceptable. Ear protective devices shall be worn properly to provide the required protection, and kept clean to reduce the possibility of ear infection.

A.18.4 At a minimum, hearing protection shall be worn when entering a generation unit that is operating.

A.19 *Clothing*

A.19.1 All employees shall always wear clothing that is suitable for the particular type of work which they are doing.

A.19.2 Employees exposed to hazards or potential electrical arc/flame hazards including but not limited to (combustible dust(s), natural gas, switch gear, etc.) shall not wear garments that, when exposed to flames or electric arcs, could increase the extent of injury. Electrical ARC Flame-Resistant clothing that meets the requirements of either the National Fire Protection Association (NFPA) 70E — 2015 standard, or Section 41 of 2012 National Electrical Safety Code (NESC), or their most current revision, shall be worn when electrical arc hazards exist. Flame Resistant clothing meeting compliant with NFPA 2112 (most current edition) shall be worn when exposed to combustible dust and/or when employees are exposed to flammable or potentially flammable atmospheres.

FR/Arc/Flame Rated clothing (National Fire Protection Association (NFPA) 70E — 2015 standard, or Section 41 of 2012 National Electrical Safety Code (NESC) or NFPA 2112) must be inspected daily to maintain proper protection. Shirttails of FR shirts must be tucked in, or worn under FR bibs. When working on or near live-line parts where the possibility of an electric arc exists, protective clothing with full-length sleeves rolled down and buttoned shall be worn in addition to an electrical safety hat. When work is performed in the vicinity of exposed energized parts of equipment, employees shall remove all exposed conductive articles such as key or watch chains, rings, body piercings, wristwatches or bands, if such articles increase the hazards associated with inadvertent contact with the energized parts.

A.19.3 Long-sleeve shirts rolled down and buttoned shall be required when there is a hazard such as low- and high-voltage contact, burn from electric arc, stings from insects, contact with poisonous plants and exposure to chemically treated poles. If

duties of an employee require work aloft on poles, structures, aerial devices (ladders, buckets, etc.) or work near energized line or equipment (low- or high-voltage), the long sleeves rolled down and buttoned are required.

A.20 *Working Near or Over Water*

A.20.1 Where the danger of drowning exists, exposed employees shall wear personal flotation devices that are approved by the U.S. Coast Guard.

A20.2 Personal flotation devices shall be maintained in a safe condition and inspected for defects frequently enough to ensure that conditions that would render it unusable — such as dry rot, mildew, water saturation, etc. — do not exist. Defective equipment shall not be used.

A20.3 Ring buoys with at least 90 feet of line shall be readily available for emergency rescue operations. The distance between ring buoys shall not exceed 200 feet.

A20.4 At least one skiff shall be immediately available at locations where employees are working over, or adjacent to, water.

A20.5 Employees shall not be allowed to work or travel in a boat while on duty unless the boat meets the following criteria:

- **a.** The boat must be approved by the U.S. Coast Guard.
- **b.** The boat must be suitable for, and capable of, carrying the personnel and tools/equipment needed for the job.
- **c.** Weight restrictions must be strictly followed.
- **d.** If used at night, the boat must be equipped with navigation lights.
- **e.** The boat must be equipped with appropriate line and anchor to stabilize the boat.
- **f.** The boat must be equipped with at least one paddle or oar.
- **g.** The boat must be equipped with a means of manually bailing water.

A20.6 Employees traveling or working on a boat shall have a means of communicating with personnel on the shore, such as a cell phone or two-way radio.

A20.7 Employees shall cross streams or other bodies of water only if a safe means of passage is provided.

A.21 *Fall Protection*

A.21.1 When an employee is exposed to a fall in excess of four feet and protective measures such as catch platforms, guardrails, and safety nets are not practical, the employee shall be protected by the use of fall-arrest equipment or positioning devices such as body harnesses, lanyards, lifelines and rope grabs.

A.21.2 Employees shall rig fall-arrest equipment so that they cannot free-fall more than six feet or contact any lower object. Anchoring points for fall-arrest equipment shall be capable of supporting at least 5,000 pounds per employee and must be located at least waist-high — and preferably overhead — in order to reduce free-fall to six feet or less and prevent contact with the lower level.

A.21.3 Positioning devices shall be rigged such that an employee cannot free-fall more than two feet. Anchorage points shall be capable of supporting at least twice the potential impact load of an employee's fall, or 3,000 pounds — whichever is greater.

A.21.4 Employees shall avoid the following lanyard snap-hook connections to help eliminate the possibility of accidental disengagement (rollout):

- **a.** Two (or more) snap-hooks connected to one D-ring, unless locking snap-hooks are used and that disconnecting any one snap-hook does not subject the user to a fall.
- **b.** Two snap-hooks connected to each other.
- **c.** A snap-hook connected back on its integral lanyard unless the manufacturer allows this practice..
- **d.** Improper dimensions of the D-ring, rebar, or other connection to the snap-hook dimension.

A.21.5 Snap-hooks may not be connected to loops made in webbing-type lanyards.

A.21.6 When vertical lifelines are used, each employee shall be protected by a separate lifeline. The lifeline shall be properly weighted at the bottom and terminated to preclude a device such as a rope grab from falling off the line.

A.21.7 Horizontal lifelines shall be used only as designed.

A.21.8 Prior to each use, the employee shall visually inspect all fall-arrest equipment and positioning devices for cuts, cracks, tears or abrasions; undue stretching; overall deterioration; mildew; operational defects; heat damage; or damage from acid or other corrosion. Equipment showing any defect shall be withdrawn from service.

A.21.9 All fall-arrest equipment and positioning devices subjected to impacts caused by a free-fall or by testing shall be removed from service.

A.21.10 Employees should store all fall-arrest equipment and positioning devices in a dry place that is not subjected to direct sunlight.

A.21.11 Employees shall not use fall-arrest equipment or positioning devices until they have been properly trained in the use of such devices.

A.21.12 ***Deleted***

A.22 *Ladders and Scaffolds*

A.22.1 All ladders and scaffolds shall be inspected frequently and regularly. Ladders with broken or missing steps, broken side rails or other defects shall be tagged and removed from service.

A.22.2 When ascending or descending ladders, employees shall face the ladder and grip the sides or rungs with both hands.

A.22.3 Boxes, crates, chairs, etc., shall not be used in place of a ladder.

A.22.4 Only one employee shall work from a ladder (except hook ladders and other ladders specifically designed by the manufacturer to permit more than employee) at one time. If the work requires two employees, a second ladder shall be used.

A.22.5 If a ladder is to be placed where the opening of a door may displace it, the door shall be locked or otherwise guarded.

A.22.6 Metal ladders shall not be used near energized equipment or lines. (Conductive ladders may be necessary in specialized work. Conductive ladders shall be prominently marked).

A.22.7 Ladders shall not be painted. They shall be treated only with a transparent, non-conducting material.

A.22.8 Only approved ladders owned by the company shall be used by employees.

A.22.9 Ladders and scaffolds shall be sufficiently strong for their intended use.

A.22.10 Ladders shall not be used as scaffold platforms unless specifically designed for that purpose.

A.22.11 Workload shall not exceed manufacturer's recommended loading.

A.22.12 Straight ladders shall not be used unless equipped with non-slip bases, held in place or otherwise secured.

A.22.13 Straight ladders shall be placed so that the distance from the foot of the ladder to the base of the wall or other support is approximately one-fourth the working length of the ladder.

A.22.14 An employee shall not stand on either of the top two rungs/steps of a ladder.

A.22.15 Ladders shall not be spliced together.

A.2216 A ladder shall never be placed against an unstable support.

A.22.17 Ladders shall be placed on a substantial base.

A.22.18 Portable ladders in use shall be tied, blocked or otherwise secured to prevent their being displaced.

A.22.19 Employees shall belt-off to a ladder whenever both hands must be used for the job or a possibility of the employee falling from an elevated position exists.

A.22.20 When transferring from a ladder to an elevated position, the ladder side rails shall extend at least 36 inches above the landing.

A.22.21 While an employee is working on a stepladder (except a safety platform ladder) at a point 10 feet or more above ground or floor, the ladder shall be tied, blocked, secured or held in place to prevent its being displaced.

A.22.22 Stepladders' legs shall be fully spread and locked open when the ladder is in use.

A.22.23 Ladders shall be used only as intended by their manufacturer.

A.22.24 Scaffolds shall be used only if erected by individuals trained in scaffold erecting and dismantling, inspected by a competent person trained in scaffold design and tagged according to company scaffold-tagging procedures.

A.22.25 All scaffolds shall be of sufficient strength and rigidly braced to safely support four times the weight of personnel and material to which they may be subjected.

A.22.26 Employees shall not use a scaffold from four to 10 feet in height and less than 45 inches wide unless proper guardrails are present to provide adequate protection, or fall-protection equipment is used.

A.22.27 Employees shall not use a scaffold over 10 feet high unless there is a standard guardrail with a midrail and toeboard to provide adequate protection.

A.22.28 All scaffold planking and platforms shall be overlapped a minimum of 12 inches and must overhang bearers a minimum of six inches unless cleated or secured from movement boards.

A.22.29 Scaffolds shall not be moved without first removing all loose tools, materials and equipment resting on the scaffold deck.

A.22.30 All scaffolds shall be sufficiently secured and braced.

A.22.31 Scaffold poles, legs, posts, frames and uprights shall always bear on base plates or screw and base plates, unless casters are being used. Footing or anchorage for scaffolds shall be sound, rigid, and capable of carrying the maximum intended load without settling or displacement. Base plates shall rest on a firm foundation such as concrete flooring. Should environmental conditions dictate, and the surface foundation is not adequately solid, mud sills shall be used with the base plates.

A.22.32 Scaffolds shall not be altered or moved horizontally while being used or occupied except when specifically designed for such use. Moveable scaffolding shall have the casters or wheels locked to prevent movement.

A.22.33 The width of all scaffolds, ramps and platforms shall be sufficient to prevent congestion of persons, materials or equipment — and in no case shall they be less that 18 inches wide.

A.22.34 Synthetic or natural-fiber rope shall not be used as guardrails.

A.22.35 An independent lifeline, body harness and a lanyard shall protect employees working on suspended scaffolds.

A.22.36 Safe access shall be provided for all scaffolds. Structural members should not be used as a mean of access.

A.23 *Hold Card/Red Tag and Lockout Devices*

A.23.1 Before starting work on any circuit, machine, belting, shafting or other apparatus which is out of service, employees shall assure themselves that the apparatus is physically rendered inoperative, and a danger, hold card/red tag or lockout device is properly attached to the apparatus control.

A.23.2 No device shall be operated while a hold card/red tag or lockout device is attached to it.

A.23.3 A hold card/red tag or lockout device that has been placed for the protection of workers shall be removed only by authorization of the person in whose name it was placed — and then only after the work has been completed and all workers and tools are in the clear. (Follow all applicable company operating instructions pertaining to the equipment involved.)

A.23.4 Each employee in charge of work on any equipment shall have his/her hold card/red tag or lockout device secured to the apparatus control.
Note: *Refer to Company Policy/Procedure for lockout/tagout procedures.*

A.24 *Tools*

A.24.1 Employees shall use only approved tools and equipment (whether owned by the employee or the company) which are in safe condition. The supervisor shall be notified if proper and safe tools or equipment are not available.

A.24.2 No one may remove, disconnect or otherwise modify a safety device on any tool or equipment.

A.24.3 All tools shall be inspected frequently and maintained in safe condition. Those which are found to be unsafe shall be removed from service, tagged "defective" and not used again until repaired.

A.24.4 Tools shall be used for only the purposes for which they have been designed, manufactured and approved.

A.24.5 Tools shall not be thrown from place to place or from person to person. Tools that must be raised or lowered from one elevation to another shall be placed in tool buckets or firmly attached to hand lines.

A.24.6 Tools shall never be placed unsecured or on elevated places such as ladders, stairs or balconies or anything that they might create a stumbling hazard or become dislodged and fall.

A.25 *Hand Tools*

A.25.1 Sharp-edged or pointed tools shall be stored and handled so that they will not cause injury or damage. They shall not be carried in pockets.

A.25.2 Tools and equipment shall not be used for unsafe practices such as substituting a knife for a screwdriver or chisel.

A.25.3 Impact tools — such as chisels, drills, hammers and wedges — with mushroomed heads shall not be used until they have been reconditioned. Pneumatic tool bits should be used only in pneumatic tools and shall not be used as hand tools.

A.25.4 Hammers, axes, shovels and similar tools shall not be used if the handles are loose, cracked, splintered or taped.

A.25.5 Defective wrenches — such as open-ended and adjustable wrenches — with sprung jaws, or pipe wrenches will dull teeth, shall not be used.

A.25.6 Shims shall not be used to make a wrench fit.

A.25.7 Adjustable wrenches shall be kept properly adjusted while being used.

A.25.8 Pipes or other extensions shall not be used on a wrench handle to increase the leverage unless the wrench is specifically designed for use of such extension.

A.25.9 Metallic rulers, metal tape lines or tape lines containing wires shall not be used near energized electric conductors or equipment.

A.25.10 Chisels, drills, punches, hammer/slugging wrenches, ground rods and pipes shall be held with suitable holders or tongs (not with hands) while being struck with a hammer by another employee.

A.25.11 When using a screwdriver, knife or other tool, employees shall place themselves in such a position that they will avoid injury if the tool slips.

A.25.12 The insulation on hand tools shall not be depended upon to protect users from electrical shock.

A.26 *Electric Tools*

A.26.1 The non-current-carrying metal parts of portable electric tools, such as drills, saws and grinders, shall be effectively grounded when connected to a power source unless:

- **a.** the tool is an approved, double-insulated type.
- **b.** the tool is connected to the power supply by means of an isolating transformer, or other isolated power supply such as a 24V DC system.

A.26.2 The employee shall adequately secure the work — and shall not hold small work in his/her hands, but shall use a clamp, jig or vise — when using an electric drill.

A.26.3 Employees shall not sweep away chips from electric drills with their bare hands.

A.26.4 Eye and face protection shall be worn whenever an electric drill is in use.

A.26.5 Employees shall be sure that the chuck key or drift has been removed from the chuck before an electric drill is started.

A.26.6 When installing a grinding wheel, the employee shall be sure that the rated speed of the wheel exceeds the maximum speed of the spindle. The employee shall also closely inspect the wheel and give it a "ring" test by supporting it freely and tapping it lightly with a wooden object. If the wheel is not defective, it should produce a clear, metallic sound.

A.26.7 Most defective wheels break when first started. New wheels shall be run at full operating speed for at least one minute before work is applied. Employees shall stand to one side, away from the wheel, each time the grinder is started.

A.26.8 Employees using abrasive wheels, chipping or grinding, shall wear a face shield in addition to goggles or safety glasses.

A.26.9 Extension-cord hand lamps shall be of the molded composition type, or other type approved for the purpose. Hand lamps shall be equipped with a handle and a substantial guard over the bulb. Metallic bulb guards shall be grounded.

A.26.10 Extension-cord hand lamps used in an explosive-type dust or gaseous atmosphere shall be of the explosion-proof type.

A.26.11 When a portable hand lamp is used near energized electrical equipment or circuits, special precautions shall be taken to prevent accidental electrical contact.

A.26.12 When employees are entering confined spaces with explosion hazards (such as coal bunkers, breaker tanks, transformer tanks, etc.), the operating voltage of temporary electric lighting (not hand-held) shall not exceed 32 volts. The operating voltage of portable electric lighting (hand-held) used in such locations shall not exceed 12 volts.

A.27 *Pneumatic Tools and Compressed Air Usage*

A.27.1 Compressed air and compressed-air tools shall be used with care.

A.27.2 Pneumatic tools shall never be pointed at another person.

A.27.3 Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected.

A.27.4 Safety clips or retainers shall be securely installed and maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled.

A.27.5 Compressed air shall not be used for cleaning purposes, except where reduced to less than 30 psi — and then, only with effective chip guarding and personal-protective equipment.

A.27.6 Compressed air shall not be used to blow dust or dirt from clothing.

A.27.7 The manufacturer's stated safe operating pressure for hoses, pipes, valves, filters and other fittings shall not be exceeded.

A.27.8 The use of hoses for hoisting or lowering tools shall not be permitted.

A.27.9 All compressed air hoses shall have a safety device at the source of supply or branch line to reduce pressure in the event of hose failure.

A.27.10 Before making adjustments or changing air tools, unless the tool is equipped with quick-change connectors, the operator shall shut off the air at the air-supply valve ahead of the hose. The hose shall be bled at the tool before breaking the connection.

A.27.12 Pneumatic tools shall be operated only by competent persons who have been trained in their use. Training shall include proper use, potential hazards and means of protection.

A.27.13 Conductive hose shall not be used near energized equipment.

A.27.14 Employees shall not use any part of their bodies to locate or attempt to stop an air leak.

A.27.15 When underground electric lines are present, appropriate class rubber gloves or rubber gloves and sleeves shall be worn while operating a jackhammer or rock drill. If the voltage is unknown, class 2 rubber gloves and sleeves shall be worn.

A.28 *Hydraulic Tools*

A.28.1 Manufacturers' safe operating pressures for hydraulic tools, hoses, valves, pipes, filters or fittings shall not be exceeded.

A.28.2 Pressure shall be released before connections are broken, unless quick-acting, self-closing connectors are used.

A.28.3 Employees shall not use any part of their bodies to locate or stop a hydraulic leak.

A.28.4 All hydraulic lines longer that 35 ft. should have check valves or provide for loss of insulating value due to partial vacuum when used where they may come into contact with exposed live parts.

A.28.5 All hoses shall be made of insulated material.

A.28.6 Frayed or damaged hose will not be used.

A.28.7 Fittings shall be clean and undamaged.

A.28.8 All shutoff valves shall be operational.

A.28.9 Only qualified and authorized persons shall repair hydraulic equipment.

A.29 *Powder-Actuated Tools*

A.29.1 Only those employees who have been trained in their use shall operate these tools.

A.29.2 Explosive charges shall be carried and transported in approved containers.

A.29.3 Operators and assistants using these tools shall be safeguarded by means of appropriate eye protection (approved safety glasses or goggles), face protection (a face shield), head protection (a hard hat) and appropriate hearing protection.

A.29.4 Tools shall be maintained in good condition and serviced regularly by qualified persons. The material upon which these tools are to be used shall be examined before work is started to determine its suitability and to eliminate the possibility of hazard to the operator and others.

A.29.5 Prior to using the tool, the operator shall inspect the tool to be sure that it is clean, moving parts operate freely and the barrel is free from obstructions.

A.29.6 A defective tool shall be tagged and immediately removed from service.

A.29.7 Powder-actuated tools shall not be used in an explosive or flammable atmosphere.

A.29.8 Tools shall not be loaded until just prior to the intended firing.

A.29.9 Only cartridges with an explosive charge adequate for the job and with proper penetration shall be used.

A.29.10 Tools and cartridges shall never be left unattended.

A.29.11 Tools shall never be pointed at any person.

A.29.12 In case of misfiring, the operator shall hold the tool in place for 30 seconds. The employee shall then try to operate the tool a second time, and if unsuccessful, shall wait another 30 seconds. Misfired cartridges shall be disposed of properly. (Place in metal container and return to supervisor).

A.29.13 Only powder charges, studs or fasteners specified by the manufacturer for the specific tool shall be used.

A.30 *Guards*

A.30.1 No guard shall be removed from any machine or piece of equipment except to perform required maintenance.

A.30.2 Guards removed to perform maintenance shall be replaced immediately when the maintenance is completed. Machines shall not be operated while the guards are removed except for maintenance certification.

A.30.3 Abrasive wheels shall be used only on machines provided with safety guards except under the following situations:

a. wheels used for internal work while within the work being ground;

b. mounted wheels, used in portable operations, that are two inches or smaller in diameter; and

c. types 16, 17, 18, 18R and 19 cones, plugs, and threaded-hole pot balls where the work offers protection.

A.31 *Welding and Cutting*

A.31.1 Welding and cutting shall be performed only by experienced and properly trained persons. Before grinding, welding or cutting is started, the area shall be inspected for potential fire or explosion hazards.

A.31.2 When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.

A.31.3 Suitable fire-extinguishing equipment shall be immediately available at all locations where welding and cutting equipment is used.

A.31.4 Matches and compressed-gas lighters shall not be carried by welders or their helpers when engaged in welding or cutting operations.

A.31.5 A fire watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a fire hazard. A fire check shall be made of the area one-half hour after completion of welding.

A.31.6 Where combustible materials such as paper clippings or wood shavings are present, the floor shall be swept clean for a radius of 35 feet before welding. Combustible floors shall be kept wet or protected with fire-resistant shields. Where floors have been wet down, personnel operating arc-welding equipment shall be protected from possible shock.

A.31.7 To protect eyes, face and body during welding and cutting, the operator shall wear an approved helmet or goggles, proper protective gloves and clothing. Helpers or attendants shall wear proper eye protection. Other employees shall not observe welding operations unless they use approved eye protection.

A.31.8 Proper eye protection shall be worn to guard against flying particles when the helmet or goggles are raised.

A.31.9 Machinery, tanks, equipment, shafts or pipes that could contain explosive or highly flammable materials shall be thoroughly cleaned and decontaminated prior to the application of heat.

A.31.10 Where there is a possibility of an explosion from dusts or gases, grinding, welding or cutting equipment shall not be used until the space is adequately ventilated.

A.31.11 Welders shall place welding cables, hoses and other equipment

so that they are clear of passageways, ladders and stairways.

A.31.12 Where the work permits, the welder should be enclosed in an individual booth or shall be enclosed with noncombustible screens. Workers or other persons adjacent to the welding areas shall be protected from rays by shields, or shall be required to wear appropriate eye and face protection.

A.31.13 After welding or cutting operations are completed, the welder shall mark the hot metal or provide other means of warning other workers.

A.31.14 Potentially hazardous materials in fluxes, coatings, covering and filler metals are released to the atmosphere during welding or cutting operations. While welding or cutting, adequate ventilation or approved respiratory protection equipment shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium and lead. Employees shall refer to Material Safety Data Sheets for specific requirements pertaining to the above listed hazardous materials.

A.31.15 Employees welding or cutting in confined spaces shall conform to the requirements of confined spaces.

A.31.16 Only approved gas welding or cutting equipment shall be used.

A.31.17 Approved backflow check valves shall be used on gas welding rigs in both gas and oxygen lines.

A.31.18 Welding hose shall not be repaired with tape.

A.31.19 Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or other approved device shall be used.

A.31.20 Oxygen or fuel gas cylinders shall not be taken into confined spaces.

A.31.21 For welding carts only, when welding equipment is not in use, the cylinder valves shall be closed and the pressure in the hose released. If cylinders are removed from the welding cart, the hoses and regulator must be removed and the cylinders secured and capped.

A.31.22 Only approved electric welding equipment shall be used.

A.31.23 The electric welding machine shall be properly grounded before use.

A.31.24 Rules and instructions supplied by the manufacturer, or those affixed to the machine, shall be followed.

A.31.25 Welders shall not strike an arc with an electrode whenever persons are nearby who might be affected by the arc.

A.31.26 When electrode holders are to be left unattended, the electrodes shall be removed, and the holders shall be placed or protected so that they cannot make electrical contact with employees or

conducting objects.

A.31.27 When the welder must leave the work or stop for any appreciable length of time, or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

A.32 *Power Lawn Mowers, Edgers, Chain Saws, etc.*

A.32.1 The engine shall be allowed to cool before refueling.

A.32.2 Any spilled oil or fuel shall be wiped off the equipment before use.

A.32.3 Employees operating powered trimming equipment shall wear suitable eye protection, full-length pants and long-sleeve shirts rolled down and fastened.

A.32.4 For information on hearing protection while using power mowers, edgers, and chain saws, see section A.18, *Hearing Conservation*.

A.32.5 Employees shall insure that all applicable guards are in place prior to using power lawn mowers, and that the guards remain in place while the mower is operating.

A.32.6 Prior to making adjustments, inspections or repairs, the employee shall turn off the mower, permit it to come to a complete stop and remove the spark plug wire.

A.32.7 When operating a power mower, the operator shall:

- **a.** Remove any rocks, pieces of wire or other foreign objects from the area to be mowed.
- **b.** Avoid placing the body in front of the discharge opening.
- **c.** Mow across the face of a slope or incline.

A.32.8 When starting a chain saw, it shall be placed on or against a solid support.

A.32.9 The operator shall grip the chain saw with both hands during the entire cutting operation.

A.32.10 Saw bumper shall be placed against tree or limb before starting a cut.

A.32.11 Chain saw operators shall, when necessary, clear the immediate area around their work to make certain that brush will not interfere with either the chain saw or operator.

A.32.12 All chain saws shall be equipped with "dead man" controls so that the saw cannot lock in the "on" position.

A.32.13 The chain saw engine or motor shall be stopped:

- **a.** When working on any part of the chain or cutting bar.
- **b.** While the saw is being moved from one location to another.
- **c.** While unit is unattended.

A.32.14 A gasoline-driven chain saw shall not be used above shoulder level.

A.32.15 Employees shall not approach chain saw operator within the

reach of the saw while the saw is in operation.

A.32.16 When operating a chain saw on ground level, chaps shall be worn.

A.32.17 Powered tools shall not be left unattended while connected to a power source.

A.32.18 Powered tools shall not be adjusted or repaired while connected to a power source.

A.33 Storage and Use of Compressed Gases

A.33.1 Cylinders shall be securely stored in an upright position in a safe and well-ventilated place prepared and reserved for that purpose.

A.33.2 Cylinders shall not be stored near elevators, walkways, stairways nor in other places where they can be knocked over or damaged.

A.33.3 Cylinders shall have the valve cap or valve protection device in place at all times, except when in actual use or connected to a welding set.

A.33.4 Cylinders shall have their contents properly identified.

A.33.5 Cylinders not having fixed hand wheels shall have keys, handles or non-adjustable wrenches on the valve stem while the cylinder is in service.

A.33.6 Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum distance of 20 feet, or by a non-combustible barrier at least five feet high.

A.33.7 Cylinders shall not be stored near sources of heat such as radiators or furnaces.

A.33.8 Hydrogen and fuel-gas cylinders shall not be stored inside any operating building. Separate storage buildings or sheltered storage areas shall be used.

A.33.9 To prevent rusting, cylinders stored outdoors should be protected from contact with the ground and against extremes of weather, such as accumulations of ice and snow in winter and continuous direct rays of the sun in summer.

A.33.10 Empty cylinders shall be conspicuously marked "empty" or placed in an area reserved and identified for empty cylinders. The valves shall be closed and the valve protection cap replaced. Empty cylinders shall not be stored with full cylinders.

A.33.11 Serious accidents may result from the misuse, abuse or mishandling of compressed gas cylinders. Observance of the following rules will help control the hazards in the handling of cylinders.

a. Cylinders shall not be dropped or allowed to strike each other violently.

b. When cylinders are transported by powered vehicles, they shall be secured in a vertical position (with the exceptions of grade D breathing air, nitrogen and SF_6 cylinders, which may be transported in the horizontal position) with valve protection caps in place.

c. Unless cylinders are firmly secured on a special carrier intended for this purpose, regulators shall be removed and valve protection caps put in place before cylinders are moved.

d. Cylinders shall not be lifted with a magnet or choker slings. They shall never be lifted by the valve or valve protection cap. When cylinders must be handled by hoisting equipment, they shall be secured on a cradle, sling board or pallet and extreme care shall be taken to prevent them from being dropped.

e. If the valve outlet of a cylinder becomes clogged with ice, it may be thawed with warm (not boiling) water. Flames shall not be used.

f. Cylinders shall not be placed where they might become part of an electrical circuit or within five feet of an electrical outlet.

g. A torch shall not be used in such a way that its flame is reflected from the work to the tank of the torch or that radiant heat from the work can strike the tank. This may furnish sufficient heat to develop a dangerous pressure in the tank. If there is a possibility of heat being reflected, the tank shall be protected with a suitable heat-proof shield.

A.33.12 Compressed gases and gas cylinders shall be used and handled only by experienced or properly instructed persons.

A.33.13 With the exception of fire extinguishers, compressed gas cylinders shall not be taken into confined spaces.

A.33.14 Leaking, damaged or defective cylinders or accessories shall not be used. A flame shall not be used to detect gas leaks; a soap solution or other approved leak detecting solution or device shall be used. Leaking cylinders shall be moved to a safe outdoor area and the valve opened to allow the gas to escape slowly. The supervisor shall be notified.

A.33.15 Before a regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regulator.

A.33.16 Employees shall not tamper with safety relief devices in cylinder valves or regulators.

A.33.17 Employees shall not attempt to interchange regulators, hoses or other equipment with similar equipment that has been used with other gases. They shall not force connections that do not fit properly.

A.33.18 Smoking, welding or open flames shall be prohibited at, or in

the near vicinity of, combustible compressed gas storage or operations. Such areas shall be conspicuously posted with "No Smoking" signs.

A.33.19 When full gas cylinders are connected to a header or manifold with other cylinders, their temperatures should be approximately the same.

A.33.20 No attempt shall be made to mix gases in a cylinder or to transfer gas from one cylinder to another except for approved methods.

A.33.21 Pure oxygen shall ***never*** be used for ventilation.

A.33.22 Oil, grease or similar materials shall not be allowed to come in contact with any valve, fitting, regulator or gauge of oxygen cylinders.

A.33.23 When an oxygen cylinder is in use, the valve should be opened fully to prevent leakage around the valve stem.

A.33.24 Acetylene cylinder valves shall not be opened more than one-and-one-half turns of the spindle, and preferably no more than three-fourths of a turn.

A.33.25 Employees shall not use acetylene in a free state at pressures higher than 15 pounds per square inch (psi).

A.33.26 While releasing carbon dioxide from cylinders (including fire extinguishers), employees shall avoid direct contact with the gas and with system fitting or piping downstream from the gas expansion location. The expansion of this gas produces a refrigerating effect, which may freeze any exposed portion of the human body.

A.34 *Chemicals and Harmful Substances*

A.34.1 A Material Safety Data Sheet (MSDS) shall be available for any chemical used or stored in the workplace.

A.34.2 Employees required to handle or use chemicals (e.g., poisons, caustics, flammable liquids) or other harmful substances shall be instructed in the safe methods of using and handling these substances. They also should be aware of the potential hazards, personal hygiene and personal protective measures upon their initial assignment, and whenever a new hazard is introduced into the work area.

A.34.3 Containers for storing and handling of chemicals, or flammable and combustible liquids, shall be of the approved type and clearly marked to identify their contents.

A.34.4 Chemicals, or flammable and combustible liquids, shall not be stored in areas used for exits, stairways or in areas normally used for the safe passage of people.

A.34.5 Adequate ventilation shall be provided or approved respiratory protective equipment shall be used when using chemicals.

A.34.6 Some cleaning fluids may present a fire or health hazard. Only approved cleaning fluids shall be used.

A.34.7 With the exception of consumer products, the application and purchase of pesticides and herbicides shall be performed only by employees holding a valid applicator's license or under their supervision.

A.35 *Painting*

A.35.1 Employees using paints, lacquers, epoxies and other coatings or thinners should avoid inhaling the vapors, and avoid getting these materials into their mouths by washing their hands carefully before eating. Thinners shall not be used to wash painting residues from the body.

A.35.2 Spray-painting operations shall require the use of approved respirators and eye protective equipment.

A.35.3 Employees wearing clothing contaminated with paint or thinner shall not use or go near open flames.

A.35.4 Spraying areas in which dangerous quantities of flammable vapors, mists, combustible residues, dusts or deposits are present shall be provided with adequate mechanical ventilation which exhausts to a safe location. This ventilation shall be kept in operation while spraying operations are being conducted, and for a sufficient time thereafter to allow vapors to be exhausted.

A.36 *Explosives and Blasting*

A.36.1 Handling, storing, transporting and using of explosives shall be done in accordance with local, state and federal regulations and shall follow the latest edition of the list of *"Do's and Don'ts" Instructions and Warnings* by the Institute of Makers of Explosives.

A.36.2 All loading and firing of explosives shall be directed and supervised by competent persons holding a "blaster's" license. Explosives and explosive materials shall not be used except with specific permission from supervisors.

A.36.3 Only persons authorized by the company shall use explosives or explosive materials. These persons shall be appropriately licensed, qualified by training or experience in the handling and use of explosives, and shall have a working knowledge of applicable state and local laws.

A.36.4 Because electric blasting caps — when not shielded by a closed metal box — have been detonated by the operation of two-way radios in vehicles, as well as by regular radio transmitter stations, no vehicle equipped with radio transmitter shall be allowed within 100 feet of blasting operations or exposed electric caps while the transmitter is in operation.

A.36.5 When electric blasting caps are used, adequate signs warning against the use of mobile radio transmitters shall be prominently displayed.

A.37 *Confined Spaces*

Note: The following is a summary of the Confined Spaces entry procedures. The entire procedures should be referred to prior to entry.

A.37.1 A brief description of a confined space is "an enclosed space with limited or restricted means of entry/or exit which is not meant for continuous human occupancy." Confined spaces shall be entered only by properly trained employees. (See *Confined Space Work Procedures*.)

A.37.2 Unauthorized personnel shall not enter a barricaded area where confined-space work is being done.

A.38 *Warnings*

A.38.1 Warning signs shall be heeded. Persons seen in a dangerous situation shall be warned without being startled. Employees not required to be near potentially dangerous places shall keep away from them.

A.39 *Manual Lifting*

A.39.1 An employee shall obtain assistance in lifting heavy objects or shall use power equipment.

A.39.2 When two or more persons carry a heavy object that is to be lowered or dropped, there shall be a prearranged signal for releasing the load.

A.39.3 When two or more persons are carrying one object, each employee, if possible, shall face the direction in which the object is being carried.
(Avoid strains from lifting objects by being sure of footing, bending the knees and keeping the back almost perpendicular. When ready to lift, straighten the legs slowly, thus taking the strain on the stronger muscles of the body.)

A.39.4 Employees should avoid twisting or excessive bending when lifting or setting down loads.

A.39.5 When moving a load horizontally, employees should push the load rather than pull it.

A.39.6 When performing a task that requires repetitive lifting, the load should be positioned to limit bending and twisting. The use of lift tables, pallets and mechanical devices should be considered.

A.39.7 When gripping, grasping or lifting an object such as a pipe or board, the whole hand and all the fingers should be used. Gripping, grasping and lifting with just the thumb and index finger should be avoided.

A.39.8 Employees shall exercise caution when moving materials near energized lines or equipment.

A.40 *Industrial Trucks*

A.40.1 Industrial trucks shall be operated only by authorized persons who are qualified and trained in their use.

A.40.2 Industrial trucks shall be inspected prior to use. Need for repairs shall be reported immediately.

A.40.3 Equipment shall always be operated at a safe speed for existing conditions.

A.40.4 Before moving the equipment, the operator shall make sure that no persons or objects are in the path of the vehicle. Clearances in all directions shall always be checked — particularly overhead clearances.

A.40.5 Industrial trucks shall not be fueled while the engine is running.

A.40.6 When picking up a load, forks shall be set squarely and placed under the load as far as possible. Loads should not be raised or lowered while traveling. Loaded or empty forks should be carried as low as possible, but high enough to clear uneven surfaces.

A.40.7 The load shall not be suspended or swung over other persons. No one should be allowed to stand or walk under elevated forks.

A.40.8 The operator shall always face in the direction of travel.

A.40.9 Whether ascending or descending inclines, all types of loaded lift trucks shall be driven with the load on the upgrade side of the driver.

A.40.10 Sudden stops that might spill the load shall be avoided.

A.40.11 All loads shall be securely fastened or safely positioned to prevent tipping or falling.

A.40.12 Movable or replaceable lift bars on forklift trucks shall be held firmly in place by a proper securing pin.

A.40.13 Only attachments provided by or approved by the manufacturer may be used. All attachments shall be properly secured. Improvised methods shall not be used.

A.40.14 No one other than the operator shall be allowed to ride on the truck, forklift or other equipment except when seats are provided for this purpose.

A.40.15 When an industrial truck is left unattended (operator is 25 feet away or the vehicle is not in his view), the load-engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off and brakes set. Wheels shall be chocked when the truck is parked on an incline.

A.40.16 Equipment with internal combustion engines shall not be operated in enclosed areas for prolonged periods of time so as not to exceed the allowable levels of carbon monoxide.

A.40.25 When loading or unloading trucks or railroad cars, approved dock boards, properly secured, shall be used. The wheels of the truck or railroad car shall be blocked.

A.41 *Cranes*

A.41.1 Only authorized persons shall be permitted in the cab or on the equipment. Only those designated persons who are qualified and trained shall operate the hoisting equipment.

A.41.2 No person shall be permitted to ride the hook, sling or load of any hoisting equipment.

A.41.3 Load limits, as specified by the manufacturer, shall not be exceeded under any circumstances.

A.41.4 Operating and maintenance procedures, as specified by the manufacturer, shall be followed.

A.41.5 The following are the minimum checks to be made daily prior to use.

- **a.** Check all control mechanisms for maladjustment that may be interfering with proper operation.
- **b.** Check all safety devices for malfunction.
- **c.** Look for deterioration or leakage on hydraulic systems.
- **d.** Examine hooks, slings and load-attachment devices.
- **e.** Make sure fire extinguisher is available.

A.41.6 Before a lift is attempted, the lifting mechanism shall be level and firmly supported with the hoist line centered over the center of gravity of the load to be lifted.

A.41.7 No load shall be lifted until its weight has been determined.

A.41.8 For the first lift of each day, the load shall be test-lifted and the brakes checked (lift load several inches, and then test brakes).

A.41.9 With every load, the slings and bindings shall be checked and shall be readjusted as necessary to insure safety and stability.

A.41.10 All slings and other fittings shall be of sufficient strength and proper style, and shall be safe for their intended use.

A.41.11 Signals to the equipment operator shall be given by a trained and qualified signal person designated to perform this task. The operator shall obey a stop signal given by anyone.

A.41.12 When mobile hoists, cranes or similar lifting devices are used near energized lines or equipment, the lifting device shall be:

- **a.** properly grounded, or
- **b.** insulated, or
- **c.** isolated, or
- **d.** considered as energized.

A.41.13 No employee shall be under a suspended load or inside the angle of a winch line. No employee shall stand or work near a cable, chain or rope under tension unless the nature of the work requires it.

A.41.14 Winch lines, ropes or wire cables shall not be guided by hand while standing within reach of the drum or sheave.

A.41.15 Wire-rope loops shall be made by proper splicing or mechanical clamping of the tail section. Wire-rope clips shall not be used to form eyes in wire-rope bridles or slings. Knots shall not be used in wire ropes for any purpose.

A.41.16 When U-bolt wire-rope clips are used to form eyes in winch lines, the number used and the spacing provided shall be in accordance with the illustration in Figure A-1. The U-bolt shall be applied so that the U-section is in contact with the dead end of the rope.

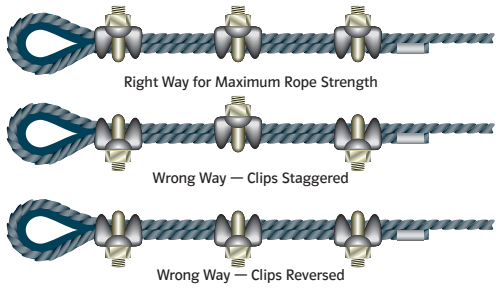
A.41.17 Operators shall not leave their position at the controls of cranes, hoists, derricks or other lifting devices while the load is suspended.

Table A-3 — Wire Rope — Safe Loads

		Improved plow		Plow	
Size	Stranding	Breaking strength (tons)	Permissible working loads (pounds)	Breaking strength (tons)	Permissible working loads (pounds)
7/16″	6 x 19	8.27	3,308	7.19	2,876
	8 x 19	7.09	2,836	6.17	2,468
	6 x 37	7.82	3,128	6.80	2,720
½″	6 x 19	10.70	4,280	9.35	3,740
	8 x 19	9.23	3,692	9.02	3,208
	6 x 37	10.20	4,080	8.85	3,540
9/16″	6 x 19	13.50	5,400	11.80	4,720
	8 x 19	11.60	4,640	10.10	4,040
	6 x 37	12.90	5,160	11.20	4,480
5/8″	6 x 19	16.70	6,680	14.50	5,800
	8 x 19	14.30	5,720	12.40	4,960
	6 x 37	15.80	6,320	13.70	5,480

All permissible work loads are based on a safety factor of five.

Figure A-1 — U-Bolt Wire-Rope Clips



A.41.18 Operators of cranes, derricks, hoists and other hoisting equipment shall exercise extreme caution when in close proximity to energized lines or equipment.

a. When performing power transmission or distribution construction, see applicable clearance requirements.

b. When work does not involve power transmission or distribution construction and maintenance, minimum clearance distances shall be the following.

Table A-4 — Minimum Working Clearance Distances

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 50	10
over 50 to 200	15
over 200 to 350	20
over 350 to 500	25
over 500 to 750	35
over 750 to 1,000	45
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

Note: The value that follows "to" is up to and includes that value. For example, over 50 to 200 means up to and including 200kV.

Table A-5 — Min. Working Clearance Distances While Traveling With No Load

Voltage (nominal, kV, alternating current)	Minimum clearance distance (feet)
up to 0.75	4
over 0.75 to 50	6
over 50 to 345	10
over 345 to 750	16
over 750 to 1,000	20
over 1,000	(as established by the utility owner/operator or registered professional engineer who is a qualified person with respect to electrical power transmission and distribution).

A.41.19 Trucks on which derricks or booms are erected above traveling height shall not be moved except under the immediate direction of a designated employee, who shall give undivided attention to the movement.

A.42 *Office Safety*

A.42.1 Serious strains often result from improper handling of boxes and bundles of office supplies, ledgers, portable filing cases and office machines. Lifting should be done with the back erect by using the more powerful leg muscles.

A.42.2 Large boxes or bundles of supplies shall be moved by hand truck or be unpacked and delivered in smaller parcels.

A.42.3 Bulky objects shall not be carried in such a way as to obstruct the view ahead or interfere with the free use of handrails on stairways. Employees shall get help when necessary.

A.42.4 Proper shoes shall be worn by employees to prevent slipping on floors or tripping on stairways.

A.42.5 Water, oil or other substances spilled on floors present a dangerous slipping hazard and should be cleaned up at once.

A.42.6 When floors are polished or waxed, care shall be taken to prevent the creation of a slipping hazard.

A.42.7 Loose objects shall not be left on stairs or floors.

A.42.8 Electrical, communication or other cords shall not be strung across aisles or walkways where someone may trip or fall over them.

A.42.9 Employees shall not stand on boxes, chairs or other makeshift supports to reach objects overhead. A ladder or step-stool shall be used when needed.

A.42.10 Doors should be opened slowly to avoid striking someone on the other side. Swinging doors, or other doors which present similar hazards, should be equipped with see-through panels within code limits.

A.42.11 Running in aisles, in corridors or on stairways is prohibited. Hand rails should be used by employees when going up or down stairways.

A.42.12 When walking, particularly at blind corners, employees shall keep to the right.

A.42.13 Desk drawers, file drawers or drawer slides shall be closed when not in use and unattended.

A.42.14 Care shall be used by employees when opening file cabinet drawers. Opening of heavily loaded upper drawers — particularly more than one at a time — may cause the cabinet to tip over. Where more than one tier of cabinets are used at one location, they should be fastened together.

A.42.15 When using electrically operated office machines, employees shall avoid touching grounded metal objects such as radiators or water pipes. Electrically defective machines, or machines with defective cords, shall not be used.

A.42.16 When using paper shredders, employees shall pay particular attention to keeping hands and loose pieces of clothing away from the feed area to prevent accidental shredding.

A.42.17 Pins shall not be used to fasten papers together. Employees shall use fasteners such as paper clips, clamps or staples for this purpose.

A.42.18 Pointed objects, such as uncapped pens, pencils, knives or scissors, should be carried by employees so as to not cause injury to themselves or others.

A.42.19 Gummed strips of envelopes should be moistened with a suitable device, not the tongue or lips. Employees should avoid opening envelopes with their fingers and sliding their fingers along edges of paper.

A.42.20 Razor blades shall not be used for cutting paper or sharpening pencils. Employees shall not keep razor blades or similar sharp instruments unprotected in desk drawers.

A.42.21 Used pressurized containers (such as aerosol spray cans), fluorescent light tubes, broken glass or other sharp objects shall not be loosely discarded in wastebaskets, but shall be wrapped and identified for safe removal.

A.42.22 Employees shall keep their fingers away from the cutting edge of paper cutters. The cutting knife on hand-operated cutters shall never be left raised and shall always be closed and secured when not in use. Machine-operated cutters shall be properly guarded to prevent inadvertent operation or contact with the cutter.

A.42.23 Exposed edges of wooden desks, tables or other furniture shall be protected as needed to prevent injuries from splinters.

A.42.24 All employees shall know the building's exit routes.

A.42.25 Walks, aisles, stairways, fire escapes, elevators and other passageways shall be clear of obstructions and tripping and slipping hazards.

A.42.26 Workstations shall be clutter-free.

A.42.27 All employees shall know all disaster plans for the building.

A.42.28 All employees should know the location of the "First Aid" and "Bloodborne Pathogen" kits.

A.43 *Video Display Terminals*

A.43.1 Employees using video display terminals for extended periods of time should consider the following.

- **a.** Keep back straight, with feet resting firmly on the floor.
- **b.** Use a back-support cushion for lower back.
- **c.** Position video display terminal so the operator's eyes are level with the top of the screen.
- **d.** Position the video display terminal directly in front of the user, and adjusted to avoid glare.
- **e.** Adjust the height of the chair or keyboard so that shoulder-elbow-arm angle is at 90 degrees.
- **f.** Use a cushioned wrist rest to keep user's hands and fingers in the same plane as the forearm.

A.43.2 Users of video display terminals should adjust position frequently to avoid muscle stiffness.

A.44 *Customer Threats and Employee Personal Security*

A.44.1 Customer threats are a serious safety concern. They can occur in the field, at LG&E and KU facilities and by phone — particularly at call centers. Employees shall be aware of these potential threats and the actions to take to ensure their personal safety and security.

A.44.2 No employee is immune to these threats. Some threats are aimed at the specific person interacting with the customer, while others occur because of dissatisfaction with the company.

A.44.3 Traditionally, customer threats have been motivated by an interruption in service or a disconnection. However, these types of situations are not all-inclusive and any perceived wrongdoing by the company can serve as motivation to threaten an employee.

A.44.4 Human behavior is unpredictable; therefore, employees must be prepared to deal with potentially threatening individuals.

A.44.5 Employee responsibility regarding customer threats and personal security

- **a.** As with safety, planning ahead and situational awareness will help ensure an employee's security and safety by addressing routine actions that may leave an individual vulnerable. To that end, employees shall follow these guidelines.
- **b.** Employees shall practice effective situational awareness planning, when representing or performing work for LG&E and KU to minimize risks associated with customer threats or violence. The employee shall be familiar with the environment in which he or she works, and know normal behaviors, sights, sounds and activity within the scope of the work area. The employee shall be alert to abnormal conditions or circumstances that could cause a customer's emotion to escalate to a threatening or violent situation. The employee shall know in advance all entrances, exits and possible barriers to escape. These procedures are particularly important when interacting with strangers on the street. By understanding what is perceived to be normal, an employee can easily identify warning signs that may trigger the employment of de-escalation skills or the ability to safely exit the scene completely.
- **c.** De-escalation skills, which are verbal and non-verbal communication skills, can be used to calm an aggressive or potentially threatening, abusive or violent individual. Some verbal de-escalation skills are voice tone and volume. Non-verbal communication skills can aid in the de-escalation process if it matches the employee's verbal communication. Reacting in a calm demeanor will potentially send a message to the threatening customer that the employee is listening

to the perceived grievance. Also, head nodding indicates an understanding of or empathy with the customer's situation. De-escalation skills shall be used in a quick attempt to calm an individual exhibiting a threatening demeanor and provide time to reassess the situation. An employee shall only proceed with job duties if the situation feels safe. If de-escalation tactics do not work, the employee shall quickly move to a safe place away from the threatening situation and contact his or her supervisor or law enforcement.

d. Report every case of threatening, abusive or violent behavior to a supervisor and law enforcement when appropriate. Contact Corporate Security to complete the proper internal paperwork as well.

A.45 *Excavation Safety*

A.45.1 Excavation hazards include exposure to cave-ins, natural gas ignition, high voltage electric utility lines, storm and sanitary sewer effluent. Ensuring the safety of the excavation prior to entry is critical. A trained Excavation Competent person (OSHA 1926.650) must evaluate every excavation regardless of the excavation's depth.

A.45.2 PPE includes — but is not limited to — hard hat, safety glasses, gloves and steel-toed safety boots. Environment, or company policy, may require additional PPE such as traffic vests, full flame-resistant clothing and/or respirators.

A.45.3 Monitor the excavation for combustible gas at 2 feet above the excavation floor. Hard Hats must be worn at all times in an excavation — the only exception is for welders who are making welds.

A.45.4 Locate all foreign utilities using Kentucky 811. Allow sufficient time for utility locating companies to locate their facilities. If facilities have not been located within allotted window, make a second request.

A.45.5 Outside of the Louisville Metro Area, calls to individual utilities may have to be made to nonmember utilities. A list may be found on the Kentucky 811 website.

A.45.6 If excavating on private property, or within an LG&E easement, private utility locates may be required.

A.45.7 Spot utilities as applicable. Hand- or vacuum-excavate 18 inches to each side of the marks. While the excavation is open, underground installations shall be protected, supported or removed as necessary to safeguard employees.

A.45.8 Spoils and all surcharge loads (equipment, vehicles, etc.) must be kept at least 2 feet away from the edge of the excavation.

A.45.9 Any excavation over 20 feet in depth, or where normal shoring or sloping would not be feasible, must be designed by a registered professional engineer.

A.45.10 Prior to entry of excavation by ***any*** personnel:

a. A competent person must visually and physically examine the excavation site regardless of the depth of the excavation.

b. The competent person shall determine the soil classification A, B, C (or stable rock) by manually testing the soil, the sloping/benching or protective system required, based on the soil classification and visual observation of the excavation site, and have the authority to take prompt corrective measures to eliminate the hazards.

c. Examination of the excavation is required daily by a competent person, at the start of the shift, and as necessary to verify safety of the excavation throughout the day.

d. The competent person shall monitor and account for surcharge loads.

e. Each person entering an excavation shall, prior to entry, determine who the competent person onsite is and shall verbally confirm with the competent person that the excavation is safe to enter.

f. Any excavation over 5 feet in depth must be sloped, benched, or shored (shielded), regardless of the soil classification.

g. Every excavation over 4 feet in depth must have a means of access and egress which could be steps, ramps or a ladder. If a ladder is used, it must be secured (prevent movement; tie-off the ladder) and must be located to require no more than 25 feet of travel laterally within the excavation to reach the ladder. It must extend 3 feet above the top of the excavation.

h. Shoring or shield systems must extend 18 inches above the adjacent grade (or sloped excavation).

A.45.11 Excavations must be made safe at the end of every shift (cease of work). This shall include the use of positive barriers such as fencing, plates, linked traffic barricades, etc.

A.45.12 Every individual on the job site should be able to identify the competent person. The competent person must be able to answer the following questions.

a. What type of soil?

b. How soil type was determined?

c. Is it safe to go in?

B. Power Generation

B.1 *General*

B.1.1 Visitors or uninstructed workers shall be accompanied by a qualified employee in stations and around utility properties.

B.1.2 All employees entering an attended station — except employees working their shift at such station — shall immediately report their presence and purpose according to plant procedure.

B.1.3 No switch, breaker, disconnect or other device used to put a circuit or equipment into service in a station shall be operated while a station hold card/red tag or similar device is attached to it.

B.1.4 Before beginning work on valves, flanges or other apparatus associated with boilers, pressure vessels or pressure piping, the pressure must be relieved and the system hold-carded/red-tagged according to established procedure. Special care shall be used when loosening bolts, nuts or other fasteners until it is certain that pressure does not exist. When pressure cannot be relieved prior to beginning work, consult plant management.

B.1.5 Wiping rags shall not be used close to moving parts where they might be caught and cause a personal injury. Extreme caution must be observed to prevent loose clothing — particularly shirt sleeves, gloves and trouser cuffs — from being caught in moving machinery.

B.1.6 When insulation has been removed from hot piping, it shall be protected by barricading or the use of signs.

B.1.7 The number of available personnel who are trained in CPR and first aid shall be sufficient to ensure that each employee exposed to electric shock can be reached in four minutes by a trained person. Where the existing number of employees is not sufficient to meet this requirement (at a remote substation, for example), all employees at the work location shall be trained.

B.1.8 All employees shall stay clear of pressurized oil, steam or air escaping from leaking lines or fittings. No attempt shall be made by an employee to stop or slow such a leak by using hands, feet or other parts of the body. The equipment shall be stopped as soon as practical.

B.1.9 Inlet and outlet circulating water valves shall be hold-carded/red-tagged and, as an option, locked out before employees enter the water box of a condenser. If these valves are electrically operated, their main breakers shall be opened, hold-carded/red-tagged and, as an option, locked out. Follow established confined-space procedures.

B.1.10 No one shall be at the opposite end of tubes being cleaned or

plugged. If absolutely necessary, however, shielding shall be installed at tube ends.

B.1.11 During work on or above open grating, a suitable covering shall be used to cover the grating in order to prevent tools or parts from dropping to a lower level.

B.1.12 A barrier such as a handrail or an attendant shall provide protection for the work area when gratings are removed.

B.2 *Boilers*

B.2.1 Employees shall not work on gauge glasses until pressure has been relieved. Gauge glasses shall be pressurized carefully according to manufacturer's recommendation or written plant procedure.

B.2.2 Adequate ventilation shall exist when welding or burning is being performed inside a boiler drum or similar vessel. Follow established confined-space and welding-and-cutting procedures. Oxygen shall never be used for ventilation because of the danger of fire or explosion.

B.2.3 On all water-tube boilers where drums are equipped with manheads at each end, both manheads shall be removed from each drum before workers enter the boiler drum. For inspection purposes, only one manhead need be removed if a worker is stationed outside during period of inspection. Follow established confined-space procedures.

B.2.4 Boilers should be satisfactorily cleaned or de-slagged when out of service for furnace or ash-hopper work. Protection against falling materials or tools may be required, such as erecting a temporary roof over the ash pit or hopper.

B.2.5 When the blowdown line of a boiler being worked on is connected to a common blowdown line with other boilers and it becomes necessary to open the blowdown valves of the boiler being worked on, a hold card/red tag shall be attached to the blowdown valves from all boilers. These hold cards/red tags shall not be removed until the valves of the boiler being worked on have been reclosed. Follow established hold card/red tag procedure.

B.2.6 Employees shall not work on safety valves while a boiler is under pressure. An exception would be to make necessary adjustments performed only by personnel who are fully trained to do so, and with plant management's authorization.

B.2.7 Leaky manheads, handhole plates and bolted flanges on steam lines shall not be worked on under pressure without specific approval from plant management.

B.2.8 When lancing boilers, employees shall wear a long-sleeved shirt buttoned at the collar (or slagging jacket), gloves and a face shield — in addition to the standard uniform and required safety equipment.

B.2.9 Before opening an inspection port or door on a boiler:

- **a.** Notify control room operator. If necessary, the ID and FD fans should be placed on "hand" control to lessen the danger of positive pressure within the boiler.
- **b.** Ensure that the control room operator will not be operating a soot blower near the port.
- **c.** Ensure the aspirating air is valved into the header (positive-pressure boilers only).
- **d.** Use appropriate eye and face protection (face shield over safety glasses or goggles).
- **e.** Use work gloves or take other measures to avoid burns while opening the port.
- **f.** Do not stand in front of the port while it is being opened.

B.2.10 While working or pounding on hoppers to aid the removal of fly ash or siftings, employees shall wear dustproof goggles, gloves and long-sleeved shirt buttoned at the collar. Respiratory protection may also be necessary.

B.2.11 Use caution when inspection plugs are removed from hoppers. To avoid injury, dustproof goggles, gloves and dust respirator shall be worn.

B.2.12 Use caution when opening ash-pit doors and gates. To avoid injury due to hot ash, water or boiler gas:

- **a.** Wear chemical goggles and a face shield, long sleeved shirt and gloves.
- **b.** Open ash pit/ash hopper gates/doors according to plant or manufacturer's guidelines.
- **c.** Position yourself in such a way to avoid being hit by the rod should a large clinker strike the rod causing the outer end to rise.

B.3 *Hydrostatic Testing*

B.3.1 During hydrostatic testing:

- **a.** ***Do not*** enter a boiler while pressure is being applied.
- **b.** ***Do not*** grind, cut, or weld on pressurized boiler parts.
- **c.** When pressure is reached, only designated inspectors are to enter the boiler.
- **d.** Safety-valve gags will only be applied as directed by the plant management.

B.4 *Chemical Cleaning*

B.4.1 Do not create, nor permit, a fire ignition source within approximately 25 feet of boiler vents or drum vents or near

chemical mixing stations. (Examples: lit smoking materials, matches, open flames and carbon-brush, motor-driven tools, which create sparks.)

B.4.2 Become familiar with the locations of chemical cleaning operations.

B.4.3 Exercise caution to avoid tripping over condensate, steam and chemical lines placed in paths of travel.

B.4.4 Be alert to the possibility of leaks in supply piping or boiler chemicals. Exercise caution to avoid physical contact with identified chemical leaks.

B.4.5 Do not work inside a boiler while chemical cleaning is in progress.

B.4.6 Areas where chemical cleaning is in progress shall be barricaded to restrict access during cleaning.

B.4.7 The number of personnel in the restricted area shall be limited to those necessary to accomplish the task safely.

B.4.8 Employees in restricted areas shall wear — as a minimum — protective clothing, boots, goggles, and gloves.

B.4.9 If flammable liquids, gases, vapors or combustible materials will be used or produced, the following shall apply.

a. The area shall be posted with signs restricting entry and warning of the hazards of fire and explosions.

b. Smoking, welding and other possible ignition sources are prohibited in these restricted areas.

B.5 *Deleted*

B.6 *Hydrogen Cooling Systems*

B.6.1 Open flames shall be kept away from hydrogen cylinders, and employees shall not smoke in the vicinity of cylinders or the manifolds to which they are connected. No smoking will be allowed in the immediate vicinity of the hydrogen seal oil unit or hydrogen dryers.

B.6.2 Purge hydrogen from the generator and remove the spool piece from the hydrogen supply line, blank the hydrogen supply line, and hold-card/red-tag the hydrogen system:

a. Before performing any welding on the cooling system or any other generator component where hydrogen may be present.

b. Before opening the water side of a hydrogen cooler for cleaning.

c. Before an access door or coverplate is removed from the generator.

d. A sufficient quantity of carbon dioxide shall be available at all times to purge the hydrogen from the generator.

e. Never mix hydrogen and air in a generator; always:

1. Purge hydrogen from the generator with carbon dioxide, then purge the carbon dioxide with air.

2. Purge air from the generator with carbon dioxide, then purge the carbon dioxide with hydrogen.

f. Only non-sparking tools shall be used on hydrogen systems.

B.7 Chemicals

B.7.1 Employees required to handle or use chemicals, caustics, acids, flammable liquids or other harmful substances shall be instructed in the methods of their safe handling and use, and be made aware of the potential hazards and personal hygiene and personal protective measures required. Material Safety Data Sheets shall be on file at the plant before receiving or working with any hazardous materials.

B.7.2 Employees must be familiar with and follow the guidelines supplied in the Material Safety Data Sheets when using a chemical.

B.7.3 Labels on chemical containers must be maintained in a readable condition.

B.7.4 Open flames and smoking are prohibited within 25 feet of acid in metal containers such as tanks, condensers or boilers, except in compliance with established hot-work procedure. Spark-proof tools shall always be used where there is the danger of accumulated hydrogen.

Note: *Certain acids in contact with metal produce explosive hydrogen.*

B.8 Chemical Storage

B.8.1 Acids — in any quantity — shall be kept in an approved carboy or other container, prominently labeled. These containers shall not be used for any other purpose.

B.8.2 Appropriate identification/warning signs must be maintained at acid-and caustic-storage areas.

B.8.3 Acids shall not be stored near heaters, steam pipes or other sources of heat.

B.8.4 Acids kept on shelves shall not be stored higher than waist level.

B.8.5 If acids or caustics are spilled, they shall be flushed away with an ample supply of water and never wiped up.

B.8.6 Employees handling acids, caustics or other corrosive, toxic chemicals shall wear approved gloves, aprons and eye and face protection, and shall take precautions to prevent personal injury.

B.8.7 The use and toxic quality of new materials shall be investigated thoroughly, and personnel shall be advised of any hazards involved.

B.8.8 Chemical pumps shall be washed externally before re-packing or performing maintenance work.

B.8.9 Areas where acid cleaning is to be done shall be barricaded by suitable means, and no smoking or open flames permitted.

B.8.10 Suitable procedures shall be established to avoid explosions from released hydrogen or injuries from the chemicals.

B.8.11 Contact lenses shall not be worn by anyone working in a laboratory or handling acids, caustics or other corrosive chemicals.

B.9 Handling Chemicals

B.9.1 Only qualified employees or suppliers' personnel shall operate valves or other equipment that control the movement of chemicals.

B.9.2 Approved protective equipment and clothing shall be worn whenever acids or caustics in harmful quantities may spill, splash, fly or drip upon the person handling them. The quantity of acid or caustic handled shall determine the kind and quantity of clothing and equipment. Minimum protection shall be chemical goggles, acid-proof gloves and apron.

B.9.3 Safety shower/eye-wash units must be located in the immediate vicinity of any acid or caustic unloading, transfer or pumping station, and they must be tested before acid or caustic transfer begins.

B.9.4 After handling large quantities of caustics, employees shall take a shower to avoid skin irritation.

B.9.5 Before lifting or moving a carboy or any other acid container, it shall be examined carefully to see that it is not in a leaky or defective condition. The wire holding the carboy stopper in place shall be checked to see that it has not corroded, and that the stopper is secure. All movements shall be made slowly to avoid excessive agitation of the acid.

B.9.6 Before starting to unload acid or caustic from a tank car or tank truck, check the indication or manually gauge the storage tank to ensure that it will not overflow.

B.9.7 When tank cars or trucks are unloaded, warning signs shall be prominently posted and barriers placed so as to warn all personnel of the potential danger.

B.9.8 Only approved methods, tools and equipment shall be used to extract acids and caustics from a container.

B.9.9 Acid in railroad tank cars or tank trucks shall be unloaded in accordance with the regulation of the Interstate Commerce Commission.

B.10 *Chlorine*

B.10.1 Only employees who have been properly trained shall operate and work on chlorine lines or equipment.

B.10.2 Move chlorine cylinders with care. Use the special lifting devices designed for one-ton cylinder handling. A well-balanced hand truck equipped with a clamp or chain should be used to move upright cylinders. Keep valve protection caps and hoods in place when moving cylinders. Cylinders should not be dropped or struck with force.

B.10.3 One-ton cylinders should be stored on cradles that act as chocks to prevent shifting and rolling.

B.10.4 Never store cylinders where they could be struck by falling objects or mobile equipment.

B.10.5 When storing cylinders outdoors, avoid placing them near elevators or ventilating systems, and provide a roof or shield covers for protection against the weather.

B.10.6 If cylinders are stored indoors, the building should comply with the recommendations of the Chlorine Institute.

B.10.7 Always make sure the ventilation systems are operating before working in an indoor chlorine storage area.

B.10.8 Report defective ventilation and chlorine detection system immediately.

B.10.9 Never alter, modify or attempt to repair a chlorine cylinder.

B.10.10 Never try to use regular pipe-threaded devices on a chlorine cylinder valve. Use equipment approved by the Chlorine Institute.

B.10.11 Never use water on a chlorine leak. The corrosive action of chlorine and water will make the leak worse.

B.10.12 If chlorine contacts the eyes, immediately flush with copious quantities of running water for at least 15 minutes. Then, see a physician.

B.10.13 In the event a chlorine cylinder leaks, only properly trained employees with the necessary personal protective equipment shall attempt to stop the leak. If the leak cannot be stopped, the cylinder shall be moved to the open air and placed a safe distance from all personnel. Leaky cylinders shall be turned so that the leak is on top.

B.10.14 A chlorine-system enclosure or shelter shall have available two units of approved, self-contained breathing apparatus and protective clothing. They shall be located outside the shelter or enclosure at a sufficient distance to make them approachable in the event of a chlorine leak.

B.10.15 Chlorine-system enclosures shall be posted with signs restricting entry and warning of hazards to health and the hazards of fire and explosion.

B.10.16 Emergency repair kits shall be available near the shelter or enclosure to allow for the prompt repair of leaks in chlorine lines, equipment or containers.

B.10.17 Before repair procedures are started, chlorine tanks, pipes and equipment shall be purged with dry air and isolated from other sources of chlorine when possible.

B.11 *Coal Handling*

B.11.1 Use extreme caution when working near conveyor belts and rollers, when near rotating or reciprocating machinery and around heavy mobile coal handling equipment.

B.11.2 Use extreme caution when maintaining rotating or reciprocating machinery. Examples:

- **a.** Making alignment adjustments to an operating conveyor or drag chain.
- **b.** Lubricating and operating conveyor, crusher or drag chain.
- **c.** Clearing blocked/plugged chutes when the system is operating.
- **d.** Following the established hold card/red tag procedure when clearing blocked/plugged chutes, which cause the worker to be in a hazardous position (examples: standing on conveyor belts; entering chutes, surge bins and hoppers).

B.11.3 Ensure that nuclear devices are disabled before entering a bunker, silo or chute.

B.11.4 Follow established confined-space procedure before entering a bunker, silo or chute.

B.11.5 Coal dust shall not be cleaned up in a manner that will create a hazardous, dusty atmosphere. Use of compressed air is especially prohibited.

B.11.6 Follow established rules when breakers must be opened or closed.

B.11.7 Be aware of eye and respiratory hazards when coal is dry and dusty. Use proper personal protective equipment.

B.11.8 Before cutting/welding in coal-handling areas, follow established hot-work procedures. Do not smoke in coal-handling areas.

B.12 *Conveyors and Crushers*

B.12.1 Operate conveyors, crushers and stacker/reclaimers according to established procedures.

B.12.2 Employees shall stay clear of conveyors, which may start at any time.

B.12.3 Employees shall not ride conveyor belts or buckets.

B.12.4 Employees shall not attempt to clear a blocked conveyor or crusher, or loosen any material therein (except from established positions outside the equipment) without first shutting off the power and following established hold card/red tag procedures.

B.12.5 Employees shall not clean around conveyor rollers while belt is in operation.

B.12.6 Belt conveyors shall be equipped with emergency stop cords for their entire exposed lengths.

B.12.7 Repairs shall not be made to conveyors or crushers except when the electrical system is isolated and hold-carded/red-tagged. Never rely on the emergency trip cord for personal protection.

B.12.8 Employees shall cross over or under conveyors only where permanent walkways with railings have been installed.

B.13 *Coal Storage*

B.13.1 When it is necessary to enter a coal bunker or silo, the isolation gate must be closed and hold-carded/red-tagged, or the associated mill feeder must be shut down and hold-carded/red-tagged. Follow established confined-space procedures.

B.13.2 Should a bunker or silo have to be entered for the purpose of dislodging coal, or for inspection, the entrant must wear an approved harness with the proper fall protection attached to an approved anchor point. An approved rescue device must also be attached to the harness. The entrant must never go below lodged coal and must use non-sparking tools.

B.13.3 Rescue equipment — consisting of self-contained breathing apparatus, air-pac mask and either a mechanical or power hoisting device — shall be available and ready for use for quick removal of a stricken or injured employee. Follow established confined-space procedures.

B.13.4 Employee shall not smoke in coal-storage buildings or buildings housing coal-crushing and -handling equipment, including the thaw sheds.

B.13.5 Only portable lights and extension cord lights meeting dust-proof requirements shall be used in coal-storage buildings or buildings housing coal-crushing and -handling equipment. Portable electrical tools and appliances shall not be operated in these areas unless special precautions are taken to eliminate explosion hazards.

B.13.6 When welding or use of open flame is required in the coal conveyor system, follow established hot work/cutting and welding procedures.

B.14 *Car Shakers and Dumpers*

B.14.1 Only tools approved by the company shall be used for releasing doors on hopper-type cars.

B.14.2 Car shakers shall be shut off before employees climb onto the car, and car shall not be moved until all personnel are out of the car.

B.14.3 Employees engaged in car-shaker operations shall use suitable eye protection, hearing protection and respiratory equipment, as prevailing conditions dictate.

B.14.4 Cars shall not be moved through the car dumper for refueling purposes.

B.14.5 Only coal cars shall be permitted on the car-dumper and car-shaker tracks.

B.15 *Barges, Boats, Tugs and Docks*

B.15.1 Before boarding any vessel or other floating equipment, all persons shall be wearing an approved flotation device that is properly fastened. Inspect flotation devices regularly and immediately replace defective devices.

B.15.2 Only qualified employees shall operate company boats.

B.15.3 The lifeboat and workboats shall, at all times, be equipped with a pair of oars and a ring buoy attached to a 90-foot, coiled, half-inch line attached to the boat.

B.15.4 Docks and walkways shall be maintained in safe condition at all times. All walkways shall be appropriately positioned and secured.

B.15.5 Employees shall stay clear of barge cables while barges are being moved.

B.15.6 When barges are moored at docks, the mooring lines shall be loose enough to allow sufficient movement of the barge to keep sway from passing boats from breaking lines — yet shall be tight enough to permit the passage of personnel from dock to barge.

B.15.7 When material unloading is in progress:

- **a.** Do not enter the machinery room unless it is absolutely necessary.
- **b.** Do not walk under any area where you could be hit if the bucket dumps prematurely.

B.15.8 Follow established procedures for pulling barge covers.

B.15.9 Cargo boxes are confined spaces. Follow the established confined-space procedures.

B.15.10 Tugboat decks shall be clean and free of tripping hazards. Barge gunwales, walkways and end decks shall be cleared of loose coal.

B.15.11 Do not attempt to operate a tug unless you have been trained and hold a pilot's license issued by the U.S. Coast Guard.

B.15.12 Only trained personnel will serve as deckhands.

B.15.13 Unloader buckets shall always be lowered before the unloader is left unattended.

B.15.14 Tugs shall be equipped with a lifeboat that has two oars available.

B.15.15 Ensure that all tug and barge unloader guardrails or chains are in good condition.

B.15.16 Inspect barge and tug cables/ropes/sheaves frequently and report any defective equipment.

B.15.17 Exercise extreme caution when walking or working on barges, and watch for ice, loose coal or open hatches. Always step over — never on — manhole covers.

B.15.18 Keep away from lines and cables that are under tension; don't step over lines and cables.

B.15.19 Do not lean over the side of a barge to grab a line. Use a pike pole.

B.15.20 Keep hands and feet from between barges, and from between barges and docks.

B.15.21 If a mooring rope must be cut, use extreme caution and use tools that will allow you to stay clear of the swing of the rope when it is cut.

B.16 *Railway Operations*

B.16.1 Only authorized employees shall operate locomotives.

B.16.2 Operate locomotives according to established procedures.

B.16.3 Before moving a locomotive, the operator shall give a proper warning. The operator shall always sound a warning when approaching a walk or driveway, when passing cars on an adjacent track or when passing any structure obscuring the operator's vision.

B.16.4 When manually operating a locomotive, operators shall not move the locomotive when they are unable to see or communicate with their switchperson.

B.16.5 Employees shall not ride on the footboards of locomotives.

B.16.6 Switchpersons shall use adequate signaling devices and standard railroad signals when working in conjunction with locomotive engineers — hand signals or appropriate flag for daytime use, or lantern or red flares at night — for switching purposes.

B.16.7 Employees shall use the steps when boarding or alighting from a railroad locomotive or car. A close lookout shall be kept for trains or cars on adjacent tracks and for obstructions which might cause injury.

B.16.8 Only in emergencies shall a locomotive be returned from empty yard through the car shaker — and then only after the operator has obtained clearance from the car-shaker operator.

B.16.9 Work (except testing procedures) shall not be performed on locomotives while they are moving. Employees shall not walk on top of railroad cars in motion.

B.16.10 Locomotives shall not be operated at unsafe speeds. The train shall be kept under control at all times.

B.16.11 Whenever the locomotive engines are shut off, the hand brake shall be set. The operator key (lever) shall not be left in an unattended locomotive.

B.16.12 Locomotive operators shall follow all signals carefully. If signals are not fully understood, operators shall not move the train until clarification has been made.

B.16.13 Employees engaged in switching or dumping cars shall not line up drawheads with their feet.

B.16.14 Drawheads or knuckles shall not be shifted while locomotives or cars are in motion.

B.16.15 Flying switches shall not be made.

B.16.16 Employees shall not jump from one car to another while either is in motion.

B.16.17 Cars shall not be spotted where they will foul another track.

B.16.18 When shoving cars, the operator shall protect the front end of the train.

B.16.19 Employees shall not go between cars, or board or leave locomotive cranes or cars while such equipment is in motion.

B.16.20 When a car is spotted for unloading on other than level ground, it shall be held in place by approved blockers in addition to setting the brakes.

B.16.21 Cars and equipment marked with a blue flag shall not be moved.

B.16.22 When a string of cars has been separated at a crossing or walkway, the cars shall not be re-coupled unless the operator is at the crossing.

B.16.23 Employees shall not walk, stand or sit on tracks except when necessary for the proper performance of duty. Caution shall be used when working or walking along railroad tracks.

B.16.24 Employees shall cross or walk on tracks at a safe distance from cars or locomotives.

B.16.25 Employees should expect trains, engines and cars to move at any time.

B.16.26 Approved car movers shall be used for moving cars by hand.

B.16.27 Companion ways and catwalks must be kept free of tools and materials.

B.16.28 Employees shall not crawl under or work beneath cars or locomotives unless the wheels have been blocked in both directions and warning flags are placed at both ends.

B.16.29 Emergency safety keyswitches and pull-ropes should be checked frequently and maintained in good condition.

B.16.30 Pulley drives, gearing, motor couplings and idlers at sealing strips shall be adequately guarded.

B.16.31 When a railroad car is stopped for unloading, the car shall be secured from displacement that could endanger employees.

B.16.32 Keep all switches clean and well lubricated.

B.16.33 Locomotive operators must ensure that switches and crossings are observed as needed.

B.16.34 Follow established procedures when connecting 110-volt power to the locomotive charging system.

B.17 *Mechanized Equipment*

B.17.1 Operate mechanized equipment only after receiving thorough training and instruction.

B.17.2 Operate equipment according to the manufacturer's instructions and only from the operator's position with the seat belt in use.

B.17.3 Exercise caution while climbing on or off the equipment, especially during slippery conditions. Face the equipment; ensure secure hand and foot placement and use the hand-hold and the steps or rungs as provided.

B.17.4 Check safety devices and operating mechanisms before use for proper operation (examples: controls, fluid levels and hydraulic systems).

B.17.5 Use only the attachments provided by — or approved by — the manufacturer or supervisor.

B.17.6 Make modifications or repairs and replace parts only as approved by the manufacturer or supervisor.

B.17.7 Whenever possible, position the equipment so as to avoid backing.

B.17.8 When backing a piece of equipment which has an obstructed view to the rear:

- **a.** The equipment shall have a reverse signal alarm audible above the surrounding noise level; or
- **b.** The equipment is to be backed only when an observer signals that it is safe to do so.
- **c.** Carefully check any blind areas.
- **d.** Watch both sides but ***do not*** depend entirely on the mirror(s).
- **e.** Back up slowly.

B.17.9 When possible, position the equipment to obtain a clear view of the operation (examples: digging, hauling, dumping and pushing material).

B.17.10 Ensure sufficient clearance between the equipment and overhead or other energized electrical equipment.

B.17.11 Maintain a sufficient distance from unsafe conditions which might result in equipment rollover. Consider the degree of the slope and the surface condition.

B.17.12 When personnel are in the work area, establish adequate verbal or visual communications.

B.17.13 Do not use the blade, bucket, boom or fork as a brake unless emergency conditions prevail.

B.17.14 Do not dismount equipment until it has been brought to a complete stop.

B.17.15 When parking on an incline is unavoidable, chock the equipment.

B.17.16 Do not ride or permit riders except on seats provided by the manufacturer.

B.17.17 Tools and materials shall be secured to prevent their movement when transported in the same compartment with employees.

B.17.18 Haul roads shall be sprinkled, watered or chemically treated, as needed, to minimize dust and maintain visibility when the road is in use.

B.18 *High- and Low-Voltage Circuits and Equipment*

See written Energy Services Electrical Safety Program for:

- ***specific PPE requirements for exposure to electrical shock and/or arc flash;***
- ***energized electrical work permit requirements; and***
- ***shock and arc flash protective barriers.***

B.18.1 Before beginning work on any electrical system or equipment:

a. Live electrical parts to which an employee might be exposed shall be put into an "electrically safe work condition" — applying energy isolation procedures before performing work — unless de-energizing is infeasible due to equipment design or operational limitations, or it introduces an additional or increased hazard.

b. A voltage test shall be conducted. ***Note:*** *Always verify proper operation of the testing equipment and its leads.*

c. The equipment shall be grounded when applicable.

Note: *In order to declare the existence of an "electrically safe work condition," the following shall be accomplished:*

a. Determine all possible sources of energy, to include temporary and back-up power sources.

b. After properly interrupting the load, open all disconnecting devices for the circuit.

c. Where possible, visually verify that all disconnect devices are open.

d. Apply energy isolation procedures, LOTO.

e. Voltage test shall be conducted to verify the absence of voltage on each point where physical contact is expected.

f. Where possible induced voltage or stored energy exists, ground when applicable.

B.18.2 Only qualified employees shall work on or near energized lines or equipment.

B.18.3 Any defective electrical equipment or tool should be immediately reported to plant management.

B.18.4 All housings, enclosures and cabinets shall be labeled to indicate the voltages contained within. Arc flash hazard danger labels shall also be affixed.

B.18.5 Never use a portable metal ladder in the vicinity of energized equipment.

B.18.6 Eye and face protection, arc-rated face shield with chin guard, hard hat and low-voltage rubber insulating gloves with protectors shall be worn when working on, or in the vicinity of, lines or equipment for which one may be exposed to voltages between 50 volts and 600 volts phase-to-phase. The same shall apply for operating open knife switches.

B.18.7 Only insulated tools and/or handling equipment shall be used for making energized low-voltage connections, or when work is performed within energized switch breaker compartments.

B.18.8 When work is to be done on energized lines or equipment, all energized and grounded conductors that may be shorted with tools or may be touched by the worker should be insulated or barricaded with a nonconductive material when possible.

B.18.9 Only approved low-voltage (six- or 12-volt) lighting, or 110-volt lighting operated through a circuit protected by a GFCI (ground fault circuit interrupter), shall be used in boilers, tanks and other pressure vessels and in wet/damp areas. The low-voltage transformer or the GFCI must always be located on the outside of the vessel or wet/damp area.

B.18.10 Eye and face protection shall be worn during soldering of electrical components.

B.18.11 Portable electric power hand tools and test equipment used for electrical work shall be:

a. double-insulated, or

b. grounded and used in conjunction with a GFCI.

B.18.12 All electrical power tools shall be examined prior to use to insure general serviceability and the presence of all applicable safety devices.

B.18.13 When working in the vicinity of energized conductors and equipment, employees shall not wear exposed metal articles such as key or watch chains, necklaces, rings, wrist watches, bands, bracelets or metal hearing-protector bands.

B.18.14 Manual switches and disconnects shall always be closed by a continuous motion. Care should be exercised when opening switches to avoid serious arcing.

B.18.15 Molded-case switches, circuit breakers or other devices

designated and designed for operation under the load involved — including molded-case breakers, lighting panels, and welding outlet disconnect switches — may be operated without the use of electrical gloves, as long as no energized exposed conductor greater than 50 volts is within four feet of the employee.

B.18.16 Fuses shall be installed and/or removed by use of insulating handles and electrical gloves rated for the voltage involved.

B.19 *Use and Care of Rubber Insulating Gloves — Class 0 Low-Voltage*

B.19.1 Only qualified employees or those under the continuous supervision of a qualified technician shall work on or use test equipment on lines or equipment energized in excess of 50 volts.

B.19.2 Class 0 low-voltage gloves with leather protectors shall be worn when working on lines or using test equipment or equipment energized at voltages between 50 volts and 600 volts phase-to-phase.

B.19.3 Low-voltage gloves shall never be worn inside-out or without leather protectors. They shall be exchanged at any time they become damaged or the integrity is suspect.

B.19.4 Class 0 low-voltage gloves shall not be used for purposes other than electrical work. Damaged gloves shall be returned to the Glove Lab.

B.19.5 Low-voltage gloves shall be inspected each day for damage, and shall be given an air test before each use.

B.19.6 When not in use, low-voltage gloves shall be kept in an approved storage bag or container. Gloves shall not be exposed to sharp objects or direct sunlight. Gloves shall never be folded during storage. Gloves should be stored with the cuffs down to permit drainage and ventilation.

B.19.7 Low-voltage gloves shall be tested and date-stamped at intervals not to exceed 90 days. The expiration date is stamped on the cuff.

B.20 *Use and Care of Rubber Insulating Gloves — Class 2 High-Voltage*

B.20.1 Only qualified employees or those under the continuous supervision of a qualified technician shall work on or use test equipment on lines or equipment energized in excess of 50 volts.

B.20.2 Class 2 high-voltage gloves with leather protectors and rubber sleeves shall be worn when working on lines or using test equipment or equipment energized at voltages above 600 volts phase-to-phase.

B.20.3 High-voltage gloves shall never be worn inside-out or without leather protectors. They shall be exchanged at any time they become damaged or the integrity is suspect.

B.20.4 Class 2 high-voltage gloves shall not be used for purposes other than approved work.

B.20.5 High-voltage gloves and sleeves shall be inspected each day for damage, and the high-voltage gloves shall be given an air test before each use.

B.20.6 When not in use, high-voltage gloves shall be kept in an approved storage bag or container. Gloves shall not be exposed to sharp objects or direct sunlight. Gloves and sleeves shall never be folded during storage. Gloves should be stored with the cuffs down to permit drainage and ventilation.

B.20.7 High-voltage gloves and sleeves shall be tested and date-stamped at intervals not to exceed 90 days. The expiration date is stamped on the cuff.

B.21 *Batteries; Battery Rooms*

B.21.1 Enclosed areas used to charge or store batteries shall be adequately ventilated. Report any defective ventilation equipment.

B.21.2 Smoking and the use of open flames, cutting, welding and the use of tools that could produce sparks in battery rooms and enclosures that contain batteries shall be avoided (exception: when following plant cutting/welding or hot-work procedures). "No Smoking" signs shall be conspicuously posted in such areas.

B.21.3 Employees shall wear adequate clothing (i.e., protective apron and overshoes, approved gloves, eye/face protection) when installing or servicing storage batteries. Such apparel shall be made of non-conductive materials.

B.21.4 Precautions shall be taken to avoid shock or electric arc when working within battery-charging areas.

B.21.5 Lighting fixtures, ventilating ducts, communication equipment and other fixtures having parts that may be dropped or which might work loose in service should not be installed directly over batteries. If such an installation cannot be avoided, care shall be taken to protect the battery from a short circuit.

B.21.6 Whenever work must be performed in a location or position from which items such as tools and equipment may be accidentally dropped upon a station storage battery, proper measures shall be taken to protect the battery before the work is started.

B.21.7 When electrolyte is made for storage batteries, the acid shall be poured slowly into the water. Water shall not be poured into the acid.

B.21.8 If battery acid gets into an employee's eye(s), the eye(s) shall be flushed immediately at an eye-wash station for several minutes. Do not rub the eye. Seek medical treatment promptly.

B.21.9 If battery acid contacts one's body or clothing, the employee shall promptly wash with plenty of water.

B.21.10 Good housekeeping practices shall be maintained in battery-storage and -charging areas.

B.21.11 Water for drenching eyes shall be kept unobstructed within 25 feet of battery-handling areas.

B.22 *Hydro Stations*

B.22.1 Whenever it is necessary to work in a location where there is a possibility of falling into dangerous water, employees shall wear a life jacket approved by the U.S. Coast Guard.

B.22.2 Rigging equipment shall be inspected before and after use.

B.22.3 Employees shall be protected from falling by secured guardrails or the use of approved harness and lanyards.

B.22.4 The hold card/red tag and confined-space procedure shall be implemented before entering penstocks, scroll cases and similar water passages.

B.22.5 Internal work performed on a generator shall be under the protection of the station hold card/red tag procedure.

B.22.6 Employees working on or close to water gates, valves, intakes, forebays, flumes or other locations where increased or decreased water flow or levels may pose a significant hazard shall be warned before water flow changes are made.

B.22.7 Employees using boats shall wear life jackets approved by the U.S. Coast Guard.

B.22.8 Work performed inside tanks, tunnels, conduits, deep manholes or other confined spaces shall conform to established confined space procedures.

B.23 *Scrubbers; Sludge Process*

B.23.1 Entry into absorber modules, booster fans or tanks, etc., shall be in accordance with established confined space procedures.

B.23.2 Prior to performing any inspection or repair work on any equipment, one shall insure that the necessary valves, switches, control devices and any other operating mechanisms have been positioned, secured, electrically disconnected and carded in accordance with established hold card/red tag procedure.

B.23.3 Employees shall use low-voltage lights or ground fault circuit interrupters while working in such places as absorber modules, booster fans, tanks, etc.

B.23.4 Prior to closing up equipment such as absorber modules, booster fans, I.D. fans or tanks and making them ready for operation, a careful check shall be made to ensure no one has been left inside.

B.23.5 During yard operating and maintenance work, appropriate personal protective equipment shall be used, including goggles, face shield, safety harness, etc., as deemed necessary for the work activity.

B.23.6 Areas that contain scrubber slurry such as thickeners, thickener return tanks, sumps, etc., have the potential for hydrogen sulfide being formed. Appropriate precautions shall be taken when this condition exists.

B.23.7 Extreme caution shall be used when performing clean-up work in and around any conveyor belts. Jewelry or loose clothing shall not be worn when work is performed around moving conveyor belts.

B.23.8 One shall not climb on or over conveyor belts at any time, unless equipment is otherwise made safe. Follow established hold card/red tag procedures.

B.23.9 When preparing a slurry barge for unloading:

- **a.** Always connect the ground cable first, and remove it last when connecting or disconnecting electrical leads.
- **b.** At least two employees shall board the work dock; never one alone.

B.24 *Carbon Dioxide (CO_2) — Combustion Turbines*

Note: *Carbon dioxide is a colorless, odorless and electrically nonconductive gas. CO_2 extinguishes fire by reducing the concentration of oxygen in the air to the point where combustion stops. For this reason, CO_2 is considered an asphyxiate. CO_2 has specific gravity of 1.65, and high concentrations can gather and exist in below-grade areas. The current OSHA PEL (8 hr. TWA) is 5,000 ppm; concentrations of 10 percent (100,000 ppm) or more can cause unconsciousness or death. Lower concentrations may cause headaches, nausea, vomiting, rapid breathing, increased heart rate, dizziness and visual disturbances. Discharge of pressurized CO_2 into the atmosphere results in release of extremely cold CO_2 snow particles (dry ice). Skin contact with these particles can cause frostbite or cryogenic "burns."*

B.24.1 Leaks and emergencies shall be handled only by qualified persons. Ventilate adjacent enclosed areas to prevent the formation of lethal concentrations of CO_2. Personnel — including rescue workers — shall not enter areas in which the CO_2 content exceeds three percent by measurement, unless wearing a self-contained breathing apparatus or air-line respirator.

B.24.2 If a person has inhaled large amounts of CO_2 and is exhibiting adverse effects, move the exposed individual to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the person warm and at rest. Summon medical attention at once. Fresh air and assisted breathing are appropriate for all cases of overexposure to gaseous carbon dioxide.

B.25 *Natural Gas (Methane) — Combustion Turbines*

Note: *Natural gas is a naturally occurring, colorless, odorless (unless commercially odorized) and highly flammable material. Natural gas is non-toxic, but can act as a simple asphyxiate by displacing air. The specific gravity of natural gas is .55 (air =1). That means it is approximately half as light as air, and will dissipate in well-ventilated areas. The lower explosive limit is 3.6 percent; the upper explosive limit is 17 percent. The NFPA Hazard Rating for natural gas is: Health = 1; Fire = 4; and Reactivity = 0. Signs of exposure include rapid fatigue, nausea and vomiting.*

B.25.1 Monitors shall be utilized for detecting leaks. Alternatively, leak detection solutions will indicate leakage through bubble formation.

B.25.2 Eliminate all sources of ignition until leaks have been repaired.

B.25.3 Shut off the sources of gas and lower the pressure in the system prior to repairing a leak.

B.25.4 Leak-test systems prior to returning system to service.

B.25.5 Fire fighting procedures should include elimination of gas supply before attempting to extinguish.

B.25.6 Only personnel specifically trained and wearing appropriate personal protective equipment shall be permitted to work at the fire scene.

B.25.7 Inhalation of low concentrations can be remedied by promptly going to an uncontaminated area and inhaling fresh air or oxygen. If breathing has stopped, perform artificial respiration. Oxygen should be administered after breathing has been restored.

B.26 *Scaffolds — Tagging*

B.26.1 The intent of scaffold tagging is to assure that personnel perform their work from a scaffold that is complete and constructed in accordance with safety and health rules and OSHA regulations. If there is a conflict between LG&E and KU safety and health rules, contractor's safety program rules and governmental regulations, the most restrictive rules shall apply.

B.26.2 All personnel shall comply with this scaffold tagging requirement. Scaffolds not displaying a signed scaffold tag shall not be used.

B.26.3 In addition to these guidelines, all employees are subject to the OSHA scaffold requirements.

B.26.4 The company's authorized representative shall be responsible to ensure contractors tag their scaffolds in accordance with the scaffolding-tagging requirement.

B.26.5 Scaffold tags shall conform to the following color codes and wording.

a. Green Tag — "This scaffold was built to meet Federal OSHA scaffold regulations; it is safe to use."

b. Yellow Tag — "This scaffold does not meet Federal OSHA scaffold regulations; body harness shall be worn."

c. Red Tag — "This scaffold is not complete; DO NOT USE."

B.26.6 The competent person whose crew constructed the scaffold shall inspect the scaffold for compliance with OSHA requirements and shall sign the tag.

B.26.7 All scaffolds that cannot be equipped with standard top rail, midrail and toeboard because of interference with structures or equipment shall be marked with a yellow tag stating that "body harness must be used." Scaffolds being constructed or torn down, or which are incomplete, shall be marked with a red tag.

B.26.8 The competent person shall periodically monitor all scaffolds. The auditing shall ensure that all scaffolds are properly tagged and in compliance with OSHA standards.

B.26.9 Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift and after any occurrence which could affect a scaffold's structural integrity.

B.26.10 In the event that a work group chooses to use another contractor's or crew's scaffold, they shall obtain permission to use the scaffold and insure the competent person has inspected and tagged the scaffold before use.

B.26.11 For additional or specific scaffold requirements, see Section A.22.

B.27 *Radiation*

B.27.1 The use, handling, transporting or storing of radioactive materials shall be restricted to those employees who are properly authorized to do so, or to qualified persons under the direction and supervision of a licensee.

B.27.2 Radioactive materials not in use shall be stored in a safe, approved place and be adequately secured against unauthorized removal.

B.27.3 The loss of radioactive materials, or damage to their containers, shall be reported immediately to the proper company authorities.

B.27.4 Unauthorized persons shall be kept at a safe distance from areas in which radioactive materials are used or stored.

B.27.5 Areas where radioactive materials are used or stored shall be conspicuously and adequately posted with approved signs and labels.

B.27.6 Adequate protection, including monitoring equipment, shall be provided for, and used by, personnel handling radioactive materials.

B.27.7 Special precautions shall be taken to prevent accidental fires in areas where radioactive materials are used or stored. Should a fire occur, responding personnel must be notified of exposure hazards.

B.27.8 If an employee inadvertently handles — or is exposed to — unshielded radioactive materials, that employee shall immediately report the incident so that proper medical attention can be provided.

B.27.9 Consult your facility's radiation emergency procedure in the event of a radiation emergency. Take the following steps immediately for a radiation incident.

- **a.** All unnecessary personnel shall leave the area.
- **b.** Shut off ventilation fans.
- **c.** Barricade the area.
- **d.** Notify plant management and the radiation officer.
- **e.** Those with possible exposure shall be checked for contamination.
- **f.** Regulate entry to the scene.
- **g.** Maintain complete records of the incident.

C. Transmission

C.1 *Electrical Work Practices*

C.1.1 Before work is commenced, a job briefing (tailgate conference) shall be held with all employees to orient each employee as to:

- **a.** The hazards associated with the job.
- **b.** The work procedures involved.
- **c.** Any special precautions to be taken.
- **d.** All energy source controls.
- **e.** Personal protective equipment required.

The job briefing shall be documented and a copy maintained for a minimum of 30 calendar days.

C.1.2 Electrical equipment and lines shall always be considered as energized unless they are positively known to be dead and grounded. Before work is started on energized equipment or circuits, a preliminary inspection (or test) shall be made to determine existing conditions.

C.1.3 When employees are working and find a condition that they cannot handle safely, they shall call for assistance.

C.1.4 Only qualified employees and trainees working under their direct supervision may work on or with exposed energized lines or parts of equipment operating at 50 volts or more, and must be familiar with the minimum working clearance and approach distances.

(See Table C-1 — Minimum Approach Distance.)

C.1.5 Two employees shall not contact separate energized primary phases while working from the same pole, structure or aerial lift.

C.1.6 At least two employees shall be present while the following types of work are being performed:

- **a.** Installation, repair or removal of lines energized at more than 600 volts.
- **b.** Installation, repair or removal of de-energized lines or equipment such as transformers, capacitors and regulators, if an employee is exposed to contact with other parts energized at more than 600 volts.
- **c.** Work involving the use of mechanical equipment, other than insulated lifts, near parts energized at more than 600 volts.
- **d.** Any other work that exposes an employee to electrical hazards greater than or equal to those listed above.

C.1.7 At least two employees do not need to be present in the following operations.

- **a.** Routine switching of circuits.
- **b.** Work performed with insulated switch sticks or live-line tools,

if the employee is positioned so that he/she is not within reach of — or otherwise exposed to — energized parts.

c. Emergency repairs necessary to safeguard the general public, as long as approved tools and proper protective equipment are used.

C.1.8 No employee may approach or take any conductive object without an insulated handle closer to exposed energized parts than the clearances set forth in Tables C-1, C-2 and C-3, unless:

a. The employee is insulated from the energized part.

b. The energized part is insulated from the employee and any other conductive object at a different potential.

c. The employee is insulated from any other conductive object, as during live-line work.

C.1.9 Employees shall avoid working on circuits or equipment from such a position that a shock or slip might bring his/her body toward exposed energized parts. Whenever practicable, work on energized lines and equipment shall be performed from below.

C.1.10 In connecting de-energized equipment or lines to an energized circuit by means of a conducting wire or device, employees shall first attach the wire to the de-energized part. When disconnecting, employees shall remove the source end first. Loose conductors shall be kept away from exposed energized parts.

C.1.11 Employees shall immediately report to the nearest supervisor any defective line, apparatus, tool or other condition which, in their judgment, may be dangerous — either to persons or property — or likely to interrupt or delay service.

C.1.12 Employees shall use extreme caution when removing or replacing fuses which are energized on either side. Cartridge fuses shall be removed and replaced with approved fuse pullers, fuse tongs or rubber gloves. Screwdrivers, pliers, etc., shall not be used for this purpose.

C.1.13 Extreme caution shall be exercised when handling common-neutral conductors, as high voltage may be encountered. Whenever needed, temporary jumpers of adequate size shall be properly connected and secured before energized equipment grounds and energized circuit neutrals are opened.

C.1.14 Employees fighting fires near exposed energized electrical parts shall use fire extinguishers or materials which are suitable for this purpose. If this is not possible, the adjacent and affected equipment shall first be de-energized.

C.1.15 When two or more employees are performing work on — or associated with — exposed lines or equipment energized at 50 volts or more (except as noted in C.1.7), at least two persons

trained in first aid and cardiopulmonary resuscitation (CPR) shall be available. (Only one trained person needs to be available if all new employees on the job are to be trained in first aid and CPR within three months of their hiring dates.)

C.2 *Flexible and Rigid Insulated Protective Equipment (Rubber, Fiber, Synthetics, etc.)*

C.2.1 Employees shall not touch or work on any energized lines or equipment except when wearing protective equipment for the voltage to be contacted.

C.2.2 Whenever any part of an employee's body may touch a conductor, or if an employee is to handle a conductive device or tool within the minimum working and clear hot-stick distances, he/she shall cover, with insulating protective equipment, the conductor, conductive device or tool within reach of any part of the body except that part of the conductor or equipment on which he/she is working.

C.2.3 When working on an energized line or apparatus — including the installation or removal of protective devices — work should be done from below if possible.

C.2.4 In applying insulating protective equipment, employees shall always protect the nearest and lowest wires first, providing protection as progress is made. In removing insulating protective equipment, the reverse order shall be maintained.

C.2.5 Flexible blankets should not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin canvas or protective mat.

C.2.6 Line hoses, hoods, blankets, line guards, etc., shall be visually inspected before each use. Hoses, hoods, blankets and other cover-up materials shall be maintained in a clean, safe condition.

C.2.7 All insulating protective equipment shall be thoroughly cleaned (with approved cleaning agents) periodically, as needed, to remove foreign substances, and shall be wiped clean of oil, grease or other damaging substances as soon as practicable.

C.2.8 Flexible protective devices shall be stored in special compartments, on trucks and elsewhere, where they will not be subjected to damage from tools, sunlight or other equipment. ***There shall be a sufficient quantity of insulating protective devices as may be required by the person or crew for the job being done.***

C.2.9 Suitable lines and tool bags shall be used for raising and lowering materials, tools and protective equipment. Employees shall not throw anything from a pole or structure or permit anything to be thrown to them.

C.2.10 If a job requires an employee to stand on a rubber protective

blanket, it shall not be used again until tested by the Glove Lab.

C.2.11 Bare communication conductors shall be treated as energized or grounded and shall be protected accordingly.

C.3 *Use and Care of Rubber Goods*

C.3.1 Only qualified employees, or those under the continuous supervision of a qualified employee, shall work on energized lines or equipment.

C.3.2 Employees shall wear Class 0 rubber gloves with leather protectors when working on lines or equipment energized at 50 to 600 volts. Low-voltage gloves are required personal protective equipment when:

- **a.** Working in an energized meter base or panel, making contact with the energized terminal or parts.
- **b.** Working with bottom-connect-type meters.
- **c.** Removing or installing energized three-phase, self-contained meters. ***Note:*** *Face shields are required additional personal protection for 480-volt meter change-outs.*
- **d.** Working on the test block for PT and CT metering installations.
- **e.** Working energized services and secondary.

C.3.3 Low-voltage gloves are not required personal protective equipment when:

- **a.** Working a turn-on or turn-off and changing out a meter (involving single-phase, self-contained socket-type meters).
- **b.** Relamping street lights.
- **c.** Making ampere and voltage checks with approved test equipment on circuits or equipment energized at 300 volts or less, provided no physical contact is being made with energized parts.

C.3.4 Employees shall wear Class 2 rubber gloves with leather protectors and Class 2 rubber sleeves when working on lines or equipment energized at 600 to 15,000 volts.

C.3.5 ***Five-Foot Rule:*** When working on lines or equipment which are energized or may become energized at voltages from 600 to 15,000 volts, Class 2 rubber gloves and sleeves shall be used. They shall be put on before the employee comes within five feet of such lines or equipment, regardless of whether or not such lines or equipment are covered by insulating protective equipment. They shall not be removed for any reason until the employee is entirely out of the five-foot clearance of such circuits or apparatus. The *Five-Foot Rule* takes precedence over the clearance Table C-1 for voltages up to 15KV.

Exception: *In certain applications, such as installing or removing transformers on straight-line poles (single- or three-phase), there is an exception to the* Five-Foot-Rule. *After the circuits have been adequately covered or guarded with insulating protective equipment, the qualified employee in charge may allow employees to remove rubber gloves and sleeves outside of the two-foot-one-inch minimum approach distance referenced in Table C-1 for voltages up to 15KV. Under no circumstances can the person in charge be the person doing the work.*

C.3.6 Class 2 rubber gloves with leather protectors and Class 2 rubber sleeves shall be worn when:

- **a.** Working on — or within five feet of — any electrical equipment or metal surfaces (cross-arms, cross-arm braces or transformer cases, etc.) which are not effectively grounded, and which may be — or may become — energized from 600 to 15,000 volts.
- **b.** Working during wet or stormy weather within five feet of any conductor or equipment which may become energized at any voltage.
- **c.** Required by supervisor.
- **d.** Operating manually controlled air-break switches. The handle and other parts of air-break switches shall not be contacted with any part of the body except the parts protected by rubber gloves and sleeves.
- **e.** Opening, closing, removing or replacing hot line clamps, fuses or fuse door on cutouts, even when using an approved switch stick. ***Exception to the previous statement:*** *A properly maintained, heavy-duty fiberglass extendo stick that has been tested and labeled with a test date may be used while standing on the ground without rubber gloves and sleeves, except in inclement weather.*
- **f.** Making tests to determine if lines are energized and applying or removing grounding devices.
- **g.** Working on or near series street lighting circuits even though they are disconnected from their source.
- **h.** Repairing series fixtures or attachments with the circuit exposed to energized conductors. One exception would be if the fixtures are disconnected from the line.
- **i.** Pulling in wire or handling other conductive materials near circuits, apparatus or equipment which is or may become energized.
- **j.** Working on or near telephone or other circuits which are subject to induced voltages from energized high-voltage circuits, unless the circuits to be worked are adequately grounded.

k. Making the initial voltage check on new transformer installations.

l. Connecting driven grounds to neutrals or static wires when circuits are energized.

See rules for underground residential distribution, Section D.

C.3.7 Rubber gloves, sleeves and blankets shall be subjected to approved electrical tests at intervals not to exceed 90 days.

C.3.8 Rubber gloves and sleeves shall be inspected daily for corona cracks or other damage and shall be given an air test at least once a day while in use. This should be done at the beginning of the work period and at any other time when their condition is in doubt. They shall be visually checked before each use.

C.3.9 Rubber gloves and sleeves shall never be worn inside-out or without leather protectors. Rubber gloves or sleeves shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of damage.

C.3.10 Leather protectors shall not be worn except when in use over Class 2 or Class 0 rubber gloves.

C.3.11 Rubber gloves and sleeves, when not in use, shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored, nor shall other objects be placed upon them.

C.3.12 Rubber gloves shall be stored in a glove bag with the cuffs down to permit drainage and better ventilation, and reduce the possibility of damage due to objects falling into the glove.

C.3.13 When working with rubber protective equipment on energized circuits or apparatus where the voltage between any two conductors is more than 600 volts, the following minimum conditions shall be met in addition to all other rules governing the use of protective equipment.

a. Class 2 rubber gloves and sleeves shall be used.

b. Employees shall not make physical contact with protective devices installed on energized primary conductors with other than their rubber gloves and sleeves.

c. Employees shall be isolated from all grounds (wooden poles shall be considered as grounds), by using approved supplementary insulation such as aerial baskets, insulated platforms, hook ladders or other approved means of isolation.

C.3.14 When it is necessary to pass through or near circuits energized at 600 volts and above in order to reach a working area above (for example, to work on transmission circuits underbuilt by these lower-voltage circuits) they must be tied out with live-line maintenance tools or covered with approved protective equipment (rubber or fiber). Approved protective equipment must be properly installed with live-line maintenance tools or from an insulated platform (aerial basket, insulated platform or hook ladder).

C.3.15 If the circuits to be passed through are energized at voltages above 15,000 volts between phases, they must be tied out with live-line maintenance tools.

C.4 *Personal Climbing Equipment*

Body belts

C. 4.1 Only approved belts and approved fall protection equipment (FPE) shall be used.

C.4.2 All equipment shall be inspected before each use. Any found damaged or excessively worn shall not be used.

C.4.3 Climbing belts shall comply with the standards described by KOSHA 1926.959, which states that when tool loops are placed on a line technician's body belt, the maximum shall be no greater than four. Tool loops on a body belt shall be placed on the belt in such a way as to allow four inches in the back center of the belt to remain unobstructed by loops or other attachments (measuring from D-ring to D-ring) so that in case of a fall, the chance of injury will be lessened.

C.4.4 FPE having double-locking snap hooks shall be worn by employees working at elevated locations on poles, ladders, towers, or other structures except where such use creates a greater hazard to the safety of the employee — in which case, other safeguards shall be used.

C.4.5 Before an employee trusts his/her weight to a climbing belt or a similar device, a determination shall be made that the double-locking snaps are properly engaged, and that the employee is secure on the structure.

C.4.6 Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belts. Leather or other non-conducting material shall be used for this purpose.

Climbers

C.4.7 Climbers shall be inspected before each use. Damaged or excessively worn straps, or missing or broken screws, shall be replaced before climbers are used.

C.4.8 Gaffs shall be kept within safe length limits (1¼ inches, minimum), properly shaped, sharp and free of burrs. Gaffs shall be tested for wear and shape by using a gauge recommended by the manufacturer.

C.4.9 Pole gaffs shall not be used for tree climbing.

C.4.10 Employees shall not wear their climbers while driving, riding in vehicles, working on the ground or working on ladders (except hook ladders). Climbers shall be put on and removed as close to the pole as safety permits.

C.4.11 When climbers are stored in the truck or tool room, the sharp gaff points shall be covered with suitable gaff guards so they will not damage other equipment or cause personal injury.

Body Harnesses

C.4.12 A harness attached to a lanyard with a double-locking snap hook shall be worn while working from or riding in an aerial device. Lanyards shall be made of nylon and equipped with a double-locking snap, and shall be no longer than six feet.

Working on Poles

C.4.13 Before any pole is climbed, employees shall first:

a. Inspect all equipment before each use. If any equipment is found to be damaged or worn, it shall be repaired or replaced.

b. Inspect the pole to determine if it is safe to climb and that it is capable of sustaining the additional or unbalanced stresses to which it will be subjected.

C.4.14 Poles that are determined to be unsafe to climb shall be made safe by guying, bracing or other adequate means. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole may be lashed to it in lieu of guying.

C.4.15 ***Deleted***

C.4.16 Fall-protection equipment shall be used in accordance with the manufacturer's direction when ascending or descending.

C.4.17 A handline shall be taken aloft whether climbing or using an aerial device.

C.4.18 Employees shall not climb or work on an elevated pole or structure without first securing themselves with FPE.

C.4.19 The safety strap shall not be put around a pole above the uppermost pole attachment, except where the pole top or attachment is above eye level. It shall not be used on pole steps, crossarm braces, insulators, insulator pins, conductors, rotten or otherwise weak crossarms or on attachments that are being moved. When it is necessary to attach to a crossarm, the safety strap shall never be placed beyond the outside crossarm attachment. It shall be so placed that it will not be cut by line equipment or twisted or fouled by material that may give way under strain.

C.4.20 Employees shall not trust their weight to guy wires, pins, braces, conductors or other such equipment that might prove unstable.

C.4.21 When two or more employees are to work on the same pole at the same time, each individual shall reach the working position before the next leaves the ground. Only one may unhook a safety strap at a time. They shall descend the pole one at a time.

C.5 *Working Live-Line Tools*

C.5.1 Planned work with live-line tools shall not be started during unfavorable weather.

C.5.2 Only tools approved by the company shall be used in live-line maintenance. All live-line tools shall be made of fiberglass and shall be visually inspected and wiped with cloth before being used. Any tools with possible defects shall be removed from service.

C.5.3 Before work with live-line maintenance tools is begun, the dispatcher or person having jurisdiction shall be notified. If, during live-line tool work, an interruption of service occurs, the dispatcher or other person having jurisdiction shall be notified immediately.

C.5.4 The automatic reclosing feature of circuit interrupting devices shall be made inoperative before work begins.

C.5.5 Lines of #6 copper, #6 ACSR and #8A copperweld or smaller shall not be worked with live-line sticks.

C.5.6 A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators and other equipment.

C.5.7 Positive control shall be maintained during the movement of any conductor. Under no circumstances shall an employee depend on another employee to hold an energized conductor clear of said employee.

C.5.8 While live-line work is in progress, no other work of any nature shall be performed on the same pole or structure.

C.5.9 Live-line tools shall never be laid directly on the ground or against sharp objects such as barbed-wire fences. Special tool holders or tarpaulins shall be used for this purpose.

C.5.10 All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for that purpose; these containers shall be stored in a dry — and, if possible, warm — place.

C.5.11 Live-line tools, including the extendo sticks, are used as primary protection and shall be removed from service every two years for examination, cleaning, repair if needed, service and testing.

C.6 *Working On De-energized Lines and Equipment*

C.6.1 All conductors and equipment shall be treated as energized until tested with an approved voltage detector to be de-energized and grounded.

C.6.2 *New Construction:* New lines or equipment may be considered de-energized and worked as such where:

- **a.** the lines or equipment are grounded; or
- **b.** the hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment (see *Five-Foot Rule*, C.3.5.)

C.6.3 Bare communication conductors on power poles or structures shall be treated as energized lines or ground unless protected by insulating materials.

C.7 *Grounding*

Note: *See the "LG&E/KU Transmission Protective Temporary Grounding Procedures" to determine ground sizes. This document can be found at* ***http://intranet1.lgeenergy.com/corph&s/osha_programs.htm****, on the LG&E and KU Corporate Health and Safety intranet, under the 'Programs' section.*

C.7.1 Electrical equipment and conductors shall always be considered as energized unless they are positively proven by approved methods to be de-energized and properly grounded. ***If it isn't grounded, it isn't dead.***

C.7.2 Proper grounding procedures shall be followed when grounding a distribution or transmission line in preparation for working the line without insulated tools and rubber gloves and sleeves. Thoroughly plan and review the grounding requirements of the work to be performed.

C.7.3 Protective grounding may be accomplished utilizing one of two methods, depending on the physical requirements of the work location. The two methods are:

- **a. Equipotential Zone (Single-Point Grounding)** — Generally includes one conductor ground set in conjunction with a personal protective jumper. ***Note:*** *LG&E and KU's preferred method of grounding.*
- **b. Bracket Grounding** — Generally includes two conductor ground sets, one on either side of the work area, with all sources of backfeed between the ground sets eliminated.

C.7.4 All lockout/tagout and appropriate switching procedures shall be followed before grounding.

Refer to company construction standards or safety procedures manual for approved grounding procedures and equipment.

C.8 *Deleted*

C.9 *Fuses*

C.9.1 Class 2 rubber gloves and sleeves shall be worn while opening, closing, removing or replacing hot line clamps, fuses or fuse doors on cutouts even when using an approved switch stick (except when using an approved, tested extendo stick from the ground). Approved eye protection shall also be used during these procedures.

C.10 *Rope (Synthetic Fiber and Manila)*

C.10.1 A rope shall not be overloaded or dragged over rough or sharp objects.

C.10.2 Short bends over sharp-edged surfaces should be avoided.

C.10.3 Kinks shall be removed before any strain is put on a rope.

C.10.4 When not in use, ropes shall be dried and stored properly and kept free from mechanical damage, excessive heat and dryness.

C.10.5 The outward appearance of rope shall not be accepted as proof of quality or strength.

C.10.6 Ropes shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.

C.10.7 Safe loads, as specified by the manufacturer, shall not be exceeded. Ropes used for hoisting heavy equipment such as transformers shall be rated for the work being performed.

C.10.8 Eyes and splices shall be made in accordance with the instructions given by the rope manufacturer.

C.10.9 Ropes used for energized work must be maintained in a safe, clean, dry condition. An approved hot line tool link stick between the conductor and the rope shall be used.

C.10.10 Handlines shall:

- **a.** Be a minimum of one half inch.
- **b.** Be maintained and used so they are safe for pole-top rescue.
- **c.** Be used on poles to raise or lower materials and equipment except those heavy enough to require the use of blocks, bull lines or winch lines. Generally, materials or equipment weighing 75 pounds or less should be handled with a handline. Do not subject rope to shock loading.
- **d.** Be made up of a three-inch, single-sheave block with a hook equipped with a snap and at least a half-inch sling. The half-inch rope handline shall have a handline snap on one end and a ring or a handline hook on the other.

C.10.11 A minimum ⅜-inch dropline or throw line may be used instead of a handline for service work on a ladder at a building or for transmission climbing inspections.

C.11 *Telescopic Switch Sticks*

C.11.1 Heavy duty telescopic switch sticks and all other sticks used for primary protection shall be tested and labeled with the test date every two years.

C.11.2 Telescopic sticks are to be used only by persons wearing a hard hat, proper eye protection, approved clothing and leather gloves if the stick has been tested and labeled. Class 2 rubber gloves and sleeves shall be worn when using the stick in inclement weather, and if the stick has not been tested or if the test date has expired.

Note: *Eliminating the use of gloves and sleeves does not apply in distribution or transmission substations.*

C.11.3 Telescopic sticks are not to be used to lower or raise the doors or fuse barrels of cutouts through congested areas, or when the wind velocity is sufficient to render it awkward or impossible to control.

C.11.4 Telescopic sticks are not to be used by persons standing on a ladder or standing on or in a vehicle.

C.11.5 Telescopic sticks are not to be used unless clean and in good operating condition, and should be carried and stored in an approved case to prevent physical damage.

C.11.6 Telescopic sticks, other than the heavy-duty type, shall not be used in distribution or transmission substations for operating disconnects or power fuses, and shall not be used on lines or equipment rated over 35 KV phase-to-phase.

C.12 *Pole Hauling and Temporary Storage*

C.12.1 The trailing end of a load of poles shall be marked by a red flag during the day, and by an amber flashing light at night. As an additional precaution, warning flags or lights may be placed in the center of long loads. An employee shall be used for flagging when necessary.

C.12.2 The wheels of the transporting vehicle shall be chocked and securely braked prior to loading.

C.12.3 Poles loaded on a truck or trailer shall be securely fastened in at least two places.

C.12.4 Employees shall not ride on pole dollies or trailers.

C.12.5 When a load of poles is within working distance of the ground, load binders shall be installed so that they can and will be operated by employees while standing on the ground.

C.12.6 Employees shall not remain on a pole pile while poles are being hoisted.

C.12.7 Poles shall be placed or blocked so they will not roll.

C.12.8 If it becomes necessary to store poles at the location where they are to be set, they should be placed so that they will not interfere with traffic. If poles are left near streets, highways or walkways overnight where they create a hazard, they shall be safeguarded by amber lights or well-lighted warning signs.

C.13 *Setting and Removing Poles*

C.13.1 While setting or removing poles between or near conductors energized above 600 volts:

- **a.** If safe clearances cannot be maintained, the conductors shall be de-energized, covered with protective devices, or spread apart — or a pole guard shall be used to minimize accidental contact.
- **b.** Employees handling the butt of the pole shall wear Class 2 rubber gloves and sleeves whether or not cant hooks, peaveys or slings are used.
- **c.** Until a pole is positively secured from moving against an energized conductor, no one shall step on or off the truck, nor shall an employee standing on the ground touch any part of the truck without using Class 2 rubber gloves and sleeves.
- **d.** Ground wires shall not be attached on the pole higher than 10 feet from the ground.

C.13.2 Employees engaged in handling or working on poles shall wear suitable gloves and a long-sleeve shirt with the sleeves rolled down and cuffs buttoned.

C.13.3 All persons not engaged in pole-setting operations shall keep out of the work area.

C.13.4 Employees shall not stand or pass under a suspended load. Employees shall not stand adjacent to or over or under a loaded winch line.

C.13.5 Hoisting equipment operators shall accept signals only from the employee specifically designated. The operator shall obey a stop signal from anyone.

C.13.6 No one shall be on a gin pole when it is being used to raise another pole.

C.13.7 When pikes are used to hold poles in place while holes are being backfilled, they shall be firmly secured until the backfill is sufficient to hold. When a pole is being canted or hooked, the pikes shall be held.

C.13.8 If any holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.

C.14 *Hoisting Cables — Conductive Materials*

C.14.1 Wire rope and other conductive materials shall not be used to raise transformers, poles or any other equipment or materials near energized lines, except:

a. When the wire rope is rigged a sufficient distance below all energized wires to prevent the possibility of electrical contact between the energized wires and the wire rope or conductive material being raised.
b. When the wire rope and any conductive material being raised are adequately protected.
c. When the energized line and equipment are adequately protected.

C.14.2 Positive control of wire rope shall be maintained at all times.

C.14.3 Use of wire rope as a hoist line shall be discontinued when it becomes worn, deteriorated or damaged.

C.14.4 Metallic slings (chain or cable) shall not be used near energized equipment. Whenever possible, chain slings should not be used for hoisting purposes — but if they are used for lifting, they shall be tagged with proper information.

C.14.5 Synthetic hoisting/pulling lines and rope shall not be considered as non-conductive unless properly maintained to preserve their insulating qualities.

C.15 *Stringing Adjacent to Energized Lines*

C.15.1 Prior to stringing parallel to an existing energized transmission line, a competent determination shall be made by the qualified person in charge to ascertain whether dangerous induced-voltage buildups will occur, particularly during switching and ground fault conditions. When there is a possibility that dangerous induced voltage may exist, the following provisions shall be followed.

a. When stringing adjacent to energized lines, the tension stringing method, or any other methods that preclude unintentional contact between the lines being pulled, shall be used.
b. All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.
c. A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor and overhead ground conductor during stringing operations.
d. During stringing operations, each bare conductor and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup, and in increments so that no point is more than two miles from the ground.
e. The grounds shall be left in place until the conductor installation is completed.
f. Such grounds shall be removed as the last phase of aerial clean-up.
g. Except for moving-type grounds, the grounds shall be placed and removed with an approved shotgun stick or switch stick.

h. Conductors and overhead ground conductors shall be grounded at all deadend or catch-off points.
i. A ground shall be located at each side and within 10 feet of working areas where conductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.
j. All conductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.
k. Work on deadend towers shall require grounding on all de-energized lines.
l. Grounds may be removed as soon as the work is completed, provided that the line is not left open-circuited at the isolated tower at which work is being completed.
m. When performing work from the structures, clipping crews and all others working on conductors or overhead ground conductors shall be protected by individual grounds installed at every work location.

C.16 *Stringing or Removing Across Energized Conductors*

C.16.1 Prior to stringing operations, a job briefing shall be held, setting forth the plan of operation and specifying the type of equipment to be used, grounding devices, procedures to be followed, crossover methods to be followed and clearance authorizations required.

C.16.2 Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced-voltage buildup, to further protect the employee from the hazards of the conductor, the conductor being installed or removed shall be grounded and provisions made to insulate or isolate the employee.

C.16.3 If the existing line is de-energized, proper clearance authorization shall be secured, and the line grounded on both sides of the crossover, or the line being strung or removed shall be considered and worked as energized.

C.16.4 When crossing over energized conductors in excess of 300 volts, rope nets or guard structures shall be installed, unless provision is made to isolate or insulate the worker or the energized conductor. Where practical, the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded on either side of the crossover or considered and worked as energized.

C.16.5 Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tielines, or other means to prevent accidental contact with energized circuits.

C.16.6 A transmission crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped-in, except on deadend structures.

C.17 *Working on Distribution Transformers*

C.17.1 The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and the secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers or other sources.

C.17.2 The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary unless they are adequately grounded.

C.17.3 Employees shall not stand on, or otherwise contact, transformer cases while working on or near energized circuits.

C. 18 *Capacitors*

See Section F.8.

Table C-1

AC Live-Line Work Minimum Approach Distance and Clear Hot Stick Distance

Voltage in Kilovolts Phase-to-Phase	Phase-to-Ground Exposure Feet–Inches	Phase-to-Ground Exposure Meters	Phase-to-Phase Exposure Feet–Inches	Phase-to-Phase Exposure Meters
0 to 0.3	Avoid Contact		Avoid Contact	
0.31 to 0.75	1′1″	0.33	1′1″	0.33
0.751 to 5.0	2′1″	0.63	2′1″	0.63
5.1 to 15.0	2′2″	0.652	2′3″	0.684
15.1 to 36.0	2′7″	0.778	3′	0.904
36.1 to 46.0	2′10″	0.852	3′4″	0.999
46.1 to 72.5	3′5″	1.02	4′1″	1.23

Table C-2

DC Live-Line Work Minimum Approach Distance with Over-Voltage Factor

Max. Anticipated Per-Unit Transient Over-Voltage	Distance in Feet–Inches Maximum Line-to-Ground Voltage in Kilovolts 250	400	500	600	750
1.5 or lower	3′8″	5′3″	6′9″	8′7″	11′10″
1.6	3′10″	5′7″	7′4″	9′5″	13′1″
1.7	4′1″	6′0″	7′11″	10′3″	14′4″
1.8	4′3″	6′5″	8′7″	11′2″	15′9″

Note 1: The distances specified in this table may be applied only where the maximum anticipated per-unit transient over-voltage has been determined by engineering analysis and has been supplied by the employer. If, however, the transient over-voltage factor is not known, a factor of 1.8 shall be assumed.
Note 2: The distances specified in this table are the air, bare-hand and live-line tool distances.

Table C-3

AC Live-Line Work Minimum Approach Distance with Transient Over-Voltage

Voltage (kV)	Phase-to-Ground Exposure Feet-Inches	Phase-to-Ground Exposure Meters	Phase-to-Phase Exposure Feet-Inches	Phase-to-Phase Exposure Meters
72.6 to 121.0	3′8″	1.10	4′11″	1.48
121.1 to 145.0	4′2″	1.26	5′8″	1.71
145.1 to 169.0	4′8″	1.41	6′8″	2.02
169.1 to 242.0	6′5″	1.95	10′7″	3.22
242.1 to 362.0	11′0″	3.33	19′0″	5.78
362.1 to 420.0	13′9″	4.17	23′5″	7.13
420.1 to 550.0	16′6″	5.00	28′4″	8.64
550.1 to 800.0	22′6″	6.84	39′2″	11.93

For voltages over 72.5 kV, employees/contractors shall utilize the minimum approach distances in Table C-3 ***or*** contact enginnering for calculated distances.

Transient Overvoltage
- Selected 3.5 for 72.6 to 420.0 voltage based on R-9 table in OSHA 1910.269
- Selected 3.0 for 420.1 to 550.0 voltage based on R-9 table in OSHA 1910.269
- Selected 2.5 for 550.1 to 800.0 voltage based on R-9 table in OSHA 1910.269

D. Distribution

D. Distribution

D.1 *Electrical Work Practices*

D.1.1 Before work is commenced, a job briefing (tailgate conference) shall be held with all employees to orient each employee as to:

- **a.** The hazards associated with the job.
- **b.** The work procedures involved.
- **c.** Any special precautions to be taken.
- **d.** All energy source controls.
- **e.** Personal protective equipment required.

The job briefing shall be documented and a copy maintained for a minimum of 30 calendar days.

D.1.2 Electrical equipment and lines shall always be considered as energized unless they are positively known to be dead and grounded. Before work is started on energized equipment or circuits, a preliminary inspection (or test) shall be made to determine existing conditions.

D.1.3 When employees are working and find a condition that they cannot handle safely, they shall call for assistance.

D.1.4 Only qualified employees and trainees working under their direct supervision may work on or with exposed energized lines or parts of equipment operating at 50 volts or more, and must be familiar with the minimum working clearance and approach distances.
(See Table D-1 — Minimum Approach Distance.)

D.1.5 Two employees shall not contact separate energized primary phases while working from the same pole, structure or aerial lift.

D.1.6 At least two employees shall be present while the following types of work are being performed:

- **a.** Installation, repair or removal of lines energized at more than 600 volts.
- **b.** Installation, repair or removal of de-energized lines or equipment such as transformers, capacitors and regulators, if an employee is exposed to contact with other parts energized at more than 600 volts.
- **c.** Work involving the use of mechanical equipment, other than insulated lifts, near parts energized at more than 600 volts.
- **d.** Any other work that exposes an employee to electrical hazards greater than or equal to those listed above.

D.1.7 At least two employees do not need to be present in the following operations.

- **a.** Routine switching of circuits.
- **b.** Work performed with insulated switch sticks or live-line tools,

if the employee is positioned so that he/she is not within reach of — or otherwise exposed to — energized parts.

c. Emergency repairs necessary to safeguard the general public, as long as approved tools and proper protective equipment are used.

D.1.8 No employee may approach or take any conductive object without an insulated handle closer to exposed energized parts than the clearances set forth in Tables D-1, D-2 and D-3, unless:

a. The employee is insulated from the energized part.

b. The energized part is insulated from the employee and any other conductive object at a different potential.

c. The employee is insulated from any other conductive object, as during live-line work.

D.1.9 Employees shall avoid working on circuits or equipment from such a position that a shock or slip might bring his/her body toward exposed energized parts. Whenever practicable, work on energized lines and equipment shall be performed from below.

D.1.10 In connecting de-energized equipment or lines to an energized circuit by means of a conducting wire or device, employees shall first attach the wire to the de-energized part. When disconnecting, employees shall remove the source end first. Loose conductors shall be kept away from exposed energized parts.

D.1.11 Employees shall immediately report to the nearest supervisor any defective line, apparatus, tool or other condition which, in their judgment, may be dangerous — either to persons or property — or likely to interrupt or delay service.

D.1.12 Employees shall use extreme caution when removing or replacing fuses which are energized on either side. Cartridge fuses shall be removed and replaced with approved fuse pullers, fuse tongs or rubber gloves. Screwdrivers, pliers, etc., shall not be used for this purpose.

D.1.13 Extreme caution shall be exercised when handling common-neutral conductors, as high voltage may be encountered. Whenever needed, temporary jumpers of adequate size shall be properly connected and secured before energized equipment grounds and energized circuit neutrals are opened.

D.1.14 Employees fighting fires near exposed energized electrical parts shall use fire extinguishers or materials which are suitable for this purpose. If this is not possible, the adjacent and affected equipment shall first be de-energized.

D.1.15 When employees are performing work on — or associated with — exposed lines or equipment energized at 50 volts or more

(except as noted in D.1.7), at least two persons trained in first aid and cardiopulmonary resuscitation (CPR) shall be available. (Only one trained person needs to be available if all new employees on the job are to be trained in first aid and CPR within three months of their hiring dates.)

D.2 *Flexible and Rigid Insulated Protective Equipment (Rubber, Fiber, Synthetics, etc.)*

D.2.1 Employees shall not touch or work on any energized lines or equipment except when wearing protective equipment for the voltage to be contacted.

D.2.2 Whenever any part of an employee's body may touch a conductor, or if an employee is to handle a conductive device or tool within the minimum working and clear hot-stick distances, he/she shall cover, with insulating protective equipment, the conductor, conductive device or tool within reach of any part of the body except that part of the conductor or equipment on which he/she is working.

D.2.3 When working on an energized line or apparatus — including the installation or removal of protective devices — work should be done from below if possible.

D.2.4 In applying insulating protective equipment, employees shall always protect the nearest and lowest wires first, providing protection as progress is made. In removing insulating protective equipment, the reverse order shall be maintained.

D.2.5 Flexible blankets should not be used on the ground without protecting them from physical damage and moisture by means of a tarpaulin canvas or protective mat.

D.2.6 Line hoses, hoods, blankets, line guards, etc., shall be visually inspected before each use. Hoses, hoods, blankets and other cover-up materials shall be maintained in a clean safe condition.

D.2.7 All insulating protective equipment shall be thoroughly cleaned (with approved cleaning agents) periodically, as needed, to remove foreign substances, and shall be wiped clean of oil, grease or other damaging substances as soon as practicable.

D.2.8 Flexible protective devices shall be stored in special compartments, on trucks and elsewhere, where they will not be subjected to damage from tools, sunlight or other equipment.

There shall be a sufficient quantity of insulating protective devices as may be required by the person or crew for the job being done.

D.2.9 Suitable lines and tool bags shall be used for raising and lowering materials, tools and protective equipment. Employees shall not throw anything from a pole or structure or permit anything to be thrown to them.

D.2.10 If a job requires an employee to stand on a rubber protective blanket, it shall not be used again until tested by the Glove Lab.

D.2.11 Bare communication conductors shall be treated as energized or grounded, and shall be protected accordingly.

D.3 *Use and Care of Rubber Goods*

D.3.1 Only qualified employees, or those under the continuous supervision of a qualified employee, shall work on energized lines or equipment.

D.3.2 Employees shall wear Class 0 rubber gloves with leather protectors when working on lines or equipment energized at 50 to 600 volts. Low-voltage gloves are required personal protective equipment when:

- **a.** Working in an energized meter base or panel, making contact with the energized terminal or parts.
- **b.** Working with bottom-connect-type meters.
- **c.** Removing or installing energized three-phase, self-contained meters. ***Note:*** *Face shields and balaclava are required additional personal protection for 480-volt meter change-outs. Additional PPE may be required, contact supervisor or safety specialist before energized work.*
- **d.** Working on the test block for PT and CT metering installations.
- **e.** Working energized services and secondary.

D.3.3 Low-voltage gloves are not required personal protective equipment when:

- **a.** Working a turn-on or turn-off and changing out a meter (involving single-phase, self-contained socket-type meters).
- **b.** Relamping street lights.
- **c.** Making ampere and voltage checks with approved test equipment on circuits or equipment energized at 300 volts or less, provided no physical contact is being made with energized parts.

D.3.4 Employees shall wear Class 2 rubber gloves with leather protectors and Class 2 rubber sleeves when working on lines or equipment energized at 600 to 15,000 volts.

D.3.5 ***Five-Foot Rule:*** When working on lines or equipment which are energized or may become energized at voltages from 600 to 15,000 volts, Class 2 rubber gloves and sleeves shall be used. They shall be put on before the employee comes within five feet of such lines or equipment, regardless of whether or not such lines or equipment are covered by insulating protective equipment. They shall not be removed for any reason until the employee is entirely out of the five-foot clearance of such circuits or apparatus. The Five-Foot Rule takes precedence over the clearance Table D-1 for voltages up to 15KV.

Exception: *In certain applications, such as installing or removing transformers on straight-line poles (single- or three-phase), there is an exception to the* Five-Foot Rule. *After the circuits have been adequately covered or guarded with insulating protective equipment, the qualified employee in charge may allow employees to remove rubber gloves and sleeves outside of the two-foot-one-inch minimum approach distance referenced in Table D-1 for voltages up to 15KV. Under no circumstances can the person in charge be the person doing the work.*

D.3.6 Class 2 rubber gloves with leather protectors and Class 2 rubber sleeves shall be worn when:

- **a.** Working on — or within five feet of — any electrical equipment or metal surfaces (cross-arms, cross-arm braces or transformer cases, etc.) which are not effectively grounded, and which may be — or may become — energized from 600 to 15,000 volts.
- **b.** Working during wet or stormy weather within five feet of any conductor or equipment which may become energized at any voltage.
- **c.** Required by supervisor.
- **d.** Operating manually controlled air-break switches. The handle and other parts of air-break switches shall not be contacted with any part of the body except the parts protected by rubber gloves and sleeves.
- **e.** Opening, closing, removing or replacing hot line clamps, fuses or fuse door on cutouts, even when using an approved switch stick. ***Exception to the previous statement:*** *A properly maintained, heavy-duty fiberglass extendo stick that has been tested and labeled with a test date may be used while standing on the ground without rubber gloves and sleeves, except in inclement weather.*
- **f.** Making tests to determine if lines are energized and applying or removing grounding devices.
- **g.** Working on or near series street lighting circuits even though they are disconnected from their source.
- **h.** Repairing series fixtures or attachments with the circuit exposed to energized conductors. One exception would be if the fixtures are disconnected from the line.
- **i.** Pulling in wire or handling other conductive materials near circuits, apparatus or equipment which is or may become energized.
- **j.** Working on or near telephone or other circuits which are subject to induced voltages from energized high-voltage circuits, unless the circuits to be worked are adequately grounded.
- **k.** Making the initial voltage check on new transformer installations.

l. Connecting driven grounds to neutrals or static wires when circuits are energized.

m. Using any type of switch stick in a distribution or transmission substation.

See rules for underground residential distribution, Section E.

D.3.7 Rubber gloves, sleeves and blankets shall be subjected to an approved electrical test at intervals not to exceed 90 days.

D.3.8 Rubber gloves and sleeves shall be inspected daily for corona cracks or other damage and shall be given an air test at least once a day while in use. This should be done at the beginning of the work period and at any other time when their condition is in doubt. They shall be visually checked before each use.

D.3.9 Rubber gloves and sleeves shall never be worn inside out or without leather protectors. Rubber gloves or sleeves shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of damage.

D.3.10 Leather protectors shall not be worn except when in use over Class 2 or Class 0 rubber gloves.

D.3.11 Rubber gloves and sleeves, when not in use, shall be kept in canvas bags or other approved containers and stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored, nor shall other objects be placed upon them.

D.3.12 Rubber gloves shall be stored in a glove bag with the cuffs down to permit drainage and better ventilation, and reduce the possibility of damage due to objects falling into the glove.

D.3.13 When working with rubber protective equipment on energized circuits or apparatus where the voltage between any two conductors is more than 600 volts, the following minimum conditions shall be met in addition to all other rules governing the use of protective equipment.

a. Class 2 rubber gloves and sleeves shall be used.

b. Employees shall not make physical contact with protective devices installed on energized primary conductors with other than their rubber gloves and sleeves.

c. Employees shall be isolated from all grounds (wooden poles shall be considered as grounds), by using approved supplementary insulation such as aerial baskets, insulated platforms, hook ladders or other approved means of isolation.

D3.14 When it is necessary to pass through or near circuits energized at 600 volts and above in order to reach a working area above (for example, to work on transmission circuits underbuilt by these lower-voltage circuits) they must be tied out with live-line maintenance tools or covered with approved protective equipment (rubber or fiber). Approved protective equipment must be properly installed with live-line maintenance tools or from an insulated platform (aerial basket, insulated platform or hook ladder).

D.3.15 If the circuits to be passed through are energized at voltages above 15,000 volts between phases, they must be tied out with live-line maintenance tools.

D.4 *Personal Climbing Equipment*

Body Belts

D. 4.1 Only approved belts and approved fall protection equipment (FPE) shall be used.

D.4.2 All equipment shall be inspected before each use. Any found damaged or excessively worn shall not be used.

D.4.3 Climbing belts shall comply with the standards described by KOSHA 1926.959, which states that when tool loops are placed on a line technician's body belt, the maximum shall be no greater than four. Tool loops on a body belt shall be placed on the belt in such a way as to allow four inches in the back center of the belt to remain unobstructed by loops or other attachments (measuring from D-ring to D-ring) so that in case of a fall, the chance of injury will be lessened.

D.4.4 FPE having double-locking snap hooks shall be worn by employees working at elevated locations on poles, ladders, towers, or other structures except where such use creates a greater hazard to the safety of the employee — in which case, other safeguards shall be used.

D.4.5 Before an employee trusts his/her weight to a climbing belt or a similar device, a determination shall be made that the double-locking snaps are properly engaged, and that the employee is secure on the structure.

D.4.6 Metal hooks, chains, etc., for holding tools or tape shall not be attached to body belts. Leather or other non-conducting material shall be used for this purpose.

Climbers

D.4.7 Climbers shall be inspected before each use. Damaged or excessively worn straps, or missing or broken screws, shall be replaced before climbers are used.

D.4.8 Gaffs shall be kept within safe length limits (1-1/4 inches, minimum), properly shaped, sharp and free of burrs. Gaffs shall be tested for wear and shape by using a gauge recommended by the manufacturer.

D.4.9 Pole gaffs shall not be used for tree climbing.

D.4.10 Employees shall not wear their climbers while driving, riding in vehicles, working on the ground or working on ladders (except hook ladders). Climbers shall be put on and removed as close to the pole as safety permits.

D.4.11 When climbers are stored in the truck or tool room, the sharp gaff points shall be covered with suitable gaff guards so they will not damage other equipment or cause personal injury.

Body Harnesses

D.4.12 A harness attached to a lanyard with a double-locking snap hook shall be worn while working from or riding in an aerial device. Lanyards shall be made of nylon and equipped with a double locking snap, and shall be no longer than six feet.

Working on Poles

D.4.13 Before any pole is climbed, employees shall first:

a. Inspect all equipment before each use. If any equipment is found to be damaged or worn, it shall be repaired or replaced.

b. Inspect the pole to determine if it is safe to climb and that it is capable of sustaining the additional or unbalanced stresses to which it will be subjected.

D.4.14 Poles that are determined to be unsafe to climb shall be made safe by guying, bracing or other adequate means. If the pole to be climbed is being replaced and the new pole is set adjacent to it, the old pole may be lashed to it in lieu of guying.

D.4.15 ***Deleted***

D.4.16 Fall-protection equipment shall be used in accordance with the manufacturer's direction when ascending or descending.

D.4.17 A handline shall be taken aloft whether climbing or using an aerial device.

D.4.18 Employees shall not climb or work on an elevated pole or structure without first securing themselves with FPE.

D.4.19 The safety strap shall not be put around a pole above the upper-most pole attachment, except where the pole top or attachment is above eye level. It shall not be used on pole steps, crossarm braces, insulators, insulator pins, conductors, rotten or otherwise weak crossarms or on attachments that are being moved. When it is necessary to attach to a crossarm, the safety strap shall never be placed beyond the outside crossarm attachment. It shall be so placed that it will not be cut by line equipment or twisted or fouled by material that may give way under strain.

D.4.20 Employees shall not trust their weight to guy wires, pins, braces, conductors, or other such equipment that might prove unstable.

D.4.21 When two or more employees are to work on the same pole at the same time, each individual shall reach the working position before the next leaves the ground. Only one may unhook a safety strap at a time. They shall descend the pole one at a time.

D.5 *Working Live-Line Tools*

D.5.1 Planned work with live-line tools shall not be started during unfavorable weather.

D.5.2 Only tools approved by the company shall be used in live-line maintenance. All live-line tools shall be made of fiberglass and shall be visually inspected and wiped with cloth before being used. Any tools with possible defects shall be removed from service.

D.5.3 Before work with live-line maintenance tools is begun, the dispatcher or person having jurisdiction shall be notified. If, during live-line tool work, an interruption of service occurs, the dispatcher or other person having jurisdiction shall be notified immediately.

D.5.4 The automatic reclosing feature of circuit interrupting devices shall be made inoperative before work begins.

D.5.5 Lines of #6 copper, #6 ACSR, and #8A copperweld or smaller shall not be worked with live-line sticks.

D.5.6 A careful check shall be made to see that the condition of the structure and lines at the point of the work is such that the job may be performed safely. In addition, the adjacent spans and structures shall be carefully checked for defects in conductors, tie wires, insulators and other equipment.

D.5.7 Positive control shall be maintained during the movement of any conductor. Under no circumstances shall an employee depend on another employee to hold an energized conductor clear of said employee.

D.5.8 While live-line work is in progress, no other work of any nature shall be performed on the same pole or structure.

D.5.9 Live-line tools shall never be laid directly on the ground or against sharp objects such as barbed-wire fences. Special tool holders or tarpaulins shall be used for this purpose.

D.5.10 All live-line tools, when not in use, shall be kept in canvas bags or weatherproof boxes provided for that purpose; these containers shall be stored in a dry — and, if possible, warm — place.

D.5.11 Live-line tools, including the extendo sticks, are used as primary protection and shall be removed from service every two years for examination, cleaning, repair if needed, service and testing.

D.6 *Working On De-energized Lines and Equipment*

D.6.1 All conductors and equipment shall be treated as energized until tested with an approved voltage detector to be de-energized and grounded.

D.6.2 *New Construction:* New lines or equipment may be considered de-energized and worked as such where:

- **a.** the lines or equipment are grounded; or
- **b.** the hazard of induced voltages is not present and adequate clearances or other means are implemented to prevent contact with energized lines or equipment and the new lines or equipment (see *Five-Foot Rule*, D.3.5).

D.6.3 Bare communication conductors on power poles or structures shall be treated as energized lines or ground unless protected by insulating materials.

D.7 *Grounding*

See grounding procedures and requirements.

D.7.1 Electrical equipment and conductors shall always be considered as energized unless they are positively proven by approved methods to be de-energized and properly grounded. ***If it isn't grounded, it isn't dead.***

D.7.2 Proper grounding procedures shall be followed when grounding a distribution or transmission line in preparation for working the line without insulated tools and rubber gloves and sleeves. Thoroughly plan and review the grounding requirements of the work to be performed.

D.7.3 Protective grounding may be accomplished utilizing one of two methods, depending on the physical requirements of the work location. The two methods are:

- **a. Equipotential Zone (Single-Point Grounding)** — Generally includes one conductor ground set in conjunction with a personal protective jumper. ***Note:*** *LG&E and KU's preferred method of grounding.*
- **b. Bracket Grounding** — Generally includes two conductor ground sets, one on either side of the work area, with all sources of backfeed between the ground sets eliminated.

D.7.4 All lockout/tagout and appropriate switching procedures shall be followed before grounding.

Refer to company construction standards or safety procedures manual for approved grounding procedures and equipment.

D.8 *Deleted*

D.9 *Fuses*

D.9.1 Class 2 rubber gloves and sleeves shall be worn while opening, closing, removing or replacing hot line clamps, fuses or fuse doors on cutouts even when using an approved switch stick (except when using an approved, tested extendo stick from the ground). Approved eye protection shall also be used during these procedures.

D.10 *Rope (Synthetic Fiber and Manila)*

D.10.1 A rope shall not be overloaded or dragged over rough or sharp objects.

D.10.2 Short bends over sharp-edged surfaces should be avoided.

D.10.3 Kinks shall be removed before any strain is put on a rope.

D.10.4 When not in use, ropes shall be dried and stored properly and kept free from mechanical damage, excessive heat and dryness.

D.10.5 The outward appearance of rope shall not be accepted as proof of quality or strength.

D.10.6 Ropes shall be examined regularly for cuts, worn spots, burns and rot. The rope shall be untwisted at various places and inspected for poor fiber and dry rot.

D.10.7 Safe loads, as specified by the manufacturer, shall not be exceeded. Ropes used for hoisting heavy equipment such as transformers shall be rated for the work being performed.

D.10.8 Eyes and splices shall be made in accordance with the instructions given by the rope manufacturer.

D.10.9 Ropes used for energized work must be maintained in a safe, clean, dry condition. An approved hot line tool link stick between the conductor and the rope shall be used.

D.10.10 Handlines shall:

- **a.** Be a minimum of one half inch.
- **b.** Be maintained and used so they are safe for pole-top rescue.
- **c.** Be used to raise or lower materials and equipment on poles except those heavy enough to require the use of blocks, bull lines or winch lines. Generally, materials or equipment weighing 75 pounds or less should be handled with a handline. Do not subject rope to shock loading.
- **d.** Be made up of a three-inch, single-sheave block with a hook equipped with a snap and at least a half-inch sling. The half-inch rope handline shall have a handline snap on one end and a ring or a handline hook on the other.

D.10.11 A minimum 3/8-inch dropline or throw line may be used instead of a handline for service work on a ladder at a building or for transmission climbing inspections.

D.11 *Switch Sticks*

D.11.1 Heavy duty telescopic switch sticks and all other sticks used for primary protection shall be tested and labeled with the test date every two years.

D.11.2 Telescopic sticks are to be used only by persons wearing a hard hat, proper eye protection, approved clothing and leather gloves if the stick has been tested and labeled. Class 2 rubber gloves and sleeves shall be worn when using the stick in inclement weather, and if the stick has not been tested or if the test date has expired.

Note: *Eliminating the use of gloves and sleeves does not apply in distribution or transmission substations.*

D.11.3 Telescopic sticks are not to be used to lower or raise the doors or fuse barrels of cutouts through congested areas, or when the wind velocity is sufficient to render it awkward or impossible to control.

D.11.4 Telescopic sticks are not to be used by persons standing on a ladder or standing on or in a vehicle.

D.11.5 Telescopic sticks are not to be used unless clean and in good operating condition, and should be carried and stored in an approved case to prevent physical damage.

D.11.6 Telescopic sticks, other than the heavy-duty type, shall not be used in distribution or transmission substations for operating disconnects or power fuses, and shall not be used on lines or equipment rated over 35 KV phase-to-phase.

D.11.7 Switch sticks such as shotgun and small telescopic sticks shall be a minimum length of eight feet.

D.12 *Pole Hauling and Temporary Storage*

D.12.1 The trailing end of a load of poles shall be marked by a red flag during the day, and by an amber flashing light at night. As an additional precaution, warning flags or lights may be placed in the center of long loads. An employee shall be used for flagging when necessary.

D.12.2 The wheels of the transporting vehicle shall be chocked and securely braked prior to loading.

D.12.3 Poles loaded on a truck or trailer shall be securely fastened in at least two places.

D.12.4 Employees shall not ride on pole dollies or trailers.

D.12.5 When a load of poles is within working distance of the ground, load binders shall be installed so that they can and will be operated by employees while standing on the ground.

D.12.6 Employees shall not remain on a pole pile while poles are being hoisted.

D.12.7 Poles shall be placed or blocked so they will not roll.

D.12.8 If it becomes necessary to store poles at the location where they are to be set, they should be placed so that they will not interfere with traffic. If poles are left near streets, highways or walkways overnight where they create a hazard, they shall be safeguarded by amber lights or well-lighted warning signs.

D.13 *Setting and Removing Poles*

D.13.1 While setting or removing poles between or near conductors energized above 600 volts:

- **a.** If safe clearances cannot be maintained, the conductors shall be de-energized, covered with protective devices, or spread apart — or a pole guard shall be used to minimize accidental contact.
- **b.** Employees handling the butt of the pole shall wear Class 2 rubber gloves and sleeves whether or not cant hooks, peaveys or slings are used.
- **c.** Until a pole is positively secured from moving against an energized conductor, no one shall step on or off the truck, nor shall an employee standing on the ground touch any part of the truck without using Class 2 rubber gloves and sleeves.
- **d.** Ground wires shall not be attached on the pole higher than 10 feet from the ground.

D.13.2 Employees engaged in handling or working on poles shall wear suitable gloves and a long-sleeve shirt with the sleeves rolled down and cuffs buttoned.

D.13.3 All persons not engaged in pole-setting operations shall keep out of the work area.

D.13.4 Employees shall not stand or pass under a suspended load. Employees shall not stand adjacent to or over or under a loaded winch line.

D.13.5 Hoisting equipment operators shall accept signals only from the employee specifically designated. The operator shall obey a stop signal from anyone.

D.13.6 No one shall be on a gin pole when it is being used to raise another pole.

D.13.7 When pikes are used to hold poles in place while holes are being backfilled, they shall be firmly secured until the backfill is sufficient to hold. When a pole is being canted or hooked, the pikes shall be held.

D.13.8 If any holes are left unfilled at the end of the work period, they shall be protected with substantial coverings.

D.14 *Hoisting Cables — Conductive Materials*

D.14.1 Wire rope and other conductive materials shall not be used to raise transformers, poles or any other equipment or materials near energized lines, except:

- **a.** When the wire rope is rigged a sufficient distance below all energized wires to prevent the possibility of electrical contact between the energized wires and the wire rope or conductive material being raised.
- **b.** When the wire rope and any conductive material being raised are adequately protected.
- **c.** When energized line and equipment are adequately protected.

D.14.2 Positive control of wire rope shall be maintained at all times.

D.14.3 Use of wire rope as a hoist line shall be discontinued when it becomes worn, deteriorated or damaged.

D.14.4 Metallic slings (chain or cable) shall not be used near energized equipment. Whenever possible, chain slings should not be used for hoisting purposes — but if they are used for lifting, they shall be tagged with proper information.

D.14.5 Synthetic hoisting/pulling lines and rope shall not be considered as non-conductive unless properly maintained to preserve their insulating qualities.

D.15 *Stringing Adjacent to Energized Lines*

D.15.1 Prior to stringing parallel to an existing energized transmission line, a competent determination shall be made by the qualified person in charge to ascertain whether dangerous induced voltage buildups will occur, particularly during switching and ground fault conditions. When there is a possibility that dangerous induced voltage may exist, the following provisions shall be followed:

- **a.** When stringing adjacent to energized lines, the tension stringing method, or any other methods that preclude unintentional contact between the lines being pulled, shall be used.
- **b.** All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.
- **c.** A ground shall be installed between the tensioning reel setup and the first structure in order to ground each bare conductor and overhead ground conductor during stringing operations.
- **d.** During stringing operations, each bare conductor and overhead ground conductor shall be grounded at the first tower adjacent to both the tensioning and pulling setup, and in increments so that no point is more than two miles from the ground.
- **e.** The grounds shall be left in place until the conductor installation is completed.
- **f.** Such grounds shall be removed as the last phase of aerial clean-up.
- **g.** Except for moving-type grounds, the grounds shall be placed and removed with an approved shotgun stick or switch stick.
- **h.** Conductors and overhead ground conductors shall be grounded at all deadend or catch-off points.
- **i.** A ground shall be located at each side and within 10 feet of working areas where conductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.
- **j.** All conductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.
- **k.** Work on deadend towers shall require grounding on all de-energized lines.
- **l.** Grounds may be removed as soon as the work is completed, provided that the line is not left open-circuited at the isolated tower at which work is being completed.
- **m.** When performing work from the structures, clipping crews and all others working on conductors or overhead ground conductors shall be protected by individual grounds installed at every work location.

D.16 *Stringing or Removing Across Energized Conductors*

D.16.1 Prior to stringing operations, a job briefing shall be held setting forth the plan of operation and specifying the type of equipment to be used, grounding devices, procedures to be followed, crossover methods to be followed and clearance authorizations required.

Table D-1

AC Live-Line Work Minimum Approach Distance and Clear Hot Stick Distance

Voltage in Kilovolts Phase-to-Phase	Phase-to-Ground Exposure Feet–Inches	Phase-to-Ground Exposure Meters	Phase-to-Phase Exposure Feet–Inches	Phase-to-Phase Exposure Meters
0 to 0.3	Avoid Contact		Avoid Contact	
0.31 to 0.75	1′1″	0.33	1′1″	0.33
0.751 to 5.0	2′1″	0.63	2′1″	0.63
5.1 to 15.0	2′2″	0.652	2′3″	0.684
15.1 to 36.0	2′7″	0.778	3′	0.904
36.1 to 46.0	2′10″	0.852	3′4″	0.999
46.1 to 72.5	3′5″	1.02	4′1″	1.23

Table D-2

DC Live-Line Work Minimum Approach Distance with Over-Voltage Factor

Max. Anticipated Per-Unit Transient Over-Voltage	Distance in Feet–Inches Maximum Line-to-Ground Voltage in Kilovolts 250	400	500	600	750
1.5 or lower	3′8″	5′3″	6′9″	8′7″	11′10″
1.6	3′10″	5′7″	7′4″	9′5″	13′1″
1.7	4′1″	6′0″	7′11″	10′3″	14′4″
1.8	4′3″	6′5″	8′7″	11′2″	15′9″

Note 1: The distances specified in this table may be applied only where the maximum anticipated per-unit transient over-voltage has been determined by engineering analysis and has been supplied by the employer. If, however, the transient over-voltage factor is not known, a factor of 1.8 shall be assumed.
Note 2: The distances specified in this table are the air, bare-hand and live-line tool distances.

Table D-3

AC Live-Line Work Minimum Approach Distance with Transient Over-Voltage

	Phase-to-Ground Exposure		Phase-to-Phase Exposure	
Voltage (kV)	Feet-Inches	Meters	Feet-Inches	Meters
72.6 to 121.0	3′8″	1.10	4′11″	1.48
121.1 to 145.0	4′2″	1.26	5′8″	1.71
145.1 to 169.0	4′8″	1.41	6′8″	2.02
169.1 to 242.0	6′5″	1.95	10′7″	3.22
242.1 to 362.0	11′0″	3.33	19′0″	5.78
362.1 to 420.0	13′9″	4.17	23′5″	7.13
420.1 to 550.0	16′6″	5.00	28′4″	8.64
550.1 to 800.0	22′6″	6.84	39′2″	11.93

D.16.2 Where there is a possibility of the conductor accidentally contacting an energized circuit or receiving a dangerous induced-voltage buildup, to further protect the employee from the hazards of the conductor, the conductor being installed or removed shall be grounded and provisions made to insulate or isolate the employee.

D.16.3 If the existing line is de-energized, proper clearance authorization shall be secured, and the line grounded on both sides of the crossover, or the line being strung or removed shall be considered and worked as energized.

D.16.4 When crossing over energized conductors in excess of 300 volts, rope nets or guard structures shall be installed, unless provision is made to isolate or insulate the worker or the energized conductor. Where practical, the automatic reclosing feature of the circuit interrupting device shall be made inoperative. In addition, the line being strung shall be grounded on either side of the crossover or considered and worked as energized.

D.16.5 Conductors being strung in or removed shall be kept under positive control by the use of adequate tension reels, guard structures, tielines, or other means to prevent accidental contact with energized circuits.

D.16.6 A transmission crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped-in, except on deadend structures.

D.17 *Working on Distribution Transformers*

D.17.1 The primary leads of a distribution transformer shall be considered energized at full voltage until both the primary and the secondary leads have been disconnected, or it has been determined that the secondary circuit to which it is attached is not energized from other transformers or other sources.

D.17.2 The cases of all transformers connected to a source of supply shall be considered as being energized at the full primary unless they are adequately grounded.

D.17.3 Employees shall not stand on, or otherwise contact, transformer cases while working on or near energized circuit.

D.18 *Capacitors*

See Section F.8.

E. Underground Residential Distribution

E.1 *URD — General*

E.1.1 Before a URD transformer enclosure is opened, all unauthorized persons — including the public — shall be required to leave the work area and remain clear of all hazards involved in the work.

E.2 *Rubber Glove Use — URD*

E.2.1 Class 2 rubber gloves and rubber sleeves shall be worn when any UG compartment or enclosure, containing primary of an unknown voltage, is opened.

E.2.2 Class 2 rubber gloves and sleeves shall be worn when removing animals, vines, weeds, grass or vegetation of any kind that has grown into an energized URD installation, whether the equipment is opened or closed.

E.2.3 Class 2 rubber gloves and sleeves shall be worn when energized primary cables are moved, handled or protected.

E.2.4 Class 2 rubber gloves and sleeves shall be worn when covering all primary cable and terminations with proper protective equipment. After all primary cable and terminations are properly protected, Class 0 rubber gloves may be substituted when work is performed on secondaries and services energized at 600 volts or less.

E.2.5 Class 2 rubber gloves and sleeves shall be worn when working on a primary neutral in an energized primary circuit.

E.3 *Opening and Closing Circuits — URD*

E.3.1 Company switching procedures, including distribution switching tag practices, shall be followed when sectionalizing URD systems.

E.3.2 When a URD circuit has opened, the route of the circuit shall be patrolled for obvious hazards before the circuit is reclosed.

E.3.3 Any URD primary circuit shall be de-energized by opening one or more devices. De-energizing shall be done with load-break elbow connectors, load-break fuse cutout at the riser pole, load-break tool or other approved load-break device.

E.3.4 Personal protective equipment, including approved eye protection, shall be worn when underground switching operations are performed. A full face shield may also be worn as added protection.

E.4 *Grounding — URD*

Note: *A capacitance charge can remain in a URD cable after it has been disconnected from the circuit, and a static-type arc can occur when grounds are applied to such cables.*

E.4.1 All URD cables and equipment — including services — that have

been energized or could become energized from any source, shall be considered as energized until the equipment is positively proven to be de-energized by approved voltage detector, and has been grounded.

E.4.2 Before doing work on de-energized primary circuits or equipment, (1) a visible open break shall be provided; (2) a voltage test shall be made; and (3) the equipment shall be grounded in an equipotential zone (EPZ) if applicable; (4) If grounding or insulating is not feasible, workers can isolate themselves from any possible transfer of potential difference by isolation. ***Note:*** *All applicable LOTO procedures shall be followed for voltages over 600 volts.*

E.4.3 When work is to be done on equipment or cables of an underground system, precautions to prevent backfeed shall be taken. This shall include grounding, (EPZ), or isolation of the secondary conductors where applicable.

E.4.4 De-energized cables shall be grounded at a point as close to the work as possible before work is started.

E.4.5 All underground cables and apparatus carrying current at voltages above 600 volts shall be de-energized and grounded (EPZ) or isolatedbefore cables are worked.

E.5 *Work on Energized Equipment — URD*

E.5.1 All underground cables and apparatus carrying current at voltages above 600 volts shall be de-energized and grounded before work is done on the conductor, or before the cables are cut into or spliced.

E.5.2 When work is performed on cables or apparatus carrying less than 600 volts, employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances and by using approved insulated tools in order to prevent short circuits.

E.5.3 When energized pad-mounted transformers are unlocked and opened, they shall be directly attended by a qualified employee. They shall be kept closed and locked at all other times.

E.5.4 A primary or secondary system neutral on any energized circuit shall not be opened under any circumstances.

E.5.5 Elbow connectors provide a great deal of flexibility in switching and system sectionalizing; however, only those connectors designed and approved for load-break use shall be used to connect or disconnect an energized circuit.

E.5.6 Only tools with 1KV insulated handles shall be used for making energized secondary connections at 600V or less, or when work is performed within energized pedestals, pad-mount compartments or submersible transformer enclosures.

E.5.7 Only one energized secondary or service conductor shall be worked on at any one time, and protective devices shall be used to insulate or isolate it from all others.

E.5.8 An approved shirt or coveralls, with full-length sleeves rolled down and cuffs buttoned, shall be worn when work is performed on any energized UG cable or apparatus.

E.6 *Excavations — URD*

E.6.1 Before opening an excavation, all interferences such as trees, sidewalks and foundations shall be removed or supported as necessary to protect employees and the public.

E.6.2 The estimated location of utility and other underground installations that may be encountered during excavation work shall be determined before opening the excavation.

E.6.3 When excavation operations approach the estimated location of underground installations, the exact location of the installations shall be determined by safe and acceptable means — usually by hand digging with insulated shovel and the use of suitable gloves.

E.6.4 If electric cables are damaged, the following steps shall be taken.

- **a.** If the damaged cable belongs to a utility other than the one performing the work, this utility shall be notified at once.
- **b.** The area shall be barricaded and the public kept out until hazardous conditions can be eliminated.

E.6.5 If gas lines are damaged, the following steps shall be taken as soon as possible:

- **a.** The hole shall be left open to allow the gas to dissipate into the atmosphere. All possible ignition sources shall be eliminated.
- **b.** Residents of the area shall be warned when necessary, and the public kept out of the area.
- **c.** The local fire department shall be notified immediately.
- **d.** The local gas supplier shall be notified at once.
- **e.** The local police department shall be notified if necessary.

E.6.6 If communication cables are damaged, the communication company shall be notified at once.

E.6.7 While the excavation is open, underground installations shall be protected, supported or removed to safeguard employees.

E.6.8 A stairway, ladder, ramp or other safe means of egress shall be located in trench excavations that are four feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

E.6.9 Employees exposed to vehicular traffic shall wear orange reflective vests or other suitable garment.

E.6.10 No employee shall be permitted beneath loads handled by lifting or digging equipment. Employees shall stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.

E.6.11 When mobile equipment is operated adjacent to an excavation and the operator does not have a clear and direct view of the edge of the excavation, a warning system such as barricades, a spotter or stop logs shall be utilized.

E.6.12 Employees shall not work in excavations in which there is accumulated water, or in excavations in which water is accumulating, unless adequate precautions have been taken to protect employees against the hazards posed by water accumulation.

E.6.13 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation.

E.6.14 Where the stability of adjoining buildings, walls or other structures is endangered by excavation operations, support systems such as shoring, bracing or underpinning shall be provided.

E.6.15 Employees shall be protected from excavated materials or equipment that could fall or roll into excavations. Protection shall be provided by placing and keeping such materials or equipment at least two feet from the edge of excavations, or by using retaining devices that are sufficient to prevent materials or equipment from falling or rolling into the excavation.

E.6.16 Daily inspections of excavations, the adjacent areas and protective systems shall be made by a competent person for evidence of a situation that could result in possible cave-ins, failure of protective systems, hazardous atmospheres or other hazardous conditions. Inspections shall be conducted before starting work, and as needed throughout the shift. Inspections shall also be made after every rainstorm. Where the competent person finds evidence of a situation that could result in a possible cave-in, failure of protective systems, hazardous atmospheres or other hazardous conditions, exposed employees shall be removed from the hazardous area until the necessary precautions have been taken to ensure their safety.

E.6.17 Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guardrails shall be provided.

E.6.18 When excavations are left open, warning devices, barricades or guardrails shall be placed to adequately protect the public and the employees.

E.6.19 At the end of each workday, as much of the excavation as practical shall be closed. No more trench shall be open at one time than is necessary.

E.6.20 Mechanical excavating equipment that is parked or operating on streets or highways shall be protected by proper warning devices.

E.6.21 When it is necessary to leave excavating equipment unattended, the blade, bucket or scoop shall be lowered to the ground and the ignition system locked.

E.6.22 Each employee in an excavation shall be protected from cave-ins by an adequate protective system — either sloping or benching, shoring or shield system — unless excavations are made entirely in stable rock or are less than five feet in depth, and examination of the ground by a competent person provides no indication of a potential cave-in.

E.6.23 When choosing a protective system, a competent person shall take into consideration soil type, vibration sources, previously disturbed soil, layered soil, presence of water, heavy equipment work adjacent to the excavation, limited work area and other hazard-increasing conditions.

E.6.24 Shoring and shield systems shall be installed and removed in a manner that protects employees from cave-ins, structural collapses or from being struck by members of the shoring or shield system.

E.6.25 Removal of shoring systems shall begin at — and progress from — the bottom of the excavation. Members shall be released slowly so as to note any indication of possible cave-ins on the side of the excavations, or possible failure of the remaining members.

E.6.26 Shields shall be installed in a manner to restrict lateral or other hazardous movement of the shield in the event of the application of a sudden lateral load.

E.6.27 Employees shall be protected from the hazards of cave-ins when entering or exiting the areas protected by shields.

E.6.28 Employees shall not be allowed in shields when shields are being installed, removed or moved vertically.

E.6.29 Sloping or benching, shoring or shielding for excavations greater than 20 feet deep shall be designed by a registered professional engineer. Refer to Table E-1 for soil type maximum slope requirements for excavations of less than 20 feet.

E.6.30 For additional information on excavation requirements, refer to *OSHA Standard 29 CFR 1926, Subpart P, Excavations*.

E.6.31 "Competent person" as used in this section is a person who meets all the requirements as set forth in the OSHA Standard 29 CFR 1926, Subpart P, Excavations.

E.7 *Opening and Guarding Holes*

E.7.1 Whenever the cover is to be removed from a manhole or a vault, or whenever any other obstruction to traffic exists, the following precautions shall be taken.

- **a.** All obstructions to traffic shall be guarded by adequate signs, barricades, lights, flares or flags. Traffic shall be warned in advance through signs, high-level standards, flashing lights, traffic cones or flaggers as may be required by the situation.
- **b.** Where permissible and practical, the truck shall be placed to guard the work area against oncoming traffic.
- **c.** A blowtorch or other open flame shall never be used to melt around a manhole or vault cover.
- **d.** Manhole vault and service box covers shall always be removed and replaced by means of approved hooks or hoists.

E.8 *Entering Underground Structures*

Note: *Before entering a manhole or vault considered to be a confined space, employees shall be trained and follow confined-space procedures.*

E.8.1 Before an employee enters a street opening such as a manhole or an unvented vault, it shall be promptly protected a barrier, temporary cover or other suitable guard.

E.8.2 No entry shall be permitted until the atmosphere is found to be safe by testing for oxygen deficiencies and the presence of explosive gases or fumes.

E.8.3 Where unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry.

E.8.4 Where factory-installed ladders are not in place, an approved nonconductive straight ladder shall be used in entering or leaving a manhole or vault. Climbing into or out of manholes by stepping on cables or hangers is forbidden.

E.8.5 While work is being performed in manholes, a qualified employee trained in first aid and CPR shall be available in the immediate vicinity to render emergency assistance if required.

E.8.6 Before any work is done on a cable, it shall be identified by an approved method. If there is any doubt as to the identification, work shall not be started until checked and identified by a qualified employee.

E.9 *Work on Energized Cables, Manholes or Vaults*

E.9.1 No employee shall approach — or take any conductive object without an insulated handle — closer to exposed energized parts of line or equipment than indicated in table D-1 unless the employee is insulated from the energized parts, the energized part is insulated from the employee and any other conductive object at a different potential, or the employee is insulated from any other conductive object.

E.9.2 Employees shall not work on equipment or lines in any position from which a shock or slip will tend to bring the employee's body toward exposed parts that are at a potential different from the employee's body.

E.9.3 When work is performed in the vicinity of exposed energized parts of equipment or lines, employees shall remove all exposed conductive articles, such as key or watch chains, rings, wristwatches or bands, or such articles shall be rendered nonconductive.

E.9.4 All underground cables and apparatus energized above 600 volts shall be de-energized before work is done on the conductor or before the cables are cut into or spliced.

E.9.5 Before any work is done on an energized cable less than 600 volts, other cables — and all grounded equipment with which contact can be made while working on the energized cable — shall be covered with rubber blankets or approved insulating shields. (Cables with non-metallic sheaths and those with an insulating jacket over the metallic sheath need not be covered.)

E.9.6 Because of the characteristics of a low-voltage network system, when work is performed on cables or apparatus carrying less than 600 volts, employees shall wear class 0 rubber gloves. Employees shall take extra precautions in the use of necessary rubber protective equipment, in observing adequate clearances and in using proper insulated tools in order to prevent short circuits.

E.9.7 Immediately after each conductor of an energized cable less than 600 volts is cut in two, the ends shall be insulated before another conductor is cut. During the course of the work, only one insulated conductor shall be worked at any one time.

E.9.8 Manholes containing circuits energized above 15 KV shall not be entered until cables have been de-energized.

E.10 *Work on De-energized Cables (Underground Manholes or Vaults)*

E.10.1 When cables and apparatus are taken out of service to be worked on, the procedure outlined in Rule D-6 shall be followed.

E.10.2 Before making an opening or removing a part of the sheath or sleeve of a cable, the line shall be grounded on the source side

and all possibility of backfeed shall be isolated and tested with an approved voltage detector to be de-energized.

E.10.3 When primary cable is to be cut, the cable shall be speared at the work location by a remotely operated, grounded spear, or a short section of the shielding — if any — completely around the cable shall be removed and a test made with approved testing devices, to determine whether or not the cable is de-energized. If no indication of alive cable is detected, the employee may proceed with the work.

E.11 *Pulling Cables*

E.11.1 Employees shall not handle pull-wires or pulling-lines within reaching distance of blocks, sheaves, winch drums or take-up reels.

E.11.2 Pull-wires, steel pulling-lines or metal rodding shall not be pushed through ducts where energized equipment is present unless another employee is stationed at the end of the run.

E.11.3 Employees shall not remain in a manhole or vault during pulling operations involving heavy pulling strains unless they can take a position clear of the pulling line.

E.11.4 Communications between manholes shall be maintained.

E.12 *Moving Energized Cables in Manholes and Vaults*

E.12.1 All cables operating at voltages greater than 600 volts shall not be moved under any circumstances.

E.12.2 All energized cables shall be handled with Class 2 rubber gloves and sleeves.

E.13 *Heating Materials in Manholes and Vaults*

E.13.1 Fuel tanks containing liquefied petroleum gas shall not be placed in a manhole.

E.13.2 Lighted torches shall not be left unattended.

E.13.3 Lighted torches must be kept at a safe distance from flammable materials.

E.13.4 Leather work gloves shall be worn when heating or working with hot compound.

Table E-1

Maximum Allowable Slopes for Excavations Less Than 20 Feet Deep[1]

Soil or Rock Type	Maximum Allowable Slopes (H:V)
Stable Rock	Vertical (90 degrees)[2]
Type A[3]	¾:1 (53 degrees)
Type B	1:1(45 degrees)
Type C	1½:1 (34 degrees)

1) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.
2) Numbers in parentheses are angles expressed in degrees from the horizontal. Angles have been rounded off.
3) A short-term maximum allowable slope of ½ H:1V (63 degrees) is allowed in excavations in Type A soil that are 12 feet (3.67 meters) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 meters) in depth shall be ¾ H:1V (53 degrees).

F. Substations

F.1 *Working in Substations*

F.1.1 Approved warning signage shall be maintained on all premises, per company standards and policies.

F.1.2 Access to substations is limited to qualified employees and company-authorized personnel. New employees, and those not familiar with the hazardous conditions inherent in a substation, shall be given a job briefing before being permitted to enter.

F.1.3 When entering and before leaving a substation for work purposes, employees shall notify the appropriate control center operator, provided they can be reached by telephone or company radio. Work purposes are any activities that could affect the operation of the substation — including operating any transmission/distribution equipment, or working near transmission/distribution lines or equipment — if the possibility exists to affect the transmission/distribution system, or when entering any transmission/distribution substation building.

F.1.4 ***Deleted***.

F.1.5 Company-issued hard hats and safety glasses shall be worn at all times working within the confines of any substation fence. ***Exception:*** *Hard hats may be removed while inside control houses, unless overhead work is being performed there.*

F.1.6 Gates to stations shall be kept closed and locked when authorized personnel are not in the station. When authorized personnel are working in the station, the gate shall be kept closed and shall be locked where required. Doors to enclosures (other than control cabinets) containing exposed energized electrical equipment shall be kept closed and locked, or equipment shall be barricaded.

F.1.7 Before work is to commence, a "job briefing" shall be held with all employees to orient each employee as to:

- **a.** The hazards associated with the job.
- **b.** Work procedures involved.
- **c.** Special precautions.
- **d.** Energy source controls.
- **e.** Personal protective equipment required.
- **f.** Location of energized equipment in, or adjacent to, the work area.
- **g.** Limits of any de-energized work area.

F.1.8 When entering a substation where work is in progress, report your presence to the person(s) in charge for a safety briefing.

F.1.9 Metal fences enclosing electrical equipment shall be adequately grounded and maintained in safe condition.

F.1.10 Temporary fencing shall be properly grounded and bonded to the existing fence.

F.1.11 Damaged fences, broken switches, and unlocked gates and control houses shall be promptly reported to the supervisor or person in charge.

F.1.12 Access to station control houses and all switches shall be kept clear and accessible.

F.1.13 The open space in switch houses, control centers and operating panels shall be kept clear of rubbish and shall not be used for storage except during construction or maintenance.

F.1.14 Employees shall not enter electrical equipment rooms or enclosures unless they have been authorized or their duties require them to be there.

F.1.15 Operating handles of disconnect switches, transformer no-load tap changers and other similar devices which could cause equipment damage if operated by unauthorized persons shall be locked with an approved lock.

F.1.16 Removable handles for manual operation of circuit breakers shall not be left in their sockets and shall be properly stored.

F.1.17 Class 2 rubber gloves and sleeves are not required in the substation if the work situation is to work solely on controls or apparatus not associated with the primary voltage of the breaker, transformers, regulator, etc., or such a situation where a tool or piece of equipment will not be carried or used within the clearance set forth in Table D-1.

F.1.18 No employee may approach, or take any conductive object without an insulated handle, closer to exposed energized parts than the clearances set forth in Table D-1 unless:

- **a.** The employee is insulated from the energized part.
- **b.** The energized part is insulated from the employee and any other conductive object at a different potential.
- **c.** The employee is insulated from any other conductive object, as during live line work.

F.1.19 Electric equipment, lines and circuits shall be considered energized until determined by testing to be de-energized and grounded.

F.1.20 An employee shall not begin work on equipment or lines until proper clearance is obtained from the responsible authority. Where these instructions are given by telephone or radio, each person shall satisfy herself/himself of the identity and authority of the other person.

F.1.21 Metal ladders shall not be used in substations.
Exception: *In EHV substations (345KV* ***and*** *500KV), metal ladders will be permitted upon approval of the supervisor on the job.*

F.1.22 When carrying long, conductive material, tools or equipment in energized areas of substations, they shall be held by at least two employees — one at each end —and carried below shoulder height.

F.1.23 Steel tapes and rulers shall not be used in the energized areas of a substation. Fish tapes and steel tapes may be used on or below ground. Extreme caution shall be used when working in areas of energized underground cables.

F.1.24 Safety interlocks shall not be bypassed or made inoperative without the approval of the responsible supervisor — and then only when absolutely necessary. It shall be the responsibility of this supervisor to be sure that the necessary procedures are set up to guard against an accident while the interlock is bypassed.

F.1.25 Employees shall use special care when working in or around circuit breaker mechanisms, linkages, transformer tap changers, etc. This type of equipment shall be locked, blocked, tagged-out or otherwise disabled, if practicable, while work is being performed on it. If it cannot be so disabled or made inoperative, the work shall be performed in such a manner that employees will not be injured if the equipment operates.

F.1.26 Lightning arresters, capacitors, capacitor bushings, generator surge protectors and similar equipment shall be properly discharged before work is performed on them.

F.1.27 Explosions may occur during maintenance work because of ignition of acetylene or other combustible gases that may accumulate from arcing in oil circuit breaker tanks, transformers and transformer tap changers. Special precautions — including ventilation, grounding storage tanks and oil drums — shall be taken to guard against this hazard. No smoking, open flames or other ignition sources shall be permitted in the area.

F.1.28 Before working on equipment that may have combustible gases present, equipment shall be force-ventilated with air or nitrogen until the air space tests below the LEL limit for combustible gases. Retests shall be made as needed.

F.1.29 When transferring liquid, the vehicle or trailer pumping equipment must be properly grounded to the station ground grid; or while connected to a 120/240 VAC source.

F.1.30 If any quantity of oil is spilled, it shall be reported to appropriate supervision.

F.1.31 Before driving a vehicle into a substation, the driver shall check the overhead clearance of the vehicle (e.g., radio antenna, boom and basket) to prevent contact with low lines or other structures, or any energized equipment.

F.1.32 Movement and operation of mechanical equipment within hazardous areas must be controlled by a qualified person, and at all times shall maintain safe clearances from energized bus and equipment.

F.1.33 Only those designated persons who are qualified and trained shall operate the hoisting equipment. Refer to section D.8 pertaining to cranes, derricks and hoisting equipment.

F.1.34 Adequate clearance from energized lines shall be maintained when vehicles and equipment are in substations. No materials, equipment or vehicles are to be stored under an energized bus, near energized equipment or in areas of ingress or egress. Other areas of the station may be used for storage with the approval of the substation manager.

F.2 *Substation Climbing*

F.2.1 When working at elevated locations above four feet (with exception of stepladders, safety platform ladders and properly set-up scaffolds), employees shall comply with all substation fall protection guidelines.

F.2.2 Employees shall not attach lanyards or safety belts to — or depend upon — lines, station bus work, station post insulators or lightning arresters to support their weight.

F.2.3 Caution must be exercised to secure all equipment and tools when working aloft. Tools shall never be placed unsecured on elevated places or thrown from place to place or person to person.

F.3 *Substation Barricades and Barriers*

F.3.1 When working on the ground or overhead, approaches to energized equipment adjacent to equipment on which work is to be done — and any similar equipment — shall be blocked off with approved barricades or barriers.

F.3.2 When working overhead where barricades or barriers are not practical to install, red flags shall be used at all approaches to energized equipment.

F.3.3 The supervisor or person in charge shall be responsible for determining what barricades, barriers or red flags are necessary, and for seeing that they are properly installed and maintained.

F.3.4 All barriers, barricades and warnings signs shall be heeded. Persons seen in dangerous situations shall be warned without being startled. Employees not required to be near potentially dangerous places shall be kept away from them.

F.3.5 Equipment with guards removed to perform maintenance operations shall not be operated while guards are removed (except for maintenance certification).

F.4 *Lockout/Tagout*

F.4.1 Switching of equipment for clearance shall comply with company lockout/tagout procedure safety rules for Transmission and Distribution (de-energizing lines and equipment for employee protection).

F.4.2 Servicing and maintenance of equipment shall comply with company lockout/tagout procedure safety rules (for servicing and maintenance of machines and equipment).

F.5 *Batteries*

F.5.1 Approved company apparel — gloves, goggles and face shield, and aprons — shall be worn when installing, removing or servicing station storage batteries or making electrolyte, unless no splash hazard is present.

F.5.2 Storage batteries produce hydrogen while being charged, and may create an explosive gas mixture. Enclosed areas used to charge or store batteries shall be adequately ventilated.

F.5.3 Any equipment that could cause sparks or electric arcs shall not be taken into the battery charging area.

F.5.4 Smoking, welding, spark-producing equipment and open flames shall not be permitted within 35 feet of battery charging areas. "No Smoking" signs shall be conspicuously posted in such areas. Adequate fire protection shall be available.

F.5.5 Employees shall use special care when cleaning, testing or servicing batteries to prevent a short circuit. Employees should use insulated tools when working on substation batteries.

F.5.6 Whenever work must be performed in a location or position from which items such as tools and equipment may be accidentally dropped upon a station storage battery, proper measures shall be taken to protect the battery before the work is started.

F.5.7 When electrolyte is made for storage batteries, the acid shall be poured slowly into the water. Water shall not be poured into the acid, because an explosion may occur.

F.5.8 If battery acid gets into an employee's eye, the eye shall be flushed immediately at an eye-wash station for several minutes. The eye should not be rubbed. The employee shall be given medical treatment promptly. Water for drenching eyes shall be kept unobstructed within 25 feet of battery handling areas.

F.5.9 If battery acid contacts an employee's body or clothing, the employee shall promptly neutralize it with baking soda and wash with plenty of water.

F.5.10 Good housekeeping practices shall be maintained in battery storage and charging areas.

F.6 *SF_6 Gas-Filled Equipment*

F.6.1 Refer to company procedures for working with equipment filled with SF_6 gas. Some equipment may require the use of respirator procedures, which shall be followed.

F.7 *Confined or Enclosed Space*

F.7.1 All substation employees shall be trained to identify equipment that is — or may become — a confined space.

F.7.2 Prior to entering a confined or enclosed space, employees shall be trained and follow company rules of the Confined Space Procedures Program.

F.8 *Capacitors*

F.8.1 Capacitors shall be disconnected from their source for a minimum of five minutes before shorting and grounding the terminals.

F.8.2 Disconnected capacitors shall not be re-energized for at least five minutes.

F.8.3 Capacitors and energized racks shall be considered at full rated voltage until they have been disconnected and discharged per company grounding standards.

F.8.4 All new capacitors shall be capacitance-tested before being energized.

F.8.5 Capacitors shall have a shorting wire in place during storage.

F.8.6 Employees shall wear Class 2 rubber gloves and sleeves and use an approved shotgun or switch stick while shorting or grounding terminals.

F.8.7 Employees shall not come in contact with an ungrounded capacitor case until the capacitor has been disconnected from the circuit and the terminals shorted.

Caution: *Substation capacitors with energized frames require special grounding procedures.*

F.9 *Regulators*

F.9.1 When energizing or de-energizing a regulator, the "bypass" switch must never be opened or closed unless the regulator is at "0" (neutral position) and the controls turned off. A regulator neutral device should be used to determine the position of the regulator mechanism.

F.10 *Testing*

F.10.1 High-Voltage Tests

a. Doble or high-potential test sets: Employee handling high-voltage cables shall wear Class 2 rubber gloves and sleeves at all times. ***Exception:*** *When making connections in oily environments, such as on vacuum bottles in LTC compartments — and then under supervision, all other steps of this section shall be followed.*

b. When employee is moving or changing connection of high-voltage cables where test voltage above 15,000 volts is available, the high-potential test set shall be visibly disconnected from its power source.

c. The high-voltage cables of the Doble or high-potential test shall be barricaded from accidental contact by other employees who are not wearing class 2 rubber gloves and sleeves.

d. When voltage-testing equipment in shop areas, equipment under test shall be case-grounded and barricaded.

F.10.2 **High Current Test**

a. When employees are moving or changing high current cables on load box or recloser test sets, the employee shall wear class 0 rubber gloves.

b. The high-current cables of the test set and equipment shall be barricaded from accidentally contacting other employees while testing.

c. Equipment being tested shall be case-grounded while testing.

F.10.3 **High Vacuum**

a. Employees shall avoid standing or climbing on equipment under high vacuum if possible.

b. If employee must climb on equipment under high vacuum, care must be taken to not stand on any unsupported surface.

G. Metering

G.1 *General*

G.1.1 Before entering customer property, employees should announce their presence and state their business, if practical.

G.1.2 When approaching or working on customer property, employees shall watch for tripping hazards, defective stairs, and the presence of dogs, cats or other potentially dangerous animals.

G.1.3 Employees shall not record meter readings or notations while walking.

G.1.4 Proper gloves, proper FR/Arc/Flame-Rated Clothing (National Fire Protection Association (NFPA) 70E — 2015 standard, or Section 41 of 2012 National Electrical Safety Code (NESC) or NFPA 2112), company-issued hard hat and proper eye protection shall be worn when installing or removing single-phase meters from meter sockets, including turn-on or turn-off applications and voltage or amperage checks (any voltage).

G.1.5 Company-issued hard hat, proper eye protection, proper arc-rated clothing and low voltage gloves are required personal protective equipment when:

- **a.** Working in an energized meter base or panel, making contact with the energized terminal or part.
- **b.** Working with bottom connected type meters.
- **c.** Working on the energized test block for PT and CT metering installations.
- **d.** Removing or installing energized three-phase, self-contained meters.
- **e.** Working on any 300- to 600-volt energized meter installations.
- **f.** Making ampere and voltage checks with approved test equipment on circuits or equipment energized at 300 to 600 volts.
- **g.** When working on energized circuits or equipment in wet, damp or other hazardous locations.
- **h.** Employees exposed to the hazards of flames or electrical arcs shall not wear clothing that, when exposed to flames or electric arcs, could increase the extent of injury. Flame-retardant clothing that meets the requirements of either the National Fire Protection Association (NFPA) 70E –2009 standard, or Section 41 of 2007 National Electrical Safety Code (NESC), or their most current revision, shall be used. When working on or near live-line parts where the possibility of an electric arc exists, protective clothing with full-length sleeves rolled down and buttoned shall be worn in addition to an electrical safety hat. When work is performed in the vicinity of exposed energized parts of equipment, employees shall

remove all exposed conductive articles such as key or watch chains, rings, wristwatches or bands, if such articles increase the hazards associated with inadvertent contact with the energized parts.

G.1.6 Face shields and balaclavas are required additional personal protection for 480-volt meter change-outs. ***Note:*** *Additional PPE may be required, contact supervisor or safety specialist before energized work.*

G.1.7 All 480-volt meter installations shall be labeled "480 volt" on the inside and outside of the meter base. Also, a "480 volt" tag shall be attached to the meter seal.

G.1.8 A meter-pulling device shall be used when removing or installing meters energized at 300 to 600 volts. Meters with smoked or apparent internal damage, or cracked or broken glass covers, shall be removed with a meter puller. Cracked or broken meter covers shall not be removed with bare hands.

G.1.9 Meter sockets shall be inspected before the meter is installed and/or the service is energized. Checks shall be made to insure there is no socket damage, loose connection or foreign object present that could cause a short circuit or flashover.

G.1.10 Before installing a socket meter or operating the bypass lever on a new service, or while reconnecting an old service, a test for proper voltage shall be made. Also, proper tests shall be made to insure there are no backfeeds, grounds, cross-phasing or phase-to-ground faults through the meter or meter socket.

G.1.11 When setting socket-type meters, the load side terminal shall be entered first, followed by the source side where possible. The removal of the meter shall take place in reverse order. Care shall be taken to prevent the meter ring from coming into contact with socket terminals.

G.1.12 Before removing a meter, a visual inspection shall be made to determine if the meter or meter socket is damaged. If damage is indicated, further investigation should be made to determine if the socket might need to be de-energized before removal of the meter.

G.1.13 If the employee determines the load is sufficient to warrant reduction or disconnection of load on installations where bypassing methods are not available, one of the following methods may be used before the meter is removed or exchanged.

a. Using the facility's main switch.

b. De-energizing the service.

G.1.14 Only approved volt meters or voltage testers shall be used for determining whether a circuit is energized.

G.1.15 Meter test equipment shall be inspected before use for broken or defective parts. It is the responsibility of the user to turn in all defective equipment.

G.1.16 During testing, the energized socket or test terminal shall not be left unguarded. If a socket is to be left energized, a meter or approved socket cover shall be in place before the worker leaves the area.

G.1.17 A check shall be made to ensure that all instrument transformer cases, secondary return wiring and associated enclosures are properly grounded.

G.1.18 The secondary circuit of an energized current transformer shall never be opened under any circumstances. The transformer circuit shall be shunted or short-circuited before any meter, instrument or other device connected in the circuit is removed or disconnected.

G.1.19 The secondary circuit of an energized-potential transformer shall never be shunted or short-circuited.

G.1.20 *Primary meter installations:* The supervisor or lead person shall place or request a "Caution Card" and switch the recloser to non-reclosing on the circuit before bypassing primary metering equipment (where applicable) prior to the start of work.

G.1.21 *Primary meter cubicles:* Visually inspect all bypass and disconnect switches before operating. After switching, test to insure transformers and switch blades are de-energized. Cover all energized parts with approved protective equipment.

G.1.22 When possible, all primary metering equipment shall be de-energized, voltage-tested and grounded per company standards before work is performed on equipment.

G.1.23 When making a comparative voltage test on potential transformers where voltages above 600 volts are present, a barrier to prevent contacting energized equipment shall enclose the test area. Walls or fences shall guard permanent test areas to keep employees out. Temporary test areas shall be guarded by barrier tape to which safety signs are attached.

H. Gas

H.1 *General*

Note: *Natural gas is not poisonous; however, it contains no oxygen and, if present in sufficient quantities to displace the air, can cause suffocation due to lack of oxygen.*

The explosive range of gases lies between two limits, which are:

- **a.** The lower explosion limit (4% LEL) of a flammable gas mixed with air is the percentage (by volume) of gas below which an explosion cannot occur because the mixture is too lean.
- **b.** The upper explosion limit (15% UEL) is the percentage of gas above which an explosion cannot occur because there is sufficient air, the mixture being too rich.

H.1.1 Only approved methods shall be used to locate gas leaks.

H.1.2 Employees shall eliminate all ignition sources, including smoking, where the possibility of escaping gas exists.

H.1.3 Fire-extinguishing equipment, suitable in capacity and class for the area or condition, shall be made available and be positioned upwind from escaping gas.

H.1.4 Special care shall be taken to remove recognized potential fire hazards so that fire extinguishers provided for protection against the primary hazard during a job will be suitable for that job.

H.1.5 Precautions shall be taken to avoid static electricity, with particular attention to plastic pipe.

H.1.6 Engine-driven equipment shall be placed on the job site upwind and away from possible gas leakage.

H.1.7 Employees, when using road-boring equipment, shall take precautions to prevent injury from the rotating auger.

H.2 *Working on Customers' Premises*

H.2.1 Open flames shall never be used for thawing frozen meters or piping.

H.2.2 Employees shall wear approved eye protection when lighting gas pilots and burners.

H.2.3 Precautions shall be taken when purging house lines and other interior gas piping:

- **a.** Ensure that all potential ignition sources have been identified and eliminated.
- **b.** Ensure that there is a valve or device available to control the flow of gas during the purging operation.
- **c.** Identify a safe area for the discharge of the gas released during the purging operation.

H.3 *Line-Stopping and -Tapping Work*

H.3.1 Experienced and qualified persons shall direct the use of line-stopping or -tapping equipment.

H.3.2 An employee shall be in close attendance and immediately available to render emergency assistance to employees engaged in the use of line-stopping, -tapping or -plugging equipment.

H.3.3 Care shall be taken to prevent damaging the stoppers by exposure to excessive heat during welding or flame cutting.

H.3.4 When using "bag stoppers" to stop elevated and low pressure gas mains, the *Gas OM&I Procedures Manual* shall be followed.

H.3.5 Purging of gas lines shall be done as outlined in the *Gas OM&I Procedures Manual*.

H.4 *Construction of Gas Pipelines and Services*

H.4.1 The following precautions shall be taken when handling, loading, hauling or unloading pipe.

- **a.** Employees shall use approved slings, skids or pick-up clamps on larger-diameter pipes. Skids, when used, shall be properly secured.
- **b.** Employees shall use approved load-binders (boomers) to secure the pipe to the trailer or truck.
- **c.** Stanchions or chocks shall not be removed so as to permit the pipe to roll off the truck or trailer.

H.4.2 Operators are responsible for the daily inspection of their own equipment.

H.4.3 The following precautions shall be taken when working with pipe coatings.

- **a.** Both cold- and hot-applied products shall be used with care to avoid injury to skin, eyes or respiratory system.
- **b.** Gasoline or other flammable liquids shall not be used for cleaning.
- **c.** A cutting torch shall not be used to apply or remove pipe coating.
- **d.** Primer or pipe coating shall not be applied to hot welds.

H.5 *Compressor Stations*

H.5.1 A diagram of station piping shall be maintained on the premises, illustrating primary piping, valves and equipment. Emergency valves shall be represented so as to provide quick reference in case of an emergency.

H.5.2 When stations are unattended, gates and outside doors shall be locked. When employees enter a locked station, gates and outside doors shall be left unlocked while the station is occupied.

H.5.3 Temporary isolation of plant piping or compressor units shall be done in accordance with approved established procedures.

H.5.4 All machinery and energy sources, where unplanned motion or release of energy can cause injury, shall be blocked and/or locked and tagged as specified prior to any maintenance, inspection, cleaning, adjusting or servicing that requires entrance into, or potential contact by, personnel.

H.5.5 Belt guards, flywheel and inspection covers shall be left in place while compressors are running.

H.5.6 Before entering a non-permit-required confined space, an air quality determination shall be made.

H.6 *Meter Shop, Storage and Proving Room*

H.6.1 Meters that are moved by hand trucks shall be placed so that they will not fall or topple over.

H.6.2 Meters stored in tiers shall be stacked, blocked or otherwise secured to prevent sliding, falling or collapsing.

H.6.3 Care shall be used in the placement of wooden racks or hand trucks so as to prevent persons from tripping or falling.

H.6.4 Smoking or open flames shall not be permitted in the paint spray area of the meter shop during spraying operations. "No Smoking" signs shall be conspicuously posted in this area.

H.6.5 Employees using chemicals shall be instructed in the proper use and the potential hazards involved, along with personal protective equipment (PPE) required.

H.7 *Drilling of Underground Storage Wells*

H.7.1 Experienced and qualified persons shall direct the drilling of gas storage wells.

H.7.2 Suitable approved personal protective equipment shall be used by persons (including contractors' employees) when working at or near a drilling rig.

H.7.3 Employees shall stand clear while tools are being lowered into, or withdrawn from, the drilled hole.

H.7.4 Adequate machine guards shall be placed on equipment, where needed, to protect the drill operator and other employees from hazards.

H.7.5 After a well has been drilled to the top of the gas rock formation and the production casing has been installed, the following precautions shall be taken.

- **a.** The drilling house shall be located at least 100 feet from the well.
- **b.** Casing, drilling tools or other spark-producing items not being used in the drilling of the well shall be moved to a location at least 1,000 feet from the well.
- **c.** When using a rotary drilling rig, a proper gas blow-out

preventer shall be in place while drilling through the gas storage formation.

d. The water tank shall be located at least 100 feet from the well.

e. If liquefied petroleum fuel — such as propane — is used, the storage tank shall be located at least 100 feet from the well.

f. Vehicles shall not be allowed within 100 feet from the well while the drilling rig is operating.

g. Flammable or combustible liquids shall be located at least 100 feet from the well.

h. Matches or lighters shall not be permitted within 100 feet of the well.

i. Smoking or open flames shall not be permitted within 100 feet of the well.

j. An approved electrical bonding (a bonding jumper) shall be installed from the drilling rig to the welling casing.

H.7.6 When it is necessary to climb the drilling rig mast, the employee shall be protected by approved fall-protection equipment.

H.7.7 When gas is encountered while drilling a well or running the acid line, adequate fire extinguishers shall be placed approximately 150 feet upwind from the well.

H.8 *Acidizing Storage Wells*

H.8.1 Experienced and qualified persons shall direct the acidizing of gas storage wells.

H.8.2 Suitable, approved personal protective equipment shall be used by persons (including contractors' employees) when working at or near a well being acidized, or while transferring acid from storage to the acidizing rig.

H.8.3 Tanks, containers and vehicles used to store or transport acid shall be properly labeled.

H.8.4 Each acidizing rig shall be equipped with an adequate fire extinguisher, first aid supplies and personal protective equipment.

H.8.5 Hoses, valves and fittings shall be visually checked for damage or defects before each use, and shall also be observed during pumping operations for possible leaks.

H.8.6 A check valve shall be installed on the outlet of the high-pressure hose that is used to transfer acid from the acidizing rig to the storage well.

H.8.7 An approved electrical bonding device (a bonding jumper) shall be installed from the acidizing rig to the wellhead before starting pumping operations.

H.8.8 An automatic pressure-relief device and a pressure-indicating gauge shall be installed on the outlet side of the high-pressure acidizing pump.

H.8.9 While a gas storage well is being cleared of acid, the following precautions shall be taken.

a. Vehicles, other than those involved in acidizing, shall not be allowed within 100 feet of the well.

b. When practicable, vehicles shall be located upwind from the well.

c. Engines shall be turned off.

d. Smoking or open flames shall not be permitted within 100 feet of the well.

e. An approved electrical bonding device (a bonding jumper) shall be installed between the wellhead and the catch tank.

H.8.10 Hoses, valves, piping and fittings that are used between the high-pressure acidizing pump and the wellhead shall be hydrostatically tested at least once every year to a pressure equal to 1.5 times the maximum operating pressure for a minimum of four hours. The maximum pressure rating of the hose shall not be exceeded during the test.

H.8.11 Suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

H.9 *Gas Well Operations*

H.9.1 Experienced and qualified persons shall direct the maintenance of gas wells.

H.9.2 Approved personal protective equipment shall be used by persons (including contractors' employees) when working at, or within 100 feet of, the well being worked on.

H.9.3 Gas readings shall be taken 10 feet from the well in a 360-degree circle when gas is present during operations. If the gas concentration exceeds 1%, fire suits must be worn; otherwise, long-sleeve fire-retardant shirts shall be worn within 100 feet of the well. All trucks shall have a fire suit in case it is needed.

H.9.4 If the possibility exists for H_2S to be present in excess of 10 ppm (by volume) in the breathing zone, the following shall apply.

a. All personnel should be trained prior to the start of work.

b. H_2S detection equipment will be fixed downwind on the rig floor.

c. All personnel shall wear H_2S monitors when working on the well.

d. Breathing equipment will be available.

e. A contingency plan will be in place.

1. Personnel will be assigned responsibilities.

2. Emergency telephone numbers will be available.
3. Location of safety equipment will be noted.

f. An action plan will be in place.
1. Move away from H_2S.
2. Don breathing equipment.
3. Alert affected personnel.
4. Assist anyone in distress.
5. Proceed to designated assembly area.

g. Legible warning signs, such as ***Hydrogen sulfide operations — Enter only when monitoring shows area to be safe*** or ***Respiratory protection equipment must be worn beyond this point*** will be posted at appropriate locations when hydrogen sulfide may be encountered.

h. Wind direction indicators will be installed (flagging on guy lines or vertical poles).

i. PPE (breathing apparatus) is required if H_2S levels exceed 10 ppm weighted average over eight hours, or 15 ppm averaged over 15 minutes, or any time H_2S levels exceed 20 ppm.

H.9.5 Vehicles not involved in the operation should be located a minimum of 100 feet from the well.

H.9.6 A ***No Smoking or Open Flame*** sign shall be posted in the vicinity of operations that constitute a fire hazard.

H.9.7 Smoking or open flames shall not be permitted within 100 feet of the well.

H.9.8 Cell phones shall not be turned on within 100 feet of the well.

H.9.9 When wells are pumped, all non-essential personnel shall stay back 100 feet.

H.9.10 Fall protection shall be used for work at more than four feet above the ground.

H.9.11 Eye-wash equipment shall be available.

H.9.12 Well-service rigs shall have readily accessible a minimum of two 20-pound-capacity fire extinguishers with a Class BC rating.

H.9.13 Hoisting lines should be visually inspected once each day when in use. They should be taken out of service when:

a. three broken wires are found within one lay length of 6 by 7 wire rope;

b. six randomly distributed broken wires are found within one lay length of 6 x 8 construction; or

c. three broken wires are found within one lay length of 6 x 8 construction.

H.9.14 High-pressure hoses shall be properly secured when pressurized.

H.9.15 Appropriate guards or shields shall be in place on well-service units to prevent risk of injury.

H.9.16 Well-service rigs shall be maintained in a workmanlike fashion.

H.9.17 Tripping hazards should be minimized to the extent feasible.

H.9.18 One-inch acid line shall not be removed from well until is has been ascertained that the well is dead. Well will be monitored at all times during the operation; if — at any time during the removal of the one-inch acid line — the well shows indications of coming back on gas, the removal operation shall cease and additional gel shall be added until the well is dead.

H.9.19 Wells being worked on within 100 feet of a roadway shall have gas and H_2S levels measured at the roadway. If natural gas levels exceed 1% or H_2S levels exceed 10 ppm, traffic control shall be instituted.

H.9.20 Wells being worked on within 100 feet of an occupied dwelling shall have gas and H_2S levels measured at the dwelling. If natural gas levels exceed 1% or H_2S levels exceed 10 ppm, the occupants shall be evacuated.

I. Motor Vehicle

I.1 *General*

I.1.1 It is the responsibility of every employee who drives a company vehicle to know and obey all local, state and federal laws and regulations covering the vehicle type and class that is driven. The employee shall be familiar with, and abide by, company rules and policies relative to the driving of company vehicles. The driver shall be personally responsible for fines and other penalties assessed.

I.1.2 Employees shall not drive company vehicles on a public thoroughfare unless they have a proper and valid driver's license in their possession permitting them to drive the type and class of vehicle for which they have been assigned. They shall report any restriction, changes, convictions of all moving violations or loss of driver's license immediately to their supervisor.

I.1.3 Supervisors shall not permit unauthorized employees or other unauthorized persons to drive vehicles for the company.

I.1.4 The driver of a company vehicle shall not transport unauthorized persons.

I.1.5 Vehicles shall be kept in safe condition and driven in a safe and courteous manner. Before driving a vehicle for the company, the driver shall assure himself/herself, insofar as can be determined, that the vehicle is in safe condition. Drivers shall be responsible for pre-trip/post-trip inspections as required by governmental regulations and shall be responsible for reporting vehicle defects to the garage or repair shop.

I.1.6 The following precautions shall be observed when fueling a vehicle.

- **a.** The engine shall be shut off.
- **b.** The fuel hose nozzle shall be kept in contact with the vehicle's fuel tank fill-pipe to avoid static sparks.
- **c.** Radio transmitters shall not be used.
- **d.** Overfilling of fuel tanks shall be avoided.
- **e.** The driver shall remain with the vehicle during fueling.
- **f.** Cell phones and company radios shall be turned off during the entire fueling process.

I.1.7 A copy of the Kentucky Dept. of Transportation (DOT) accident reporting form — as well as any other forms required by company policies or local, state and federal laws and regulations — shall be carried in the vehicle at all times.

I.1.8 The driver of a vehicle shall be familiar with the capacity and required clearances for the safe use of the vehicle.

I.1.9 The driver shall inspect windshield wipers frequently to insure they are in good operating condition, and make sure that windows and windshield have sufficient visibility for safe operation of vehicle.

I.1.10 Objects or persons being transported shall be located so that the driver's view will not be obstructed and the safe operation of the vehicle will not be hindered.

I.1.11 Drivers of radio-equipped vehicles shall be sure that proper clearance is maintained between the antenna and energized lines and equipment or other structures.

I.2 *Operation*

I.2.1 Before the operation of a motor vehicle, the operator shall examine the area around the vehicle ("Circle of Safety").

I.2.2 The operator of a motor vehicle shall clearly signal any intention of turning, passing or stopping.

I.2.3 Drivers shall not permit more than two additional persons in the front seat, and seat belts shall be worn by all occupants while the vehicle is in motion.

I.2.4 A driver shall not operate a vehicle when medically, physically or mentally unfit to do so.

I.2.5 Drivers shall yield the right-of-way to emergency vehicles such as police cars, fire trucks, and ambulances.

I.2.6 Low-beam headlights (not parking lights) shall be used from one-half hour before sunset to one-half hour after sunrise, or whenever visibility demands.

I.2.7 Vehicles driven after dark shall not be operated at a speed that prevents stopping within the distance clearly illuminated by the headlights.

I.2.8 The driver of a vehicle shall not attempt to pass another vehicle going in the same direction unless the driver can see far enough ahead to be sure that the vehicle can be passed safely. Proper signals shall be used to warn other drivers.

I.2.9 Drivers shall keep a sharp lookout for children, especially in school zones or play areas. The driver shall reduce the vehicle's speed and be prepared for an immediate stop.

I.2.10 The driver of a vehicle shall be courteous toward other operators and pedestrians. Drivers shall practice defensive driving — that is, make every effort to avoid an accident even though the other party may be in error. Do not insist on your so-called right-of-way.

I.2.11 The operator of a vehicle shall maintain the vehicle under control so as to be able to bring it to a complete stop within the assured clear distance ahead. A following distance of at least one second for each 10 feet of vehicle length shall be allowed for speeds below 40 miles per hour. At greater speeds, add an additional second.

I.2.12 While stopped in traffic, the driver shall maintain adequate distance from the vehicle in front. The forward vehicle's rear tires should be in view.

I.2.13 Drivers of vehicles shall not permit anyone to ride on the running boards, fenders or any part of the vehicle except on the seats. Passengers shall not stand up in moving vehicles.

I.2.14 Employees shall not ride on trailers.

I.2.15 Employees shall not jump on or off vehicles in motion.

I.2.16 Transporting personnel in the cargo bed of a pickup truck shall not be permitted.

I.2.17 Drivers of vehicles shall approach railroad crossings cautiously and be prepared to stop clear of the tracks. When transporting hazardous materials, drivers shall bring the vehicle to a complete stop no closer than 15 feet from the nearest track. Drivers shall proceed only if the way is clear.

I.2.18 Driver shall not shift gears when crossing railroad tracks.

I.2.19 When approaching a school bus that has stopped to load or unload passengers (except on divided highways), the driver shall stop the vehicle and proceed only after the school bus is in motion.

I.3 *Parking*

I.3.1 Except in an emergency, drivers shall park their vehicles only in positions permitted by law. Care shall be used in parking to avoid accidents or property damage.

I.3.2 Where work requires that a vehicle or equipment be parked on the travel portion of a street or highway, or closer than 10 feet to the traveled road surface, traffic control procedures shall be used as needed to regulate, warn or guide traffic in accordance with Kentucky Department of Transportation guidelines.

I.3.3 When a vehicle is temporarily parked along a highway at night, the parking lights shall be left on, and if the vehicle is so equipped, the flashing and/or rotating lights shall be turned on.

I.3.4 To change a tire or make other necessary repairs along a highway, the driver shall pull off the pavement as far as possible. Flashing and/or rotating lights shall be turned on. Traffic-control procedures and emergency-warning devices shall be used as required.

I.3.5 When a vehicle is parked on an incline, the driver shall be sure that the brakes are properly applied, the engine is shut off and the vehicle is in the lowest gear or in the "Park" position. The vehicle's front wheels shall be turned at an angle to the adjacent curb or the vehicle shall be chocked.

I.3.6 Occupants should enter or leave a parked vehicle on the curb side. If doors must be opened on the road side, extreme caution should be exercised to avoid danger from other vehicles.

I.3.7 When a vehicle is parked, the parking brake shall be set.

I.3.8 When a vehicle is left unattended, the motor shall be stopped, the ignition key removed and the parking brake set. A vehicle is considered unattended when the driver is more than 100 feet away from the vehicle or the driver's view of the vehicle is obstructed or impaired.

I.3.9 When an occupied vehicle is parked with the engine running, the windows shall be left partially open so as to provide adequate ventilation to prevent asphyxiation from carbon monoxide.

I.3.10 A vehicle's engine shall not be operated, except for brief periods, in an enclosed structure unless adequate ventilation is provided.

I.4 *Backing*

I.4.1. If possible, the vehicle shall be positioned to avoid the necessity of backing later.

I.4.2. Extreme caution shall be exercised when backing a vehicle, to avoid injury to persons and to prevent property damage. If another employee is present, he/she shall be stationed at the rear of the vehicle to assist the driver in backing the vehicle safely.

I.4.3. When backing a vehicle which has an obstructed view to the rear,

- **a.** a reverse signal (backup alarm) audible above the surrounding noise level shall be used; or
- **b.** an observer shall signal that it is safe to back.

I.4.4. During all backing operations, the vehicle operator shall:

- **a.** Keep a constant lookout during the entire time.
- **b.** Carefully check any blind areas.
- **c.** Back slowly.
- **d.** Watch both sides. Do not depend entirely on mirrors.
- **e.** Enlist the aid of another person to act as a guide, when such help is available.

I.5 *Traffic Incident Procedure*

I.5.1 Employees shall not become involved in an argument or discussion as to who was responsible for the incident.

I.5.2 Employees shall not admit responsibility for an incident, offer to make any kind of settlement or sign any statements at the scene of an incident. Representatives of the company or the insurance company will handle this.

I.5.3 These instructions shall be followed by an employee if involved in a traffic incident while on duty.

- **a.** ***Stop***. Whenever a police investigation of the incident is indicated, do not move the vehicle until directed to do so by the police.
- **b.** Do not leave the scene of an incident without first stopping to identify yourself and to render assistance if needed.
- **c.** Assist injured persons insofar as you are able. Do not move seriously injured persons unless necessary for their protection against further injury. Report the incident to the police and inform them of any injuries.
- **d.** Flag-persons should be used if needed. Set flags or other traffic control devices if available and considered necessary.
- **e.** Obtain the name, address and license number of the other driver; the vehicle's license number; the names of the vehicle's owner and insurance company; names and addresses of witnesses and passengers in the other vehicle; and other information needed on the incident reporting form. (*See Forms*).
- **f.** When requested, give your name, address, company name, driver's license information and the name of the insurance company to the other party.
- **g.** If the incident involves damage to an unattended vehicle or a fixed object, take reasonable steps to locate and notify the owner. If the owner cannot be found, leave a notice in a conspicuous place on the vehicle.

I.6 *Operation of Trucks and Trailers*

I.6.1 Local, state, federal or other regulations shall be complied with governing lights, markers, length, width and loading of vehicles. This includes regulations pertaining to explosives, flammable or combustible liquids or other hazardous materials.

I.6.2 Before a truck or trailer is moved, it shall be carefully inspected to see that materials and equipment are properly loaded and secure so they will not cause a hazard by shifting.

I.6.3 When transporting materials that could be scattered during operation (such as earth, gravel, refuse or similar loose material in an open truck), the material shall be covered with a tarpaulin or other approved covering.

I.6.4 Trucks or trailers shall not be loaded in excess of their rated capacity.

I.6.5 Material which extends more than four feet beyond the front or back of the truck or trailer shall have warning devices attached. During the day, red flags shall be used; at night and during periods of poor visibility, amber lights shall be used.

I.6.6 Trailers, while being towed, shall be securely coupled to the

towing vehicle. Trailers (except those attached to a tractor by a "fifth wheel") shall be secured by safety chains or cables. Trailers equipped with braking systems shall be properly connected to the towing vehicle before moving.

I.6.7 While a truck is being loaded by a high-lift, power shovel, crane or other loading equipment, the truck should be positioned so that the load does not pass over the driver. If a truck cannot be so positioned, the driver shall stand clear of the truck and loading equipment.

I.6.8 Before a truck is loaded or unloaded, the brakes shall be securely set and the wheels shall be blocked or chocked.

I.6.9 The capacity of booms, derricks or other hoisting equipment mounted on trucks shall not be exceeded.

I.6.10 Heavily loaded trucks proceeding down steep grades shall be shifted into a lower gear.

I.7 *Aerial Lift Trucks*

I.7.1 A short daily inspection at the start of each shift shall be conducted to reveal maladjustments and unusual wear. The daily inspection should cover, but not be limited to, the following.

- **a.** All attachment welds between actuating cylinders and booms or pedestals.
- **b.** All pivot pins (for security of their locking devices).
- **c.** All exposed cables, sheaves and leveling devices (for both wear and security of attachment).
- **d.** Hydraulic system (for leaks and wear).
- **e.** Lubrication of boom.
- **f.** Boom and basket (for cracks or abrasions).
- **g.** Operation of boom from ground controls through one complete cycle. Listen for unusual noises and look for deviations from normal operation.
- **h.** Any other inspections recommended by the manufacturer.
- **i.** Defects found should be reported and corrected before they develop into dangerous conditions.

I.7.2 Only authorized persons who are properly trained and qualified shall use or operate this equipment.

I.7.3 The operating and maintenance instruction manuals issued by the manufacturer shall be read and followed.

I.7.4 Load limits of the boom and basket shall not be exceeded. Shock loading (sudden stops or starts) of the equipment shall be avoided.

I.7.5 Aerial lifts shall not be field-modified unless such modification is certified by the manufacturer. The insulated portion shall not be altered in any manner that might reduce its insulating value.

I.7.6 Articulation-boom and extensible-boom platforms, primarily designed as personnel carriers, shall have both platform (upper) and lower controls. Lower-level controls shall not be operated unless permission has been obtained from the employee in the lift, except in an emergency.

I.7.7 The truck shall not be moved unless the boom is lowered, the basket cradled and secured and the outriggers retracted.

I.7.8 Employees shall not ride in the bucket while the truck is traveling.
Exception: Employee may ride in the basket for short moves at the work location if the basket is returned to the cradled position for each move.

I.7.9 When employees are in the bucket of an aerial lift, the parking brake of the vehicle shall be set. Wheel chocks and outriggers shall be used to provide added protection. When the vehicle is on an incline, wheel chocks shall be used regardless of whether outriggers are used. The truck should sit approximately level when viewed from the rear.

I.7.10 When outriggers are used, they shall be set on pads or a solid surface. Outriggers shall not be extended or retracted outside of clear view of the operator unless all employees are outside the range of possible equipment motion.

I.7.11 When working from an aerial lift, employees shall wear a body harness, and a lanyard shall be attached to the boom.

I.7.12 Employees shall not be permitted to transfer from a bucket to a pole or structure except with the permission of the supervisor.

I.7.13 Safety rules governing the use of hot line tools, rubber goods, personal protective equipment and general safety practices shall also apply to work done from aerial baskets.

I.7.14 When the boom must be maneuvered over a street or highway, necessary precautions shall be taken to avoid incidents with traffic and pedestrians.

I.7.15 The operator shall always face in the direction in which the basket is moving and shall see that the path of the boom or basket is clear when it is being moved.

I.7.16 Employees shall not stand or sit on the top or edge of the basket, or on ladders placed in the basket. Employee's feet shall remain on the floor while the employee is in the basket.

I.7.17 When two employees are in the basket or baskets, one of them shall be designated to operate the controls. One employee shall give all signals, which shall be thoroughly understandable by all persons concerned.

I.7.18 Climbers shall not be worn by employees while in the basket.

I.7.19 When two employees are working from an aerial lift, extreme

care shall be taken to avoid one employee's contacting poles, crossarms or other grounded or live equipment while the second employee is working on equipment at a different potential.

I.7.20 No more than one energized conductor or phase shall be worked on at one time.

I.7.21 The aerial lift — together with the employees in the basket, and all tools and equipment — shall maintain proper clearances from unprotected energized conductors unless isolated or insulated. (*See Table D-1.*)

I.7.22 When using pneumatic or hydraulic tools in a bucket, the operator shall be sure that hoses or lines do not become entangled in the operational controls.

I.7.23 When working near energized lines or equipment, aerial lift trucks shall be barricaded and considered as energized equipment, or the aerial lift truck shall be insulated for the work being done. Unless they wear rubber protective equipment, employees on the ground must not approach the equipment if safe clearance is not maintained between the unprotected energized conductors or apparatus and conductive areas of the truck or its equipment. When safe clearance of uninsulated areas of the aerial lift cannot be maintained, the truck must be barricaded and considered as energized.

I.7.24 Personal rubber protective equipment must be available off of the truck for use by employees working on the ground.

I.8 *Radio Operations*

I.8.1 The radio in company vehicles shall be monitored except where prohibited or impractical.

I.8.2 In areas utilizing the Emergency Signal system, if the Emergency Signal is on, any transmission not directly related to the emergency is prohibited.

I.8.3 In areas utilizing the Emergency Signal system, the radio should be monitored when the Emergency Signal is on.

I.8.4 Radio transmissions within 1,000 feet of any rock-removal crew work site are prohibited without the consent of the rock-removal foreman.

I.9 *Operation of Garages and Repair Shops*

I.9.1 Garage and repair shops shall have adequate fire protection equipment.

I.9.2 Smoking is prohibited in garages and vehicle repair shops.

I.9.3 Cutting or welding is prohibited unless the work area is made fire-safe by removing combustibles or protecting combustibles from ignition sources.

I.9.4 Gasoline and/or diesel fuel shall not be used for cleaning or degreasing purposes.

I.9.5 Employees using chemicals shall be instructed in the proper use and of the potential hazards involved. Personal protective equipment shall be used when necessary (*see Chemicals and Harmful Substances*).

I.9.6 Employees shall be instructed in the proper use of power tools, equipment, machinery and testing equipment before using (*see A.24 — Tools*).

I.9.7 Compressed air shall not be used for cleaning purposes except where the pressure is reduced to less than 30 PSI — and then only when using effective chip-guarding and personal protective equipment.

I.9.8 Air hoses shall be maintained in safe condition. They shall be returned to their rack, or be properly stored, after each use.

I.9.9 Employees shall not use compressed air to clean dust or dirt from their clothing.

I.9.10 A safety tire rack, cage or equivalent protection shall be provided and used when employees are inflating tires installed on multi-piece rims.

I.9.11 Employees shall use a hose with sufficient length between the clip-on chock at the valve core and the in-line valve while inflating tires mounted on multi-piece rims to enable all persons to stand outside of the potential trajectory of the rim components should they come apart.

I.9.12 Tires on single-piece-rim wheels shall be contained within a restraining device during inflation unless bolted on the vehicle with the lugnuts fully tightened.

I.9.13 Adequate ventilation shall be provided for garages, repair shops and other enclosed areas to prevent the accumulation of vehicle fumes.

I.9.14 Adequate machine guards shall be placed on equipment, where needed, to protect the operator and other employees from hazards.

I.9.15 Employees shall use care to avoid being burned when removing pressurized radiator caps while a vehicle's engine is hot.

I.9.16 Care shall be used by employees to prevent injury when lifting, moving and handling large parts or heavy tire assemblies.

I.9.17 The manufacturer's rated capacity shall be legibly marked on jacks and shall not be exceeded. Jacks shall have a positive stop to prevent over-travel. When it is necessary to provide a firm foundation, the base of the jack shall be blocked or cribbed. Where there is a possibility of slippage of the metal cap of the jack, a wood block shall be placed between the cap and the load.

I.9.18 When vehicles or equipment are raised for working underneath, they shall be adequately blocked or cribbed to prevent them from falling or shifting.

I.9.19 Trucks with dump bodies shall be equipped with positive means of support, permanently attached and capable of being locked in position, to prevent accidental lowering of the body while maintenance or inspection work is being done.

J. Emergency Treatment

J.1 *First Aid*

J.1.1 Due to potential hazards associated with bloodborne pathogens that cause diseases such as hepatitis B and AIDS, care shall be taken, when administering any type of first aid, to limit or eliminate contact with blood and other potentially infectious materials.

- **a.** Use of gloves, eye protection, and CPR mask is recommended.
- **b.** Employees shall wash hands and other exposed body areas with soap and water. If soap and water is not immediately available, a waterless anti-microbial waterless hand cleaner should be used until soap and water is available.
- **c.** Remove all contaminated clothing immediately after exposure and immediately report all exposure to blood and other potentially infectious materials to their supervisors so post-exposure care can be initiated.

J.1.2 Employees who are trained in first aid and CPR basics should provide emergency treatment to fellow employees. Personnel should be knowledgeable of the treatment for shock due to traumatic injury which includes the possibility of administering assisted ventilations and control of bleeding. Pre-planning for a potential emergency situation is most valuable. All employees should be aware of the medical services available and how to obtain them.

J.1.3 Personnel engaged in overhead line work shall know the essential elements of pole-top rescue.

J.1.4 Where first-aid kits are supplied, employees shall be familiar with the location, contents, and instructions given with the first-aid kit. Each employee shall learn to use this equipment so he/she can render treatment when needed. Except for minor injuries, the services of a physician shall be obtained. In the case of a more serious or life threatening event, call 911.

J.1.5 The contents of first-aid kits shall be inspected each week and expended items replaced.

J.2 *Wounds and Control of Bleeding*

J.2.1 A person can die from blood loss in a very short time — less than one minute. Therefore, in the event of an injury that results in significant bleeding, immediate steps must be taken to prevent the loss of blood.

J.2.2 Bleeding may be controlled by the use of direct pressure applied to the wound with a clean dressing; elevating the extremity above the level of the heart will assist in controlling the bleeding. Secure the dressing in place with a bandage. There may be times when bleeding cannot be controlled with direct pressure and

elevation, and in those cases, the use of a tourniquet may be necessary.

a. Applying a tourniquet

1. The tourniquet material should be at least 2" in width.

2. The tourniquet should be applied above the wound, as close to the wound as possible.

3. The tourniquet should tightened with the use of a windlass (stick or any other tool that can be twisted to draw the tourniquet tight).

4. When bleeding has been controlled, secure the windlass so that it does not loosen.

5. Write the letters ***TK*** on the patient's forehead with the time the tourniquet was applied.

J.2.3 Shock can be present in all cases of serious bleeding. Attention must be given to the prompt treatment for shock.

J.3 *Shock*

J.3.1 Shock usually occurs following a severe loss of blood or some type of serious injury. It can occur from a minor injury or even from anxiety or emotional stress. Regardless of the cause, the signs and symptoms are the same and similar treatment is required.

J.3.2 Shock is easier to prevent than to cure. Every injured person is potentially a shock victim and should be treated as such — whether the signs and symptoms of shock are present or not.

J.3.3 The following are signs and symptoms of shock.

a. Chalk-like appearance.

b. Dull or anxious expression.

c. Rapid or irregular breathing.

d. Weak or rapid pulse.

e. Cool, moist skin.

J.3.4 Recommended treatment for shock includes the following.

a. The victim should be kept warm and comfortable, but not hot. In many cases, the only first-aid necessary and possible is to cover the victim, underneath as well as on top, to prevent loss of body heat. It is best not to move the victim at all.

b. Keep the victim's body horizontal or, if possible, position him/her so that the feet are at least six inches higher than the head. In any case, always keep the victim's head low. The single exception to this positioning is the case of a victim who obviously has an injury to the chest and has difficulty breathing — or if you suspect head, neck, or back injuries, or possible broken bones in the hips or legs. In this case, the victim should be kept horizontal.

c. Clear the victim's mouth of all foreign bodies and make sure he/she is breathing properly. Do not give the victim anything to eat or drink, even though he/she is likely to be thirsty. Call local emergency number immediately. Shock can't be managed effectively by first-aid alone. A victim of shock requires advanced medical care as soon as possible.

d. Loosen tight clothing at the neck, chest and waist.

e. Proper transportation is never more imperative than in the case of a person who may develop shock. It constitutes the most important single measure in the prevention and treatment of shock. Use an ambulance, if possible. If other means must be used, follow the above points as closely as possible.

J.4 *Eye Injuries*

J.4.1 *Foreign bodies*

a. When a small foreign body — such as dust or wood flake — is on the eye or eyelid, the eye should be irrigated with and eyewash station, eyewash solution, or clean water. Never attempt to remove any object off the surface of the eye with anything other than a gentle stream of water as this may cause permanent damage to the eye.

b. Objects in the eye must not be removed except by a physician. Both the eyes of the victim should be bandaged loosely and the person taken to the doctor immediately. The injured person should be instructed not to move the eyes.

J.4.2 *Chemical burns, acid or caustic:* Immediately irrigate the eye with large quantities of clean water. Flushing of the eye should be continued for 20 minutes.

J.4.3 All eye injuries — regardless of first-aid measures taken — should be taken to a physician to be checked, and applicable treatment administered.

J.5 *Cardiopulmonary Resuscitation (CPR)*

J.5.1 Whenever a person is found unconscious, call 911 immediately, then check to determine if the person is breathing. If the victim is not breathing, immediately start CPR, and summon for an automated external defibrillator (AED) if one is available.

J.5.2 In electric shock cases, do not rush in and become a victim. If possible, de-energize or isolate the power source. Move victim outside of the danger zone.

J.5.3 *CPR procedures*

a. Determine if the patient is unconscious by tapping and shouting, "Are you okay?" If the person is unconscious, call or have someone phone 9-1-1 and get an AED.

b. If you do not have a cell phone or no one responds to your call for help, you can leave the person briefly to call 9-1-1.
c. Determine if the victim is breathing or only gasping. Scan from the head to waist repeatedly for at least 5 seconds (but no longer than 10 seconds). If unconscious and not breathing adequately, this person needs CPR.
d. Make sure the victim is lying on his/her back or a firm, flat surface. Begin CPR.
e. Quickly remove clothes out of the way.
f. Put the heel of one hand on the center of the chest (over the lower half of the breastbone). Put your hand on top of the first hand. Push straight down at least 2 inches. Push at a rate of 100 to 120 compressions per minute. Count the compressions out loud. Let the chest come back up to its normal position after each compression. Try not to interrupt compressions for more than 10 seconds, even when giving breaths. Provide 30 hard and fast compressions.
g. Immediately open the airway by the head-tilt/chin-lift maneuver and provide two rescue breaths, watching for the chest to rise.
h. Repeat sets of 30 compressions and 2 breaths for 5 cycles, or about 2 minutes. Repeat cycles of compressions and ventilations until EMS arrives or someone arrives with an AED.
i. After performing CPR for two minutes, if an AED is present, start AED procedures.
j. Turn the AED on and follow prompts. Attach the AED pads to the AED and attach to the victim's bare chest. Let the AED analyze the heart rhythm. If a shock is not needed, resume CPR. Deliver a shock if needed. Loudly state, ***"clear"*** and make sure that no one is touching the victim. Push the shock button to deliver the shock. Immediately resume CPR.
k. Repeat cycle of CPR and shocks until EMS arrives on scene or victim becomes responsive.

J.6 *Training*

J.6.1 All employees engaged in electrical work shall receive training in resuscitation and in rescue from their working environment (poles, structures, manholes, boilers, aerial baskets, confined or enclosed spaces, etc.)

K. Telecommunications

K.1 *Work Area Protection*

K.1.1 Before work begins in the vicinity of vehicular or pedestrian traffic that may endanger employees, traffic warning signs, vehicle lights or other control devices shall be positioned to alert approaching traffic and used in accordance with the Telecommunications Traffic Safety Program.

K.1.2 Employees exposed to vehicular traffic shall be provided with, and required to wear, Type III vests marked with, or made of, reflective, high-visibility materials.

K.2 *Communication Cable and Open-Wire Lines and Equipment*

K.2.1 Electrical rubber gloves, rated for the specific voltage to be encountered, shall be worn when working on all wire lines or equipment above 50 VDC, unless the employee is adequately insulated from the ground and other conductors, or positively knows the line to be shorted and grounded. (This does not apply to communication equipment on the station side of telephone insulating transformers or other protection equipment on the communication terminal rack.)

K.2.2 Power fuses shall not be removed or replaced except by the use of suitable insulated tools with electrical rubber gloves — rated for the specific voltage to be encountered — unless the fuse block is first entirely disconnected from the line or lines.

K.3 *Portable Power Equipment*

K.3.1 All portable power equipment used in telecommunications work shall be grounded.

K.3.2 Nominal 120V (or less) portable generators used for providing power at work locations do not require grounding if the output circuit is completely isolated from the frame of the unit.

K.3.3 Grounding shall be omitted when using soldering irons, soldering guns or wire-wrap tools on telecommunication circuits.

K.3.4 Portable lights, tools and appliances, when operated from commercial power, shall have their metal parts grounded unless these tools or appliances are double-insulated or are used with a GFCI. Double-insulated tools or appliances must be indicated on the manufacturer's label. When an extension cord is added, the cord shall be protected by a GFCI at the source/receptacle.

K.3.5 When fueling portable, gasoline-driven generators, one shall:

a. Allow the engine to cool before refueling.

b. Wipe off any spilled oil or fuel on the equipment before use.

K.3.6 Flammable liquids shall be properly stored in approved and clearly marked containers.

K.4 *Eye Protection*

K.4.1 Microwave — Employees shall not look into an open waveguide which is connected to an energized source of microwave radiation.

K.4.2 Fiber Optics — One shall not look:

a. into the beam of an operating laser diode or LED beam; or

b. into the end of an optical fiber at any time.

K.5 *Body Harnesses*

K.5.1 A harness attached to a lanyard with a double-locking snap hook shall be worn while working from or riding in an aerial device. Lanyards shall be equipped with a double locking snap and shall be no longer than six feet.

K.6 *Hold Card; Lockout/Tagout*

See Section A.23

K.7 *Excavations/Trenching*

K.7.1 Prior to excavation or trenching work, all existing underground utility installations — sewer, telephone, fuel, water and electrical, shall be identified and marked.

K.7.2 All regulatory excavations/trenching safety work practices shall be followed.

K.8 *Microwave and Two-Way Radio Transmission*

K.8.1 Accessible areas associated with microwave or two-way radio communication systems where the radio-frequency (RF) electromagnetic radiation level may exceed the recommended radiation protection limits shall have a warning sign posted.

K.8.2 When an employee works in an area where the RF electromagnetic radiation exceeds the FCC maximum permissible exposure limits, measures shall be instituted that will insure that the employee's exposure is not greater than that permitted by the radiation limits. Such measures shall include — but not be limited to — those of an administrative or engineering nature, or those involving personal protective equipment.

K.9 *Use and Care of Rubber Goods*

K.9.1 Electrical rubber goods — rated for the voltage levels to be encountered — shall be provided, and the supervisor shall ensure that they are used by employees as required by this section.

K.9.2 Only qualified employees, or those under the continuous supervision of a qualified employee, shall work on or use test equipment on equipment energized at 50 volts or greater.

K.9.3 Class 0 low-voltage gloves with leather protectors shall be worn when working on equipment or using test equipment that is energized at 50 to 600 volts.

K.9.4 Electrical rubber gloves shall be subjected to an approved electrical test at intervals not to exceed 90 days.

K.9.5 Electrical rubber gloves shall be inspected before each use for corona cracks or other damage, and shall be given an air test at least once a day while in use. This should be done at the beginning of the work period and at any other time when their condition is in doubt.

K.9.6 Electrical rubber gloves shall never be worn inside out or without leather protectors. They shall be exchanged at any time they become damaged or the employee to whom they are assigned becomes suspicious of damage.

K.9.7 Electrical rubber gloves shall not be used for purposes other than electrical work. Damaged gloves shall be returned to the Glove Lab.

K.9.8 Leather protectors shall not be worn except when in use over the Class 0 electrical rubber gloves.

K.9.9 Electrical rubber gloves, when not in use, shall be kept in canvas bags or other approved container that is designated and used exclusively for them. Gloves shall be stored where they will not become damaged from sharp objects or exposed to direct sunlight. They shall never be folded while stored, nor shall other objects be placed upon them.

K.9.10 Electrical rubber gloves shall be stored in a glove bag with the cuffs down to permit drainage and better ventilation, and to reduce the possibility of damage due to objects falling into the glove.

K.10 *Storage Batteries*

K.10.1 Enclosed areas used to charge or store batteries shall be adequately ventilated. Report any defective ventilation equipment to your supervisor.

K.10.2 Smoking and the use of open flames, cutting, welding and the use of tools that could produce sparks in enclosures that contain batteries shall be avoided.

K.10.3 Precautions shall be taken to avoid shock or electric arc when working within battery charging areas.

K.10.4 Whenever work must be performed in a location or position from which items such as tools and equipment may be accidentally dropped upon a storage battery, proper measures shall be taken to protect the battery before the work is started.

K.11 *Electrical Safety*

K.11.1 Only trained and certified workers shall install, maintain or repair electrical equipment.

K.11.2 Only qualified employees shall work in areas containing unguarded, uninsulated energized lines, or parts of equipment, operating at 50 volts or more.

K.11.3 No qualified person shall come within four feet of an exposed, energized or conductive part unless:

- **a.** the worker is properly insulated from the energized part with electrical gloves — rated for the voltage levels to be encountered — or other approved insulation; or
- **b.** the energized part is properly insulated from the worker and any other conductive object; or
- **c.** the worker is properly isolated and insulated from any other conductive object.

K.11.4 Prior to conducting any electrical work, the worker shall de-energize the equipment and place the system in an "electrically safe work condition" according to energy isolation procedures (lockout/tagout).

K.11.5 Where equipment cannot be de-energized, the requirements of the electrical safe work practices program shall be followed.

K.12 *Powerline Carrier Tuner Maintenance*

K.12.1 Prior to opening the tuner cabinet, examine the associated trap and coupling capacitor for physical damage. Ensure the cabinet is grounded.

K.12.2 When opening the tuner cabinet, listen for arcing sounds that may indicate a problem. *See note under K.12.5*.

K.12.3 Visually inspect the interior of the cabinet for damage.

K.12.4 Close the ground switch during maintenance, or leave open for measurements or adjustments.

K.12.5 Return ground switch to the open position to restore PLC to service.

Note: *If, at any time, an unsafe condition exists, stop work and report the trouble to your supervisor. See Safety Manual for appropriate PPE.*

K.13 *Fiber Optics*

K.13.1 Only qualified and authorized personnel shall cleave or splice fiber cable.

K.13.2 Only approved eye protection with side-shields shall be worn to prevent loose fiber from entering the eyes.

K.13.3 Bare fiber shall be handled with extreme caution and disposed of properly to reduce injury from sharp ends or loose scrap pieces.

K.13.4 Employees shall avoid direct exposure to invisible laser radiation, which may emanate from unterminated fiber connections.

K.13.5 Employees shall not look into ends of open fibers, unterminated fibers or the transmission parts of fiber equipment.

K.13.6 Employees shall take necessary precautions when working with flammable or combustible cleaning agents used in fiber-optic splice preparation.

K.14 *Contractor/Subcontractor Safety and Health*

K.14.1 Contractors/subcontractors are responsible for providing their employees, and affected members of the public, a work site that is free from safety and health hazards.

K.14.2 All contractors/subcontractors working at an LG&E/KU generating station site are required to attend the station's site-specific training/orientation prior to engaging in work activities. In addition, they shall also undergo an ammonia-awareness training/orientation, where applicable, prior to conducting work.

K.14.3 All contractors/subcontractors conducting work in a substation shall first complete a Substation Entry Training Program.

K.14.4 All contractors/subcontractors shall comply with the LG&E and KU Contractor/Subcontractor Safety Policy.

K.15 *Tent Heaters, Torches and Open Flame*

K.15.1 Open flames shall not be used within ground tents or on platforms within aerial tents unless:

- **a.** the tent covers are constructed of fire-resistant materials; and
- **b.** ventilation is provided in order to maintain safe oxygen levels and avoid harmful buildup of combustible gases.

K.16 *Tower Climbing*

K.16.1 All tower or structure climbing shall be in accordance with the LG&E and KU Telecommunications Communications Structure Climbing Policy.

K.16.2 Those workers who perform tower or elevated work shall be medically qualified, trained and certified as "Qualified" and have the appropriate equipment to perform those jobs.

K.16.3 Prior to commencement of such work, a Health and Safety Management Plan and a Hazard Analysis shall be developed (*see Contractor/Subcontractor Safety Policy*).

K.16.4 The supervisor, or person in charge, shall specify the fall-protection system to be used. He/she shall evaluate the physical condition of the climbers before allowing them to climb.

K.16.5 All climbing and fall-protection equipment shall be inspected prior to each use. Defective equipment shall be immediately removed from service and tagged.

K.16.6 All members of the work crew shall adhere to established fall-protection procedures and rules.

K.16.7 Head protection shall be worn at all times on the job site, whether one is on the ground or climbing the tower. Hard hats shall be equipped with a chin strap when climbing.

K.16.8 Steel-toed, reinforced-soled tower-climbing boots or shoes are recommended for tower climbers.

K.16.9 Leather work gloves are recommended when climbing towers.

K.16.10 Safety goggles or safety glasses shall be used when climbing.

K.16.11 When climbing towers, workers shall wear suitable work clothes to offer protection from cuts and abrasions, weather conditions and tower structure hazards.

K.16.12 Communication shall be maintained at all times between the climber and the ground personnel.

K.16.13 Climbers shall wear a calibrated RF level monitoring device when working on a tower which may have active transmitters, or where the status of transmitters is unknown.

K.16.14 During all climbing activities at least two qualified climbers shall be present on the job site.

K.16.15 Climbing, moving, relocating, transitioning, and transferring activities performed on the tower require 100% attachment to an anchorage point.

K.16.16 Only PPE certified by the manufacturer to meet all OSHA standards and regulations is authorized for use.

K.16.17 All climbers shall have a current certification in first aid and CPR.

K.16.18 Any climber who is ill and/or on medication which may inhibit actions or cause over-stimulation, dizziness, drowsiness, etc., shall not climb.

K.16.19 Climbing shall not be conducted during adverse weather conditions.

K.16.20 An emergency plan shall be established prior to each tower climbing assignment.

LG&E and KU Services Company
Contractor Safety Management
Job Performance Monitoring Tool

This form shall be filled in by LG&E and KU Services Company contract proponent or designee. The form shall be forwarded to the Health and Safety Specialist/Consultant and the results discussed with contractor management.

Monitoring performed by:

Employee #: **Date:**

Location:

	Check One		
Job Briefing conducted	Yes ☐	No ☐	
Hazard Analysis or accepted alternative presented	Yes ☐	No ☐	
Housekeeping			
Job site clean and free of excess trash and debris	Yes ☐	No ☐	N/A ☐
Walkways and passages are clear	Yes ☐	No ☐	N/A ☐
Material or equipment properly stored	Yes ☐	No ☐	N/A ☐
Electrical cords, hoses, welding, leads, and alike (Elevated and protected to prevent hazards.)	Yes ☐	No ☐	N/A ☐
Scrap material free of protruding nails or other puncture hazards	Yes ☐	No ☐	N/A ☐
Trash receptacles are provided for work area	Yes ☐	No ☐	N/A ☐
Barricades installed, maintained, and disassembled if job completed	Yes ☐	No ☐	N/A ☐
Break areas, offices, trailers and like areas are specific to the contractor	Yes ☐	No ☐	N/A ☐
Equipment			
Abrasive Wheel Machinery (Proper use / wheels adjusted)	Yes ☐	No ☐	N/A ☐
Aerial Work Platform Operation (Inspected and operated as required)	Yes ☐	No ☐	N/A ☐
Barricades (Installed as required)	Yes ☐	No ☐	N/A ☐
Excavation Equipment (Inspected and operated as required)	Yes ☐	No ☐	N/A ☐
Compressed Gas Cylinders (Stored, connected and used properly)	Yes ☐	No ☐	N/A ☐
Cranes (Area control, powerline safety, inspected daily and documents retained)	Yes ☐	No ☐	N/A ☐
Forklift Operation (Proper seat belts, speed & loading)	Yes ☐	No ☐	N/A ☐
Ground Fault Protection (Proper GFI's/GFCI's)	Yes ☐	No ☐	N/A ☐
Grounding devices and processes (Properly applied)	Yes ☐	No ☐	N/A ☐
Hand Tool / Power Tools / Wood Working Machinery (Proper use & guards)	Yes ☐	No ☐	N/A ☐
No safety features by-passed or defeated on any equipment?	Yes ☐	No ☐	N/A ☐
Hazardous Substances			
Anhydrous Ammonia (related requirements and work practices complied with)	Yes ☐	No ☐	N/A ☐
Arsenic (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Asbestos (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Bloodborne Pathogens (Applies to all) (Complying with required procedures)	Yes ☐	No ☐	
DOT Hazardous Materials (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
EPA Hazardous Waste (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Flammable Atmosphere	Yes ☐	No ☐	N/A ☐
Hazard Communication (Applies to all) (MSDS's available)	Yes ☐	No ☐	N/A ☐
Radiation (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Lead and other toxic metals concerns (Complying with required procedures)	Yes ☐	No ☐	N/A ☐
Natural Gas	Yes ☐	No ☐	N/A ☐
Hydrogen Sulfide	Yes ☐	No ☐	N/A ☐
Oxygen Deficient Atmosphere	Yes ☐	No ☐	N/A ☐
Other / Specify:	Yes ☐	No ☐	N/A ☐

Personal Protective Equipment

Low voltage gloves (Class 0, 50-600volts)	Yes ☐	No ☐	N/A ☐
Arc Flash PPE	Yes ☐	No ☐	N/A ☐
Class 2, 600-15kv gloves/sleeves	Yes ☐	No ☐	N/A ☐
Rubber insulated blankets/hoses	Yes ☐	No ☐	N/A ☐
Eye Protection (Required at all times.)	Yes ☐	No ☐	
Directly or Indirectly vented goggles; cutting goggles (Applied as required)	Yes ☐	No ☐	N/A ☐
Welding Hood	Yes ☐	No ☐	N/A ☐
Fall Protection or Prevention (guards, guard rails, body harnesses properly worn, (lanyards and 5400# anchorage, perimeter guarding, static lines and rat lines installed)	Yes ☐	No ☐	N/A ☐
Foot Wear (with steel toes) (Applied as required)	Yes ☐	No ☐	N/A ☐
Foot wear (Electrical Hazard rated at > 50 volts)(Applied as required)	Yes ☐	No ☐	N/A ☐
Gloves (Applied as required)	Yes ☐	No ☐	N/A ☐
Hard Hats (Applies to all)	Yes ☐	No ☐	
Hearing Protection (Applied as required)	Yes ☐	No ☐	N/A ☐
Natural Gas Exposure PPE			
Fire Suit	Yes ☐	No ☐	N/A ☐
Positive Pressure Respirator	Yes ☐	No ☐	N/A ☐
Hood	Yes ☐	No ☐	N/A ☐
Harness	Yes ☐	No ☐	N/A ☐
Lifeline	Yes ☐	No ☐	N/A ☐
Gloves	Yes ☐	No ☐	N/A ☐
PFD (personal flotation device)	Yes ☐	No ☐	N/A ☐
Traffic Vest	Yes ☐	No ☐	N/A ☐
Respiratory Protection (Change schedule, proper storage and disposal)	Yes ☐	No ☐	N/A ☐
Portable ventilation equipment (Air monitoring as required to substantiate)	Yes ☐	No ☐	N/A ☐

Specific Work Requirements

Bulk Chemical Unloading (Proper barricades, communication, PPE, showers)	Yes ☐	No ☐	N/A ☐
Confined Space Entry (Air monitoring, permit-if required, hot work permit, non-entry rescue)	Yes ☐	No ☐	N/A ☐
Permit Required	Yes ☐	No ☐	N/A ☐
CPR First Aid qualified person on site	Yes ☐	No ☐	
Cranes / Powerlines (proper clearances maintained by ASME B30.5 standards)	Yes ☐	No ☐	N/A ☐
DOT Commercial Driver's License (Applied as required)	Yes ☐	No ☐	N/A ☐
Excavation/Trenching and Shoring (sloped and shored, access every 25ft., daily inspections)	Yes ☐	No ☐	N/A ☐
Fire Protection (Hot work, welding, housekeeping, flammable materials & alike) (Oxygen and combustibles separated, containers labeled, fire extinguisher) (Hot work and welding screens, flammable storage cabinets)(Explosive Hazards)	Yes ☐	No ☐	N/A ☐
Gas Operator Qualifications	Yes ☐	No ☐	N/A ☐
Gas Repair Procedures	Yes ☐	No ☐	N/A ☐
Ladders (Proper angles, secured, exceeds landing by 3 ft.)	Yes ☐	No ☐	N/A ☐
Lead work (abatement, personal protection, disposal, control of the area)	Yes ☐	No ☐	N/A ☐
Lifting and Rigging (Slings tagged, softeners as required, area controlled)	Yes ☐	No ☐	N/A ☐
Lighting (proper work area lighting)	Yes ☐	No ☐	N/A ☐
Lockout/Tagout 147/269 (clothing, restricted areas at > 50 volts)	Yes ☐	No ☐	N/A ☐
Marine Standard (Decks clear, equipment stored, life preservers, access/egress)	Yes ☐	No ☐	N/A ☐
Scaffold Competent Builder (Proper access and egress, tagged, inspected prior to each shift)	Yes ☐	No ☐	N/A ☐
Scaffold Competent User (Scaffolds inspected by each user)	Yes ☐	No ☐	N/A ☐
Suspended Scaffolding (Inspected daily or at the start of each shift, torqued J clips)	Yes ☐	No ☐	N/A ☐
Permits (air, water, environmental, asbestos, building, etc)	Yes ☐	No ☐	N/A ☐
Permits (OSHA related: Dig permits, hot work, and alike)(Applied as required)	Yes ☐	No ☐	N/A ☐
Traffic control/Work zone hazards properly marked	Yes ☐	No ☐	N/A ☐
Vehicles (Speed, lights working, seat belts, properly maintained, licenses and certificates as req.)	Yes ☐	No ☐	N/A ☐

Contractor Firm Name:

Employee(s) Name:

Valid Passport(s) presented?

Time:

Specific location:

Detail the specifics of any performance correction cited.
Detail:

What contractor Leadership / Management representative was notified and by whom?

LG&E and KU
Contract Management
Quality Assurance Job Closure Form

At the completion of any project, the contractor's representative must inspect and attest to each of the following and shall return this form to their contract proponent prior to departure for the job site.

Work location _____

Work Description_____
_____
_____

Name of LG&E KU Contract Proponent _____

Question	**YES**	**NO**
Has the technical scope of the work been completed?		
Has the job site been cleaned and returned to original or better condition?		
Have all materials been properly disposed of and documented as required?		
Have all Lockout / Tagout clearances been removed and/or released?		
Have all required statistics been entered into the Contractor Safety Database (i.e. Avetta)?		

REQUIRED DETAIL
If a **"NO"** box is checked, specific details are required for submission of this job closure form. An explanation on each **"NO"** box may be added to reverse side of this form and/or a separate page may be attached.

Name of Contractor Firm_____

Name of Contractor Representative _____

Contractor Representative Phone Number_____

Contractor Signature _____**Date**_____

LG&E KU USE ONLY:
Contract Proponent Comments_____
_____
_____

DocuSign

Certificate Of Completion

Envelope Id: A41DD67338FA4ABD80FCC45C29708FE6
Subject: Please DocuSign:2027 NGCC Feasibility Study
Source Envelope:
Document Pages: 227
Certificate Pages: 5
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-05:00) Eastern Time (US & Canada)

Signatures: 2
Initials: 1

Status: Completed

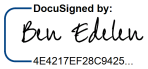
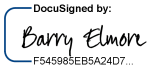
Envelope Originator:
John Jacobs
220 W Main St Ste 1400
Louisville, KY 40202-5301
john.jacobs@lge-ku.com
IP Address: 170.119.138.24

Record Tracking

Status: Original
4/7/2022 4:02:14 PM

Holder: John Jacobs
john.jacobs@lge-ku.com

Location: DocuSign

Signer Events	Signature	Timestamp
Kathleen Reed Kathleen.Reed@lge-ku.com Sr. Contract Administrator LG&E and KU Energy Security Level: Email, Account Authentication (None)	DS  Signature Adoption: Pre-selected Style Signed by link sent to Kathleen.Reed@lge-ku.com Using IP Address: 170.119.138.24	Sent: 4/8/2022 9:34:24 AM Viewed: 4/8/2022 9:50:22 AM Signed: 4/8/2022 9:51:27 AM
Electronic Record and Signature Disclosure: Not Offered via DocuSign		
Ben Edelen Ben.Edelen@hdrinc.com Sr. Vice President HDR Engineering, Inc. Security Level: Email, Account Authentication (None)	DocuSigned by:  4E4217EF28C9425... Signature Adoption: Pre-selected Style Signed by link sent to Ben.Edelen@hdrinc.com Using IP Address: 163.116.129.119	Sent: 4/8/2022 9:51:32 AM Resent: 4/12/2022 2:41:23 PM Viewed: 4/14/2022 2:27:09 PM Signed: 4/14/2022 2:27:21 PM
Electronic Record and Signature Disclosure: Accepted: 4/14/2022 2:27:09 PM ID: c6fc3625-b927-4e3f-a7e7-4cffb1e81066		
Barry Elmore Barry.ELmore@lge-ku.com Manager Contracts/Major Cap. Projects - PE Security Level: Email, Account Authentication (None)	DocuSigned by:  F545985EB5A24D7... Signature Adoption: Pre-selected Style Signed by link sent to Barry.ELmore@lge-ku.com Using IP Address: 170.119.138.24	Sent: 4/14/2022 2:27:26 PM Viewed: 4/14/2022 3:10:00 PM Signed: 4/14/2022 3:17:34 PM
Electronic Record and Signature Disclosure: Accepted: 4/14/2022 3:10:00 PM ID: b028c3e7-d9ec-43d7-bd99-b2569e2ebfa3		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Doug Schetzel Doug.Schetzel@lge-ku.com Director, Project Engineering Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 4/18/2022 8:45:45 AM ID: 1c16286d-041d-48d2-805e-053350977d63	COPIED	Sent: 4/14/2022 3:17:38 PM Viewed: 4/14/2022 3:18:50 PM
Dianne Ware Dianne.Ware@lge-ku.com LG & E-KU Services Company Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via DocuSign	COPIED	Sent: 4/14/2022 3:17:39 PM Viewed: 4/15/2022 7:06:34 AM
Trish Smith Deltricia.Smith@lge-ku.com Coordinator of All Important Things Louisville Gas & Electric Company Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Accepted: 7/26/2018 11:05:41 AM ID: bcb65d98-a872-4587-9f53-c6a9d86801b7	COPIED	Sent: 4/14/2022 3:17:39 PM Viewed: 4/18/2022 8:51:16 AM
Mark Wiitanen Mark.Wiitanen@hdrinc.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via DocuSign	COPIED	Sent: 4/14/2022 3:17:40 PM

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	4/8/2022 9:34:24 AM
Certified Delivered	Security Checked	4/14/2022 3:10:00 PM
Signing Complete	Security Checked	4/14/2022 3:17:34 PM
Completed	Security Checked	4/14/2022 3:17:41 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

Electronic Record and Signature Disclosure created on: 2/16/2018 9:58:29 AM
Parties agreed to: Ben Edelen, Barry Elmore, Doug Schetzel, Trish Smith

CONSUMER DISCLOSURE

From time to time, LG & E-KU Services Company (we, us or Company) may be required by law to provide to you certain written notices or disclosures. Described below are the terms and conditions for providing to you such notices and disclosures electronically through the DocuSign, Inc. (DocuSign) electronic signing system. Please read the information below carefully and thoroughly, and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button at the bottom of this document.

Getting paper copies

At any time, you may request from us a paper copy of any record provided or made available electronically to you by us. You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after signing session and, if you elect to create a DocuSign signer account, you may access them for a limited period of time (usually 30 days) after such documents are first sent to you. After such time, if you wish for us to send you paper copies of any such documents from our office to you, you will be charged a $0.00 per-page fee. You may request delivery of such paper copies from us by following the procedure described below.

Withdrawing your consent

If you decide to receive notices and disclosures from us electronically, you may at any time change your mind and tell us that thereafter you want to receive required notices and disclosures only in paper format. How you must inform us of your decision to receive future notices and disclosure in paper format and withdraw your consent to receive notices and disclosures electronically is described below.

Consequences of changing your mind

If you elect to receive required notices and disclosures only in paper format, it will slow the speed at which we can complete certain steps in transactions with you and delivering services to you because we will need first to send the required notices or disclosures to you in paper format, and then wait until we receive back from you your acknowledgment of your receipt of such paper notices or disclosures. To indicate to us that you are changing your mind, you must withdraw your consent using the DocuSign 'Withdraw Consent' form on the signing page of a DocuSign envelope instead of signing it. This will indicate to us that you have withdrawn your consent to receive required notices and disclosures electronically from us and you will no longer be able to use the DocuSign system to receive required notices and consents electronically from us or to sign electronically documents from us.

All notices and disclosures will be sent to you electronically

Unless you tell us otherwise in accordance with the procedures described herein, we will provide electronically to you through the DocuSign system all required notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to you during the course of our relationship with you. To reduce the chance of you inadvertently not receiving any notice or disclosure, we prefer to provide all of the required notices and disclosures to you by the same method and to the same address that you have given us. Thus, you can receive all the disclosures and notices electronically or in paper format through the paper mail delivery system. If you do not agree with this process, please let us know as described below. Please also see the paragraph immediately above that describes the consequences of your electing not to receive delivery of the notices and disclosures

electronically from us.

How to contact LG & E-KU Services Company:

You may contact us to let us know of your changes as to how we may contact you electronically, to request paper copies of certain information from us, and to withdraw your prior consent to receive notices and disclosures electronically as follows:

To contact us by email send messages to: jacque.english@lge-ku.com

To advise LG & E-KU Services Company of your new e-mail address

To let us know of a change in your e-mail address where we should send notices and disclosures electronically to you, you must send an email message to us at jacque.english@lge-ku.com and in the body of such request you must state: your previous e-mail address, your new e-mail address. We do not require any other information from you to change your email address..

In addition, you must notify DocuSign, Inc. to arrange for your new email address to be reflected in your DocuSign account by following the process for changing e-mail in the DocuSign system.

To request paper copies from LG & E-KU Services Company

To request delivery from us of paper copies of the notices and disclosures previously provided by us to you electronically, you must send us an e-mail to jacque.english@lge-ku.com and in the body of such request you must state your e-mail address, full name, US Postal address, and telephone number. We will bill you for any fees at that time, if any.

To withdraw your consent with LG & E-KU Services Company

To inform us that you no longer want to receive future notices and disclosures in electronic format you may:

i. decline to sign a document from within your DocuSign session, and on the subsequent page, select the check-box indicating you wish to withdraw your consent, or you may;
ii. send us an e-mail to jacque.english@lge-ku.com and in the body of such request you must state your e-mail, full name, US Postal Address, and telephone number. We do not need any other information from you to withdraw consent.. The consequences of your withdrawing consent for online documents will be that transactions may take a longer time to process..

Required hardware and software

Operating Systems:	Windows® 2000, Windows® XP, Windows Vista®; Mac OS® X
Browsers:	Final release versions of Internet Explorer® 6.0 or above (Windows only); Mozilla Firefox 2.0 or above (Windows and Mac); Safari™ 3.0 or above (Mac only)
PDF Reader:	Acrobat® or similar software may be required to view and print PDF files
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	Allow per session cookies

** These minimum requirements are subject to change. If these requirements change, you will be asked to re-accept the disclosure. Pre-release (e.g. beta) versions of operating systems and browsers are not supported.

Acknowledging your access and consent to receive materials electronically

To confirm to us that you can access this information electronically, which will be similar to other electronic notices and disclosures that we will provide to you, please verify that you were able to read this electronic disclosure and that you also were able to print on paper or electronically save this page for your future reference and access or that you were able to e-mail this disclosure and consent to an address where you will be able to print on paper or save it for your future reference and access. Further, if you consent to receiving notices and disclosures exclusively in electronic format on the terms and conditions described above, please let us know by clicking the 'I agree' button below.
By checking the 'I agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC CONSUMER DISCLOSURES document; and

- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference and access; and

- Until or unless I notify LG & E-KU Services Company as described above, I consent to receive from exclusively through electronic means all notices, disclosures, authorizations, acknowledgements, and other documents that are required to be provided or made available to me by LG & E-KU Services Company during the course of my relationship with you.