INTERCONNECTION AGREEMENT

FED **05** 2004

This Interconnection Agreement ("Agreement") is made and entered into this <u>for an of</u> <u>(ULH&P"</u>), 20<u>04</u>, by and between **The Union Light, Heat and Power Company** ("**ULH&P"**), a corporation organized and existing under the laws of the Commonwealth of Kentucky, ("Company"), and **DHL Worldwide Express, Inc., a Delaware Corporation with a place of business at 236 Wendell H. Ford Blvd., Erlanger, KY** ("Customer")(hereinafter sometimes referred to individually as "Party" or together as "Parties").

WITNESSETH:

WHEREAS, Customer is installing or has installed generation equipment, controls, and protective relays and equipment ("Generation Facilities") used to interconnect and operate in parallel with the Company's electric system described as follows and in Exhibit A, which is attached hereto and is incorporated herein by reference:

Location: DHL Facility at Cincinnati/Northern Kentucky International Airport

Generator Size and Type: 3 – 2250kW Diesel Powered Synchronous Generators

NOW, THEREFORE, in consideration thereof, Customer and Company agree as follows:

1. Application. It is understood and agreed that this Agreement applies only to the operation of Customer's Generation Facilities described above and on Exhibit A.

2. Interconnection. Company agrees to allow Customer to interconnect and operate in parallel with the Company's system the Generation Facilities described in Exhibit A in accordance with any operating procedures or other conditions specified in this Agreement, Exhibit A and any applicable tariffs. By this Agreement, or by inspection, if any, or non-rejection, or approval, or in any other way, the Company does not give any warranty, express or implied, as to the adequacy, safety, compliance with applicable codes or requirements, or other characteristics of the Generation Facilities. The facilities installed by Customer shall comply with the National Electrical Code, the National Electrical Safety Code, the Company's applicable rules and regulations for electric service in effect from time to time, the rules and regulations of the Commission, and all other applicable local, state, and federal codes and laws, and Customer warrants such compliance.

Customer shall install, operate, and maintain in good order, at its sole cost and expense, such Generation Facilities for safe, efficient and reliable operation of the Generation Facilities in parallel with Company's electric system. Customer shall bear full responsibility for the installation and safe operation of the Generation Facilities.

Customer agrees that no changes shall be made to the configuration of the Generation Facilities described in Exhibit A, and that no relay or other control or protection settings specified in Exhibit A shall be set, reset, adjusted or tampered with without written permission from the Company, except to verify that such equipment complies with Company approved settings.

3. **Operation by Customer.** Customer shall operate its Generation Facilities in such a manner as not to cause undue fluctuations in voltage, intermittent load characteristics or otherwise interfere with the operation of Company's electric system. At all times when the Generation Facilities are being operated in parallel with Company's electric system, Customer shall so operate the Generation Facilities in such a manner that no disturbance will be produced in the Generation Facilities thereby to the service rendered by Company to any of the other customers.

Customer's Control Equipment shall immediately, completely, and automatically disconnect and isolate the Customer's Generation Facilities from Company's electric system in the event of a fault on Company's electric system, a fault on Customer's electric system, or loss of source on 2013

Company's electric system. This automatic disconnecting device shall not be capable of reclosing until after service is restored on Company's electric system. Additionally, if the fault is on Customer's electric system, the automatic disconnecting device shall not be reclosed until after the fault is isolated from the Customer's electric system.

Access by Company. Upon reasonable advance notice to Customer. Company shall 4. have reasonable access to Customer's Generation Facilities at any time whether before, during or after the time the Generation Facilities first produce energy in order to inspect and test the Generation Facilities and to verify that the installation and operation of Customer's Generation Facilities complies with the requirements of this Agreement. Company shall also have at all times immediate access to breakers or any other equipment that will isolate Customer's Generation Facilities from Company's electric system. Company shall have the right and authority to isolate said Generation Facilities at Company's sole discretion if Company believes that (a) continued parallel operation creates or contributes to an emergency on either Company's or Customer's electric system, (b) Customer's Generation Facilities present a hazardous condition or (c) Customer's Generation Facilities interfere with the operation of Company's electric system or creates or contributes to a disturbance to the service rendered by Company to any of its other customers. In non-emergency situations, Company shall give Customer reasonable notice prior to isolating Customer's Generation Facilities.

5. Rates and Other Charges. This Agreement does not constitute an agreement by the Company to purchase or wheel power produced by the Generation Facilities nor does it address charges for excess facilities that may be installed by the Company in connection with interconnection of the Generation Facilities. It is understood that if Customer desires an agreement whereby Company wheels power or purchases energy and/or capacity from Customer's Generation Facilities, Company and Customer may enter into negotiations concerning another separate agreement detailing the charges, terms and conditions of such purchase or wheeling, to the extent permitted by law. It is also understood that if excess facilities are required, including any additional metering equipment, as determined by Company, in order for Customer's Generation Facilities to interconnect with and operate in parallel with Company's system, then a separate agreement which details the charges and terms of such excess facilities, shall be entered into by Customer and Company.

6. Insurance. Customer shall procure and keep in force during all periods of parallel operation with Company's electric system, the following insurance, with insurance carriers acceptable to Company, with Company as an Additional Insured as Company's interests may appear in this Agreement, with Company as an Additional Insured only to the extent of indemnities and obligations listed herein, and in amounts not less than the following:

Coverage	Limits
Comprehensive General Liability and	
Contractual Liability	
Bodily Injury:	\$5,000,000 per occurrence
Property Damage:	\$5,000,000 per occurrence
Customer shall deliver a CERTIFICATE	OF INSURANCE verifying the required coverage to:
UHL&P Attention: Rhonda Whitaker 107 Brent Spence Square Covington, Kentucky 41014	PTIALIC SERVICE COMPLICATION OF KENTUCKY ESTEC CIVE
at least fifteen (15) days prior to any Customer.	interconnection with Company's electric system by
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7. Release, Hold Harmless and Indemnification.

(a) Each Party shall release and hold harmless the other Party from and against all claims, liability, damages and expenses, based on any damage to any of the first Party's property, including loss of use thereof, arising out of, resulting from or connected with, or that may be alleged to have arisen out of, resulted from or connected with, an act or omission by the second Party, its employees, agents, representatives, successors or assigns in the construction, ownership, operation or maintenance of such second Party's facilities used in connection with this Contract, unless caused by the gross negligence or willful misconduct of the second Party.

(b) The Customer shall indemnify, defend and hold the Company harmless from and against all claims, liability, damages and expenses, including attorneys' fees, based on any injury to any person, including loss of life, or damage to the property of any third party, including loss of use thereof, arising out of, resulting from or connected with, or that may be alleged to have arisen out of, resulted from or connected with, an act or omission by the Customer, its employees, agents, representatives, successors or assigns in the construction, ownership, operation or maintenance of such third party's facilities used in connection with this Agreement.

(c) The Company shall indemnify, defend and hold the Customer harmless from and against all claims, liability, damages and expenses, including attorneys' fees, based on any injury to any person, including loss of life, or damage to the property of any third party, including loss of use thereof, arising out of, resulting from or connected with, or that may be alleged to have arisen out of, resulted from or connected with, an act or omission by the Company, its employees, agents, representatives, successors or assigns in the construction, ownership, operation or maintenance of such third party's facilities used in connection with this Agreement.

(d) If a Party is required to bring an action to enforce its rights under this Section 7, either as a separate action or in connection with another action, the non-prevailing Party shall reimburse the prevailing Party for all expenses, including attorneys' fees, incurred in connection with such action.

8. Effective Term and Termination Rights. This Agreement becomes effective upon the date it is executed by both Parties and shall continue in effect for an initial term of five (5) years, and thereafter shall continue in effect for succeeding one-year terms, unless and until terminated by written notice given by one Party to the other Party at least sixty (60) days prior to the initial date of expiration, or any succeeding expiration date, and stating an intention to terminate this Agreement as of the applicable expiration date. In addition, Company may terminate by giving Customer at least sixty (60) days notice in the event that there is a material change in an applicable rule or statute.

9. Termination of Any Applicable Existing Agreement. From and after the date when service commences under this Agreement, this Agreement shall supersede any oral and/or written agreement between Company and Customer concerning the service covered by this Agreement and any such agreement shall be deemed to be terminated as of the date service commences under this Agreement. There are no other representations, terms or conditions of this Agreement other than as set forth in writing herein. This Agreement cannot be amended or modified other than in writing and signed by both Parties.

10. Force Majeure. "Force Majeure" means any cause or event not reasonably within the control of the Party claiming Force Majeure, including, but not limited to, the following: acts of God, strikes, lockouts, or other industrial disturbances; acts of public enemies; orders or permits or the absence of the necessary orders or permits of any kind which have been properly applied for from the government of the United States, the Commonwealth of Kentucky, any political subdivision or municipal subdivision or any of their departments, agencies or officials, or any civil or military authority; unavailability of a fuel or resource used in connection with the generation of electricity; extraordinary delay in transportation; unforeseen soil conditions; equipment, material,

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supplies, labor or machinery shortages; epidemics; landslides; lightning; earthquakes; fires; hurricanes; tornadoes; storms; floods; washouts; drought; arrest; war; civil disturbances; explosions; breakage or accident to machinery, transmission lines, pipes or canals; partial or entire failure of utilities; breach of contract by any supplier, contractor, subcontractor, laborer or materialman; sabotage; injunction; blight; famine; blockade; or quarantine.

If either Party is rendered wholly or partly unable to perform its obligations because of Force Majeure, both Parties shall be excused from whatever obligations are affected by the Force Majeure (other than the obligation to pay money) and shall not be liable or responsible for any delay in the performance of, or the inability to perform, any such obligations for so long as the Force Majeure continues. The Party suffering an occurrence of Force Majeure shall, as soon as is reasonably possible after such occurrence, give the other Party written notice describing the particulars of the occurrence and shall use its best efforts to remedy its inability to perform, provided, however, that the settlement of any strike, walkout, lockout or other labor dispute shall be entirely within the discretion of the Party involved in such labor dispute.

11. Commission jurisdiction. Company is subject to the jurisdiction of the Kentucky Public Service Commission ("KyPSC") and the Federal Energy Regulatory Commission ("FERC"). To the extent that KyPSC or FERC approval of this Agreement may be required now or in the future, this Agreement and Company's commitments hereunder are subject to such approval, and the Parties agree to cooperate with each other in obtaining such approval.

IN WITNESS WHEREOF, the Parties have executed this Agreement, effective as of the date first above written.

ULH&P By: (Title) <

DHL Worldwide Express, Inc. Bν aveme.

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EXHIBIT A

Interconnection Agreement – DHL Worldwide Express, Inc.

Exhibit A includes this page and the following attachments:

Attachment #1: Electrical One-Line Diagrams (three sheets) – Drawing DHL_E1 and Automated Switch Co. Dwgs E6660P-1 and E6660P-2

Attachment #2: Relay Settings (One page)

Attachment #3: "Sequence of Operation" (8 pages) (Pages 8 through 15 from ASCO "Sequence of Operation and Operating Instructions" for DHL CVG HUB Standby Generator System.)

Description of Generator and Interconnection Facilities:

The generator facilities consist of 3 - 2250kW, 12,470V 3-phase diesel-driven synchronous generator sets and is located at the DHL facility at the Cincinnati/Northern Kentucky International Airport. The primary purpose of the generators is for emergency power to this facility during loss of normal utility power. Paralleling capability is included to allow for closed transition of load to and from the generator. The generator neutral is solidly grounded and the windings are in a wye configuration, generating directly at 12,470V. There are no transformer connections between the generators and the Company's system.

Interconnection protection, except for overfrequency, is provided by a GE SR750 Multilin relay that will trip the 52U breaker. The interconnection protection functions as shown in Attachment #2 are in setting group #2, which is active only when the 52U and 52GM breakers are both closed. Overfrequencey protection settings, as shown in Attachment #2 are provided on relays that trip individual 52G1, 52G2, and 52G3 breakers on each generator.

Conditions of Parallel Operation:

The generator may operate in parallel with the Company's system only under the following conditions:

- 1. The generator and interconnection system configuration is as shown on Attachment #1, Electrical One-Line Diagrams.
- 2. The utility protective relays include the settings as specified in Attachment #2, Relay Settings.
- 3. The system is operated as described in Attachment #3, Sequence of Operation. Normal parallel operation is for brief periods for purposes of closed transition of load to and from the generator.
- 4. At no time during parallel operation will the generator power output cause power to flow through the utility circuit breaker to the Company (as shown on Attachment #1ak Single Line Diagram) to the utility.

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- 1: ALL AUXILIARY 51G RELAYS ON THE FEEDER BREAKERS ARE TO BE DIS-ABLED. THESE RELAYS WILL NOT BE USED IN THE PROTECTION SCHEME. IT IS ALSO NECESSARY TO ENSURE THAT THE SYSTEM DOES NOT DIS-ABLE THE 51G FUNCTION IN THE SR735 WHEN THE SYSTEM IS DN-GENERATOR.
- 2' THE GENERATOR RELAY SETTINGS ARE PREDICATED ON THE REPLACEMENT 2505 C.T.'S BEING INSTALLED NEUTRAL-TO-GROUND.
 - THE MULTILIN RELAY POLARIZING GROUND C.T. MUST BE CONNECTED IN A RESIDUAL MANNER OFF THE PHASE-C.T. INPUTS IN ORDER TO ENABLE THE 67/67N FUNCTIONALITY. VOLTAGE POLARIZING IN THIS SITUATION CANNOT BE ACCOMPLISHED WITH THE OPEN-DELTA P.T. CONFIGURATION.
- 41 THE SYMMETRICAL STEADY-STATE SHORT-CIRCUIT CURRENT VALUES ILLUSTRATED HERE ARE WORST-CASE WITH ALL THREE GENERATORS PARALLELED WITH THE UTILITY.
- 51 THE MORE-SENSITIVE' RELAY SETTING GROUP REQUESTED BY CINERGY IS ACTIVATED ON A SERIES-COMBINATION OF MOC/A CONTACTS ON 52U AND 52GM. WITH BOTH BREAKERS CLOSED, THE SR750 ON 52U WILL ADVANCE TO SETPOINT-GROUP-2 FOR THE DURATION OF PARALLEL OPERATIONS. SETPOINT GROUP SWT ACCOMPLISHED VIA DIGITAL INPUT #1 BEING ASSERTED ON CON?
- 6: DIRECTIONAL OVERCURRENT ELEMENTS, ANSI ELEMENT 67, CONV THAT 67-FVD IS FOR FAULT CURRENT 'ONTO' THE BUS FROM TH LIKEWISE, 67-REV IS FOR FAULT CURRENT FROM THE GENERATH THE UTILITY.
- 7: ALL C.T. AND P.T. RATIOS USED ARE AS-SHOWN IN THE ASCO S DIAGRAM, DRAWING #E6660P-1. THE BUS SENSING P.T. ARRANGEM TO BE ACROSS A-PHASE AND B-PHASE FOR THE 52U-750.
- 8 REFERENCING 52U ASCO DRAVING E6660P-7, IT IS UNCLEAR AS PRESENCE OR ABSENCE OF 52/AUX CONTACTS TO THE SR750. T FIELD-VERIFIED.
- 9 THE REVERSE POWER PROTECTION, ANSI ELEMENT 32R, IS NOT VITHOUT THE RELAY CONNECTED. THIS ELEMENT MUST BE SET-ACTIVATED IN THE FIELD.
- 10 THE 52U-SR750 IS NOT CAPABLE OF TWO SEPARATE 67N FAMIL AND REVERSE, IN THE SAME SETPOINT GROUP, THEREFORE, THE REVERSE GROUND DVERCURRENT) IS ACTIVE HONLYH IN SETPO WHICH IS ACTIVE ONLY WHILE THE UTILITY IS PARALLELED.
- UN VOLTAGE INPUT CONVENTION WITH THE SR750 IS THAT "BUS" SOURCE AND "LINE" IS THE LOAD-SIDE OF THE BREAKER.
- 2: SYNCHROCHECK, ANSI ELEMENT 25, IS NOT ACCOMPLISHED IN 1 THE UNDERFREQUENCY, ANSI ELEMENT 81U, IS PRESENT IN BOT-AND IN THE SR489'S ON THE GENERATOR, BUT DNLY THE SR4E_ OVERFREQUENCY TRIP, ANSI ELEMENT 810.

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Electrical One-Line Diagram

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DHL Interconnection Agreement Exhibit A – Attachment #1 Electrical One-Line Diagram (2 of 3)



EXHIBIT A

Interconnection Agreement - DHL Worldwide Express, Inc.

Attachment #2 – RELAY SETTINGS

The following settings are to be included in the specified relays. This list does not prohibit use of other protective functions available in the relays, but not specified below.

GE SR750 Multilin Relay Settings in Setpoint Group 2, tripping 52U Breaker:

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Underfrequency: 59.8Hz @ 0.1sec with "Minimum Operating Voltage" set at zero and "Minimum Operating Current" set at zero.

Reverse Power: Equiv to 300kVA actual 12.47kV flow @ 10 sec

The overvoltage and undervoltage settings will trip at the following definite times when the 12.47kV voltage is at or below the following percentages:

Undervoltage Trip 1: 90% @ 2.0 sec Undervoltage Trip 2: 70% @ 0.1 sec Overvoltage Trip 1: 110% @ 2.0 sec Overvoltage Trip 2: 120% @ 0.1 sec

With a potential transformer ratio of 12000/120 volt and the "VT Secondary Voltage" defined as 120 volts in the relay setup, the actual equivalent relay settings are as follows, all with "Minimum Operating Voltage" set at zero:

Undervoltage Trip 1: 0.94 @ 2.0 sec Undervoltage Trip 2: 0.73 @ 0.1 sec Overvoltage Trip 1: 1.14 @ 2.0 sec Overvoltage Trip 2: 1.25 @ 0.1 sec

Directional Overcurrent settings for current flow from the generator out to the utility: (Amp levels are at 12.47kV)

Phase: 200 Amp pickup, IAC Extremely Inverse Curve, 0.5 Multiplier (Time Dial) Ground: 80 Amp pickup, IAC Extremely Inverse Curve, 2.0 Multiplier (Time Dial)

GE SR489 Generator Management Relay Settings for in-parallel operation, tripping 52G1, 52G2, and 52G3 Breakers:

Overfrequency: 60.5Hz @ 0.1 sec

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DHL Interconnection Agreement Exhibit A – Attachment #1 Electrical One-Line Diagram (3 of 3)

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V. SEQUENCE OF OPERATION

A. EMERGENCY MODE: OPEN TRANSITION

Conditions:

SW. POS.	status/position	description	POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch STOP/RESET-OFF-AUTO OFFLINE TEST-ONLINE	
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	OFF	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer Transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
IOS	OFF	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

This system is designed to work in conjunction with EMCPII controls mounted near the generator. The EMCPII generator controls will crank the engines for starting, provide Cooldown (nominally set at a very low level or 0 as the PLC will be providing a Cooldown period) and shutdown logic and have their own annunciation. A CIM module will be mounted in the Switchgear to echo the alarms and shutdown from the generator controls.

When the master system sends a start signal to the generators PLC, these will then send start signals to their respective generator. The first generator to reach rated speed and voltage will close its breaker to a dead bus. The other generators will be prevented from closing to a dead bus via Multi Circuit interlock built into the MSLC/DSLC system. Subsequent generators will match voltage and frequency via their synchronizers into the MSLC/DSLC system prior to closing.

During sequences where the generator bus is paralleled to the utility the same synchronizers in the MSLC/DSLC will be used for this purpose. The MSLC/DSLC will also control the loading or unloading of the generators when going on or off of the utility.

Upon loss of normal power as detected by the utility voltage negative sequence/under voltage relay device-47, After an adjustable time delay (*factory set at 5 sec*).

All engines will sequence through the auto-start cycle. The first genset to reach rated speed and voltage will close its breaker to the dead bus. When additional units are available, they will be automatically synchronized to the bus.

After all engine generators are connected to the generator bus, the Generator main breaker 52GM shall be closed automatically.

If the load-shed switch is in SHED GSE position, feeder 52F2 trips open before generator main breaker 52GM closes.

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ASCO Power Technologies, LP, SO# 6660

B. MOMENTARY UTILITY OUTAGE AUTOMATIC OPERATION

Upon loss of normal power as detected by the utility voltage negative sequence/under voltage relay device-47, After an adjustable time delay (*factory set at 5 sec*).

All engines will sequence through the auto-start cycle. The first genset to reach rated speed and voltage will close its breaker to the dead bus. When additional units are available, they will be automatically synchronized to the bus.

If normal utility power returned as detected by device 47/27 before the Generator main breaker closes.

After an adjustable time delay (*factory set at 5 sec*). The main utility breaker 52U re-closes if the generator main breaker 52GM has not already closed.

All generator breakers shall be tripped. Engine will after 0-15 minute (field adjustable) factory set at 6 minutes cooldown period, will shutdown and be set up in ready standby condition for the next operation.

Total Facility load remains connected to the normal utility power.

C. UTILITY RESTORED: AUTOMATIC SOFT RE-TRANSFER

Conditions:

SW. POS.	status/position	description	POSITIONS		
LSS	AUTO Load shed control		SHED-OFF-MAN-AUTO		
ES	AUTO Engine control switch		STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST		
MS	AUTO	System master control	MANUAL-AUTO		
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6		
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF		
STS	OFF	System test	OFF-NOLOAD-LOAD		
TMS	CLOSE	Transfer transition	OPEN-CLOSE		
LDS	ON	Load demand	OFF-ON		
RTS	AUTO	Return to normal	MAN-AUTO		
IOS	OFF	Interruptible mode	OFF-ON		
HWOS	OFF	Hazardous Weather Operation	OFF-ON		

Upon restoration of utility power as detected by the relaying on the utility breaker, a return to normal source time delay will be started (0-30 min.). After expiration of this time delay online generators will be synchronized to incoming utility, and that utility breaker closed. After closing the Utility main breaker 52-U, the **MSLC & DSLC** will begin to soft unload running Generators. Once all generators are fully unloaded all generator breakers and generator main shall be tripped.

Engine will after 0-15 minute (field adjustable) factory set at 6 minutes cooldown period, will shutdown and be set up in ready standby condition for the next operation.

If the load shed circuit had previously tripped open feeder 52F2, then feeder 52F2 will be reclosed after main utility breaker 52U closes.

NOTE: If MSLC failed to automatically synch incoming utility source to the generator bus or If soft loading operation exceeds a pre-set time delay (adjustable delay factory set at 60 sec.), soft transfer to or from utility will be terminated and connected loads shall be remain connected to the Generator source.

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UTILITY RESTORED: MANUAL SOFT RE-TRANSFER

Conditions:			
SW. POS.	status/position	description	POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	OFF	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer mode	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	MAN	Return to utility	MAN-AUTO
IOS	OFF	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

Upon restoration of utility power as detected by the relaying on the utility breaker, a return to normal source time delay will be started (0-30 min.). After expiration of this time delay, the Green light within the INITIATE AUTO RE-TRANSFER TO UTILITY pushbutton located at the master section will flash and the horn will sound.

The operator pushes the retransfer push-button to initiate Auto retransfer to utility as described in Part V.C

Stabilization period can be bypassed by depressing the push-button before it begins flashing.

E. LOAD SHED

If the load-shed switch LSS is in OFF position, load shedding is inhibited.

If the load-shed switch LSS is in MANUAL position, load shed is done manually.

If the load-shed switch LSS is in SHED GSE position, feeder 52-F2 is always tripped open before transferring the connected loads to running generators.

If the load-shed switch LSS is in AUTO position, load shed is activated if connected loads exceeds the 95% of the connected generator capacity for an adjustable time delay (*factory set at 5 sec*). Level 1 load shed is initiated first and opens feeder 52F2.

If after an adjustable time delay the load still exceeds the 95% level, level 2-load shed is initiated. (Future feeder).

If the main generator bus under frequency drops below 58HZ for more than an adjustable time delay (*factory set at 3 sec*), Both load shed circuits (LEVEL 1 & 2) will be activated.

All shed loads will be restored automatically after normal utility power is restored.

F. UTILITY LOCKOUT

If utility main circuit breaker is tripped due to an overload or other utility fault (67, 50/51), standby generators shall not be started, the operator after investigating the cause of fault should reset the lockout relay device 86U. If normal power is available, Utility main breaker shall be automatically reclosed to a dead bus.

G. LOAD DEMAND START/STOP CONTROL

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1. After three generators sets have been paralleled to the bus and all loads connected, a stabilization time delay (0-600 seconds) factory set at 300 seconds shall be initiated. At the expiration of this time delay period, the system will operate in a load demand mode. The load demand monitor and its associated controls shall control the number of generating sets on the bus.

 Upon sensing that the on-line reserve capacity exceeds the 120% of one Gen KW, A 300 seconds (adjustable 0-1800 seconds) time delay shall be initiated.
If the reserve capacity remains continually for the duration of this time delay, the circuit breaker of the selected set shall be opened the engine shall run for its cooldown period, then shutdown. This time delay shall be re-initiated and the process continued until the on-line reserve capacity no longer exceeds 120% of the on-line generating capacity

3. Upon sensing that the actual load has decreased the reserve capacity to 80% or less of one Gen KW. A 5-seconds time delay (field adjustable from 0-300 seconds) is initiated. If the reserve capacity stays below 80% for the duration of the time delay, the controls will initiate the starting and paralleling of the next set in sequence.

If, during the time delay period, the bus experiences an under frequency condition, the time delay shall be bypassed and all idle sets with its control switch in Automatic shall be immediately started and paralleled. At the same time, a lamp indicating a bus under frequency shall light and signals shall be given to shed load.

- 4. Upon sensing that the actual load has reached the 110% of online capacity for 0.5 second, the controls will initiate the starting and paralleling of the next set in sequence.
- 5. If while operating in the load demand mode, an engine-generator set malfunction occurs, the affected set shall be removed from the bus, and the second set shall be started and connected to the bus.
- 6. The system shall maintain a minimum of two Engine/Gen sets online during emergency

H. UTILITY RESTORED: OPEN TRANSITION TRANSFER

Conditions:

SW. POS.	status/position	description	POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	OFF	System test	OFF-NOLOAD-LOAD
TMS	OPEN	Transfer transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
IOS	OFF	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

Upon restoration of utility power as detected by the relaying on the utility breaker a return to on normal source time delay will be started (0-30 min.). After expiration of this time delay the generator and generator main breakers will be opened and utility breaker closed in an open transition mode.

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Engine will after 0-15 minute (field adjustable) factory set at 6 minutes cooldown period, will shutdown and be set up in ready standby condition for the next operation.

SYSTEM NO- LOAD TEST: AUTOMATIC

Conditions:

I.

SW. POS.	status/position	description	POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch STOP/RESET-OFF-AUTC OFFLINE TEST-ONLINE	
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	NO-LOAD	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
IOS	OFF	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

Switching the STS to NO-LOAD TEST position shall start all engine/generator sets, all available engines shall be automatically synchronized to the bus; Utility source shall remain connected to the bus and generator main breaker shall remain opened.

Engine/Gens shall remain in running mode until switching the system test switch back to OFF position.

The NO-LOAD test mode shall be terminated upon a loss of normal power, and the system shall be switched to the emergency mode as previously described.

J. SYSTEM LOAD TEST SOFT TRANSFER

Conditions:

SW. POS.	W. POS. status/position description		POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	LOAD	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
10S	OFF	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

Switching the STS to LOAD TEST position shall close generator main breaker start all engine/generator sets, all available engines shall be automatically synchronized to the bus.

Once two or more generators are synchronized to the generator bus, MSLCDSLC will start softunload Utility source before tripping the utility main breaker. Connected load shall be powered from the emergency source.

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If normal power is available, switching the STS switch to OFF, shall cause running generators to be synchronized to incoming utility, close utility main breaker, soft load the utility source open the generator main breaker and return the system to standby mode.

Open transition mode during load testing is not permitted.

All load-shed circuits are operative during load test.

During Load Test mode, loss of normal power shall terminate load test, after automatic re-transfer back to utility, the operator can resume the load test by switching the load test to OFF position then back to load test.

K. HAZARDOUS WEATHER OPERATION

SW. POS. status/position		description	POSITIONS	
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO	
ES	AUTO	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST	
MS	AUTO	System master control	MANUAL-AUTO	
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6	
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF	
STS	OFF	System test	OFF-NOLOAD-LOAD	
TMS	CLOSE	Transfer transition	OPEN-CLOSE	
LDS	ON	Load demand	OFF-ON	
RTS	AUTO	Return to normal MAN-AUTO		
IOS	OFF	Interruptible mode	OFF-ON	
HWOS	ON	Hazardous Weather Operation	OFF-ON	

Conditions:

Switching the Hazardous weather selector switch "HWOS" to ON position shall close generator main breaker start all engine/generator sets, all available engines shall be automatically synchronized to the bus.

Once two or more generators are synchronized to the generator bus, MSLC/DSLC will start softunload Utility source before tripping the utility main breaker. Connected load shall be powered from the emergency source.

If the connected loads exceed the online generating capacity While operating in the hazardous weather mode, Due to a loss of more than one-engine generator sets or due to bus under frequency. The system shall automatically goes into the load-shed mode according to the LSS position.

If normal power is available, overload shall cause running generators to be synchronized to incoming utility, close utility main breaker, soft load the utility source open the generator main breaker and return the system to standby mode.

Retransfer to normal power will be initiated by switching the HWOS switch to OFF, running generators shall be synchronized to incoming utility, close utility main breaker, soft load the utility source open the generator main breaker and return the system to standby mode.

If load shed circuit had previously tripped feeder 52F2, then feeder 52F2 will be automatically reclosed.

L. INTERRUPTIBLE OPERATION

Conditions:

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SW. POS.	status/position	description	POSITIONS
LSS	AUTO	Load shed control	SHED-OFF-MAN-AUTO
ES	AUTO	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST
MS	AUTO	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	OFF	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
IOS	ON	Interruptible mode	OFF-ON
HWOS	OFF	Hazardous Weather Operation	OFF-ON

Switching the interruptible mode selector switch "IOS" to ON position shall close generator main breaker start all engine/generator sets, all available engines shall be automatically synchronized to the bus.

Once two or more generators are synchronized to the generator bus, MSLC/DSLC will start softunload Utility source before tripping the utility main breaker. Connected load shall be powered from the emergency source. The system will function as in load test mode.

Retransfer to normal power will be initiated by switching the IOS switch to **OFF**, running generators shall be synchronized to incoming utility, close utility main breaker, soft load the utility source open the generator main breaker and return the system to standby mode.

If load shed circuit had previously tripped feeder 52F2, then feeder 52F2 will be automatically reclosed.

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M. MANUAL OPERATION

Conditions:

SW. POS.	status/position	description	POSITIONS
LSS	MAN	Load shed control	SHED-OFF-MAN-AUTO
ES	ONLINE TEST	Engine control switch	STOP/RESET-OFF-AUTO- OFFLINE TEST-ONLINE TEST
MS	MAN	System master control	MANUAL-AUTO
PSS	OFF	Gens manual synch selector	OFF-GEN1 THRU GEN6
SMS U & G	RUN	Synchronizer mode switch	AUTO-PERM-CHECK-OFF
STS	OFF	System test	OFF-NOLOAD-LOAD
TMS	CLOSE	Transfer transition	OPEN-CLOSE
LDS	ON	Load demand	OFF-ON
RTS	AUTO	Return to normal	MAN-AUTO
IOS	OFF	Interruptible mode	OFF-ON
HWOS	ON	Hazardous Weather Operation	OFF-ON

By switching the Master control switch "MS" to MAN position, all automatic engine start, synchronizing and load control shall be locked out and the start and stopping of the engine generators can be controlled from their engine control switch device ES.

See operation instruction Part VI for detailed manual operations.

K. ALARM SYSTEM OPERATION

- 1. The alarm system consists of alarm/status panel with a central audible alarm and manual horn silence push-button at the master control panel.
- 2. Status lights are green and do not turn on the horn.
- 3. Pre-alarms are amber and all shutdowns are red. Each of these alarms turns on the audible alarm. The audible alarm must be manually turned off using the horn silence push-button. The visual pre-alarms shall remain on until manually acknowledged., however the shutdown alarms must be manually reset by placing the engine switch (ES) into the OFF/RESET position.
- 4. The audible alarm horn will turn on for subsequent alarms. The alarm system includes pulse modules, which latch each alarm as it is received and provides momentary pulse to the horn which seals in through the horn relay. The horn will remain on until silenced.

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PRODUCER	REATEOFLIABLE	THIS CERT	IFICATE IS ISSU	JED AS A MATTER C	DATE(MM/DD/YY) 12/17/03 F INFORMATION
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PHONE - (215) 255-2000	FAX - (215) 255-1893	COMPANY AI	merican Home A	Assurance Co.	
DHL Worldwide Express,	Thc.	COMPANY B			
8100 SW 10th Street Suite 4000 Plantation FL 33324 USA		COMPANY C			
COVERAGES					
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				EACH OCCURRENCE	\$5,000,000
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	-			MED EXP (Any one person)	\$5,000
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HIRED AUTOS				BODILY INJURY (Per accident)	
				PROPERTY DAMAGE	
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				PRODUCTS - COMP/OP AGG	\$5,000,000
				EACH OCCURRENCE	\$5,000,000
OWNER'S & CONTRACTOR'S PROT				FIRE DAMAGE(Any one tire)	\$50,000
				MED EXP (Any one person)	\$5,000
				COMBINED SINGLE LIMIT	
ALL OWNED AUTOS				BODILY INJURY (Per person)	
				BODILY INJURY (Per accident)	
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