DUKE ENERGY®



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Rocco O. D'Ascenzo
Associate General Counsel

**VIA OVERNIGHT DELIVERY**

November 22, 2016

Ms. Talina Rose Mathews
Executive Director
Kentucky Public Service Commission
211 Sower Blvd
Frankfort, KY 40602-0615

**Re: Case No. 2016-00349**
**In the Matter of Duke Energy Kentucky, Inc. Alleged Failure to Comply with KRS 278.042**

Dear Ms. Mathews:

Duke Energy Kentucky, Inc. hereby submits its responses to the *Staff's First Set of Information Requests.* In addition, please find Duke Energy Kentucky, Inc.'s Petition for Confidential Treatment. Also enclosed in the white envelope is one (1) copy of the confidential documents being filed under seal. In compliance with 807 KAR 5:001, the original and twelve (12) paper copies have been enclosed.

Please date-stamp the two copies of the letter, the petition and the responses and return to me in the enclosed return envelope.

Respectfully submitted,

Rocco D'Ascenzo (92796)
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Rocco.D'ascenzo@duke-energy.com
*Counsel for Duke Energy Kentucky, Inc.*

cc: Rebecca W. Goodman (w/enclosure)

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PUBLIC SERVICE COMMISSION

**COMMONWEALTH OF KENTUCKY**

**BEFORE THE PUBLIC SERVICE COMMISSION**

| | | |
|---|---|---|
| **In the Matter of:** | ) | |
| | ) | |
| **DUKE ENERGY KENTUCKY, INC.** | ) | **CASE NO. 2016-00349** |
| | ) | |
| | ) | |
| **ALLEGED FAILURE TO COMPLY WITH KRS 278.042** | ) | |
| | ) | |

DUKE ENERGY KENTUCKY, INC.'S
PETITION FOR THE CONFIDENTIAL TREATMENT OF CERTAIN INFORMATION CONTAINED IN ITS RESPONSES TO STAFF'S FIRST SET OF INFORMATION REQUESTS

Duke Energy Kentucky, Inc. (Duke Energy Kentucky or Company), pursuant to 807 KAR 5:001, Section 13, respectfully requests the Commission to classify and protect certain information provided by Duke Energy Kentucky filed in response to STAFF-IR-01-001. The information contained in STAFF-IR-01-001 Attachments 1 and 2 (Attachments), for which Duke Energy Kentucky now seeks confidential treatment (Confidential Information), contains confidential and proprietary information including internal work processes and safety performance measures for multiple jurisdictions within the Duke Energy Corp organization. The information contains Duke Energy Kentucky's analysis of the incident and the corrective actions discussed, preliminary recommendations, and processes to implement changes to work processes. The information contains identification of Company employees involved in the investigation including contact information as well as discusses non-jurisdictional safety initiatives and risk analysis.

In support of this Petition, Duke Energy Kentucky states:

1. The Kentucky Open Records Act exempts from disclosure certain commercial information. KRS 61.878(1)(c). To qualify for this exemption and, therefore, maintain the confidentiality of the information, a party must establish that disclosure of the confidential information would permit an unfair advantage to competitors of that party. Public disclosure of the information identified herein would, in fact, prompt such a result for the reasons set forth below.

2. The information submitted and for which the Company is seeking confidential protection was developed internally by Duke Energy Corp and Duke Energy Kentucky personnel, is not on file with any public agency, and is not available from any commercial or other source outside Duke Energy Corp and Duke Energy Kentucky. The aforementioned information is distributed within Duke Energy Corp only to those employees who must have access for business reasons, and is generally recognized as confidential and proprietary in the energy industry. The analysis, recommendations, root cause risk assessments are not known outside the Company and releasing this information could have a negative impact on the Company's ability to implement the corrective measures identified, particularly if persons participating in the analysis are identified.

3. Duke Energy Kentucky does not object to limited disclosure of the Confidential Information described herein, pursuant to an acceptable protective agreement, with the Attorney General or other intervenors with a legitimate interest in reviewing the same for the purpose of participating in this case.

4. This information was, and remains, integral to Duke Energy Kentucky's effective execution of business decisions. And such information is generally regarded as confidential or proprietary. Indeed, as the Kentucky Supreme Court has found, "information concerning the

inner workings of a corporation is 'generally accepted as confidential or proprietary.'" *Hoy v. Kentucky Industrial Revitalization Authority*, 904 S.W.2d 766, 768 (Ky. 1995).

5. In accordance with the provisions of 807 KAR 5:001, Section 13(3), the Company is filing one copy of the Confidential Information separately under seal, and one copy without the Confidential Information included.

6. Duke Energy Kentucky respectfully requests that the Confidential Information be withheld from public disclosure for a period of ten years. This will assure that the Confidential Information – if disclosed after that time – will no longer be commercially sensitive so as to likely impair the interests of the Company or its customers if publicly disclosed.

7. To the extent the Confidential Information becomes generally available to the public, whether through filings required by other agencies or otherwise, Duke Energy Kentucky will notify the Commission and have its confidential status removed, pursuant to 807 KAR 5:001 Section 13(10)(a).

WHEREFORE, Duke Energy Kentucky, Inc., respectfully requests that the Commission classify and protect as confidential the specific information described herein.

Respectfully submitted,

DUKE ENERGY KENTUCKY, INC.

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Amy B. Spiller (85309)
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## CERTIFICATE OF SERVICE

This is to certify that a copy of the foregoing Response has been served via overnight delivery to the following party on this 22nd day of November, 2016.

Office of the Attorney General
Rebecca W. Goodman
1024 Capital Center Drive, Suite 200
Frankfort, Kentucky 40601

Rocco O. D'Ascenzo

## VERIFICATION

**STATE OF NORTH CAROLINA** )
) **SS:**
**COUNTY OF MECKLENBURG** )

The undersigned, Kerim Lamar Powell, General Manager, Transmission Operations Services, being duly sworn, deposes and says that he has personal knowledge of the matters set forth in the foregoing information requests, and that the answers contained therein are true and correct to the best of his knowledge, information and belief.

Kerim Lamar Powell, Affiant

Subscribed and sworn to before me by Kerim Lamar Powell on this 22nd day of November, 2016.

SARAH A. BLAZEWICZ
Notary Public
Wake County
My Commission Expires
10/22/2021
NORTH CAROLINA

NOTARY PUBLIC

My Commission Expires: 10/22/2021

# KYPSC CASE NO. 2016-00349
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**Duke Energy Kentucky**
**Case No. 2016-00349**
**Staff First Set of Information Requests**
**Date Received: November 15, 2016**

**PUBLIC STAFF-IR-01-001**
**(As to Attachments Only)**

**REQUEST:**

Produce the Root Cause Analysis (RCA) Close-Out documentation for the incident.

**RESPONSE:**

**CONFIDENTIAL PROPRIETARY TRADE SECRET (As to Attachments Only)**

Please see STAFF-IR-01-001 Confidential Attachments 1 and 2 submitted under seal and pursuant to a motion for confidential treatment.

**PERSON RESPONSIBLE:** Kerry Powell

# STAFF-IR-01-001 CONF ATTACHMENT

# AND

# STAFF-IR-01-002 CONF ATTACHMENT

# FILED UNDER CONFIDENTIAL SEAL

**Duke Energy Kentucky**
**Case No. 2016-00349**
**Staff First Set of Information Requests**
**Date Received: November 15, 2016**

**STAFF-IR-01-002**

**REQUEST:**

Produce the Duke Energy Operational Excellence Documentation described during the informal conference.

**RESPONSE:**

See STAFF-IR-01-002 Attachment.

**PERSON RESPONSIBLE:** Kerry Powell


# Duke Energy Operational Excellence Framework

# Duke Energy Operational Excellence Framework

**From the Chief Operating Officer**

Duke Energy has a commitment to achieve the highest standards of safety, optimized reliability, and sustainable efficiency - to accomplish Operational Excellence. Operational Excellence is an essential contributor to Duke Energy's sustainable performance and growth, and is the key driver for our enterprise strategy, 'The Road Ahead'.

Establishing a common framework will contribute to our alignment and accelerate the journey to Operational Excellence. The Operational Excellence Framework is the foundation for our commitment to managing safety and reliability risk, while achieving sustained efficiency. Application of the Framework within Duke Energy will align our leadership and employees, and will establish the necessary systems and practices. The Framework is scalable by each business unit--meaning that the scope, priority, and pace of management system implementation will be consistent with the risks associated with the business. Implementation of these consistent elements will help guide Duke Energy towards our vision of a workplace where the safety of our employees, our community, and our environment is protected, where resources are allocated to reach optimal reliability, and where efficient processes are sustained.

The tools, systems, and processes described in this Framework will be most effective with focused leadership and oversight on the right priorities and when our employees are accountable and fully engaged in event -free operations. In response to significant operational issues in recent years, we must continue to learn and implement key principles which support Operational Excellence.

We must maintain our focus on the basics of event-free operations. We set and maintain high standards, own our mistakes, hold ourselves accountable for finding and addressing the root causes of issues, and commit to improving the way we conduct our business. We understand the dangers of complacency and the risk factors that threaten to undermine our commitment to Operational Excellence.

Our leadership must constantly look with fresh intrusive perspectives at operations, challenge assumptions, and uncover any blind spots. Managers and supervisors must observe operations directly, with personal accountability, active caring, and hazard recognition, to be able to answer the question "How do we know?". Effective oversight must ensure verification of critical or potentially hazardous activities to minimize operational risk.

# Duke Energy Operational Excellence Framework

I expect every leader within Duke Energy to:

- Personally model behaviors that demonstrate operational discipline
- Ensure intrusive oversight at all levels
- Engage employees and remove barriers that impact their effectiveness
- Recognize, highlight, and reward examples of good behaviors

Our leadership must also demonstrate a strong desire to identify and pursue performance gaps. Like water in a system that will find a leak path, events will find the gaps in our operation. Managers and supervisors must be diligent in finding the opening within their organization that can lead to an event - and when they find it, they must seal the gap. That work is never done - we must always be searching for any weakness and strengthening our performance.

Leaders at all levels must be relentless on the most significant issues, evaluating the outcomes achieved by their organization. They must not be blinded by activity, but instead constantly challenge themselves and our employees - and question if the actions that we take are leading to the necessary results and improvements. Leaders must constantly consider if the goals and objectives that have been set are driving superior operational results, and recognize when goals and objectives must be changed to focus on new issues or risks. These challenges should be routinely applied during management meetings and other interactions to drive performance and results.

Duke Energy will be defined and set apart by the actions we take that drive safe, reliable, efficient operations. This will be reflected in our commitment to event-free operations, and to our stakeholders. We must maintain the highest standards within our operations, with quality processes and job plans, consistent procedural compliance and effective oversight of contractors and vendors. We must sustain organizational learning and work for continuous improvement in our operations, learning from our mistakes and from industry experience. Aspiring to be the best, understanding the public's expectations of our changing business, building margins to avoid risk, and sustaining employee engagement are all essential to Operational Excellence.

# Duke Energy Operational Excellence Framework

## Purpose

The purpose of this document is to define the Duke Energy Operational Excellence Framework and to outline elements required for success.

## Overview of Operational Excellence

The Duke Energy Operational Excellence Framework is a foundation of our commitment to manage safety and reliability risk while achieving sustained, efficient performance. It is one of the four priorities of 'The Road Ahead' to power the lives of our customers and the vitality of our communities.

An overview of the Duke Energy Operational Excellence Model is provided in Attachment 1, Operational Excellence Model.

- Achieving Operational Excellence is a combination of Operational Discipline and Results.
- The Duke Energy Operational Excellence Model demonstrates how leadership and employee accountability - The Duke Energy Way - supports the management systems, continuous improvement, and employee enablement necessary to achieve Operational Excellence.
- Operational Excellence outcomes are demonstrated by a four-quadrant graph that illustrates the types of organizational behaviors that would be observed with varying degrees of Operational Discipline and Results.

## Definitions

**Operational Discipline:** The act of performing the right task, the right way, every time; which is achieved through leaders who set clear expectations of performance and a workforce that is personally accountable to achieve the desired results.

**Operational Excellence:** The organizational alignment, behaviors, and processes to achieve the highest standards in safety, optimized reliability, and sustainable efficiency.

**Operational Excellence Framework:** The guidance document for the enterprise. It outlines the hierarchy of attributes and elements that defines how Duke Energy will execute Operational Discipline and achieve Results.

**Operational Excellence Attributes:** The major areas that establish the Operational Excellence Framework.

**Operational Excellence Elements:** Individual programs or behaviors to fully implement each of the Operational Excellence Attributes.

**Results:** The performance outcomes produced by each organization.

# Duke Energy Operational Excellence Framework

## Operational Excellence Framework

The Operational Excellence Framework is the approved Duke Energy model for achieving and sustaining Operational Excellence.

The Operational Excellence Framework consists of the following four overarching Operational Excellence *Attributes*, supported by fourteen Operational Excellence *Elements* to fully implement the Duke Energy Operational Excellence Framework.

I. **High Level of Accountability for Leadership and the Workforce** - Leaders and individuals achieve results in alignment with Duke Energy standards, values, and the Duke Energy Accountability Model.

1. Defined Accountability Model (Duke Energy Standard)
2. Competency Framework (Duke Energy Standard)

II. **Management Systems** - The governance structure and standard processes used by each organization to implement Operational Excellence objectives.

3. Defined Objectives and Associated Action Plans
4. Risk Identification and Mitigation
5. Work Standards and Expectations
6. Performance Oversight

III. **Continuous Improvement** - The methods and tools used by each organization to create programs and a culture for continuous improvement to achieve Operational Excellence.

7. Observation Program
8. Corrective Action Program
9. Assessment Program
10. Benchmarking Program
11. Lessons Learned Program

IV. **Employee Enablement** - The enablers for the entire organization (including employees, contract workers, and vendors) to develop the correct behaviors, culture, and skills to achieve Operational Excellence.

12. Human Performance Program
13. Training and Capability
14. Recognition

# Duke Energy Operational Excellence Framework

## Responsibilities

### Senior Leadership Team

1. Provide oversight of the implementation of the Operational Excellence Framework for their respective organizations.

2. Support cross-organization reviews to provide feedback and hold other members of the Senior Leadership Team accountable to the Operational Excellence Attributes.

3. Ensure Managers and Supervisors within the implementing organizations are held accountable to the Operational Excellence Attributes.

### Managers and Supervisors

1. Execute the requirements for each Operational Excellence Element.

2. Drive Operational Discipline and hold the workforce accountable for results.

### Individuals

1. Support and effectively implement Operational Excellence behaviors.

2. Embrace Operational Discipline, hold self, and peers accountable.

# Duke Energy Operational Excellence Framework

## Operational Excellence Elements

Operational Excellence Elements expand on the Operational Excellence Attributes, to establish standards and ensure consistency across the enterprise.

- The Requirements established for each element are intended to be applied at a level commensurate with the needs of the implementing organization. For example, some organizations may need a complex causal evaluation process to meet regulatory requirements, while other organizations may apply a more streamlined format, as long as it supplies sufficient information to address the problems and establish corrective actions.
- Organizations should also vary the depth and rigor of element Requirements over time, as organizations mature or operational objectives change. For example, if there is an increase in near miss incidents, an organization should adjust the frequency or breadth of observations in order to gain insight to the problem at hand. Similarly, if performance in an area exceeds expectations on an ongoing basis, performance oversight meetings could be refocused to another area.

Each Operational Excellence Element includes desired outcomes, which describe expected performance and necessary improvements related to safety, reliability, and efficiency.

- **Safety** desired outcomes address aspects of safety (e.g., personal, radiological, or environmental) and event free operations.
- **Reliability** desired outcomes address the reliability of programs, processes, plant operations, and service to customers.
- **Efficiency** desired outcomes address the determination of programmatic or organizational efficiencies ensuring cost effective operations.

Each Operational Excellence Element provides the following information:

- **Element Description** - A description of the Operational Excellence Element that provides a clear definition that can be applied to all organizations.
- **Example Desired Outcomes** - A description of results that are expected related to safety, reliability, and efficiency through implementation of the Operational Excellence Element.
  - Examples of desired outcomes are listed in Attachment 2, Operational Excellence Elements.
  - Each organization is expected to develop specific desired outcomes for safety, reliability, and efficiency.
  - There may be some desired outcomes that are part of broader operational objectives and are implicit in the element requirements and do not need to be re-stated.
  - Each organization should carefully consider the desired outcomes to accomplish current business plans and performance gaps and implement Operational Excellence elements to accomplish the desired outcomes.

# Duke Energy Operational Excellence Framework

- **Requirements** - A description of the minimum requirements to satisfactorily implement the Operational Excellence Element. These are intended to be non-negotiable and shall be included by the implementing organizations. Requirement shall:
  - Be formally documented and communicated to the organization.
  - Include a description of assessment, performance measures, or other means of determining element effectiveness.
- **Options** - A description of options that would reflect industry best practices and are recommended to support specific organizational objectives.

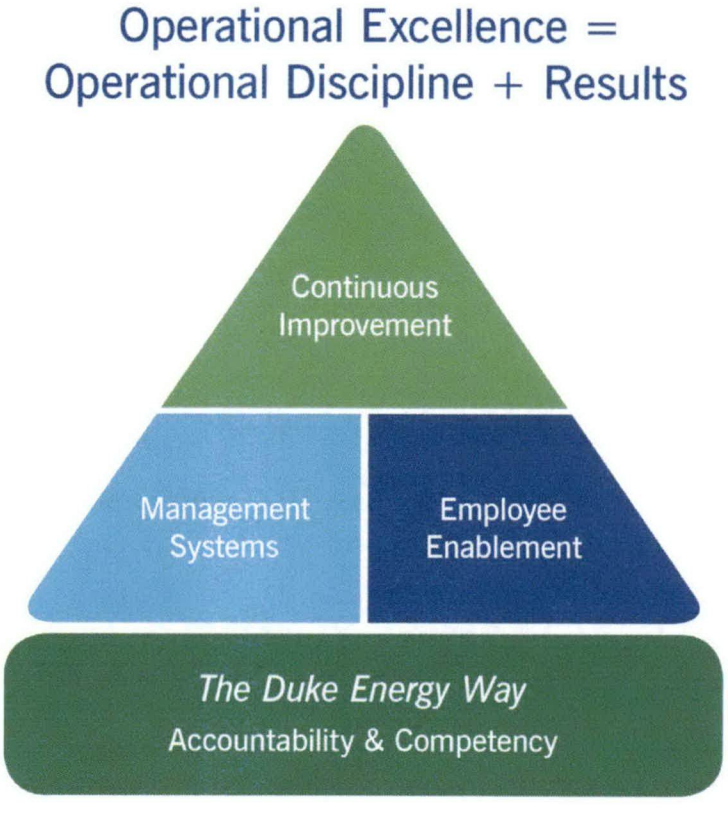
Refer to Attachment 2, Operational Excellence Elements, for the details of each defined Operational Excellence Element in the Operational Excellence Framework.

# Duke Energy Operational Excellence Framework

**Attachment 1 - Operational Excellence Model**
**(Page 1 of 2)**

The Operational Excellence Framework may be pictured as a pyramid with the Duke Energy Competency Framework and Accountability Model as the base, supporting Management Systems, Continuous Improvement, and Employee Enablement.

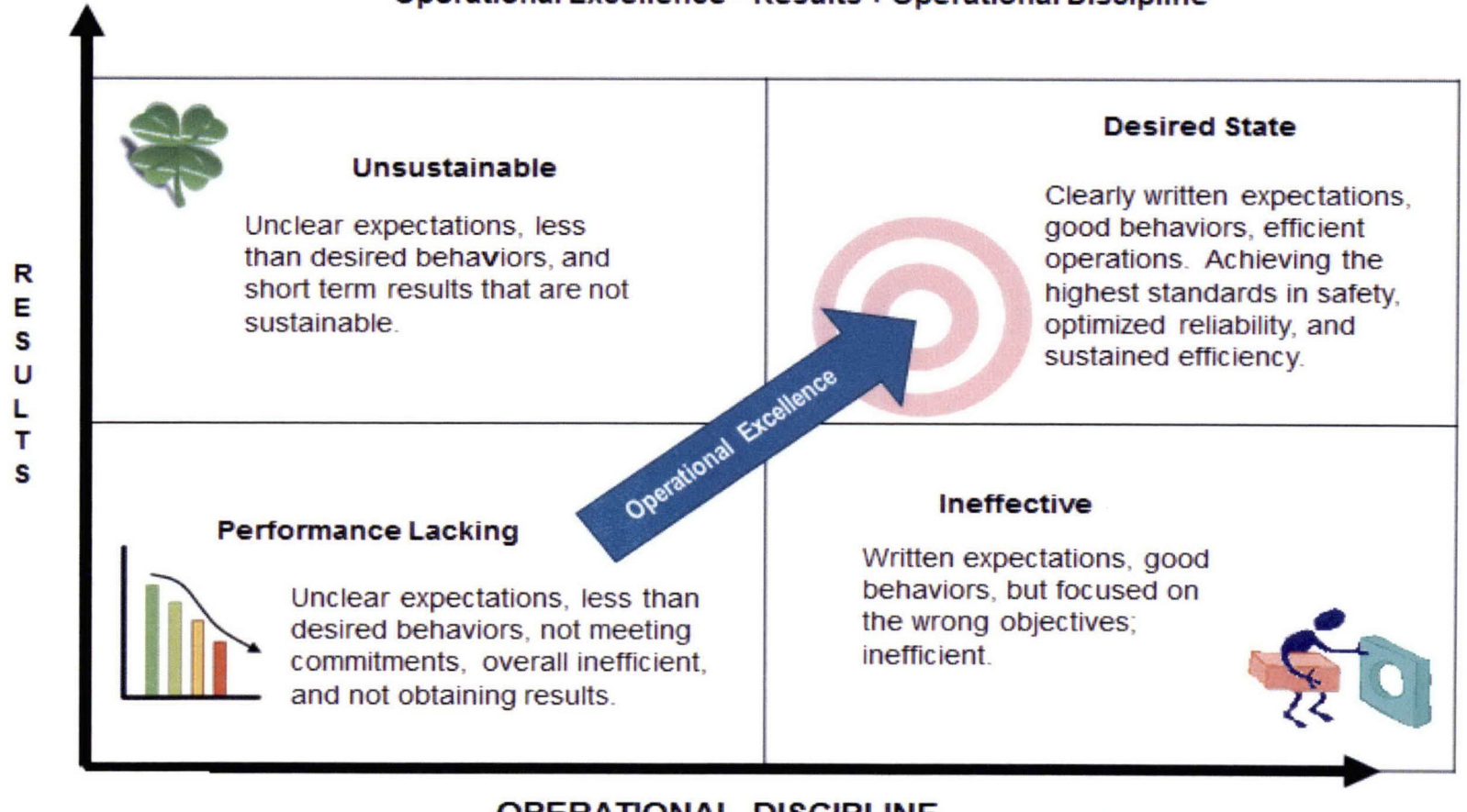
**Operational Excellence = Results + Operational Discipline**



# Duke Energy Operational Excellence Framework

**Attachment 1 – Operational Excellence Model**
**(Page 2 of 2)**

**Operational Excellence = Results + Operational Discipline**



# Duke Energy Operational Excellence Framework

## Attachment 2 - Operational Excellence Elements (Page 1 of 14)

**ATTRIBUTE:** HIGH LEVEL OF ACCOUNTABILITY FOR LEADERSHIP AND THE WORKFORCE

**ELEMENT #1:** DEFINED ACCOUNTABILITY MODEL (DUKE ENERGY STANDARD)

### Element Description

The Duke Energy Accountability Model demonstrates that personal accountability of each employee is at the core of Operational Excellence, enabled by leadership and the overall organization, to deliver a continuous cycle of improvement (Plan-Do-Check-Adjust).


### Example Desired Outcomes

- **Safety Outcome** - Demonstrated integration of the Accountability Model in safety improvement plans.
- **Reliability Outcome** - Leaders and individuals identify and take action on equipment trends.
- **Efficiency Outcome** - Individuals are accountable to identify efficiencies in work processes.

### Requirements

To meet the minimum requirements for Operational Excellence, the Duke Energy Accountability Model must be:

- Communicated throughout the organization.
- Included in business unit operating models.
- Included in new employee and leadership training.

### Options

Additional options listed below are not required to meet the minimum standards for the Accountability element. These are recommended element options to support specific organizational objectives.

- Expansion or cascading of the Accountability Model steps to fit organizational priorities or activities.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 2 of 14)**

**ATTRIBUTE:** HIGH LEVEL OF ACCOUNTABILITY FOR LEADERSHIP AND THE WORKFORCE

**ELEMENT #2:** COMPETENCY FRAMEWORK (DUKE ENERGY STANDARD)

**Element Description**

Competencies are clusters of knowledge, abilities, and personal characteristics required for successful individual performance. These competencies serve to integrate Duke Energy's Talent Management processes and systems including talent acquisition, performance management, succession planning, and leadership development. The competencies are standard for the enterprise, and are maintained by Talent Development.

While all the competencies are important, Operational Discipline is critical to Operational Excellence. As such, the development of this competency must be high priority for all employees in operational roles.

| Competency | Description |
|---|---|
| Strategy and Planning | **Supports Work Group Plans** - Provides insights and input into work group planning and understands how individual role supports work group plans. |
| Business Acumen | **Displays Business Awareness** - Demonstrates knowledge of business operations and how personal actions impact the bottom line. |
| Customer Focus | **Engage Customers** - Keeps voice of the customer front and center and builds positive customer relations. |
| Innovation and Change | **Embrace Innovation and Change** - Identifies opportunities to improve work group products, services and processes; embraces change and new ways of working. |
| Collaboration | **Collaborates** - Builds effective working relationships across organizational boundaries; shares information and resources to achieve common goals. |
| Engaging and Developing Employees | **Engage and Develop Employees** - Engages and coaches others to higher levels of commitment and contribution (Management). |
| Communicating with Impact | **Communicates with Impact** - Engages other to build trust and gain support, commitment, and buy-in through effective communications and interactions. |
| Decision Making | **Recommends Solutions** - Recognizes issues and opportunities and takes appropriate action to recommend timely solutions. |
| Operational Discipline | **Deliver Results** - Delivers results that are consistent, repeatable, and reliable and support an environment of high accountability. |
| Learning and Agility | **Demonstrate Learning and Agility** - Learns from experience, agile in adapting to new and different situations; actively pursues personal development and career goals. |
| Personal Accountability | **Personal Accountability** - Demonstrates visible commitment to our core values and highest ethical standards and accepts personal responsibility for decisions and behavior. |

**Requirements**

To meet the minimum requirements for Operational Excellence, the Duke Energy Competencies must be:

- Communicated throughout the organization and included in new employee and leadership training.
- Utilized for employee performance management and developmental planning.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 3 of 14)**

**ATTRIBUTE:** MANAGEMENT SYSTEMS

**ELEMENT #3:** DEFINED OBJECTIVES AND ACTION PLANS

**Element Description**

Organizations must have clearly stated goals and expected outcomes to drive the organization towards Operational Excellence. These goals and outcomes are linked to the organization's business planning process and begin with a clear vision of success. Performance gaps have action plans developed, implemented, monitored, and assessed for effectiveness.

**Example Desired Outcomes**

- **Safety Outcome** - Highly visible and demanding safety objectives.
- **Reliability Outcome** - Reliability goals and action plans aligned to the mission of the asset.
- **Efficiency Outcome** - Clearly defined cost reduction, efficiency targets.

**Requirements**

To meet the minimum requirements for Operational Excellence, Defined Objectives and Associated Action Plans must include the following:

- Documented and communicated objectives, outcomes, and goals.
- Performance measures and targets with ranges of acceptable performance.
- Action plans include clearly stated actions, assigned owners, and expected dates for completion.
- Action plans are evaluated to ensure desired results are being achieved and adjusted if performance is off-track, or if business conditions change.

**Options**

Additional options listed below are not required to meet the minimum standards for the Defined Objectives and Action Plans element. These are recommended options to support specific organizational objectives.

- Establish key performance indicators with linkage to actionable information tied to higher-level performance objectives.
- Communicate plan progress through use of dashboards and standard reports.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 4 of 14)**

**ATTRIBUTE:** MANAGEMENT SYSTEMS

**ELEMENT #4:** RISK IDENTIFICATION AND MITIGATION

**Element Description**

Risk identification and mitigation is a continuous process to address threats to operations. The process includes recognition of risks in activities affecting our employees, community, shareholders, and regulatory compliance. Assessment and development of preventative and compensatory strategies allows Duke Energy to avoid an identified risk or minimize the consequences.

**Example Desired Outcomes**

- **Safety Outcome** - Oil spills to the environment are prevented through the use of secondary containments.
- **Reliability Outcome** - Projects are prioritized based on methodical approach, such as equipment risk grids.
- **Efficiency Outcome** - Early indication of potential project over-runs are escalated.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Risk Identification and Mitigation process must include the following:

- Identification and prioritization of risks impacting the highest standards in safety, optimized reliability, and sustained efficiency.
- Escalation process by which risks are raised to management via the risk identification and mitigation business planning process.
- Development of prevention and mitigation strategies including recovery from a realized risk.

**Options**

Additional options listed below are not required to meet the minimum standards for the Risk Identification and Mitigation element. These are recommended element options to support specific organizational objectives.

- Training for employees and leaders to develop risk identification capabilities and management response to risk escalation.
- Alignment with Assessment, Lessons Learned, and Observation Programs.
- Documentation of decision basis for the disposition of identified risks.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 5 of 14)**

**ATTRIBUTE:** MANAGEMENT SYSTEMS

**ELEMENT #5:** WORK STANDARDS AND EXPECTATIONS

**Element Description**

Work standards and setting clear standards of use are the foundation to Operational Excellence. Well-designed and effectively implemented standards are necessary to deliver desired results.

The design and rigor of each standard should be based on the risks associated with the implementing organization's unique operations. A complex operation with many possible hazards or an operation in a sensitive environment will have more rigorous standards in place than a less complex operation in a safer location. The implementing organization is accountable for setting standards of rigor.

**Example Desired Outcomes**

- **Safety Outcome** - A complete and clearly written safety handbook.
- **Reliability Outcome** - Work standards for equipment maintenance that support process repeatability.
- **Efficiency Outcome** - Identified efficiencies are incorporated into work standards and expectations to institutionalize identified improvements.

**Requirements**

To meet the minimum requirements for Operational Excellence, Work Standards and Expectations must include the following:

- Determine which activities should have a formally documented and accessible work standard.
- Clearly communicate to the organization which tasks are formally documented and expectations for compliance.
- Process for revising work standards and expectations when improvement opportunities are necessary.

**Options**

Additional options listed below are not required to meet the minimum standards for the Work Standards and Expectations element. These are recommended element options to support specific organizational objectives.

- Integration of the work standards and expectations with the Observation and Assessment Program elements.
- All standards are assessed periodically and the highest priority standards are assessed on a more frequent basis.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 6 of 14)**

**ATTRIBUTE:** MANAGEMENT SYSTEMS

**ELEMENT #6:** PERFORMANCE OVERSIGHT

**Element Description**

The process by organizational leadership to determine performance results compared to documented business plans, objectives, and standards. Oversight includes use of defined measures, and reports to ensure periodic review of performance to ensure business objectives are being achieved. Oversight methods include inspections, assessments, review meetings as well as direct evaluation of all aspects of business performance. Leaders set priorities and ensure focus on the select few, mission critical aspects of operations.

**Example Desired Outcomes**

- **Safety Outcome** - Negative safety trends are addressed with intense and urgent mitigation (such as Cardinal Electric Safety Rules, Lockout-Tagout improvement efforts)
- **Reliability Outcome** - Plant health committee reviews performance data and condition assessments.
- **Efficiency Outcome** - Financial oversight process provides early identification of budgetary pressure points.

**Requirements**

To meet the minimum requirements for Operational Excellence, Performance Oversight must include the following:

- Complete and transparent reporting by implementing organizations.
- Scheduled, periodic review of action plans to close performance gaps.
- Defined methods and frequency of organizational performance reviews.
- Regular and in depth observation of operations by senior leaders.
- Leaders follow up on key action items and ensure results.

**Options**

Additional options listed below are not required to meet the minimum standards for the Performance Oversight element. These are recommended element options to support specific organizational objectives.

- Defined business plan corrective actions for adjusting plans, objectives, programs, and projects.
- Defined apparent and root cause parameters and methods for significant performance gaps.
- Performance oversight process that cascades to other management levels.
- Standardized scorecards and dashboards that are shared and used within the organization.
- Performance oversight process uses cross-functional reviews.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 7 of 14)**

**ATTRIBUTE:** CONTINUOUS IMPROVEMENT

**ELEMENT #7:** OBSERVATION PROGRAM

**Element Description**

Observations of routine and non-routine work activities with the purpose of improving performance of leaders, teams, or individuals by providing critical feedback and recognizing positive performance when expectations are met or exceeded. Observations should address behaviors and performance; provide feedback; and be documented.

**Example Desired Outcomes**

- **Safety Outcome** - Pre-job briefings are observed on a defined frequency.
- **Reliability Outcome** - Leadership uses field observations and engagement with employees to identify problem equipment.
- **Efficiency Outcome** - Leadership uses field observations and engagement with employees to identify barriers to employee productivity.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Observation Program must include the following:

- Description of the types of observations included, who is required to conduct observations, expected standards for documentation, and expected observation frequency.
- Description of actions to take when improvement opportunities and positive performance are identified.
- Leaders review and provide feedback on completed observations.

**Options**

Additional options listed below are not required to meet the minimum standards for the Observation Program. These are recommended element options to support specific organizational objectives.

- Paired observations including multiple layers of management.
- Peer to Peer observations.
- Peer Leadership (from other organizations) observations.
- Description of methods and frequency for periodic assessment or program review.
- Targeted observations on infrequently performed tasks, critical tasks, or higher risk work.
- Trending and analysis of observation results.
- Use of technology in the program to reduce burden.
- Inclusion of plant and equipment material conditions in observations.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 8 of 14)**

**ATTRIBUTE:** CONTINUOUS IMPROVEMENT

**ELEMENT #8:** CORRECTIVE ACTION PROGRAM

**Element Description**

A process for an organization to systematically identify issues and drive action and accountability to resolve those issues. The program sustains a culture of continuous improvement and ownership of performance outcomes. The program will provide process and guidance for identification, reporting and evaluation of performance issues and require cause evaluations consistent with the significance of the issue. The program enables an organization to learn from its own mistakes to prevent reoccurrence.

**Example Desired Outcomes**

- **Safety Outcome** - Causes of safety issues are evaluated, and corrective actions are established to minimize the probability of recurrence.
- **Reliability Outcome** - Equipment issues are identified and corrected.
- **Efficiency Outcome** - Causes of rework are identified and corrected, leading to reduction of costs.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Corrective Action Program must include the following:

- Identification of gaps, issues, and conditions for resolution.
- A process for characterizing the significance of identified issues and prioritizing for resolution.
- Processes for evaluation of issues and underlying causes. Evaluations should be commensurate with the significance of the event and determine root causes for the most significant events.
- Methods to consider the extent of condition of issues in other processes, systems, and areas of the organization.
- Development of timely and effective corrective actions. Corrective actions to resolve the root cause and prevent recurrence should be implemented for the most significant issues.
- Evaluation of the effectiveness of corrective actions and modification of action plans if corrective actions are not effective.

**Options**

Additional options listed below are not required to meet the minimum standards for the Corrective Action Program. These are recommended element options to support specific organizational objectives.

- Qualified Evaluators - Root Cause and Apparent Cause evaluation skillsets for subject matter experts should be considered to conduct investigations for significant or close call issues.
- Organizational Learning - evaluation of events, conditions, evaluations and trends which enable organizational learning and reduce the likelihood of future events.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 9 of 14)**

**ATTRIBUTE:** CONTINUOUS IMPROVEMENT

**ELEMENT #9:** ASSESSMENT PROGRAM

**Element Description**

Assessments provide information to identify gaps between performance and desired standards. Assessments should provide critical and thoughtful evaluation to avoid unexpected performance gaps and sustain continuous improvement. Desired standards may be requirements established by external stakeholders (regulatory requirements), target standards identified by industry benchmarking, or standards of Operational Excellence necessary to achieve specific performance objectives.

**Example Desired Outcomes**

- **Safety Outcome** - Environmental compliance assessments are performed on a defined frequency.
- **Reliability Outcome** - Seasonal or outage readiness assessments are performed in a timely manner.
- **Efficiency Outcome** - Preventive maintenance work activities are evaluated for necessity and correct frequency.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Assessment Program must meet the following:

- Define when assessments will be performed based on program requirements, performance monitoring, and oversight feedback. These should be commensurate with the risk to the enterprise.
- Assessments should be performed following significant change initiatives, to ensure effectiveness.
- Follow up from assessment findings are prioritized and documented in the Corrective Action Program.

**Options**

Additional options listed below are not required to meet the minimum standards for the Assessment Program. These are recommended element options to support specific organizational objectives.

- Standards for assessments including assessment types, planning and scheduling, participation, documentation of gaps, and tracking.
- Cross-functional evaluation of organizational performance; or inclusion of external assessors.
- Planned and comprehensive functional reviews of specific programs or business activities, such as safety, training, operations.
- Specific and targeted evaluation of risk within assessment methods and planning.
- Training and certification of audit team leaders, auditors, assessment team leaders, and assessors.
- Systematic and cognitive trending of performance measures to gain information from lower consequence issues to identify potential areas for improvement

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 10 of 14)**

**ATTRIBUTE:** CONTINUOUS IMPROVEMENT

**ELEMENT #10:** BENCHMARKING PROGRAM

**Element Description**

Benchmarking provides a comparison of internal performance to external organizations performance to provide a basis for continuous improvement. Benchmarking provides an external perspective to understand best industry performance.

**Example Desired Outcomes**

- **Safety Outcome** - Best practices from other industry peers are used to improve radiological safety results.
- **Reliability Outcome** - Reliability metrics are compared to industry peers.
- **Efficiency Outcome** - Financial and performance results are regularly compared to industry peers to identify gaps.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Benchmarking Program must include the following:

- Process for selection and planning of benchmarking activities.
- Process to document, prioritize, and implement actionable improvements.

**Options**

Additional options listed below are not required to meet the minimum standards for the Benchmarking Program. These are recommended element options to support specific organizational objectives.

- Development of a graded approach to benchmarking (formal and informal).
- Making formal connections to the Assessment and Corrective Action Programs.
- Development of a formal annual benchmarking plan.
- Benchmarking activities are selected based on known performance gaps.
- Industry performance measures are incorporated into benchmarking.
- Methods to determine effectiveness of each benchmarking activity.
- Methods to capture 'reverse benchmarking' (when someone comes to benchmark your organization).
- Maintain a listing of benchmarking sources (who is the industry best).

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 11 of 14)**

**ATTRIBUTE:** CONTINUOUS IMPROVEMENT

**ELEMENT #11:** LESSONS LEARNED PROGRAM

**Element Description**

Provides a standard and integrated program for recording, analyzing, and communication of operating experience. Capturing lessons learned in day-to-day operations should ensure all information is shared in a timely manner. Lessons learned documents serve as a valuable tool for use by others that are assigned similar tasks to describe what went wrong and suggest ways to avoid similar occurrences.

**Example Desired Outcomes**

- **Safety Outcome** - Environmental incidents are evaluated and methods to avoid similar events are well understood throughout the organization.
- **Reliability Outcome** - Equipment failure causes are considered for broader applicability to reduce likelihood of failures within similar systems.
- **Efficiency Outcome** - Waste or cost reduction strategies are shared widely, with the expectation for implementation by others.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Lessons Learned Program must include the following:

- Leadership and employees openly share lessons learned, both from deficiencies, and from 'good catches,' to benefit the entire organization.
- Lessons learned from significant events result in follow up actions and are entered into the Corrective Action Program.

**Options**

Additional options listed below are not required to meet the minimum standards for the Lessons Learned Program. These are recommended element options to support specific organizational objectives.

- Lessons Learned are easily and readily available for use by others.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 12 of 14)**

**ATTRIBUTE:** EMPLOYEE ENABLEMENT

**ELEMENT #12:** HUMAN PERFORMANCE PROGRAM

**Element Description**

Humans are fallible and will inevitably make errors, but events are always preventable. To achieve operational excellence, human performance principles and behaviors are used to prevent, detect, and correct errors, thereby preventing events.

**Example Desired Outcomes**

- **Safety Outcome** - Employees are provided tools to minimize risk of human error that could lead to an accident.
- **Reliability Outcome** - Proper verification techniques are used on critical tasks that could threaten reliable operation.
- **Efficiency Outcome** - Error reduction tools are utilized to prevent rework.

**Requirements**

To meet the minimum requirements for Operational Excellence, the Human Performance Program must include the following:

- Tools and desired behaviors are integrated into work processes, creating barriers that prevent errors from becoming events.
- Leaders and individuals reinforce and encourage behaviors, which contribute to event free operations.

**Options**

Additional options listed below are not required to meet the minimum standards for the Human Performance Program. These are recommended element options to support specific organizational objectives.

- Use of measures to evaluate human performance: counts, clocks, or indexes.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 13 of 14)**

**ATTRIBUTE:** EMPLOYEE ENABLEMENT

**ELEMENT #13:** TRAINING AND CAPABILITY

**Element Description**

Workforce effectiveness is supported by a training program to set the foundation of Operational Excellence knowledge for leadership and employees. An established training program enhances the capabilities of the employees to set the path of desired behaviors and to meet the standards for Operational Excellence.

**Example Desired Outcomes**

- **Safety Outcome** - Employees are provided periodic environmental awareness training.
- **Reliability Outcome** - New equipment training is provided in a timely manner.
- **Efficiency Outcome** - Training is assessed for applicability, and then targeted to specific functional needs of the organization.

**Requirements**

To meet the minimum requirements for Operational Excellence, Training and Capability must include the following:

- Training is identified and aligned to the targeted skills, behaviors, and technical competencies.
- Individual performance reviews and development plans address skill and knowledge gaps.

**Options**

Additional options listed below are not required to meet the minimum standards for the Training and Capabilities element. These are recommended element options to support specific organization objectives.

- Training matrix that identifies pertinent information to the training such as course codes, training frequency, delivery method, duration, and targeted audience.
- Establishment of a mentoring program.
- Learning methodologies outside of traditional (ILT/CBT) course execution (books on CD) available.
- Methods to determine training effectiveness.
- Governance to evaluate the effectiveness of training program.

# Duke Energy Operational Excellence Framework

**Attachment 2 - Operational Excellence Elements (Page 14 of 14)**

**ATTRRIBUTE:** EMPLOYEE ENABLEMENT

**ELEMENT #14:** RECOGNITION

**Element Description**

A tool to sustain employee engagement and Operational Discipline. Recognition of individual employee actions, team successes, and organizational achievements provide reinforcement of Operational Excellence attributes and contributes to workforce understanding of the desired outcomes.

**Example Desired Outcomes**

- **Safety Outcome** - Outstanding individual event free behaviors are rewarded publicly on a defined frequency.
- **Reliability Outcome** - SAIDI and SAIFI performance goal achievements are celebrated.
- **Efficiency Outcome** - Waste or cost reduction ideas are solicited, rewarded, and followed to fruition.

**Requirements**

To meet the minimum requirements for Operational Excellence, employee Recognition processes must include the following:

- Expectations for leaders to recognize positive behaviors and results.
- Method to consistently communicate employee recognition opportunities.

**Options**

Additional options listed below are not required to meet the minimum standards for the employee Recognition element. These are recommended element options to support specific organizational objectives.

- Employee awards for specific accomplishments.
- Standard recognition levels and communication process.
- Coordinated and regular communication standards on scheduled intervals.

**Duke Energy Kentucky**
**Case No. 2016-00349**
**Staff First Set of Information Requests**
**Date Received: November 15, 2016**

**STAFF-IR-01-003**

**REQUEST:**

Produce the Cardinal Electric Safety Rules (CESR) Overview documentation described during the Informal Conference.

**RESPONSE:**

See STAFF-IR-01-003 Attachment.

**PERSON RESPONSIBLE:** Kerry Powell

# A message from Buddy Rogers and Nelson Peeler - Attention Needed: Commitment to Improve Our Electrical Safety

11/16/2015

Leaders of Transmission, Delivery Operations, and Health and Safety met recently to review the significant number of electrical flash/contact events that involved Duke Energy employees and contractors over the last fifteen months. During that period, 54 electrical flash/contact events were documented and 18 members of our Duke Energy family were seriously or fatally injured.

Effective immediately, our Transmission team is joining Delivery Operations and Health and Safety to take steps to address this unacceptable trend with the implementation of our cardinal electrical safety rules (CESR) campaign. This electrical safety campaign focuses on three primary barriers that we must observe:

- Personal Protective Equipment (PPE)
- Grounding / Zero Energy Check / Tagging
- Cover-up / Insulate and Isolate

These barriers are non-negotiable, and when applied with the right discipline, will keep our team safe.

**Next steps**

The foundation previously established by our Human Performance (HP) Steering Team and the Safety Steering Committee has positioned Transmission well for this targeted approach to improving electrical safety. In September, the HP Steering Team launched our Island Hopping initiative, which has yielded positive returns in its early stages. This assessment effort will continue its observations on pre-job briefs, but attention will now be directed to observations of the three electrical safety focus areas.

In addition, our regional and local safety meetings will incorporate an emphasis on PPE, grounding / zero energy check / tagging, and cover-up / insulate and isolate. We are going to reinforce one standard for protection in Transmission, and through the course of observations, constructive feedback and communication, we will identify gaps and strengthen our performance. Additional details about our emphasis on electrical safety improvement will be shared as they become available.

As Michael Lewis recently communicated, safety and operational excellence are core values to our ONETransmission team – they are non-negotiable and will not be compromised. Safety always comes first, and our approach to every assignment must be to *Just Do It Safer*. Please take the appropriate steps to ensure your personal safety, actively care for one another and use our HP tools in your tasks each day.

Thank you for your commitment to helping our Transmission team achieve and sustain the highest standards for safety, human performance and operational excellence.

Nelson Peeler
Chair – Transmission Human Performance Steering Team

Buddy Rogers
Executive Sponsor – Transmission Safety Steering Committee

# A message from Nelson Peeler and Buddy Rogers - Transmission CESR Update

9/14/2016

Last year, we announced the creation of the Cardinal Electrical Safety Rules (CESR) campaign as the way to eradicate electrical contacts and flash events for our employees and contractors. Since its inception, Transmission, in partnership with Delivery Operations and Health and Safety, has made a focused commitment to this work and effectively implemented many improvements to our operations. CESR is the top priority for Transmission, and we have accomplished a great deal so far this year.

**Transmission CESR Accomplishments**

- Introduced the Leadership Accountability Model to ensure managers and supervisors are engaged and sharing information with their teams
- Implemented three updated CESR-related work methods (1.5 Pre-job Briefs, 5.21 Energized Testing Greater Than 600 Volts and 5.22 Energized Testing 600 Volts or Less)
- Added Minimum Approach Distance (MAD) and Clearance Boundaries to the original barriers (PPE, Grounding, Cover-up) covered under CESR
- Updated our CESR Guidance document to be more descriptive for MAD and adequate physical space to complete work safely in substations
- Implemented reporting for CESR events and CESR Deficiencies in PlantView, to include regularly sharing these events with work teams
- Gathered input for a master list of all substations with concerns for space and maintaining MAD. Work Management implemented a review procedure for all work/clearance requests for those locations to ensure our personnel are safe.

Thank you for your support of these improvements. We know these changes are not always easy, but they are critical to the safety of our personnel. Our current safety record proves the changes being made are helping us perform work more safely. Remember – we are only as good as we perform today, so more changes are planned to further build on these accomplishments.

**Additional Improvements Planned This Year**

- Continue the Island Hopping effort with a specific focus on Pre-job Brief forms' effectiveness
- Three additional CESR-related work methods will be implemented (2.2 Minimum Approach Distance, 2.8 Using Red Tape Red Flags in Substations and 3.3 Rubber Gloves and Rubber Sleeves)
- Language added to contracts for CESR expectations and penalties for noncompliance for our contractors
- Insulate & Isolate (cover-up) / Clearance training for Construction & Maintenance personnel and identified support partners

Please refer to the September Leader Guide for more details on the various activities completed to date and those planned for the remainder of the year, and share the information with your teams by **Sept. 30**. A Transmission CESR SharePoint page is also available for all CESR-related information specific for Transmission.

Our ONETransmission team has established safety and operational excellence as core values – they are non-negotiable and will not be compromised. Safety always comes first and must remain first in all we do. We must continue to approach every assignment as an opportunity to *Just Do It Safer*. Please take the appropriate steps to ensure your personal safety, actively care for one another and use our HP concepts and tools in your tasks each day.

Thank you for your commitment to achieving and sustaining the highest possible standards for safety, human performance and operational excellence in the work you perform.

**Nelson Peeler**

Chair – Transmission Human Performance Steering Team

**Buddy Rogers**

Executive Sponsor – Transmission Safety Steering Committee

# Cardinal Electrical Safety Rules (CESR) Guidance Document

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**Purpose:** Provide guidelines to clarify definition and responses for Cardinal Electrical Safety Rules (CESR) Events, Deficiencies, and Non-CESR Electrical Flashes (NCEF).

**Cardinal Electrical Safety Rules (CESR):**

1. Cover-up / Insulate and Isolate
2. Grounding / Zero Energy Check
3. Electrical Safety PPE

**CESR Guiding Principles:**

- Eradicate at-risk CESR behaviors that can cause flashes or electrical contacts.
- Hold impacted individual and leadership accountable for CESR deficiencies.
- Self-reporting of a CESR deviation is encouraged and applauded.
- Ensure effective collaboration and calibration between stakeholders.
- Provide management discretion and flexibility with respect to required responses.

**CESR Definitions and Responses:**

| CESR Event | CESR Deficiency | Non-CESR Electrical Flash |
|---|---|---|
| A deficiency/gap in CESR behaviors that contributed to a flash or electrical contact. | An observed deficiency/gap in CESR behaviors that placed teammates at risk of a flash, electrical contact, or injury. | An event that occurs involving a flash with **NO** deficiency/gap in CESR behaviors. |
| **Examples* (not all inclusive)** | **Examples* (not all inclusive)** | **Examples* (not all inclusive)** |
| • Direct or indirect electrical contacts involving AC/DC at voltages above 50 volts, regardless if injury occurs<br>• Flashes from primary or secondary voltages where CESR gaps or rule deficiencies existed<br>• Any Life Altering Injury (LAI) or potential LAI associated with an electrical contact and/or flash<br>• Line/cable energized inadvertently resulting in a flash or contact that exposed crew to potential harm (in the vicinity of their work) | • Critically deficient I&I/Cover-up<br>• Improper grounding<br>• Minimum Approach Distance (MAD) deficiency, including not obtaining clearances to maintain adequate physical space, including a margin of error for one inadvertent act, to safely perform work in substations<br>• Failure to perform zero voltage check<br>• PPE not properly inspected or worn<br>• Failure to inspect required rubber goods<br>• Switching /Tagging deficiencies resulting in unintended non-zero energy state | • Improper mobile equipment movement<br>• Work positioning or out of sequence steps (HP errors not related to CESR)<br>• Equipment/component failure<br>• Improper non-CESR defined work practice (willful or un-willful) |
| **Response** | **Response** | **Response** |
| • Initial response: Stop work at the job site<br>• Notify Business Unit GM, C&M VP and H&S<br>• Data captured in PlantView and eTRAC<br>• PIRT report-out for LAI (PLAI/PSIF- at mgmt. discretion)<br>• One-pager for weekly EHS report if (SIF/PSIF)<br>• 7am call report-out if no PIRT is required<br>• Appropriate use of Leadership or Contractor Accountability Model | • Initial response: Stop work at the job site<br>• Notify Business Unit GM, C&M VP and H&S<br>• Data captured in PlantView event database<br>• Mgmt. discretion to elevate response as appropriate<br>• Local/regional report-out calls as appropriate<br>• Appropriate use of Leadership or Contractor Accountability Model | • Initial response: Stop work at the job site<br>• Notify Business Unit GM, C&M VP and H&S<br>• Management discretion to elevate as appropriate<br>• Data captured in PlantView event database |

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# Cardinal Electrical Safety Rules
# PlantView Event Entry Guide

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Eradicate electrical contacts and flashes.

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# CESR Reporting Sequence

1) Incident/event occurs
2) Notify H&S, Regional GM and C&M VP to ensure proper dialogue on CESR classification
   a) Team will use CESR guidance document and CESR examples list to determine proper categorization
3) For contractor incidents/events, initial data will be gathered via two options:
   a) Preferred - Contractor/vendor will submit a PIR with the CESR classification in the Incident Description/Summary section
   b) Alternative - Duke Contractor Mgmt. /H&S will provide information for direct entry into PlantView
   c) HP/H&S to coordinate on data entry into PV, based on availability of PIR and known information
4) Enter in PlantView (utilize the next 4 slides for step by step process)
   a) Contractor CESR events/injury events will be entered by the Regional Contractor H&S Professional
   b) Contractor CESR deficiencies & Non-CESR electrical flashes will be entered by the designated HP employee
   c) Employee incidents/events will be entered by the BU representative
   d) Pertinent information will carry through to eTRAC via the PlantView-eTRAC interface, based on the selections made in the PV entry; H&S will process the eTRAC entry
5) H&S will make final determination via a weekly review to ensure consistency for weekly H&S/EHS reports, tracking, trending, etc.

Note: The CESR guidance document can be found on the Duke Energy Portal under Work-Related Sites > Delivery Operations > CESR Criteria and Definitions. The guidance document is applicable across all T&D, Metering, and Grid Solutions business units.

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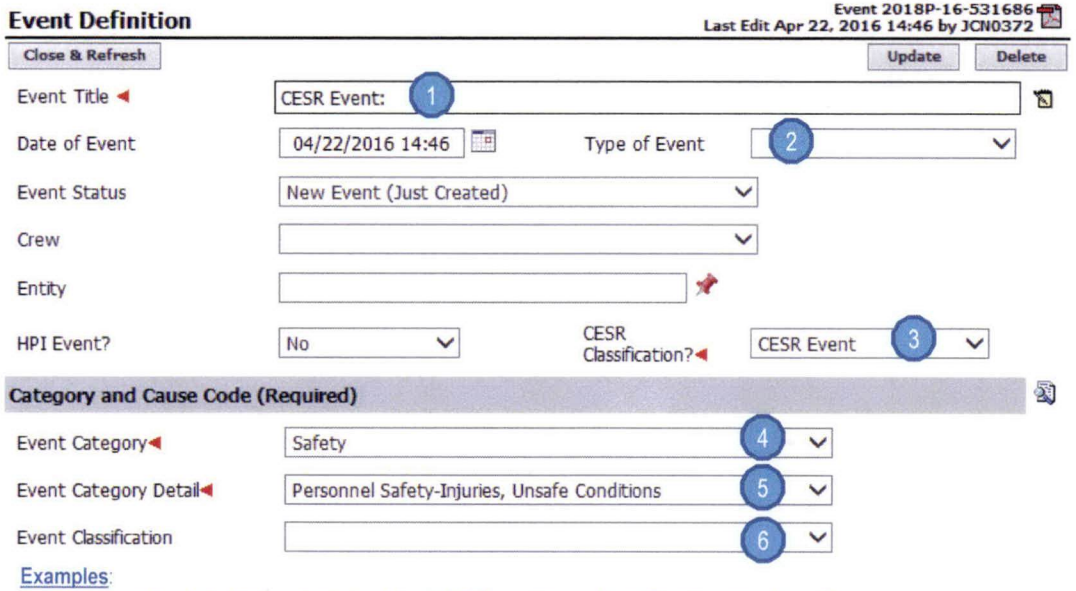
# CESR Event

A deficiency/gap in CESR behaviors that contributed to a flash or electrical contact .




Examples:

- Direct or indirect electrical contacts involving AC/DC at voltages above 50 volts, regardless if injury occurs
- Flashes from primary or secondary voltages where CESR gaps or rule deficiencies existed
- Any Life Altering Injury (LAI) or potential LAI associated with an electrical contact and/or flash
- Line/cable energized inadvertently resulting in a flash or contact that exposed crew to potential harm (in the vicinity of their work)

1. Begin Event Title with "CESR Event"
2. In Type of Event, select "Contractor" for contractor-related events. Otherwise, select appropriate choice from drop-down.
3. In CESR Classification, select "CESR Event"
4. In Event Category, select "Safety"
5. In Event Category Detail, select "Personnel Safety-Injuries, Unsafe Conditions"
6. In Event Classification, select appropriate choice from drop-down (Illness/Injury or Significant Near Miss Level 1).
7. **See slide 6 for event description instruction**

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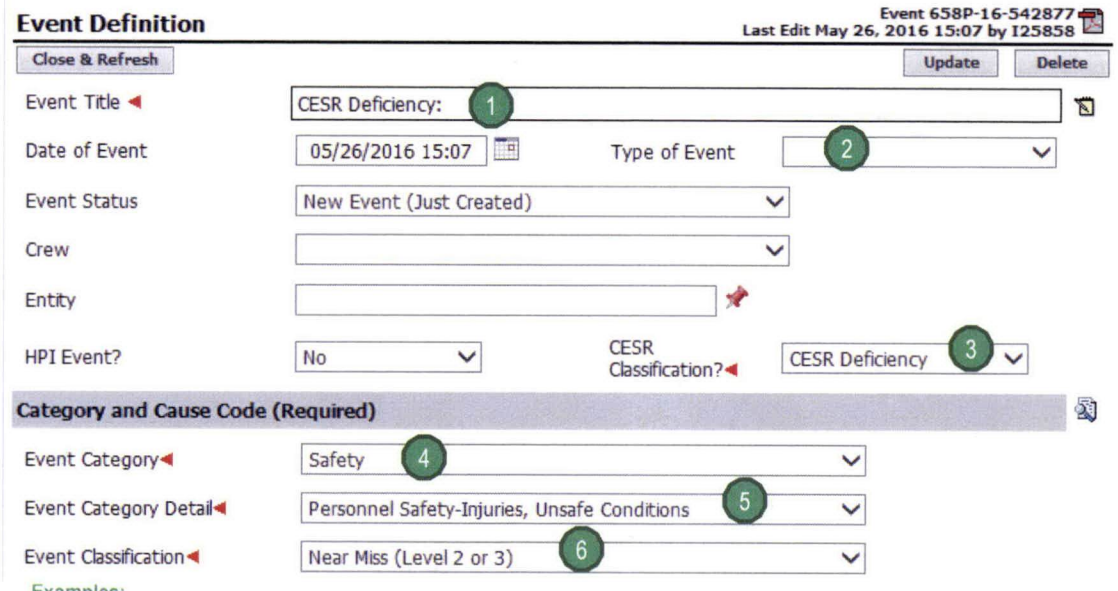
# CESR Deficiency

An observed deficiency/gap in CESR behaviors that placed teammates at risk of a flash, electrical contact, or injury.




Examples:

- Critically deficient I&I/Cover-up
- Improper grounding
- Minimum Approach Distance (MAD) deficiency
- Failure to perform zero voltage check
- PPE not properly inspected or worn
- Failure to inspect required rubber goods
- Switching /Tagging deficiencies resulting in unintended non-zero energy state

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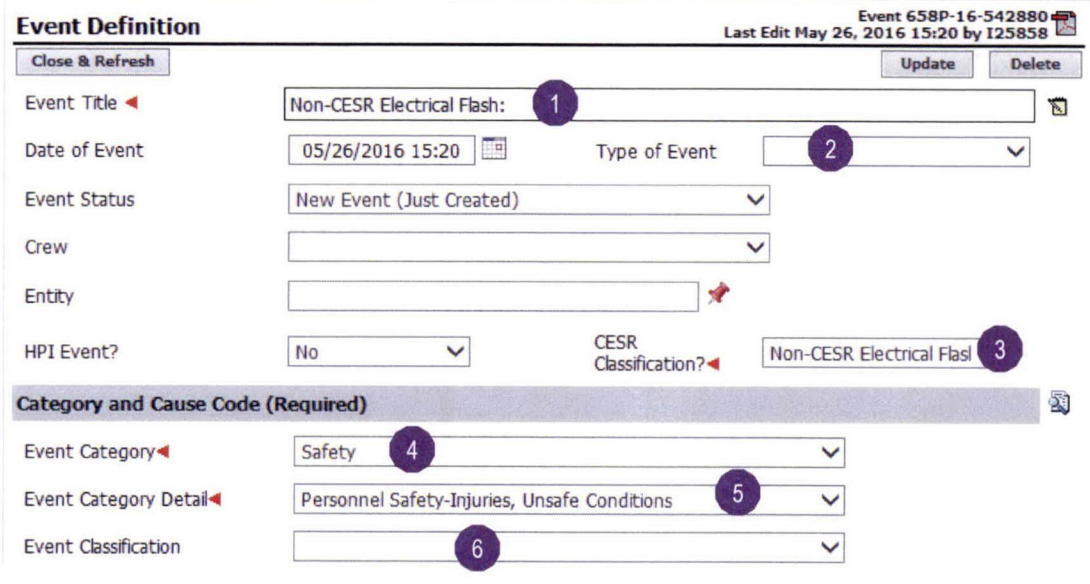
1. Begin Event Title with "CESR Deficiency"
2. In Type of Event, select "Contractor" for contractor-related events. Otherwise, select appropriate choice from drop-down.
3. In CESR Classification, select "CESR Deficiency"
4. In Event Category, select "Safety"
5. In Event Category Detail, select "Personnel Safety-Injuries, Unsafe Conditions"
6. In Event Classification, select "Near Miss (Level 2 or 3)"
7. **See slide 6 for event description instruction**

Cardinal Electrical Safety Rules
Eradicate electrical contacts and flashes.

# Non-CESR Electrical Flash

An event that occurs involving a flash with NO deficiency/gap in CESR behaviors.




Examples:

- Improper mobile equipment movement
- Work positioning, or out of sequence steps (HP errors not related to CESR)
- Equipment/component failure
- Improper non-CESR defined work practice (willful or un-willful)

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1. Begin Event Title with "Non-CESR Electrical Flash"
2. In Type of Event, select "Contractor" for contractor-related events. Otherwise, select appropriate choice from drop-down.
3. In CESR Classification, select "Non-CESR Electrical Flash"
4. In Event Category, select "Safety"
5. In Event Category Detail, select "Personnel Safety-Injuries, Unsafe Conditions"
6. For Event Classification, contact your H&S Professional for assistance in determining the proper classification.
7. **See slide 6 for event description instruction**

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# Event Description Entry (for all CESR category types)

**Event Background Information (Required)**

Work Description

Event Description ◄ CESR Event: 7

Describe what would have prevented the event

Summarize the Immediate Actions Taken

7. Begin Event Description with "CESR Event:" when entering a **CESR event**. This is where the full event description needs to be entered.

**Event Background Information (Required)**

Work Description

Event Description ◄ CESR Deficiency: 7

Describe what would have prevented the event

Summarize the Immediate Actions Taken

7. Begin Event Description with "CESR Deficiency:" when entering a **CESR deficiency**. This is where the full event description needs to be entered.

**Event Background Information (Required)**

Work Description

Event Description ◄ Non-CESR Electrical Flash: 7

Describe what would have prevented the event

Summarize the Immediate Actions Taken

7. Begin Event Description with "Non-CESR Electrical Flash:" when entering a **Non-CESR Electrical Flash**. This is where the full event description needs to be entered.

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## Cardinal Electrical Safety Rules (CESR) Update – November 2016
## *A Change Guide for Transmission*

**ACTION NEEDED:**

- **General Managers** – Please carefully review the content and share with your managers and supervisors.
- **Managers and Supervisors** – Please carefully review the content and share with your team **by Dec. 16.**

### 2016 Year-to-Date CESR Metrics

| As of 11/9/2016 | CESR Related OSHA Recordable | | CESR Events | | CESR Deficiencies | |
|---|---|---|---|---|---|---|
| *Data pulled from EHS weekly report 11/9/16* | Employee | Contractor | Employee | Contractor | Employee | Contractor |
| **Transmission** | 1 | 0 | 3 | 4 | 22 | 16 |

### ✓ Reminder: Entering CESR Information into PlantView

CESR-related events and observations are required to be entered into PlantView. We have seen great progress for entering these events, but we can build upon this progress even more. As a self-critical organization, sharing these types of events makes us all safer. There are two CESR-related categories for entering the information:

- **CESR Event** - a deficiency/gap in CESR behaviors that contributed to a flash or electrical contact
- **CESR Deficiency** - an observed deficiency/gap in CESR behaviors that placed teammates at risk of a flash, electrical contact or injury

When entering observations into PlantView that do not translate to our near miss, good catch or CESR categories, an event entry is required in addition to the observation entry.

Please refer to the CESR Criteria and Definitions document for more information on these categories. The CESR Reporting Sequence presentation provides additional steps for entering in PlantView.

### ✓ Reminder: CESR- Related Work Methods Training and Implementation

- ✓ **Group 1 CESR-related work methods are now effective:** 1.5 Job Briefings, 5.21 Transmission Energized Testing Greater Than 600 Volts and 5.22 Transmission Energized Testing 600 Volts or Less.
- ✓ **Group 2 CESR-related work methods are now effective:** 2.2 Minimum Approach Distance, 2.8 Using Red Tape and Red Flags in Substations and 3.3 Rubber Gloves and Rubber Sleeves
- ✓ **Group 3 CESR-related work methods will be trained and rolled out beginning in January, 2017:** 4.1 Grounding Vehicles and Mobile Equipment and 2.1 Protective Insulating Equipment

Please send any questions regarding the work methods to AskTransTWM@duke-energy.com.

### ✓ New Missing Substation Grounds Policy

To reinforce the importance of inspecting substations for missing grounds before performing work and ensure consistency across the regions, a new Missing Substation Grounds policy was introduced to CMV. The policy provides direction for identifying and addressing missing substation grounds. The Training & Workforce team provided webinars to review the new policy with CMV in October and November.

### ✓ Reminder: Leadership Accountability Model

Leaders play an important role in making CESR a priority and engaging their teams to do the same. You, as leaders, have embraced this role. The Leadership Accountability Model reiterates and more clearly defines your responsibilities to help embed CESR in our organization's culture. The CESR team plans to reemphasize this model in the new year to remind leaders to make this focus a priority day in and day out.

### What's Next: Temporary Protective Grounds Road Shows

The Tools & Work Methods team has completed a great deal of research to analyze the temporary protective grounding equipment used by Transmission and have found opportunities for improvement. Transmission is using a phased approach to update the grounding equipment and associated work methods. A series of road

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shows are scheduled through December to introduce CMV to the new equipment and explain why we are updating the Temporary Protective Grounding process and equipment. We want to hear from you directly and have your full engagement in creating the new process. Attendance is required, so please make every effort to attend one of the various sessions.

Work Methods 4.3: Personal Protective Grounding for Substations and 4.6: Grounding Transmission Lines will be updated with input from the field and the new processes and equipment will be deployed in 2017.

### What's Next: Expanding Definition for Insulate and Isolate

Transmission plans to expand the definition of Insulate and Isolate to more accurately ensure an increased focus on evaluating clearance distance and boundaries to safely perform work. This update will be shared in more detail when the full Insulate and Isolate training is deployed for Transmission next year.

## What's Complete and What's Next

| Activities for Transmission | Timing |
|---|---|
| **CESR event and deficiency metrics** added to the enterprise Environmental, Health & Safety and Human Performance reports.<br>• CESR Criteria and Definitions<br>• CESR Examples<br>• CESR Event Entry Job Aid | March, April, May, July 2016 ✓ |
| **CESR contractor improvement plans**<br>• Development of CESR improvement plans for high-risk contractors<br>• Implementation and monitoring of plans | <br>March 2016 ✓<br>Ongoing |
| Deployment of the **CESR Leadership Accountability Model** | April 2016 ✓ |
| Revisit pre-job briefing forms to determine if updates are needed | May 2016 ✓ |
| Employees sign CESR commitment posters | May/June 2016 ✓ |
| Deployment of **14 revised work methods**<br>✓ **Group 1:** 1.5 Job Briefings, 5.21 Transmission Energized Testing Less than or Equal to 600 V and 5.22 Transmission Energized Testing Greater Than 600 V<br>✓ **Group 2:** 2.2 Minimum Approach Distances, 2.8 Using Red Tape and Red Flags in Substations and 3.3 Rubber Gloves and Rubber Sleeves<br>✓ **Group 3:** 4.1 Grounding Vehicles and Mobile Equipment, 2.1 Protective Insulating Equipment | <br>✓ **Group 1:** June – September 2016<br>✓ **Group 2:** October – November 2016<br>✓ **Group 3:** January – February 2017 |
| Deployment of new Missing Substation Missing Grounds Policy | October / November 2016 ✓ |
| Temporary Protective Grounds Road Shows | December 2016 |
| Deployment of **Insulate & Isolate program** | Begin in first quarter 2017 |

# TRANSMISSION

## Cardinal Electrical Safety Rules
## Leadership Accountability Model

# CESR - Leadership Accountability Model

**Vision**: To eradicate all events related to the violation of Cardinal Electrical Safety Rules

**Strategy**: Implement the actions contained in the CESR Leadership Accountability Model

# CESR - Leadership Accountability

# CESR - Leadership Accountability

DUKE ENERGY.

| Commitment | Validate | Observe/Audit | Contract Partners |
|---|---|---|---|
| • Transmission Managers to ensure each employee commits to electrical safety rules and signs the commitment poster. Managers will ensure that a copy of the signed poster is displayed in work locations where employees may gather. | • Annual validation of applicable Work Methods and Insulate/Isolate proficiency through knowledge checks and documented observations for performers and leaders.<br>• Validate all electrical safety equipment is in compliance. (gloves, blankets, sleeves, hoses, covers, meters, sticks) | • Perform regular targeted CESR observations and incorporate results in Duke employee's performance evaluations or contractor performance review<br>• Establish standards for a CESR observation inspection process for employees, contractors, and Transmission<br>• Multiple levels of observation review/assessment/audit<br>• Opportunity for external industry expert to perform audit in CESR activities | • Meet with executive teams of T&D contractors to strengthen partnerships and reinforce CESR. This is being accomplished through our Contractor QBRs with our contract partner's leadership teams. |

# CESR - Leadership Accountability

DUKE ENERGY.

| Reinforce Expectations | Checkpoints | Reward/Hold Accountable | CESR Proficiency |
|---|---|---|---|
| • Leadership team will review definitions of CESR related activities with employees, and where applicable ensure discussion of this topic during meetings.<br>• CESR work will be discussed during daily Pre-Job and Post-Job Briefs, Monday morning crew meetings, and monthly Safety Meetings. | • Institute I&I check point (stop, review & document) requirement for all critical tasks on energized work. Inspect documentation daily<br>• Institute Test & Ground check point requirement for de-energized work. Inspect documentation daily | • Recognize and reward superior performance<br>• Initiate advanced disciplinary actions for egregious violations of CESR. Implement retraining when needed. | • Know and understand all aspects of cardinal electrical safety rules (CESR)<br>- Insulate / Isolate (Cover Up) Training and Certification<br>- Voltage Test and Grounding (Work Method revision and education)<br>- Electrical safety PPE (Work Method revision and education). |

# Duke Energy – Transmission Missing Grounds Policy

**Ground Inspection Requirements upon entering a Substation:**

- Before entering a Duke Energy energized facility such as a substation or a underground vault, verify that the grounds at the entry point are properly connected prior to touching the facility for entry per Substation Entry Policy.
- Review the facility to verify equipment or apparatus in the vicinity of the work location are properly grounded prior to touching or operating the equipment.

**What you should do if you discover a Missing or Damaged Ground:**

OSHA: **1910.269(l)(11)**

*"Non-current-carrying metal parts.* Non-current-carrying metal parts of equipment or devices, such as transformer cases and circuit-breaker housings, shall be treated as energized at the highest voltage to which these parts are exposed, unless the employer inspects the installation and determines that these parts are grounded before employees begin performing the work."

- If missing grounds are discovered, ensure the Transmission Supervisor is notified. The Supervisor should ensure applicable management, appropriate dispatching authority, local maintenance crews, applicable Distribution crews, and Corporate Security are notified. The Supervisor shall also ensure that a Work Order is issued.
- If you are entering a station with missing or damaged fence or gate grounds, Class 2 rubber gloves are required to make contact with the fence and opening the gate lock and gate leafs. Class 2 rubber gloves are not required to conduct an inspection of the Substation, however contact shall not be made with any equipment that has missing grounds.
- Ensure "Caution - Missing Substation Grounds" sign placed on the main gate until the missing grounds have been repaired.
- Ground repairs are completed per Training and Work Methods guidance. Ground repairs are encouraged to be completed immediately if trained and materials are readily available.
- Please take the following actions for missing/damaged grounds:
    - *Tier One* – Transformers/Regulators/Neutral Reactors or Resistors with Missing or Damaged Neutrals that results in no path to ground:
        - Evacuate any unnecessary personnel
        - Work with TCC/ECC/CMV Management to determine how to remove the equipment from service ASAP
        - Substation shall not be left unattended until the Affected Equipment is de-energized
        - Once the Equipment is de-energized, barricade the piece of equipment per the Safety Signs and Barricades section of the Health and Safety handbook
        - Issue/Request a Work Order at Priority Zero for Repair
        - Repairs on Transformers/Regulators/Neutral Reactors with Missing or Damaged neutrals must be performed de-energized
    - *Tier Two* – Non-Voltage Changing Equipment with Missing or Damaged Grounds:
        - Barricade Equipment with Missing Grounds as per Safety Signs and Barricades section of the Health and Safety handbook
        - Identify the Equipment with a clear description of issues via the Log Book, White Tag, Information Tag, etc.
        - Issue/Request a Work Order at Priority One
        - Class 2 rubber gloves are required when working within the Barricaded Zone; Work being performed outside the Barricade does not require Class 2 rubber gloves.
    - *Tier Three* – Fence Missing or Damaged Grounds:
        - If the Electric System is normal (i.e. no faults) – fence contact is allowed while wearing Class 2 rubber gloves.
        - Issue a Work Order at Priority One

**Duke Energy Kentucky**
**Case No. 2016-00349**
**Staff First Set of Information Requests**
**Date Received: November 15, 2016**

**STAFF-IR-01-004**

**REQUEST:**

Explain how the Take-10 on scope change was reinforced as described in the informal conference.

**RESPONSE:**

In addition to the information provided as a follow up from the settlement discussion on November 15, 2016, Duke Energy Transmission has implemented additional activities that reinforce effective behaviors by its front line employees.

1. Supervision in the Field: in 2015, Transmission implemented an additional monthly measure to track the percent of time supervisors are in the field, setting 75 percent as the target.

2. 2-Minute Drill: as part of its Human Performance tools, Transmission reinforces the use of the 2-minute drill as a means to revisit and adjust job plans when scope has changed. As part of its Work Method development and training, human performance tools are included with the implementation of each work method and reviewed in training for front-line teams. See STAFF-IR-01-004 Attachment 1. A copy of Work Method 3.3 (Rubber Gloves) is included as reference, showing the human performance tools. See STAFF-IR-01-004 Attachment 2.

**PERSON RESPONSIBLE:** Kerry Powell

**AUTHORIZED COPY**

Document title:

# Human Performance Program & Process Document

Document number:

ADMP-ADM-DOS-00005

Revision No.:

001

Keywords:

Human Performance, HP, Events, RCA, EHS, Customer Operations, Power Generation Operations, Corrective Action, PlantView, Transmission, Delivery, Distribution, Generation, Safety, Fossil, Reliability, Customer Service, Financial, eTRAC, Assessments, Observations, Effectiveness Review, Root Cause

Applies to:

Delivery Operations, Transmission, Fossil Hydro Operations, Environmental Health & Safety , Operations Support, Grid Solutions, Customer Service, Market Services



## 1.0 PURPOSE

This document describes the processes and activities that constitute the Human Performance (HP) Program for Duke Energy Delivery Operations. This includes identifying, documenting, tracking, reviewing, and correcting the causes of HP events. This document also describes the roles and responsibilities of those involved in initiating HP event reviews, investigating HP events, and ultimately resolving issues identified.

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## 2.0 PHILOSOPHY – PRINCIPLES OF HUMAN PERFORMANCE

2.1 **Principles of HP:** Five simple statements listed below are referred to as the principles, or underlying truths, of HP. Excellence in HP will be realized when individuals at all levels of the organization embrace these principles and concepts and the practices that support them. Integrating these principles into leadership practices, worker practices, and the organizations' processes and values is instrumental in developing a working philosophy and implementing strategies for improving HP within the organization.

2.1.1 **People are fallible, and even the best people make mistakes.** Error is universal. No one is immune regardless of age, experience, or educational level. It is human nature to be imprecise. Consequently, errors will happen. No amount of counseling, training or motivation can alter a person's fallibility. Unlike a machine that is precise — each time, every time — people are imprecise, especially in certain situations.

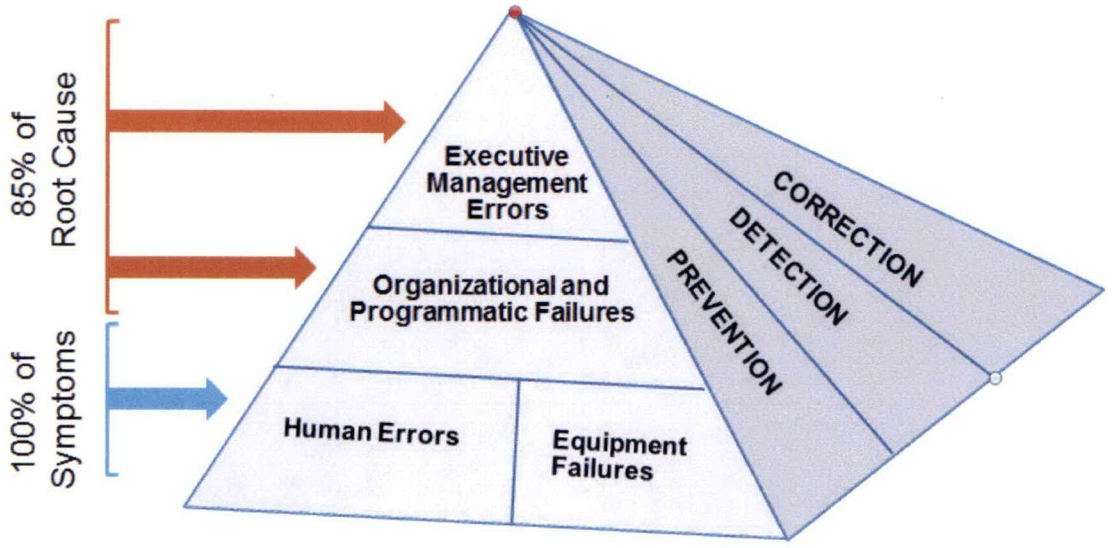
2.1.2 **Error-likely situations are predictable, manageable, and preventable.** Despite the inevitability of human error in general, specific errors are preventable. Recognizing error traps and actively communicating these hazards to others proactively manages situations and prevents the occurrence of error. By changing the work situation to prevent, remove, or minimize the presence of conditions that are precursors to error, tasks and individual factors can be managed to prevent the chance for error.

2.1.3 **Individual behavior is influenced by organizational processes and values.** Organizations are goal-directed and, as such, their processes and values are developed to direct the behavior of the individuals in the organization. The organization mirrors the sum of the ways work is divided into distinct jobs and then coordinated to conduct work and generate deliverables safely and reliably. Management is in the business of directing workers' behaviors. Work is achieved, however, within the context of the organizational processes, culture, management planning and control systems. HP teaches us that many organizational processes, planning and procedures are unintentionally flawed.

2.1.4 **People achieve high levels of performance because of the encouragement and reinforcement received from leaders, peers, and subordinates.** The organization is tuned to get the performance it receives from the workforce. All human behavior, good and bad, is personally reinforced by immediate consequences or by past experience. A behavior is reinforced by the consequences that an individual experiences when the behavior occurs. The level of safety and reliability of a facility is directly dependent on the behavior of people. Positive and immediate reinforcement for expected behaviors is ideal.

2.1.5 **Events can be avoided through an understanding of the reasons mistakes occur and application of the lessons learned from past events (or errors).** Traditionally, improvement in HP has resulted from corrective actions derived from an analysis of facility events and problem reports — a method that reacts to what happened in the past. Learning from our mistakes and the mistakes of others is reactive — after the fact — but important for continuous improvement. HP Improvement requires a combination of both proactive and reactive approaches.

2.2 **HP Pyramid:** the following graphic depicts many aspects of the principles of HP. The diagram illustrates the importance of looking beyond the individual and the equipment. The majority of root cause factors have little to do with the workers themselves or the equipment, and are more related to organization, programs, and day-to-day decision making In fact, as few as 7.5% of the causal factors are related to people making outright mistakes. In order to prevent errors resulting in events and ensure zero recurrence of events, HP seeks to discover and understand the drivers and error traps – beyond the individuals and equipment – that are embedded in the organization.




Performance Pyramid

2.3 **MATURITY MODEL**

A maturity model is a structured collection of elements that describe characteristics of an effective process. A maturity model offers:

- a place to start
- the benefit of a community's prior experiences
- a common language and a shared vision
- a framework for prioritizing actions
- a way to define what improvement means for your organization

The HP Maturity Model provides a consistent definition for operational excellence (identified as Level 5) and a common foundation to assess and measure where each business unit is. More importantly, it provides a structure - including information on resources available - to address gaps identified during the assessment process. This tool provides a framework for developing and prioritizing short and long term initiatives based on a common vision of operational excellence. See **Appendix 13** for an example of the HP Maturity Model and **Appendix 14** for the HP Maturity Levels.

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## 3.0 TERMS AND DEFINITIONS

3.1 **Adverse Trend:** An unacceptable or undesirable change in the frequency of an event type or event cause. An adverse trend may justify the need for a common cause assessment.

3.2 **Apparent Cause:** The most probable cause of an issue or event based on information obtained from an immediate review or limited investigation. Apparent cause investigations typically use a graded approach based on the consequences and significance of the event.

3.3 **Causal Factor:** A condition that shapes the outcome of a situation. Causal factors are the reasons why undesirable consequences occur. Causal factors may be classified as either contributing causes or root causes, depending on their relevance. Causal factors should consider error precursors, flawed defenses, and latent organizational weaknesses which may have led to the event.

3.4 **Common Cause Assessment:** A cause analysis tool used to collectively evaluate a given set of data for common cause drivers and establish actions to address those drivers. Common cause is not considered a standalone process of cause investigation. It is a tool used with other techniques to investigate events.

3.5 **Contributing Cause:** A condition, which alone would not have caused the event, but when present, will shape the outcome of the event. Any number of contributing causes may be determined as attributable to an event.

3.6 **Corrective Action:** Actions aimed at eliminating the root cause(s) and preventing future similar events. To be effective, corrective actions must satisfy three objectives:

- Prevent reoccurrence
- Be within the assigned organization's control
- Meet business objectives (safety, reliability, economics, environmental).

3.7 **Corrective Action (CA) Folder.** PlantView storage location created by the HP Specialist to record and assign specific Action Plan Items.

3.8 **Corrective Action to Prevent Recurrence (CAPR):** Actions aimed at eliminating the root cause(s) and preventing future similar events. To be effective, corrective actions must satisfy the following objectives:

- SMART Actions: Specific, Measurable, Attainable, Related, Time-Sensitive
- Prevent reoccurrence
- Be within the assigned organization's control
- Meet business (safety, reliability, economics, environmental) objectives.

3.9 **Corrective Action Review Board (CARB):** The CARB provides a forum for management review of results from selected cause analysis efforts. For root cause investigations, the CARB will gain assurance that the corrective actions to prevent recurrence (CAPR) will prevent repeat events. Additionally, the CARB may provide management oversight of the Corrective Action Program health and perform an independent evaluation of completed RCA Level 1 Effectiveness Reviews.

3.10 **Critical Step:** Procedure step or action that will cause irreversible harm to people or system equipment if performed improperly.

3.11 **Department Head:** A representative of management, typically at a director level or above, and in some cases may be defined as the Management Sponsor of the Root or Apparent Cause. An individual organization may also use other terms to serve the role as department head such as: Corrective Action Review Board (CARB) or CARB Chairman, as they so determine.

3.12 **Effectiveness Review:** A review of an event after corrective actions have been implemented and sufficient time has elapsed to determine if the actions taken were effective in preventing reoccurrence of the event. The timeframe for this review will be dependent upon the complexity of the corrective actions implemented (typically 6 months - 1 year after the last corrective action has been completed) and management discretion. Refer to GDLP-ADM-DOS-00004 for Effectiveness Review Guidelines and template.

3.13 **Error:** Human performance shortcoming. An action or inaction that unintentionally departs from an expected behavior. Error is behavior without malice or forethought. An error may or may not lead to an event. An *Active Error* is the initiating action of a potential event. A *Latent Error* is an error resulting in undetected organization-related weaknesses or equipment flaws that lie dormant.

3.14 **Event:** An undesirable consequence resulting from either human action (or inaction) or system conditions. Depending on severity, an event may be investigated using various investigation levels.

3.15 **Error Precursor:** Unfavorable prior conditions that reduce the opportunity for successful behavior.

3.16 **Extent of Condition:** The review for applicability to other systems, units, organizations, programs, processes, components, or trains for similar conditions.

3.17 **Fallibility:** Fundamental, internal characteristic of human nature to be imprecise.

3.18 **Flawed Defense:** Defects with defensive measures that, under the right circumstances, may fail to protect system equipment or people against hazards or to prevent the occurrence of active errors.

3.19 **Good Catch:** Proactive efforts taken to prevent a potential incident. Examples include use of proper HP tools and concepts and actions taken to address degraded conditions, risks, error precursors or latent organizational weaknesses.

3.20 **Human Performance:** A set of concepts and principles utilizing and encouraging effective behaviors and providing appropriate barriers to reduce errors and prevent events (event-free operations).

3.21 **Inappropriate Acts:** An act, inaction, occurrence, or omission that transforms normal performance into an abnormal situation.

3.22 **Latent Organizational Weaknesses:** Undetected deficiencies in the management control processes or values creating workplace conditions that either provoke error or degrade the integrity of defenses. Most causes of events are rooted in organizational weaknesses or flaws.

3.23 **Near (Hit) Miss:** Work-related incident that did not result in an event, but had the potential if circumstances had been different. These are incidents where all barriers failed and only luck prevented the event.

3.24 **Root Cause:** The fundamental reason(s) or cause which, if corrected, will prevent the reoccurrence of the event or similar events.

3.25 **Serious Injury or Fatality (SIF):** A work-related incident that results on a serious injury or fatality, as described in **Section 7.5.1.**

3.26 **SIF Near Miss / SIF Potential Near Miss:** A work-related incident that did not result in serious injury/fatality, but had the potential if circumstances had been different. These are incidents where all barriers failed and only luck prevented serious/fatal injury.

## 4.0 ROLES AND RESPONSIBILITIES

### 4.1 Executive Leadership Team

- Establishes expectations for excellence in HP.
- Provides visible leadership, oversight, and ownership for the HP program.
- Reinforces an attitude of intolerance for process and workplace deficiencies that could hinder HP.
- Fosters a work environment that encourages timely reporting of incidents and near misses.
- Communicates and reinforces desired values and behaviors.

### 4.2 HP Steering Team Member

- Implements consistent governance structure.
- Advances leadership commitment including setting the tone and defining how strong leadership commitment looks like.
- Provides leadership to HP plans and initiatives.
- Serves as a liaison for communication, vetting of key initiatives, standards and plans.
- Provides input on best practices, development of HP standards and communications.
- Monitors, reviews, elevates and communicates trends and emerging issues. Work with key stakeholders to implement improvement strategies.
- Ensures alignment with key industry groups (e.g. INPO, Transmission Forum).

### 4.3 Corrective Action Review Board (CARB)

- Review of Root Cause Team Charters.
- Review of completed Root Cause investigation reports. During the CARB meeting the Management Sponsor will address questions from CARB members. CARB members will ensure the following:
    - Interim Corrective Actions are sufficient to prevent recurrence until Corrective Actions are implemented.
    - Corrective Actions adequately address the causes, Organizational and Programmatic contributors, and the Extent of Condition.
    - Corrective Actions are SMARTER (Specific, Measurable, Attainable, Related, Time-Sensitive, Effective and Reviewed).
    - Corrective Actions are assigned to the correct organization with a reasonable due date.
    - Actions that rate low on the Safety Precedence criteria or are enhancement in nature are minimized.
    - Training needs are considered and addressed.

- CARB's main focus in reviewing a cause analysis is ensure adequate measures are in place to correct conditions adverse to quality and in the case of significant conditions adverse to quality (Root Cause), the measures shall assure that the cause of the condition is determined and corrective action are taken to preclude repetition.

- At management discretion additional items (e.g. Apparent Causes, Health Measures, RCA Effectiveness Review) may be selected for review by Site CARB.

### 4.4 Manager and Supervisor

- Fosters a culture that promotes the use of HP principles and tools through observation, coaching, correction, and positive reinforcement of desired behaviors.
- Holds employees accountable for adhering to the guidance of the HP Program.
- Positively reinforces desired behaviors exhibited by personnel.
- Fosters a work environment that encourages timely reporting of incidents, near misses and good catches.
- Facilitates open communication.
- Supports investigation team actions for incidents in own organization.
- Ensures availability of subject matter experts and leads to support investigations.
- Identify and eliminate organizational weaknesses that create conditions for errors.

### 4.5 Employee

- Understands and applies HP principles and tools in order to prevent events.
- Searches for and eliminates conditions that could lead to human error.
- Openly communicates reasons for errors and ensure lessons learned are applied to prevent future errors.
- Reports all incidents, near misses and good catches to management.
- Works with line management and investigators to determine incident causes.
- Provides accurate and appropriate information to support applicable incident investigation.

### 4.6 Incident Investigation Management Sponsor

- Ensures the investigation process is initiated by the HP program.
- Accepts the overall responsibility for the incident investigation.
- Selects and appoints members to the investigation team when needed.
- Receives investigation report and takes ownership to implement corrective actions.
- Communicates actions to applicable stakeholders.

### 4.7 Incident Investigation Leader

- Works with Management Sponsor to assemble team appropriate to the level of incident to be investigated.
- Checks with Legal at the start of an event investigation (mostly with RCAs) to determine if the Attorney-Client Privilege status is required.
- Is trained in cause analysis techniques and qualified to lead the investigation.
- Facilitates all aspects of the investigation including planning, interviews, data analysis, report writing, etc.
- Ensures that team completes investigation within recommended timeframe.

- Ensures that investigation results and corrective actions are reviewed and approved by applicable management and corrective action owners.
- In FHO only, Leader attaches the investigation reports and supporting data to PlantView and enters corrective actions into PlantView.

*Notes:*
- ***Level 1 safety events**: with the exception of FHO, will be led by the EHS organization.*
- ***Level 2 events**: will be led by the appropriate business unit, though EHS may choose to lead select Level 2 safety-related events.*

### 4.8 Incident Investigation Participant

- Performs review and analysis of events.
- Provides subject matter expertise and is an active and engaged participant on the investigation.
- Remains objective and considers all reasonable aspects relevant to the event.

### 4.9 Action Item (i.e. Corrective Action) Recipient

- Understands the scope, objective and expectations including deadlines associated with the action items.
- Completes the corrective action assignments by the established due date.

### 4.10 Corrective Action Program (CAP) Program Manager / Lead

- Provides oversight for the CAP by maintaining procedures and performing periodic assessments of program effectiveness.
- Responsible for all necessary change management to support changes, training and program communications.
- Provides periodic reports and KPIs to leadership with program information (examples include: open/closed action items, overdue action items, adverse trends, etc.).

### 4.11 HP Specialist

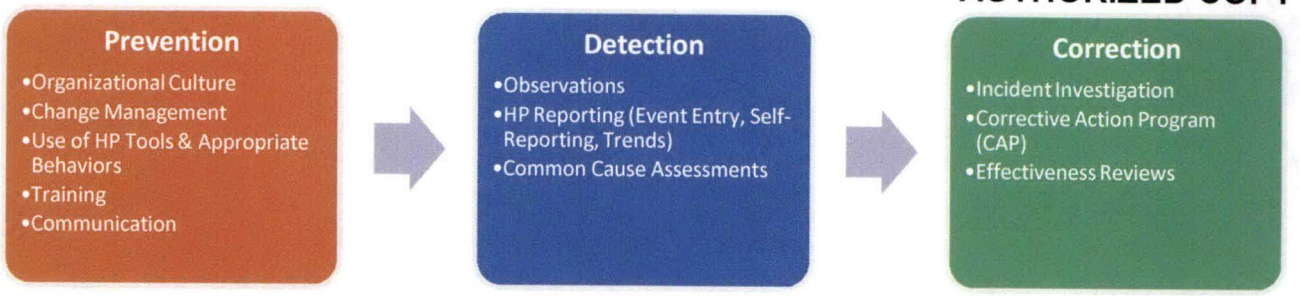
- Provides technical assistance and guidance in conducting incident investigations.
- Develops and delivers training for HP curriculum listed in **Section 6.4.**
- Provides governance, oversight, and strategic direction for the Event Reporting, CAP, Root Cause Analysis (RCA) and Apparent Cause Analysis (ACA) processes.
- In all other business units except FHO, the HP Specialist attaches the investigation reports and supporting data to PlantView and enters corrective actions into PlantView.

## 5.0 P-D-C MODEL

The HP program promotes excellence in HP through behaviors that support safe and reliable operations. Fundamental aspects are:

- **Prevention** of significant events by reducing human error and managing defenses
- **Detection** of errors and trends
- **Correction** of problems

HP program activities under each fundamental aspect are summarized in the table below. The following sections expand on key activities.




## 6.0 PREVENTION

Prevention is a **proactive** approach to reducing error rates that can lead to events by constantly focusing upfront on processes, tools and techniques that add value to overall event prevention. Proactive examples include:

- Program documents which describe all aspects of HP for Duke Energy.
- Comprehensive curriculum of HP training.
- Effective communication trends, best practices and lessons learned.

### 6.1 HP ORGANIZATIONAL CULTURE

The set of shared values that guide acceptable behaviors through sharing of lessons learned and self-reporting. It calls for:

- Learning focused on collaboration and trust to achieve event-free operations.
- Actively engaged leaders who exemplify HP principles, facilitate open communication, reinforce desired behaviors and hold employees accountable.
- Organizations that recognize and reward self-reporting and active engagement in error reduction. Employees promptly report errors and incidents in an environment free from retribution.
- Employees that demonstrate a keen understanding of HP principles, practice desired behaviors, share lessons learned and hold each other accountable.
- Proactive efforts to seek and implement best practices and lessons learned, including extent of condition and operating experience.

### 6.2 HP CHANGE MANAGEMENT

HP change management focuses on the alignment, effective prioritization and implementation of initiatives that will help achieve event-free operations. It calls for:

- A well-defined governance structure* to identify need for change and to develop corresponding initiatives to support such changes.
- Business units becoming self-sufficient and effective at leveraging their governance structures to address business unit specific opportunities.
- Initiatives being supported by a solid and proficient change management plan that includes:
    - Effective communication through multiple channels
    - Timely and appropriate training
    - Change verification
    - Corresponding documents (training, procedures, etc.)

- Having a framework in place to evaluate change management effectiveness.

** **Governance Structure:** the HP Steering Committee provides strategic direction for the program to establish a culture of learning and eliminate significant HP events. The structure within each line of business will be up to that business unit (BU). Steering Committee representatives will function as the liaison between HP Steering Committee and BU.*

### 6.3 HP TOOLS – see APPENDIX 9 for tool definitions and uses

The basic purpose of HP tools is to help individuals perform their work activities without consequential error. The tools have been designed to help workers anticipate, prevent and catch errors before they happen. When used appropriately, these tools give the individual more time to think about the task at hand, help gain clarity about what is happening, what will happen, and what to do if things do not go as expected. In order for tools to be utilized to their full potential, tools should be:

- Clearly defined, understood, consistent, and entrenched in daily activities.
- Reinforced in event communications, planning meetings, non-HP training, and general business communications.
- Habitual and used instinctively.

The following are HP tools that should be utilized in daily activities:

| Concept | Tools |
|---|---|
| Job Briefings | • Pre Job Brief<br>• Post Job Brief |
| Situational Awareness | • 2 Minute Drill |
| Self Check | • STAR |
| Communication | • 3-Way Communication<br>• Phonetic Alphabet |
| Verification | • Peer Check<br>• Concurrent Verification<br>• Independent Verification |
| Procedure Use & Adherence | • Place Keeping Techniques<br>• Procedure Administration |
| Questioning Attitude | • QV&V (Qualify, Validate and Verify)<br>• Stop When Unsure |

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## 6.4 HP TRAINING

The HP Program contains a standard HP training curriculum that is available for all employees. This curriculum includes offerings that meet the needs of the various employee groups. Business units may identify and address specific training needs based on trending of events, observation results or other factors. Additional training needs should be determined by periodic trending of HP behaviors that are documented in the observation program. Below is the standard HP Training Curriculum and the HP Business Observation Training.

### 6.4.1 HP Standard Training Curriculum

| Course Name | Duration | Description | Recommended Audience | Recommended Timing |
|---|---|---|---|---|
| HP Fundamentals Comprehensive COT255 | 4 hrs | Review of HP principles and proven tools & methods to prevent errors. Includes practical exercise where participants working in small teams have the opportunity to apply HP concepts and tools. | ➢ Craft / Field Employees<br>➢ Engineers<br>➢ Leaders for Field and Engineering Employees | ➢ Prior to assuming full job responsibilities without oversight<br>➢ Within 1 year of employment |
| HP Fundamentals Condensed COT261 | 2 hrs | Introduction to key HP principles and proven tools & methods to prevent errors. Provides general awareness of basic tools and principles. | ➢ Office Employees<br>➢ Leaders for Office Employees<br>➢ Refresher for Field Employees | ➢ Within 1 year of employment |
| HP Fundamentals Online – Summarized COT352 | 1 hr | High level overview of key HP definitions and concepts. Intended to be used as a refresher and provides an alternative to the instructor lead courses. | ➢ Customer Service Associates<br>➢ Office Employees | ➢ Within 1 year of employment |
| HP for Supervisors COT262 | 2-3 hrs. | Review of key HP principles for supervisors including their role in advancing a strong HP culture. Primary focus of this course is on understanding behaviors, effective observations, reinforcement ,coaching and feedback. | ➢ Managers and Supervisors | ➢ Within 1 year of supervision role |
| Plant View Event Entry COT183 | 2 hrs | Step-by-step review on how to enter events into PlantView. Including: information on what constitutes a good quality event entry, types of events, cause codes and other key fields. | ➢ Supervisors<br>➢ Individuals responsible for entering events | ➢ Prior to entering events in PlantView<br>➢ As needed |
| Apparent Cause Analysis COT263 | 8 hrs | Review of process, including roles & responsibilities, requirements, and basic event analysis tools. Intended for individuals designated to lead basic investigations (Apparent Cause Analysis (ACA),. Contains a practice ACA exercise, which includes interviewing sessions, C&F charting, report writing, etc. | ➢ Employees engaged in cause investigations | ➢ Prior to leading cause investigations |
| Root Cause Analysis (RCA) COT525 | 3 days | Reviews all aspects of the Root Cause Analysis process in detail in order to prepare participants to lead the more complex investigations. The components include problem definition, extent of condition, development of SMARTER corrective actions interviewing techniques, event and causal factor charting, change and barrier analysis, and cause effects | ➢ Employees identified to lead Root Cause Analysis | ➢ Prior to leading cause investigations |

*Note: Targeted training has been developed for various individual business unit programs. The objective of these courses is to ensure consistent understanding and application of the standards, enhance critical eye, practice providing meaningful feedback and learn the use of PlantView. All courses include practical exercises to apply skills learned.*

## 7.0 DETECTION

### 7.1 OBSERVATION PROGRAM

Observations have two purposes: to provide opportunities for coaching/immediate feedback and to collect data on behaviors. Coaching is always needed for humans to ensure standards and expected behaviors are performed. Behaviors are a real-time indicator of HP issues, human errors, and precursors to significant events. The goal of feedback and coaching is to positively reinforce desired behaviors and to correct undesired behaviors.

Objectives of the observation program include:

- When managers and supervisors devote time to observations, workers are reassured that their leadership actually knows what is going on and that they have an opportunity to express their opinions, feelings, and concerns about work without fear of retribution.

- Personal involvement raises the credibility of the manager/supervisor in the eyes of the worker. Direct involvement in work activities improves managerial awareness of strengths and opportunities that need improvement. It also promotes the real-time correction of unsafe or at-risk practices, with the prompt reinforcement of expectations/ideal behaviors. Trends from observation data help to detect seemingly insignificant problems before they lead to more significant events.

- Experience has shown that the causes of inconsequential events are similar to those for events that have severe consequences. The identification and timely correction of weak defenses and of unsafe or at-risk practices can prevent significant events. The trending of observed performance issues help managers and supervisors identify focus areas during future observations.

- The types and frequency of observations will be determined by leadership and documented on corresponding Guidance and Range Of Our Tolerance Documents (ROOT). As a general rule, observation requirements and frequency will be driven by the level of risk and exposure for a particular work group.

- Real-time field observations provide managers and supervisors with opportunities to do the following:

    - See first-hand, actual job-site conditions and employee practices.
    - Provide performance feedback to employees through face-to-face reinforcement and coaching.
    - Detect organizational and programmatic weaknesses related to the support of in-field work.
    - Enhance organizational alignment on expectations and values.
    - Document organizational factors, including immediate action taken to improve organizational effectiveness.

Observations are currently being performed using various tracking tools. Some key observations used by multiple business units are being tracked in the PlantView Observation Module in order to facilitate linkage between event and observation trends. A ROOT document describing the specifics for meeting and not meeting expectations is required for all observation programs. Having the specific behaviors documented in detail helps ensure consistency for observation programs used by multiple business units.

## 7.2 ESTABLISHING A REPORTING CULTURE

Organizations that embrace HP strongly encourage employees to report errors. This feedback is necessary to identify opportunities and helps the organization learn from its errors. Documenting and learning from patterns of behavior provides actionable information.

Establishing a strong reporting culture is instrumental for the success of any HP program. Before establishing a reporting culture, there are a number of organizational and psychological barriers that must be overcome. These include:

- A natural reluctance to self-report errors.
- Fear of repercussions.
- Skepticism about whether the situation will be addressed.
- Too much time and effort to compose a report

To overcome such barriers, organizations should employ the following:

- **Anonymity:** Omit any identifying information from reporting. A consistent focus on the *how* and *why*, rather than the *who*, is necessary to build trust and obtain unfiltered data. Proper analysis of accurate and complete data yields the highest probability of recurrence elimination.

- **Protection:** If employees trust they will not be punished for honest mistakes, they will be more likely to self-report errors. However, because some acts are deliberate (e.g. voluntary non-compliance), it is not feasible to offer complete immunity from disciplinary actions.

- **Feedback/Communication:** Timely and constructive feedback is essential for encouraging continuous reporting of errors. This helps reassure that information reported is being utilized by management to improve the performance of the organization.

- **Reporting simplicity:** Information should be easily entered in a standardized form that provides a means for extracting actionable data, while also allowing the user to elaborate freely so a complete picture of the event can be captured.

- **Separation of functions:** Data collection and analysis should be done independently from those who determine disciplinary action in order to prevent biases and/or conflicting interests.

In order for the Event Analysis and Investigation Processes described in **Section 8** to be effective we must have a strong self-reporting culture. The effectiveness of self-reporting (events, near misses, lessons learned, good catches, etc.) is measured in terms of quality and timeliness of the information. This will allow us to learn from events, near misses and good catches and implement actions to prevent reoccurrence.

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## 7.3 HP REPORTING

The ability to effectively trend the data captured in the HP system PlantView is key for detection efforts. There are a number of standard reports, for both events and observations, that are updated daily. These are located on the HP Reports SharePoint site and designated business unit sites. Available types of HP reports include:

- **Trending Reports**
  - *HP Events* – event levels, self-reporting metrics, event types, good catches and near misses
  - *Field Observations* – behaviors, answer trends, cross-referenced "behaviors not met" that resulted in events with behaviors observed during work activities (observation program) , observer comments
  - *Driver Observations* – behaviors, answer trends (e.g. Did Not Meets), cross-reference "behaviors not met" that resulted in events, observer comments.
- **Event Data Reports**
  - *Business Object Report (BoFunc)* - daily email report that provides preliminary event information
  - *Event Detail Report List* – snapshot of details from prior week events (includes YTD details as well)
- **Compliance Reports**
  - *RCA Compliance Report* – event investigation status with related information
  - *Action Item Report* – status of open corrective actions; ability to view completed items.

It is important that business units effectively use analytics to understand and address trends (not just gather data). This includes knowing, and proactively using, available reporting tools with drill-down/interactive capabilities vs. relying exclusively on static reports that are pushed to the organization.

** PlantView: tool used to collect HP data for events, observations and cause investigations.*

## 7.4 EVENT ENTRY

Establishing a strong reporting culture is instrumental for the success of any HP program. Capturing and distributing event information in a timely manner allows us to share lessons learned and implement actions to prevent reoccurrence. An event should be reported in PlantView if you can answer "yes" to *either* of the following two questions:

- Is this an undesirable state that does not meet our standard or expectation?
- Would reporting the event benefit others in Duke?

### 7.4.1 Typical Event Process Flow

- An event occurs.
- The person involved reports the event to supervisor/management/EHS as needed. The immediate supervisor should evaluate the event, near miss, or good catch incident prior to entry in the PlantView Event Module for completeness of information. The supervisor may request additional information if needed.

- An employee or designee who works in the area where the event occurred (a/k/a Event Initiator) enters the event in PlantView. Events must be entered in the PlantView event module under the following requirements:

  - **Safety events** – must to be entered within 24 hours of occurrence
  - **Non-safety events** – must be entered within 48 hours of occurrence

- All available information should be recorded. The event can be updated with additional or revised information once it is determined, but it is important to enter the event as soon as possible. The Event Initiator should only enter what is known at the time of entry – some data fields may be left blank.

- The manager or supervisor will determine the event level using the criteria established in **Section 7.5** and the applicable investigation requirements (local ACA or independent RCA). If no investigation is required, no further action beyond the remedial actions and the distribution of the event via the daily event report are required.

***Note:*** *Refer to* ***Appendix 10*** *for a high-level process flow for an event (from initiation to correction).*

## 7.5 EVENT LEVEL CLASSIFICATION

Events are categorized based on consequence and severity of error. Levels are used to implement a graded approach to incident investigations, reviews and analysis.

### 7.5.1 Level 1:

**Safety:** fatality or serious injury with a potential for fatality that meets the **Serious Injury or Fatality (SIF)** criteria described below:

- Fatality
- Amputation (involving bone)
- Concussions and/or cerebral hemorrhages
- Injury to internal organs
- Bone fractures excluding fingers and toes
- Tendon and ligament tears
- Herniated disk (neck or back)
- Lacerations resulting in severed tendons, a deep wound requiring internal stitches
- 2nd degree burn (>10% body surface) or 3rd degree burns
- Eye injuries resulting in eye damage or loss of vision
- Injections of foreign materials (e.g. hydraulic fluid)
- Severe heat exhaustion and all heat stroke cases
- Dislocation of a major joint (hip, shoulder, elbow, etc.)

***Note:*** *The following are excluded even if they are OSHA-recordable: non-preventable vehicle accidents; medical conditions such as heart attacks and seizures; injuries from normal body movements; hairline fractures; chipped teeth.*

**SIF Potential Near Miss**: A work-related incident that did not result in serious injury/fatality, but had the potential if circumstances had been different. These are incidents where all barriers failed and only luck prevented serious/fatal injury

**Environmental:** A reportable environmental event resulting in significant impact. Refer to the Environmental Event Reporting and Classification procedure (PRO-ENV-01-013) for additional information. Examples include:

- Regulatory citation with penalty > $5,000
- Release of oil into waters of the US (>10 gallons).

**Operational/Reliability, Megawatt Loss, Customer Service, Financial, Vehicle, Other:** major impact upon any of these areas and meeting the Level 1 criteria described in **Appendixes 1 thru 8.**

Level 1 events require an **Independent Review (RCA)** for analysis. This requirement may only be waived with approval of the appropriate department head. All Level 1 RCAs require approval of Department Head prior to release. Management may at their discretion elevate any event or near miss to require a formal (independent or local) RCA. Initial investigation, including submission of the draft report to the Sponsor, should be completed within **2 weeks.** Any extensions require Sponsor approval. Final approval of the RCA by the sponsor should occur within **90 days** of the event discovery date.

7.5.2 **Level 2:**

**Safety/Environmental:** OSHA recordable event that does not meet Level 1 criteria, or industrial hygiene overexposure with potential for significant health effects or employee relations where protective measures (e.g. respirators) were not in place.

**Exception**: An RCA is not required for less serious OSHA recordable injuries. Includes those that did not result in lost or restricted work days and involved:

- Minor muscle strain where doctor prescribed prescription dose of over the counter medication.
- Bee sting or insect bite where no adverse reaction occurs but injection (epinephrine or Benadryl) is administered by employee or by healthcare provider.
- Non-preventable vehicle accident where minor employee recordable injury occurs.
- Hearing loss/standard threshold shift.
- Particle in eye is removed by doctor and antibiotic prescribed as precaution.
- Minor laceration where surgical glue is used.
- Chipped tooth where no repair/dental work is performed.

**Environmental:** Any other reportable environmental event. Refer to the Environmental Event Reporting and Classification procedure (PRO-ENV-01-013) for additional information. Examples include:

- Regulatory citation <=$5000.
- Release of oil into water <=10 gallons.
- Chemical releases greater than the RQ.
- Release of wastewater to the environment greater than the reportable quantity with some remediation required.

**Operational/ Reliability, Megawatt Loss, Customer Service, Financial, Vehicle, Other:** impact upon any of these areas and meeting the criteria for Level 2 in **Appendixes 1 thru 8.**

Level II events require a **local review Apparent Cause (ACA)** for analysis. Management may, at their discretion, elevate any event or near miss to require a formal (independent or local) RCA. Initial investigation including submission of the draft results to the Sponsor should be done within **30 days**. Any extensions require sponsor approval. Final approval of the ACA by the sponsor should occur within **45 days** of the event discovery date.

7.5.3 **Level 3:**

Event that does not meet Level 1 or 2 requirements.

Level 3 events do not require further analysis; however RCA or ACA investigations can be conducted for Level 3 events. Management may, at their discretion, elevate any event or near miss to require a formal (independent or local) RCA. Level 3 events are used for trending purposes.

7.6 **EVENT LEVEL CRITERIA** – See **Appendixes 1 thru 8** for level-specific criteria at the business unit level.

7.7 **COMMON CAUSE ASSESSMENT (CCA)**

A Common Cause Assessment (CCA) is an analysis of multiple like-events to uncover commonalities among causes, behaviors and organizational failures. The end result is the development of corrective action **recommendations** to prevent or reduce the likelihood of the reoccurrence of comparable events.

A CCA is usually prescribed by an adverse trend of similar events and is not a Root Cause Analysis. CCAs are initiated at the sole discretion of management or requested/suggested by HP teams (i.e. HP Department., HP Steering Team, HP Review Committee) through identification or evaluation of adverse event trending.

See **Appendix 11** for the Common Cause Assessment template.

## 8.0 CORRECTION

### 8.1 EVENT ANALYSIS

Event Analysis is an essential part of an effective corrective action program. Event Analysis consists of the following three processes that are designed to address events at the applicable level.

- **Root Cause Analysis (RCA)** – Prevents repetitive or similar human and equipment performance problems by the identification and correction of specific causes of failures. Root Cause Analysis is the structured use of a set of formal methods for investigating and determining the root cause (s) of the inappropriate action(s) or component failure(s). By definition, therefore, the root cause is the fundamental reason or cause which, if corrected, will prevent recurrence of a problem and/or similar problems.

- **Apparent Cause Analysis (ACA)** – Investigation to determine the apparent cause(s) believed to be the most probable cause(s) based on readily available information at the time of the investigation.

- **Trending Only** – Lowest level category for issues that have little or no potential effect on safety and/or reliability of system operations and does not require a cause evaluation. Trended events may be addressed and assessed through a CCA.

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## 8.2 EVENT INVESTIGATION - REVIEW LEVELS

### 8.2.1 Independent Investigation (RCA) Level 1 events:

Independent investigations are comprised of an RCA team leader external to the group in which the event occurred. The RCA sponsor is typically the organizational head of the group where the event occurred, however in some cases, sponsorship may be external to the group as well. Team membership shall be comprised of subject matter experts and be diverse enough to provide the needed expertise. Members can be from any organization. Persons directly involved in the event are not to be part of the RCA team. RCA sponsors are not part of an RCA team. (See Sponsor Role).

All Level 1 events require an independent investigation. This requirement may only be waived with the approval of the appropriate department head.
This type of investigation is typically referred to as a formal in-depth RCA. It is performed by the use of standard assessment methodologies to correct the specific issue, and all contributing causes. This type of event investigation is intended to provide a high-level of confidence that the primary causes of the issue/event have been addressed and mitigated. Additional findings in the form of improvements should also be formalized as corrective actions.

Corrective actions must be assigned and implemented for the root cause(s) to preclude reoccurrence and must be communicated to all appropriate personnel and institutionalized for the most relevant contributing causes. The timeframe for completion of the review will vary according to the event complexity and approval of the sponsor.

Investigation team for **safety** related events will consist of:

- Management sponsor from the business unit involved.
- Investigation team leader from H&S or Human Performance with qualified training and experience in Level 1 investigations.
- Other subject matter experts as necessary: craft, engineering, etc.

Investigation team for **non-safety** related events will consist of:

- Management sponsor from the business unit involved.
- The RCA team leader shall be a trained root cause investigator.
- Other subject matter experts as necessary; craft, engineering, etc.

### 8.2.2 Local Investigation (ACA) Level 2 events:

Local investigations may be comprised of ACA team members and an ACA team leader internal to the group where the event occurred. The ACA sponsor is typically the local manager of the group where the event occurred. The ACA may be performed by a single individual or by a team of individuals depending on level of complexity and subject matter expertise required.

This type of event investigation is intended to provide a reasonable level of confidence that the primary causes of the issue/event have been addressed and mitigated. A local investigation consists of a cause analysis performed by the use of standard assessment methodologies to correct the specific issue, contributing causes. It may be performed by a single individual or by a team of individuals.

The individual performing the ACA or the ACA team leader shall be a trained apparent cause investigator.

Corrective actions must be assigned and implemented for the cause(s) to preclude reoccurrence and must be institutionalized and communicated to all appropriate persons for the most relevant contributing causes.

8.2.3 **No Further Action Required Level 3 Events:**

No additional investigation efforts are required for reported events that contain sufficiently documented information. Further investigation would be of no or minimal value to the organization. A determination of the most apparent cause can be derived from the information provided.

*NOTE: When considering the most appropriate level of event review, the Review Owner should consider the "Extent of Condition." This refers to the investigation of similar situations at other facilities and locations which may indicate either a trend or a larger, underlying problem. Based on this extent of condition, the evaluating manager may upgrade the significance level of the event or the level of review if he/she deems it appropriate.*

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## 8.3 RCA / ACA PROCESS

8.3.1 Management of the organization where the event occurred takes ownership of the investigation and serves as the Management Sponsor. The level of investigation required is based on the criteria summarized in **Section 7.5.**

8.3.2 The Management Sponsor designates a qualified RCA/ACA Team Leader. For Level 1 events, RCA Leaders must be selected from a pre-qualified list of experienced investigators.

8.3.3 The Management Sponsor together with the Investigation Team Leader identifies subject matters experts and resources requirement to complete the investigation. Team members will be made up of subject matter experts not directly involved in the event.

8.3.4 The Management Sponsor, together with the Investigation Team Leader, defines expectations for the team's work schedule, including scope of investigation and expected completion.

8.3.5 The Management Sponsor may attend the team kick-off meeting. The manager sponsor should never be part of the team nor attend the team meetings other than to kick-off the teams work. The kick-off meeting discussion may include the following:

- General purpose of an RCA/ACA is to develop corrective actions to prevent reoccurrence.
- The expectation to complete the RCA/ACA as the team's top priority; Team participation will not be considered a collateral duty particularly for Level 1 Independent RCA investigations.
- The need to utilize and follow established event review methodologies.

The expectation that the team will deliver an impartial and complete account of the incident, along with the appropriate and effective corrective actions to greatly reduce or eliminate the possibility of a future occurrence.

***NOTE:*** *All Level 1 event RCAs REQUIRE approval of the DEPT HEAD prior to the release.*

## 8.4 PERFORMING THE RCA / ACA

8.4.1 The team performs its investigation and analysis in conformance with established cause analysis principles and training.

8.4.2 The team documents the findings including the corrective actions using the standard approved templates. A standard RCA template must be used for all Level 1 RCA investigations. Some ACAs may be documented directly on a Power Point or other communication forms depending on level of complexity. The reference section of this document contains links to standard templates.

8.4.3 Potential corrective action plan items shall be discussed with the organization(s) and/or person(s) that will be assigned corrective actions in order to obtain concurrence. This may be accomplished by including representation of those areas affected by the corrective actions on the investigation team, or by direct consultation with the assignees prior to the release of the report.

8.4.4 Upon team consensus of the findings and corrective actions, the Team Lead delivers the RCA/ACA team's results to the Management Sponsor for review and comment. Level 1 RCAs must be documented on a formal RCA report.

8.4.5 At the discretion of the sponsor, the team may be directed to further investigate or analyze specifics of the report.

8.4.6 The sponsor approves the report and findings and shares the results as appropriate with key stakeholders. All Level 1 RCA events must be reviewed with the appropriate CARB *(ref. CAP Process Document GDLP-ADM-DOS-00001)* or adhoc Cross-Functional Management Review Team prior to communication and assignment of corrective actions. Sponsor reviews the corrective actions (CA) with the CA owners for input and acceptance of both the action and due date.

8.4.7 Upon sponsor and CARB/management review and acceptance, the appropriate HP Specialist, Team Lead or designee attaches the RCA/ACA report to the Event module in PlantView and updates the applicable information pertaining to the specific event.

8.4.8 The corrective actions, as a result of the RCA, are entered by the appropriate HP Lead, Team Lead or designee into the PlantView CAP Module.

8.4.9 The manager sponsor communicates the RCA/ACA findings to appropriate personnel.

## 8.5 PLANTVIEW CORRECTIVE ACTION PROGRAM (CAP) MODULE:

### 8.5.1 Assignment of Corrective Action Types:

PlantView accepts two types of corrective actions: Those resulting from an RCA/ACA event investigation and subsequent recommendations, or Independent Management Directives not the result of a specific event.

### 8.5.2 Corrective actions resulting from an event investigation:

The following steps are to be taken to initiate corrective action assignments in PlantView that are based upon an RCA/ACA event investigation:

- The HP Specialist or designee creates the CAP folder which will store the Action Plan Items developed by the Team. For FHO, this step is done by the Team Lead.

- The HP Specialist, team lead or designee creates individual Action Plan Items correlating to the RCA/ACA recommendations. Notification of Action Plan Items is sent to the recipients via an automatic PlantView generated email.

- Upon completion of the Action Plan Item, the recipient indicates the completion of this task in PlantView. Notification is automatically sent to the HP Lead/designee. The assignee may alternatively notify the HP lead of completion. The recipient of the action also provides proof of what was done to complete the action. The HP Specialist/designee will attach the supporting information into the action item.

- The HP Specialist/designee verifies completion of all Action Plan Items. When all are completed, the HP Lead/designee will close out the Corrective Action folder.

- Conduct an Effectiveness Review if applicable: after corrective actions have been implemented and sufficient time has elapsed to determine if the actions taken were effective in preventing a reoccurrence of the event, the Manager Sponsor initiates an effectiveness review. Use the approved Effectiveness Review guidelines and form found in GDLP-ADM-DOS-00004. Effectiveness Reviews are required for all Level 1 RCAs.

- A CARB may perform an independent evaluation of completed RCA Level 1 Effectiveness Reviews.

- Due date modifications the following approvals are required:
  - **Level 1:** Requires approval from the Senior Vice President. Very significant Safety events may require additional approval from the Health and Safety Performance Council (HSPC)
  - **Level 2:** Requires approval from the investigation Sponsor and the Sponsor's Manager (e.g. Vice President, Director, General Manager)

8.6 **Action Plan Items assigned as independent management directives, not the result of an RCA/ACA or specific event (stand-alone corrective actions).**

The following steps are required to initiate Action Plan Items in PlantView that are based upon independent management directives:

8.6.1 Communication takes place between the initiator of action items and the recipients of those action items to determine scope and intent.

8.6.2 When action items are assigned, recipients need to concur that the assignments are feasible and achievable.

8.6.3 The CAP folder and related Action Plan Items are created directly in the CAP Module within PlantView by either the HP Lead or designee.

8.6.4 Once Action Plan Items are entered, PlantView will automatically send notification to the specific individuals responsible for their completion.

8.6.5 The Action Plan Item recipient completes the assignment. Upon completion of the assignment the recipient updates PlantView and indicates completion of this task. Notification is automatically sent via PlantView to the HP Lead or designee.

8.6.6 The HP Lead/designee verifies completion of the all Action Plan Items and when all are completed, the HP Lead/designee closes out the CA folder.

*Note: Dependent upon the project and the corrective actions the CARB may choose to insert their process authority over the: creation, execution, review or completion approval of these corrective actions. See GDLP-ADM-DOS-00001 for the Corrective Action Program Process document.*

## 9.0 CONTRACTOR HUMAN PERFORMANCE

Contractors are required to report events while performing work for Duke. These events are classified and recorded using the same criteria used for company events. For serious events that meet the investigation requirement, contractors may conduct their own investigations and provide the results along with corrective actions to Duke. Contractor requirements to report events, conduct investigations and submit the results to the company for review are established in contract language. In some cases the company may request to conduct a joint investigation or have a company representative on the team for more serious events. Contractor events are tracked and analyzed for trends. Specific Human Performance activities currently vary per business unit and type of contractor but include review of contractor events, investigation results, joint investigations and common cause reviews.

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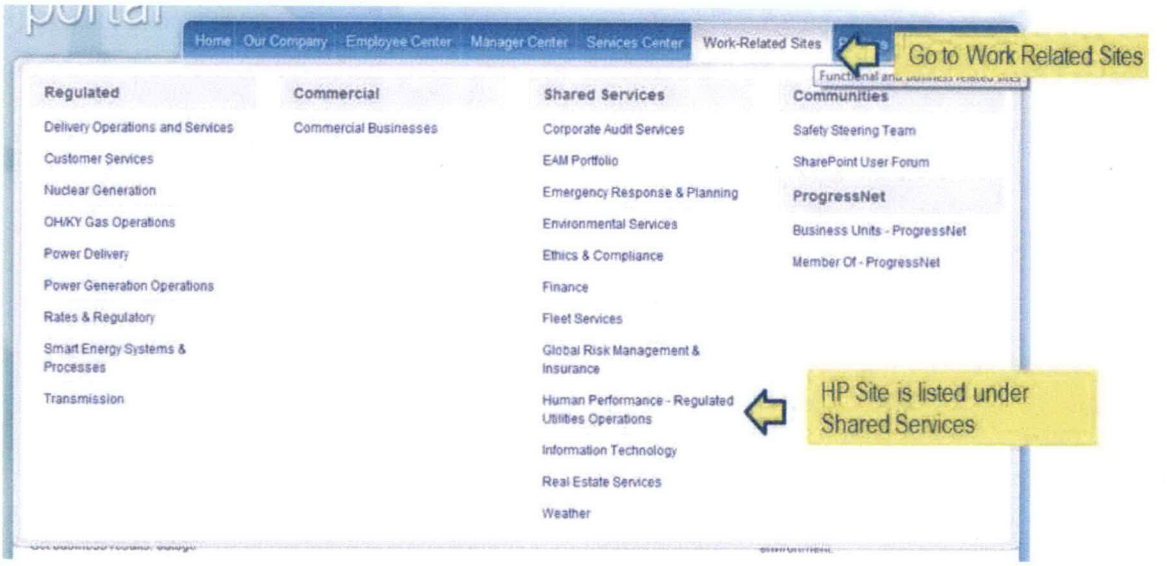
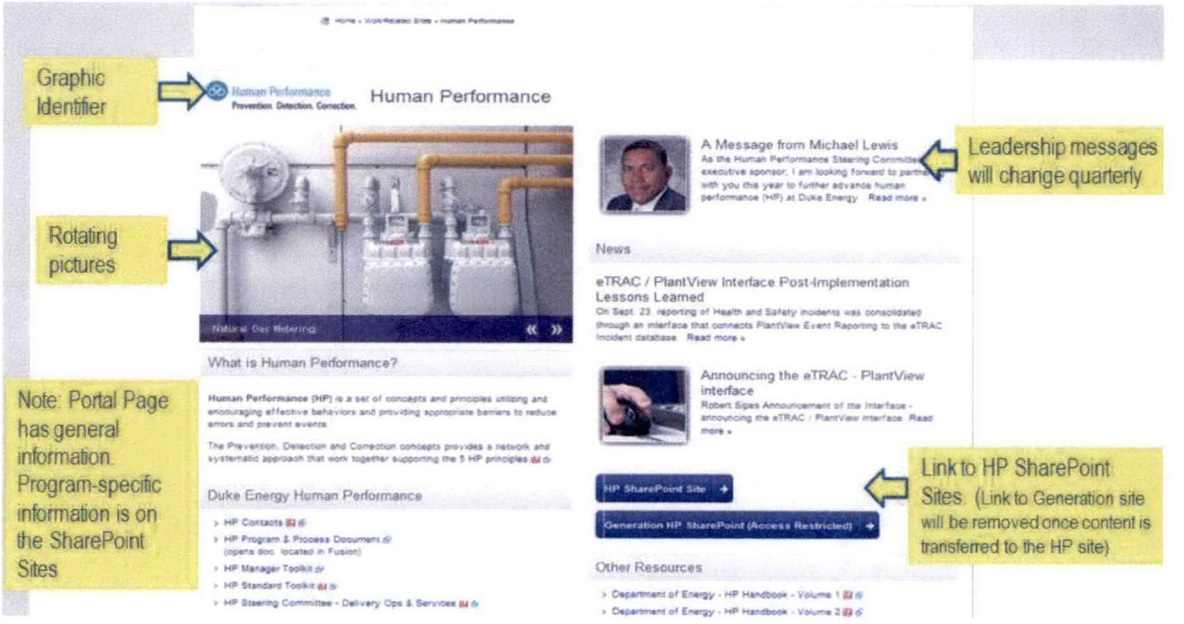
## 10.0 HP SHAREPOINT SITE

Standardized forms, process documents, training materials, reports, etc., can be found on the HP SharePoint site, which can be accessed via the following link or from The Portal as shown in the screenshots below:

https://team.duke-energy.com/sites/RUO-HP/SitePages/Home.aspx



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## APPENDIX 1: Event Criteria – FOSSIL HYDRO OPERATIONS

| Category | Level 1 – Root Cause Analysis (RCA) HIGH RISK | Level 2 - Apparent Cause Analysis (ACA) MODERATE RISK |
|---|---|---|
| **Health & Safety** | • Any event resulting in an employee<br>• OSHA recordable injury or illness (1)<br>• Contractor OSHA recordable (2)<br>• Health hazard overexposure (3)<br>• PSM event (per plant criteria)<br>• Significant LOTO Event (4)<br><br>Note: Refer to **Section 7.5** for exclusions | OSHA recordable event that does not meet Level 1 criteria.<br><br>• Safety related events that include Potential SIFs<br>• LOTO Procedural Deviations (4)<br>• Significant near misses (when potential for a more severe injury was likely)<br>• **Vehicle**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). |
| **Environmental** | Category 1 Reportable Environmental Events (REEs)<br>*A reportable environmental event resulting in a significant impact as described in **Section 7.5.*** | Category 2 Reportable Environmental Events (REEs)<br>*Any other reportable environmental event as described in **Section 7.5.*** |
| **Asset Damage** | An incident or operating practice that results in equipment damage greater than $100K as determined by failure causal codes | • Events with potential Human Performance failure modes<br>• Any equipment repair that is not a routine part of O&M<br>• Any evidence of fire impacting plant equipment |
| **Megawatt Loss** | ≥ 50% loss of MDC for ≥60 minutes as determined by failure causal codes (5) | Other events that impact generation capability or equipment failure |
| **Management Discretion** | Other circumstances determined by management (e.g. significant near miss, financial impact, category 2 REE, etc.) | Any event or condition determined by management to need further investigation where cause apparent or obvious |

(1) For some recordable injuries or illnesses, it may not add value to conduct a Root Cause Analysis and an Apparent Cause Analysis will suffice.
(2) Contracting firms are expected to conduct their own incident investigations and provide the results to Duke Energy for review / approval. Duke Energy may assist with, or actually conduct the investigations, for instances where contracting firms may not possess the internal expertise to conduct investigations or at the desired quality.
(3) Health hazard overexposures are determined through personal exposure monitoring for certain contaminants such as lead, inorganic arsenic, asbestos, chemical constituents, noise levels, etc. The trigger for performing a RCA would be the documenting of the overexposure in MEDGATE and providing written notification to the affected employee(s).
(4) Based upon Operations Steering Criteria as established in the LOTO Error Matrix Decision Tree
(5) As defined by our HP Failure Mode cause codes (Executive Management, Organizational and Programmatic and Human Error codes).

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| APPENDIX 2: Event Criteria - TRANSMISSION | | | |
|---|---|---|---|
| **Category** | **Level 1 – Independent Root Cause Analysis (RCA)** | **Level 2 - Apparent Cause Analysis (ACA)** | **Level 3** |
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in **Section 7.5.**<br>• Near Miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br><br>Note: Refer to **Section 7.5** for exclusions. | OSHA recordable event that does not meet Level 1 criteria.<br><br>Note: Refer to **Section 7.5** for exclusions on minor OSHA recordable events that do not require a formal investigation.<br><br>**Vehicle Events**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Environmental** | A reportable environmental event resulting in a significant impact as described in **Section 7.5.** | Any other reportable environmental event as described in **Section 7.5.** | |
| **Operations Reliability** | • Outage totaling 1,000,000 CMI or more (human performance must be suspected to be the root cause or a significant contributor to the event).<br>• Generating impact event (GIE): Generating facilities include Company-owned Nuclear, Fossil, Hydro and Peaking Plants. Must be determined to be the root cause or a significant contributor to the event.<br>○ Complete or partial loss of one or more company-owned generating units. Includes creating situations that prohibit a unit from coming on-line if needed.<br>○ LOOP (Loss of off-site Power).<br>• Interruptions significantly impacting a Transmission priority (commercial or industrial) customer.<br>• Unintended operation of a bulk electrical system element with significant reliability or safety risk, as defined by management.<br>• Any event that meets NERC Event Analysis (Version 2) Categories 2-5 where human performance is determined to be the root cause or a significant contributor to the event. | • Violations of regulatory mandated requirements that result in moderate to high potential risk to reliability of Bulk Electric System or public service commission complaints where Human Performance is suspected to be the apparent cause or a significant contributor to the event.<br>• Outage totaling 500,000 but less than 1,000,000 CMI. (Human Performance must be suspected to be the apparent cause or a significant contributor to the event.)<br>• Any event that meets NERC Event Analysis (Version 2) Categories 1 where human performance is suspected to be the apparent cause or a significant contributor to the event.<br>• Switching and/or tagging error which creates an unsafe condition, unintended equipment operation, public injury, and equipment damage or customer outage. Switching error is defined as open/close wrong device, switching or breaker, drop load, closed device when all employees and equipment are not in the clear. | |

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| APPENDIX 2: Event Criteria - TRANSMISSION | | | |
|---|---|---|---|
| **Category** | **Level 1 – Independent Root Cause Analysis (RCA)** | **Level 2 - Apparent Cause Analysis (ACA)** | **Level 3** |
| **Financial** | Error that results in repair, rework, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | Significant adverse public relations event as determined by management. | Event affecting ability to provide services causing a significant public impact as determined by management. | |
| **Management Discretion** | Other significant event or near miss determined by management . | Any event or condition determined by management to need further investigation. | |

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## APPENDIX 3: Event Criteria – DELIVERY OPERATIONS

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 - Apparent Cause Analysis (ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in **Section 7.5.**<br>• Near Miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br><br>Note: Refer to **Section 7.5** for exclusions. | OSHA recordable event that does not meet Level 1 criteria.<br><br>Note: Refer to **Section 7.5** for exclusions on minor OSHA recordable events that do not require a formal investigation.<br><br>**Vehicle Events**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Environmental** | A reportable environmental event resulting in a significant impact as described in **Section 7.5.** | Any other reportable environmental event as described in **Section 7.5.** | |
| **Operations Reliability** | Human Error Outage events totaling 150,000 CMI or more. This excludes major storm events.<br><br>Note: Outage Investigative Process under Asset Management investigates all significant outage. Scope of this document is outages deemed to be caused by Human Error after the initial Asset Management Investigation is completed. | • Switching and/or tagging error which creates an unsafe condition, public injury, and equipment damage or customer outage. Switching error is defined as open/close wrong device, switch or breaker, drop load, close device when all employees and equipment are not clear.<br>• Non-storm related distribution feeder breaker/ recloser lockout.<br>• Flash events (excluding pulling meters where proper procedure is followed). | |
| **Financial** | Error that results in repair, rework, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | Significant adverse public relations event as determined by management. | Event affecting ability to provide services causing a significant public impact as determined by management. | |
| **Management Discretion** | Other significant event or near miss determined by management. | Any event or condition determined by management to need further investigation. | |

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## APPENDIX 4: Event Criteria – GAS OPERATIONS

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 - Apparent Cause Analysis (ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in **Section 7.5.**<br>• Near Miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br><br>Note: Refer to **Section 7.5** for exclusions. | OSHA recordable event that does not meet Level 1 criteria.<br><br>Note: Refer to **Section 7.5** for exclusions on minor OSHA recordable events that do not require a formal investigation.<br><br>**Vehicle Events**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Environmental** | A reportable environmental event resulting in a significant impact as described in **Section 7.5.** | Any other reportable environmental event as described in **Section 7.5.** | |
| **Operations Reliability** | Customer outage impacting 10% of the gas system customers in Ohio and Northern Kentucky. | Threshold for reportable outage as defined by the PUCO and KYPSC. | |
| **Financial** | Error that results in repair, rework, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | Significant adverse public relations event as determined by management. | Event affecting ability to provide services causing a significant public impact as determined by management. | |
| **Management Discretion** | Other significant event or near miss determined by management. | Any event or condition determined by management to need further investigation. | |

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## APPENDIX 5: Event Criteria – FLEET SERVICES

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 - Apparent Cause Analysis (ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in **Section 7.5.**<br>• Near Miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br><br>Note: Refer to **Section 7.5** for exclusions. | OSHA recordable event that does not meet Level 1 criteria.<br><br>Note: Refer to **Section 7.5** for exclusions on minor OSHA recordable events that do not require a formal investigation.<br><br>**Vehicle Events**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Environmental** | A reportable environmental event resulting in a significant impact as described in **Section 7.5.**<br><br>Additional Criteria for Fleet Services: Any event that leads to a regulatory environmental reportable incident or Notice of Violation (NOV). | Any other reportable environmental event as described in **Section 7.5.**<br><br>Additional Criteria for Fleet Services: Any environmental event that may potentially lead to an NOV or other environmental incidents that do not meet "reportable" criteria. | |
| **Financial** | Error that results in repair, rework, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | Significant adverse public relations event as determined by management. | Event affecting ability to provide services causing a significant public impact as determined by management. | |
| **Management Discretion** | Other significant event or near miss determined by management. | Any event or condition determined by management to need further investigation. | |

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## APPENDIX 6: Event Criteria – CUSTOMER SERVICE

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 - Apparent Cause Analysis (ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in **Section 7.5.**<br>• Near Miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br><br>Note: Refer to **Section 7.5** for exclusions. | OSHA recordable event that does not meet Level 1 criteria.<br><br>Note: Refer to **Section 7.5** for exclusions on minor OSHA recordable events that do not require a formal investigation.<br><br>**Vehicle Events**: Preventable vehicle incidents will be categorized as a Level 2. A forma ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Environmental** | A reportable environmental event resulting in a significant impact as described in **Section 7.5.** | Any other reportable environmental event as described in **Section 7.5.** | |
| **Operations** | • Loss of Major Customer Communications Technology for >6 hours (IVR, call center, web portals, CIS).<br>• Loss of metering functionality or inability to provide metering information to CIS. | • Technology failure greater than 3 hours in duration.<br>• Self-identified or public service commission complaint or non-compliance. | |
| **Financial** | Error that results in repair, rework, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | Significant adverse public relations event as determined by management. | Event affecting ability to provide services causing a significant public impact as determined by management. | |
| **Management Discretion** | Other significant event or near miss determined by management. | Any event or condition determined by management to need further investigation. | |

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## APPENDIX 7: Event Criteria – INFORMATION TECHNOLOGY

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 – Root Cause Analysis (RCA/ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in Section 7.5<br>• Near-miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different.<br>Note: Refer to Section 7.5 for exclusions. | • OSHA recordable event that does not meet Level 1 criteria.<br>Note: Refer to Section 7.5 for exclusions on minor OSHA recordable events that do not require a formal investigation.<br>Vehicle Events: Preventable vehicle incidents will be categorized as a Level 2B. A formal RCA is not required.<br><br>Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | • Any event where documenting the event can benefit others (lessons learned, close calls, self-reports) or for trend analysis. |
| **Environmental** | • A reportable environmental event resulting in a significant impact as described in Section 7.5. | • Any other reportable environmental event as described in Section 7.5. Level 2B event. | • Any event where documenting the event can benefit others (lessons learned) or for trend analysis. |
| **Operations Reliability** | • Service Impacting Event that resulted in the declaration of a **Crisis Event**.<br>• The specific crisis management program is defined in the Crisis Management Process document. | • Service Impacting Event that resulted in the declaration of a **Critical Service Disruption Event** (SDE). Level 2A requires an RCA.<br>• Service Impacting Event that resulted in the declaration of a **Limited Service Disruption Event**. Level 2B requires an ACA, at a minimum.<br>• The specific definitions for SDEs is defined in the Service Disruption Event Level Definitions document. | • All other events that have been resolved but did not result in the declaration of an SDE and where documenting the event can benefit others (lessons learned) or for analyzing trends.<br>• Chronic issues that require investigation and corrective action tasks to resolve. |
| **Financial** | • Error that results in repair, rework, redesign, billing mistake or regulatory fines (NRC, NERC, FERC, SOX, EPA, SEC), which exceed $100,000. | • Level 2B event requiring an ACA, at a minimum.<br>• Error that results in repair, rework, redesign, billing mistake or regulatory fines (NRC, NERC, FERC, SOX, EPA, SEC) in excess of $50,000 but less than $100,000.<br><br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | • Any event where documenting the event can benefit others (lessons learned) or for trend analysis. |
| **Customer Service** | • Significant adverse public relations event as determined by management | • Level 2B event requiring an ACA, at a minimum.<br><br>• Event affecting ability to provide services causing a significant public event as determined by management. | • Any event where documenting the event can benefit others (lessons learned) or for trend analysis. |
| **Management Discretion** | • Other significant event or near miss determined by management | • Level 2B event requiring an ACA, at a minimum.<br>• Any event or condition determined by management to need further investigation | • Any event where documenting the event can benefit others (lessons learned) or for trend analysis. |

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## APPENDIX 8: Event Criteria – GRID SOLUTIONS

| Category | Level 1 – Independent Root Cause Analysis (RCA) | Level 2 – Apparent Cause Analysis (ACA) | Level 3 |
|---|---|---|---|
| **Safety** | • Employee Fatality or serious injury with a potential for fatality. Meets the Serious Injury and Fatality (SIF) criteria described in Levels section above.<br>• Near miss incidents that did not result in serious injury/fatality but had the potential if circumstances had been different<br>• **Note:** Refer to Levels section above for exclusions | • OSHA recordable event that does not meet Level 1 criteria<br>  ○ Note: Refer to Levels section above for exclusions on minor OSHA recordable events that do not require a formal investigation<br>• **Vehicle Events:** Preventable vehicle incidents will be categorized as a Level 2. A formal ACA is not required. Please refer to HS-003 Record Keeping for Vehicle Accidents to determine if the incident is a Preventable Vehicle Accident (PVA). | Minimal further lessons can be achieved by additional investigation beyond what has already been performed in documenting the event. |
| **Operations / Project Work** | • For projects over $750K:<br>  ○ Deviation of 75% or more from the accepted range on project estimates or projections at close gate.<br>  ○ Deviation of 75% or more from the accepted range on delivery of expected project benefits at certain gates in the project (close gate, future effectiveness reviews) | • For projects over $100K but under $750K:<br>  ○ Deviation of 75% or more from the accepted range on project estimates or projections at close gate.<br>  ○ Deviation of 75% or more from delivery of expected project benefits at certain gates in the project (close gate, future effectiveness reviews)<br>• **Outages:** For outages affecting distribution, transmission, gas, or generation, Grid Solutions adopts the Level 1 / Level 2 standards of the affected organization. | |
| **Financial** | • Error that results in repair, rework, loss of productivity, redesign or billing mistake in excess of $100,000. | • Error that results in repair, rework, loss of productivity, redesign or billing mistake in excess of $50,000 but less than $100,000.<br>• Customer property damage claims paid in excess of $5,000.<br>• Employee damage to company equipment, including preventable vehicle events in excess of $20,000. | |
| **Customer Service** | • Significant adverse public relations event as determined by management (Ventyx, OMS, etc.) | • Event affecting ability to provide services causing a significant public impact as determined by management | |
| **Management Discretion** | • Significant event or near miss determined by management | • Any event or condition determined by management to need further investigation | |

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## APPENDIX 9: Human Performance Tools

| | Concept | Tool | What | How | When |
|---|---|---|---|---|---|
| 1 | **Job Briefings** | Pre-Job Brief | Deliberate meeting of job participants that focuses on everyone's understanding of job scope, requirements, hazards, risks and defenses. | Discuss key questions applicable to the job:<br>* What will be accomplished?<br>* What needs be avoided (risks)?<br>* What are the critical steps?<br>* What's the defense (mitigation)? | * Prior to job<br>* Before ANY activity take place<br>* Following any significant changes |
| | | Post-Job Brief | Method of self-assessment conducted after a work activity to solicit feedback from participants to identify what went well and lessons learned. | Team discussion on:<br>* Work procedures used<br>* Hazards encountered<br>* Special precautions/deviations<br>* What went wrong/ errors | * After any job, particularly when it does not go according to plan<br>* When an event occurs |
| 2 | **Situational Awareness** | 2 Minute Drill | Final situational check before beginning a task to ensure conditions reflect those that are expected or were discussed during the pre-job brief and that the workers are re-focused on the critical aspects of the job. | Stop and verify that actual conditions match those discussed during the Pre-Job Brief and other planning information. | * Prior to starting work<br>* Bridge between Pre-Job Brief and Self Checking |
| 3 | **Self-Check** | STAR | Conscious and deliberate review of intended actions and expected results BEFORE performing a task. | **Stop:** Pause and focus on task at hand<br>**Think:** Is this the right thing to do based on my current mental model?<br>**Act**: Point, Touch and Verbalize prior to execution<br>**Review**: Did I achieve the desired results? | * At the beginning of a task<br>* After being interrupted<br>* When conditions change<br>* When the task is completed |
| 4 | **Communication** | 3-Way Communication | Set of verbal communication standards and specific techniques designed to help us communicate clearly and effectively. | 1. Sender initiates the message<br>2. Receiver acknowledges message by repeating it back<br>3. Sender confirms accuracy of the message by saying "correct" or "wrong" | When important verbal information (e.g. instructions, equipment operation, condition, switching orders) is exchanged between people via face-to-face, telephone, or radio |
| | | Phonetic Alphabet | When the only distinguishing difference between two component designators is a single letter, then the phonetic alphabet form of the letter should be substituted for the distinguishing character. | Alpha, Bravo, Charlie, Delta, Echo, Foxtrot, Golf, Hotel, India, Juliet, Kilo, Lima, Mike, November, Oscar, Papa, Quebec, Romeo, Sierra, Tango, Uniform, Victor, Whiskey, Xray, Yankee, Zulu. | * Communicating alpha-numeric information (e.g. phase, channel designation)<br>* Possibility of misunderstanding sound-alike systems, high noise, poor radio/phone reception |

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## APPENDIX 9: Human Performance Tools (continued)

| | Concept | Tool | What | How | When |
|---|---|---|---|---|---|
| 5 | **Verification** | Peer Check | Series of actions by two individuals working together at the same time and place, before and during a specific action, to prevent an error by the Performer (i.e. Doer). | 1. **Performer** verbalizes intended actions<br>2. **Peer** verifies actions and verbalizes agreement<br>3. **Performer** proceeds with the action.<br>4. **Peer** confirms expected results | Work activities involving critical tasks and/or could result in significant consequences. |
| | | Concurrent Verification | Performer and Verifier independently perform Self-Check, then decide together that an action is correct and will achieve the intended result before the Doer performs any action **(Prevent Errors)**. | 1. **Performer** and **Verifier** mutually agree on the action<br>2. **Performer** self-checks<br>3. **Verifier** separately self-checks<br>*Only proceed if* ***Performer*** *and* ***Verifier*** *agree* | Typically reserved for key components where an error could result in significant consequences. |
| | | Independent Verification | Verifier confirms condition of equipment, document accuracy or calculations required for safe operation. Requires a time and space interval between actions of the Performer and the Verifier **(Detect Errors)**. | Verifier independently compares condition to guidance documents and standards. Independent verification is performed after completion of the task. | When an improver component, state or document could result in adverse consequences if remained undetected. |
| 6 | **Procedure Use & Adherence** | Place Keeping Techniques | Technique of clearly marking instructional steps in a document to indicate completion status of a particular step. | Circle/Slash Technique<br>1. Circle the step number of bullet<br>2. Place a slash to indicate step is complete<br>**Check marks** and **initials** can also be used | When following written instructions (e.g. switching orders). |
| | | Procedure Administration | Defined process and expectations for the use, adherence, creation and approval of procedures based on established classifications.<br><br>***Note:*** *Best practice from Generation being proposed for other BU to provide greater clarity for procedure adherence compliance and expectations (****Future State****).* | Procedures are classified in:<br>* Continuous Use: Requires step by step adherence and a copy of document<br>* Reference Use: Requires step by step adherence unless flexibility is allowed<br>* Information Only: Technical instruction/guidance; a copy is not required<br>* Multiple Use: Contains combination of continuous, reference and/or information | Anytime written procedures govern the work task. |
| 7 | **Questioning Attitude** | QVV (Qualify, Validate & Verify) | Questioning attitude technique to determine that the course of action is correct. | 1. Qualify source of the Information<br>2. Validate information internally<br>3. Verify information independently | Anytime things DO NOT seem right! |
| | | Stop When Unsure | Stop the work and call a "time out" when unsure to obtain the most accurate information. | 1. **STOP** the activity<br>2. Place the work in a safe condition<br>3. Contact supervisor<br>4. Resolve questions | Anytime things DO NOT seem right! |

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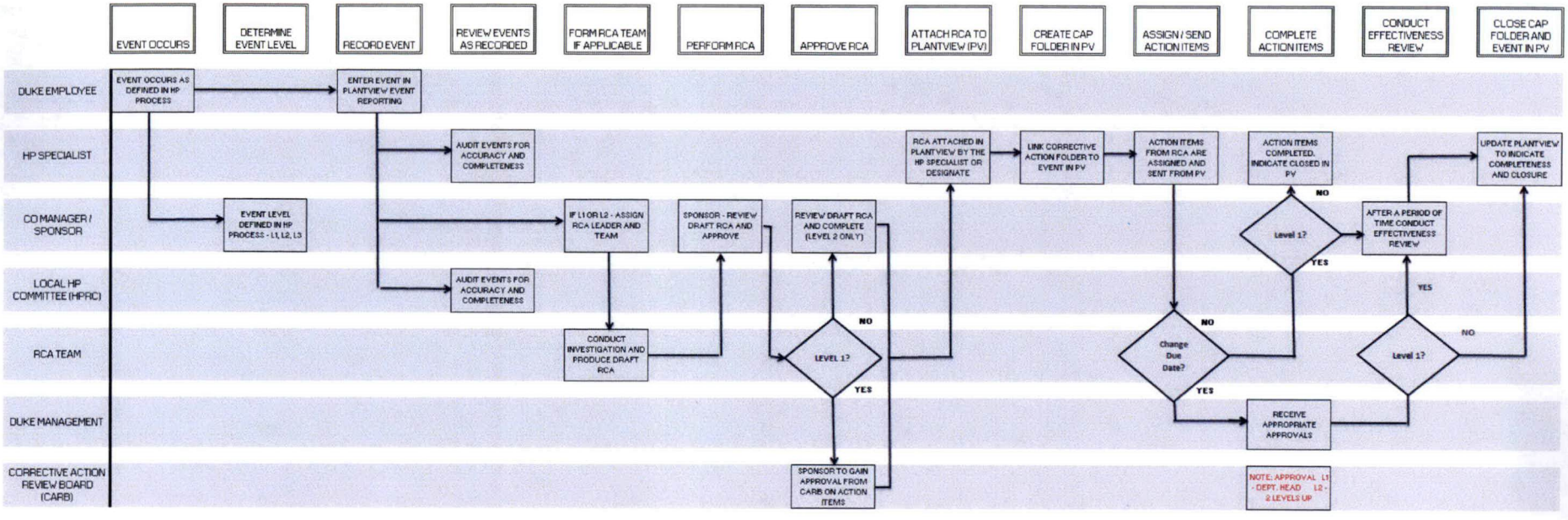
## APPENDIX 10: Event Process Flow Chart



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## APPENDIX 11: Common Cause Assessment (CCA) Template

| | |
|---|---|
| Date of Report | |
| Date Range of Events | |
| Management Sponsor | |

| CCA Team Members | Team Objectives |
|---|---|
| | |

| Scope of Analysis |
|---|
| |

| Overview of Events Analyzed |
|---|
| |

| Team Binning and Data Analysis |
|---|
| |

| Causes of Events |
|---|
| |

| Additional Findings |
|---|
| |

| Team Recommendations | Assigned To (Last Name, First Name) | Mgmt. Accepted | Due Date |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

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## APPENDIX 12: HP Maturity Model (Example)

| | | | | Score 1-5 | | | |
|---|---|---|---|---|---|---|---|
| Category | Attribute | Criteria for Level 5 (Optimized) | POE Ref# | Current State (self) | Ind. Review | Program Support | Links to Program Information |
| Prevention | **HP Training**<br>Timely, relevant, effective and verified | • Curriculum and delivery is timely, relevant to its audience, validated via structured approaches and effective in its content and delivery.<br>• Materials are developed by subject matter experts working in conjunction with individuals proficient in adult learning methodologies.<br>• Part of standard curriculums for new hires and continuing education/refreshers.<br>• HP Concepts and tools are part of standard job-related training. It is part of how we do work.<br>• Effective learning and consistent application of skills are validated via structured approaches. Gaps are immediately communicated and addressed. | #5<br>#6<br>#8 | 5 | | • HP curriculum with standard materials on general concepts, business unit specific exercises, and examples to facilitate alignment and application.<br>• Structured approach to reverify the effective application of HP concepts and tools (observation program, HPI Sheet, etc.)<br>• Business unit training organizations provides structure and expertise in developing materials based on adult learning mythologies. | HP Training<br>HP Training Reinforcement Tools |
| Detection | **Observation Programs**<br>Defined, timely, reinforce and encourage desired behaviors; proactively address behavior opportunities | • Supported by framework to define behaviors; efficiently capture results and identify trends.<br>• Clear standards that define what a quality observation is. Mechanisms are in place to provide training and ongoing feedback to observers.<br>• Supervisors are effective at providing coaching/feedback, focused on positive reinforcement (ratio goal: 4-1) and proactively addressing opportunities.<br>• Employees understand the intent and value of observations, which are seen as opportunities to engage on how work is done.<br>• Employees are actively engaged in observation efforts (peer-to-peer observations).<br>• Observations effectively identify and address opportunities; validates training effectiveness and adherence to work processes (new and updated).<br>• Leverage observations as a feedback tool on program effectiveness (e.g. a procedure needs to be updated, training not adequate).<br>• Business units independently execute targeted observations. | #11 | 3 | | • Standard Application (PlantView) Observation module used to capture observation results.<br>• Business unit field observation forms establish common standards and expectations to measure performance.<br>• Range Of Our Tolerance (ROOT) documents are used to define behaviors associated with specific work tasks. Facilitates consistency among observers.<br>• Comprehensive, automated reporting tool to effectively identify behavior trends at various levels (business unit, region, department, crew).<br>• Training curriculum includes a leadership module on coaching & feedback, as well as lessons on how to apply ROOT documents for larger programs.<br>• Defined standards for quality observations to provide guidance and ongoing feedback to observers (in progress). | Field Observations ROOT Document Library<br>Driver Observation ROOT Document |
| Correction | **Corrective Action (CA) Program**<br>Effective at preventing reoccurrence | • Business units have ownership of corrective actions (CA) resulting from their events. This includes understanding investigation results, while assuring proper action items are developed, resourced and completed in a timely manner.<br>• CAs prevent re-occurance of similar events (extent of condition).<br>• Established CA effectiveness reviews are regularly performed on most important action items.<br>• Consolidated reporting and visibility on CA status.<br>• Governance over due date extensions for all CAs to ensure proper approval and visibility.<br>• Clear standards and training on CA development to ensure they meet the SMARTER criteria (intent and success factors are clear).<br>• Alignment with observation programs and other support structures (training, work methods, business unit procedures, etc.) to ensure ongoing reinforcement and assessment of effectiveness, post implementation. | #16 | 2 | | • Comprehensive CA governance structure for initial development, extensions, status reporting and completion requirements (2015 initiative - complete).<br>• Corrective Action Review Boards (CARB) are being implemented in the larger business units (T&D).<br>• Standard tracking and reporting for CAs. This includes daily updates of SharePoint status reports, system generated notifications to CA owners and bi-weekly status reports pushed out to both owners and leadership. | Corrective Action Program Process Document |

**POE** - North America Transmission Forum Principles of Operating Excellence for Human Performance
Links to Program Information are for visual purposes only and are not functional in this document.

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## APPENDIX 13: HP Maturity Model Levels

| Level | Maturity Name | Description | Criteria |
|---|---|---|---|
| 1 | Adhoc | No repeatable processes; reactive management | Situations are unique, sometimes leading to business chaos.<br>Reactive management<br>Most actions/solutions done on an adhoc basis |
| 2 | Initial | Process dependable on individuals | Business processes and practices are not well-defined or understood<br>Business processes and practices aren't applied consistently<br>Tools and technology minimally used<br>Human Performance factors are not considered |
| 3 | Developing | Capable of meeting business needs, unproven, feedback loop not established | Business processes are well defined, documented and deployed but not consistently followed<br>Clearly defined metrics are developed but not fully communicated<br>Tools and technology are in place, understood but only used occassionally<br>Human Performance factors occasionally considered when developing a practice |
| 4 | Managed | Process meeting customer needs, controls in place (PDC model) | Business processes and best practices are consistently followed<br>Desired behaviors and outcomes are effectively monitored and measured (metrics)<br>Tools and technology are effectively leveraged where appropriate<br>HP factors are considered when developing a practice |
| 5 | Optimized | Continuous improvement, innovation, exceeding goals | Desired behaviors and HP Tools are habits (used all the time)<br>Effective metrics are in place and consistently yielding desired results<br>Proactive actions are taken by the business to achieve continous improvement<br>Reduced reliance on support organizations to execute HP PDC structure and other best practices<br>Tools and technology are fully integrated to support behaviors<br>HP Factors, behavior measures and metrics drive decisions on how to improve performance |

# Document Approval Form

published 1/22/16

**Section A: Document identification and type of action**

Document no.: ADMP-ADM-DOS-00005 | Revision no.: 001

Document title: Human Performance Program & Process Document

Type of action:

☐ New ☐ Cancellation ☐ Suspension
☐ Renumber ☐ Ownership Change
☑ Revision ☐ Periodic review completed, as required

For Corporate Document Center use only:
☐ Editorial Change ☐ Migration
☐ Control element revision _____ (does not require approval authority signature)

Applies to: (Select all that apply)

☐ Duke Energy
☑ Duke Energy Carolinas, LLC
☑ Duke Energy Progress, LLC
☑ Duke Energy Florida, LLC
☑ Duke Energy Indiana, Inc.
☑ Duke Energy Kentucky, Inc.
☑ Duke Energy Ohio, Inc.
☑ Group Transmission, FHO, EHS
☐ Department _____
☑ Other Customer Service Grid Solutions, Market Solutions

**Security Restrictions Required:** ☐ Yes ☐ No
If yes, explain (see instructions on page 2) _____

**Compliance Applicability:** (required field)
☑ None ☐ State Codes/Standards ☐ HIPAA ☐ Sarbanes-Oxley ☐ OSHA _____
☐ NERC ☐ FERC Standards of Conduct ☐ Patriot Act ☐ Other _____

**Applicable to forms only:** (see instructions on page 2)
Does the form have a parent, governing or instructional procedure? ☐ No ☐ Yes (Procedure No: _____)
How is the form to be completed or used? ☐ Hard Copy Completion (by hand) ☐ Online Data Entry

☑ Communication plan established ☑ Impact Reviews completed

Description of document action or summary of changes:

This document describes the processes and activities that constitute the Human Performance (HP) Program for Duke Energy Delivery Operations. This includes identifying, documenting, tracking, reviewing, and correcting the causes of HP events. This document also describes the roles and responsibilities of those involved in initiating HP event reviews, investigating HP events, and ultimately resolving issues identified.

rev001 changes - change title of section 8.0 to Correction (from Event Investigation); added note for responsibility of L1 Safety and L2 Event investigations; updated table of contents

**Section B: Approval** Who should sign? see instructions on page 2

**Preparer(s)/Author(s)/Writer(s)** (*signature not required*):

Rick Colombotti; Terry Hayford; Angela Stroud; Anthony Gilday; Chris Newell; Stacy Deason; Annie Fletcher; Ryan Crabtree

| | | |
|---|---|---|
| Approval recommended (*print name*): | (*signature*) | Date: |
| Approval recommended (*print name*): | (*signature*) | Date: |
| Approval recommended (*print name*): | (*signature*) | Date: |
| **Final Approval** (*print name*): Steve Skora | (*signature*) Steve Skora | Date: 01/19/2016 |

**RETURN SIGNED FORM AS SCANNED PDF VIA E-MAIL OR FAX TO (919) 235-3165**

| Document title: | Document number: |
|---|---|
| **3.3 Transmission - Rubber Gloves and Rubber Sleeves (Work Methods Manual)** | Trans. WM – 3.3 |
| | Revision No.: 000 |
| Keywords: keyword, work methods manual | Applies to: Transmission |

This document provides Transmission work methods to safely plan and perform work in accordance with Occupational Safety and Health Administration (OSHA) Standards and Duke Energy approved safety policies, procedures and related standards while incorporating appropriate and applicable best practices and incident corrective actions expected to be followed.

## Keys to Life

All jobs must start by following all of the Transmission Keys to Life.

- **Driving Safely**
- **Pre-Job Briefing**
- **Electrical Safety**
- **Falls from Elevation**
- **Rigging**
- **Trenching/Excavations**
- **Personal Protective Equipment**
- **Work Zone Safety**
- **Pole/Structure Inspection**
- **Falling Objects/Line of Fire**
- **Confined Space**

Human Performance (HP) concepts and principals are integrated into the culture of an elite ONETransmission organization. One of the most effective methods to integrate Human Performance is to always consider and incorporate HP Standard Tools in work planning and execution. The Human Performance concepts, as well as their corresponding tools, are listed below and are critical to achieving operational excellence and event-free operations:

| Concept | Tools |
|---|---|
| **Job Briefings** | Pre-Job Brief<br>Post-Job Brief |
| **Situational Awareness** | 2-Minute Drill |
| **Self-Check** | STAR (Stop, Think, Act, Review) |
| **Communication** | 3-Way Communication<br>Phonetic Alphabet |
| **Verification** | Peer Check<br>Concurrent Verification<br>Independent Verification |
| **Procedure Use & Adherence** | Place Keeping Techniques<br>Procedure Administration |
| **Questioning Attitude** | QV&V (Qualify, Validate & Verify)<br>Stop When Unsure |

# Table of Contents

# 1 Purpose

This work method provides guidance of when to use rubber gloves and rubber sleeves for Transmission workers. It also provides guidance on the care, inspection and testing of rubber gloves and rubber sleeves.

# 2 Scope

While this work method covers the majority of the situations for rubber gloves usage, it does not clarify all situations that require the use of rubber gloves and rubber sleeves.

You must adhere to all personal protective equipment (PPE) requirements for the task to be performed.

You must refer to, understand and adhere to manufacturer safety guidelines for all tools and equipment.

# 3 Work Methods

## 3.1 Safety Requirements

Workers must not approach or bring any conductive object closer to exposed energized parts than the employer's established minimum approach distance (MAD) unless:

- The worker is insulated, for the maximum voltage exposure, from the energized part or ungrounded de-energized part
  - Rubber gloves, or rubber gloves and rubber sleeves, constitute insulation of the worker from the energized part, or ungrounded de-energized part, upon which the worker is working provided that the worker has control of the part in a manner sufficient to prevent exposure to uninsulated portions of the worker's body

**OR**

- The energized part is insulated from the worker and from any other conductive object at a different potential

**OR**

- The worker is insulated from any other exposed conductive object in accordance with requirements for live-line bare-hand work

  **Note: In addition to the requirements in this work method, the worker may wear rubber gloves or rubber gloves and rubber sleeves anytime he/she considers them necessary for his/her personal safety. When working outside of MAD, Transmission workers are not required to wear rubber gloves when using any properly tested live-line tool.**

- **1910.269(l)(4)(ii)**: When a worker uses rubber insulating gloves or rubber insulating gloves and rubber sleeves as insulation from energized parts, the employer shall ensure that the worker:
  - **1910.269(l)(4)(ii)(A):** Puts on the rubber insulating gloves and rubber sleeves in a position where he or she cannot reach into the MAD, established by the employer.

**and**

  - **1910.269(l)(4)(ii)(B):** Does not remove the rubber insulating gloves and rubber sleeves until he or she is in a position where he or she cannot reach into the MAD, established by the employer.

### 3.2 Usage Requirements

Always wear appropriately rated rubber gloves or rubber gloves and rubber sleeves (if required by the business unit) when:

- Working on energized parts or equipment and MAD cannot be maintained
- Opening, closing, removing or installing panels or doors on substation switchgear, padmount transformers and padmount switchgear that expose uninsulated energized parts or equipment
  - For known voltages within the enclosure greater than 1kV **OR** if the voltage within the enclosure is unknown, wear a minimum of Class 2 rubber gloves
  - For known voltages within the enclosure less than 1kV, wear a minimum of Class 0 rubber gloves
  - Rubber gloves are not required when locking or unlocking
- Operating gang-operated switches in energized circuits that have handles that are manually operated from the ground (Must wear Class 2 rubber gloves)
- Working on the ground while handling poles being set or removed in energized Distribution lines
  - Rubber gloves are not required if using live-line tools to control the poles
- Short circuiting or grounding individual capacitor units
- Working on the ground when repairing and handling downed distribution conductors (grounded or ungrounded)
- Handling distribution neutral conductors (Must wear Class 2 rubber gloves)
- Handling downed distribution conductors
- Working on the ground when repairing and handling Transmission conductors or overhead ground wire (OHGW) that could contact Distribution conductors
- Connecting or disconnecting grounding systems in an energized environment if there is a hazard of creating a parallel current flow path or interrupting an existing current flow path as determined by the hazard analysis
  - Does not apply to personal protective grounding greater than 600V
- Induced voltage hazards exist
  - Do not remove rubber gloves until the hazard is removed

Use rubber gloves when driving ground rods, unless a locate service has provided an all-clear or no electrical underground hazards were identified through print or site assessment during the job briefing. This includes driving temporary grounding rods for vehicles and equipment. If rubber gloves will not be used, this must be documented in the job briefing.

### 3.3 Insulated Hand Tools

- When working in close proximity to energized parts or equipment, appropriate insulated hand tools must be used as protection from accidental contact
- Before using insulated hand tools, visually inspect them to assure the insulating material is not damaged
- Use insulated hand tools with a minimum rating of 1000 volts AC and 1500 volts DC
- Use insulated hand tools only for their designated purposes
  - Do not use insulated hand tools on circuits above the tool rating
- Insulated hand tools must be marked with double triangles by the manufacturer to indicate they were manufactured and tested in compliance with ASTM F1505, Standard Specification for Insulating and Insulated Hand Tools
- Coverings on the handles of hand tools not marked with double triangles must not be considered as insulated
- Wear rubber gloves with insulated hand tools if the work could cause the MAD to be violated

### 3.4 Rubber Gloves and Rubber Sleeve Ratings

Rubber gloves and rubber sleeves must be rated for the maximum phase-to-ground voltage for the lines and equipment being worked, as listed in Table 1.

**Note: Whenever rubber gloves are required, leather glove protectors must be worn over the rubber gloves. Leather glove protectors may not be worn without rubber gloves. Do not use leather glove protectors for any other purpose.**

**Table 1**
**Rubber Gloves and Rubber Sleeve Ratings**

| Class | Label Color | Test Voltage Maximum (kV) | Voltage Phase-to-Ground (kV) |
|---|---|---|---|
| 0 | Red | 5 | 1 |
| 2 | Yellow | 20 | 17 |
| 3 | Green | 30 | 26.5 |
| 4 | Orange | 40 | 36 |

### 3.5 Testing and Inspecting

- Rubber gloves and rubber sleeves are tested every four months by the Rubber Goods Test Lab
- Rubber gloves and rubber sleeves are marked with the test date and expiration date
  - The four month test period expires on the last day of the month stamped on the glove or sleeve
  - Confirm that rubber gloves and rubber sleeves have a current test date before use
- Visually inspect rubber gloves and rubber sleeves for cuts, punctures, tears, oils or other defects daily before each use

### 3.5.1 Air-Testing

Air test rubber gloves before each day's use and immediately after any incident that is suspected of causing damage using one of the following methods:

- Manual glove inflator (bellows)
  - The manual glove inflator is the preferred method for air-testing rubber gloves
- Tightly rolling the rubber glove by hand or with a field air inflation tool (FAIT), from the cuff toward the palm, so that trapped air expands the glove

After the rubber glove is inflated or rolled, feel for and listen for any loss of air. Visually inspect for any defects.

## 3.6 Replacing

Defective rubber gloves and rubber sleeves must be replaced.

- Remove defective rubber gloves and rubber sleeves from service, tag them and send them to the Rubber Good Test Lab
  - Cut off one finger of defective rubber gloves and cut defective rubber sleeves in half before sending them to the Rubber Goods Test Lab

    **Note: Do not cut or mark gloves that need further investigation or are involved in an incident. Contact the Rubber Goods Test Lab for handling instructions for gloves in these situations.**
- Remove out-of-date rubber gloves and rubber sleeves from service immediately

## 3.7 General use and Care

- If rubber gloves or rubber sleeves come in contact with oil, grease or any other damaging material, wipe them clean using an approved cleaner as soon as possible
  - Contact the testing facility for information regarding approved cleaners
- If leather glove protectors become saturated with any petroleum product, replace them before continuing with any work
- Store rubber gloves, rubber sleeves and leather glove protectors in storage bags provided for that purpose
  - Store rubber gloves with the cuff facing down and store tools in separate pockets from the rubber gloves
- Only approved rubber glove liners are allowed to be worn under rubber gloves
- If you are wearing rubber sleeves, the cuffs of the gloves must be outside the rubber sleeves at all times and the sleeves must be properly adjusted to cover the shoulders
  - Rubber gloves are to be worn with the cuffs on the outside of rain suits or jackets if rubber sleeves are not worn

## 3.8 Rubber Glove and Rubber Sleeve Change-Out

The Rubber Goods Test Lab will communicate the change-out schedule to field locations annually.

Rubber gloves are available in electrically rated classes 0, 2, 3 and 4 and in whole and half sizes.

Rubber sleeves will be yellow with red interior, with the extra-curved design. Rubber sleeves are available in electrically rated classes 2 and 4 and in sizes regular, large and extra-large.

Field locations will provide the Rubber Goods Test Lab with the sizes required for field worker's rubber glove and rubber sleeves and will be changed out by location.

Supply Chain, interoffice courier mail or Logistics will deliver and pick up shipments of rubber gloves and rubber sleeves using established delivery routes.

Rubber gloves and rubber sleeves will arrive at field locations two days before the scheduled change-out date. Rubber gloves and rubber sleeves will be paired and shipped in large plastic containers. Workers will select their sizes from the container.

### 3.8.1 Construction, Maintenance and Vegetation (CMV) Field Supervisor Responsibilities for Change-Out

The CMV Field supervisor is responsible for:

- Managing the change-out process
- Ensuring that the change-out is completed within five business days and all workers have switched out their rubber gloves and rubber sleeves
- Ensuring that the rubber gloves and rubber sleeves to be returned are properly packaged into the plastic totes and shipping crates, with return labels showing
    - Do not pack rubber gloves and rubber sleeves with other heavy material loaded on top of them
- Coordinating the return shipment with the appropriate shipping or Supply Chain delivery service technician
- Ensuring that spare rubber gloves and rubber sleeves are stored away from ozone-generating electrical equipment and direct contact with high-pressure sodium or metal halide warehouse lighting
    - Empty cardboard sleeve and factory glove boxes for storing spare rubber gloves and rubber sleeves are available from the Rubber Goods Test Lab
- Reviewing the exchange memo (packing list) that accompanies each shipment and contacting the Rubber Goods Test Lab if quantity adjustments are required

### 3.8.2 Worker Responsibilities for Change-Out

Upon receiving changed-out rubber gloves and rubber sleeves, workers are responsible for:

- Visually inspecting rubber gloves and rubber sleeves to make sure they are in proper condition
- Returning out-of-date rubber gloves and rubber sleeves to the Rubber Goods Test Lab to maintain inventory

# 4 References

## 4.1 Regulatory References

- OSHA 29 CFR 1910.269

## 4.2 Technical References

- ASTM F1505

## 4.3 Related Work Methods

- 2.2 Minimum Approach Distances
- 5.20 Power Factor Testing
- 5.21 Energized Testing Greater Than 600V
- 5.22 Energized Testing 600V or Less
- 8.26 Installing and Removing Transmission Poles

## 4.4 Related Documents and Forms

- None identified