ATTACHMENT 9.4 **POST MODIFICATION TEST PLAN FORM**

Note: Component(s) to be tested are identified in **Bold Face Type**

EC # 5000033794		**Rev** 1.	**Title** Station Blackout and Appendix R Diesel Generator Set	
		Test Requirement(s)		**Acceptance Criteria**
Mechanical				
Item # 1	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform a VT on final pipe welds. For fuel oil and service water piping only: perform LPT on final weld.		ENN-NDE-10.08 (Visual) ENN-NDE-9.40 (LPT)
Item # 2	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Perform Visual In-Service Test at normal system operating pressure.** - **Cooling Water (city water and service water piping)** - **Jacket Water** - **Aftercooler** - **Crank case breather system** - **Lube oil reservoir** - **Fuel Oil - between check valves (down-stream of GT25/GT26) and globe valve (upstream of solenoid valve) Lube oil system**		No leakage observed.
Item # 3	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify valve operability by stroking valve through one complete cycle of full travel. • **Cooling Water butterfly valves** • **Fuel Oil manual isolation valves** • **Drain and vent valves**		Verify that the following valves operates smoothly with no binding: **JW-112 through JW- ~~119~~ 125,** **CC-172 through CC-179,** **DF-141 through DF- ~~151~~ 152 and DF-SOV-151,** **UW-831 through UW-845, UW-854 and UW-855, UW-860 through UW-863** **SWT-834 through SWT-837**

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Item # 4	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Perform Cummins Engine/ Generator Site Acceptance Test per Cummins prepared test procedure. Include the following:** Perform manual start up (DG has no autostart), synchronizing to energized busses, and loading. Verify DG load speed control, and governor control. Perform manual unloading, separating from site busses, and controlled shutdown. Verify DG operates properly from Unit / Parallel Mode Switch. Verify protective trips of engine and breaker (e.g. undervoltage, overcurrent, under and over frequency, loss of cooling, emergency manual trip, etc.) under fault conditions. Applicable to: **SBO/App R Diesel Generator and DG output breaker**		Operating parameters are within design values per the vendor operating manual. Acceptance criteria are based on vendor site acceptance test and therefore govern the satisfactory completion of the testing requirements. DG protective trips, unit / parallel mode switch, synchronization, load speed control, and governor control function correctly. ~~The DG set run time to be for a minimum of 2 hours at rated full load.~~

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Item # 5	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform system functional operability test to ensure proper operation. **SBO/App R Diesel Engine:** • **Fuel Oil System (Supply Tank to Day Tank & Day Tank to Engine)** • **DG Engine Cooling Water System** **City Water –** **Jacket Water flow of 118gpm (+0, -10) as indicated on FI-7979 and Aftercooler flow of 87gpm (+0, -10) as indicated on FI-7980;** **Service Water –** **Jacket Water flow of 185gpm (+0, -10) as indicated on FI-7979 and Aftercooler flow of 137gpm (+0, -10) as indicated on FI-7980;** **confirm flow to HX's using ultrasonic flow meter** • **Lube Oil System**	Acceptance criteria are based on vendor site acceptance test and therefore govern the satisfactory completion of the testing requirements. **Fuel Oil System: Fuel Oil Day Tank level is maintained as evidenced by no low level indication on the Fuel Control & Monitoring (FCM) display. Adequate fuel flow to the engine, as evidenced by acceptable DG operation throughout testing.** ~~**DG Engine Cooling: (1) Cooling water gpm is ≤ 205 gpm (jacket water ≤ 118 gpm; aftercooler ≤ 87 gpm; (2) jacket water HX (TI-908) and aftercooler HX (TI-909) outlet temperatures are less ≤ 212 °F and 170 °F, respectively.**~~ **Adequate engine cooling as evidenced by no high temperature alarms for Jacket Water and Aftercooler circuits on DG control panel.** **Lube Oil System: DG engine lube oil level is maintained as evidenced by no low level alarm on DG display panel.**
Electrical / Instrumentation & Controls				
Item # 6	☐ Construction ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	~~**Perform Engine Vibration Checks – At interface between engine & generator and top rails (both sides) of engine at the Aftercoolers.**~~		~~**Record data (for future monitoring/trending) and submit to System Engineering.**~~

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Item # 7	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform meggering **(See ENN-EE-S-008-IP, Section 5.8)** prior to termination of **all newly installed ~~MV and~~ LV power and control cables.**		Minimum acceptable IR in megohm = [Rated voltage in kV + 1] *1000/cable length in ft. Contact Design Engineering for further evaluation if values are less than acceptance criteria.
Item # 8	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform point-to-point wiring verifications (continuity checks **per ENN-EE-S-008-IP, Section 5.8)**. Applicable to **all wiring**.		All wiring demonstrates continuity and wires are terminated at points shown on the termination drawings.
Item # 9	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Check the physical rotation of the motor by manually rotating the shaft in the direction that the motor is expected to drive the equipment. Verify shaft is free from binding, noise and drag effects. Conduct a phase rotation test to verify that the correct phases have been connected to AC motors. Bump the motor and verify proper rotation. Applicable to: **Fuel Oil transfer pump#1 (FOP-11)** **Fuel Oil transfer pump#2 (FOP-12)** **DG Ventilation Fan (ARDG-REF-MTR)**		No binding, noise or drag. Motor rotates in the correct direction.
Item # 10	☐ Construction ☒ Functional **(IPEC PE)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Energize the motor and verify that the motor speed is within tolerance. Perform PDMA and vibration tests. Applicable to: **~~Fuel Oil transfer pump#1 (FOP-11)~~** **~~Fuel Oil transfer pump#2 (FOP-12)~~** **DG Ventilation Fan (ARDG-REF-MTR)**		Motor speed is within tolerance. **No PDMA anomalies.** Vibration level is less than: **1.0 mil @ 3600 rpm** **2.0 mils @ 1800 rpm** **2.5 mils @ 1200, 900 or 600 rpm** Contact Performance Engineering for further evaluation if acceptance criteria are not met.

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Item # 11	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Verify that the local MCC HAND–AUTO control switch (CS) for the fan operates appropriately.** ~~**The thermostat setpoint is adjustable, and may be changed to facilitate testing. The deadband of the thermostat (~ 3°F) is not adjustable. After testing, set the thermostat to the value of 90°F (+/- 3°F).**~~ There is no alarm associated with operation of the fan. **The DG Control Panel automatically starts and stops the area fan with the engine start and stop signal.** Verify the operation of the MCC red "on" and green "off" lights. Applicable to: **DG Ventilation Fan (ARDG-REF)** ~~**Thermostat (TS-7982)**~~	**In HAND (OFF) at the MCC control switch, the fan runs (stops) respectively. In AUTO, the fan starts when the DG starts; after DG shutdown, the fan stops. Lights operate correctly.**
Item # 12	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Perform insulation resistance and dielectric tests of all newly installed MV cables PRIOR TO splicing as follows:** **A. Insulation Resistance Test at 1000 volts DC for 1 minute** **B. Dielectric Test at 15kV DC for 5 minutes** **C. AFTER MV cable splicing and bus terminations are complete perform 1000VDC megger of MV cables.**	**A. >/= 15 Megaohms** **B. >/= 15 Megaohms** **C. >/= 15 Megaohms** **Contact Design Engineering for further evaluation if values are less than acceptance criteria**
Item # 13	☒ Construction **(IPEC I&C)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform a bench or in place calibration. Verify that all fluid pressure boundaries are not leaking and can hold pressure. Verify gauge reading is consistent with expected system pressure. Applicable to **Fuel Oil Day Tank supply pressure gauge (PI-8030)**	Gauge is calibrated. No fluid pressure boundary leakage. Gauge reading is consistent with expected system pressure.
Item # 14	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the temperature control switch (TE-8027) turns the fan on and off. The "on" and "off" setpoints are the responsibility of the vendor and were set at the factory and should not require re-setting. See PRYCO drawing FCM00176-1. Applicable to: **Day Tank Fuel Oil Cooler**	Temperature control switch turns the fan on and off correctly, such that the engine fuel oil return temperature is lowered.

Attachment 7.46 - Post MOD Test Plan

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		Test Requirement(s)		**Acceptance Criteria**
Item # 15A	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**(Note: the existing fuel oil transfer pumps are identified as FOP-11 and FOP-12 on plant mechanical drawings; and also as FO Pump #1 and #2 on plant electrical drawings.)** **Verify that the control, and indication circuits operate when the pumps are powered as follows:** **1. #11 FO pump powered by the existing Turbine Auxiliary MCC, and #12 FO pump powered by the new DG MCC.** **2. Both #11 and #12 FO pumps powered by the new DG MCC.** **Applicable to:** **FO transfer pump #11 and pump #12** ~~**FO pump flow switch #1 (pump #11 fail)**~~ ~~**FO pump flow switch #2 (pump #12 fail)**~~ **FO common header solenoid valve (DF-SOV-151)** **FO transfer pump #11 power transfer switch**	Normally, day tank level can be maintained by just one pump cycling on/off between level setpoints. The SOV energizes and opens at the same time as either pump is energized.

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Item # 15B	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Verify the following alarms:** **Day Tank Rupture Alarm** **Critical High Fuel Alarm** **High Fuel Alarm** **Low Fuel Alarm** **Low Flow (Pump Fail) Alarm** **Applicable to the following components:** **Day Tank Flow Control Monitor (FCM)** **Day Tank Ultrasonic level sensor** **Day Tank level (float) switches** **Day Tank rupture basin float switch** **Day Tank critical high float switch**		**Alarms sound and clear on Day Tank Flow Control Monitor when condition corrected.**
Item # 16	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify successful breaker or thermal overload heater operation with load connected if applicable. Applicable to: **MCC starter for Fuel Oil transfer pump#1** **MCC starter for Fuel Oil transfer pump#2** **MCC starter for DG Ventilation Fan** **MCC breaker for battery charger** **MCC breaker for coolant heaters** **MCC breaker for 120VAC transformer**		Breaker or thermal overload heater operation with full load connected is acceptable such that breakers and thermal overloads do not trip during ~~full load~~ testing.
Item # 17 A	☒ Construction **(POWELL)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Prior to energizing switchgears perform micro-ohm drop test across 13.8/6.9kV bus connections made in the field.** **(Perform after completion of Item 26)**		**Resistance recorded across connections is within +/-1-ohm of resistance recorded across a similar length of bus bar.**
Item # 17 B	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Determine phase sequence of 13.8kV L&P Bus 3 and of 6.9kV Buses 5 and 6 and record.** **With new DG operating and DG switchgear energized determine the phase sequence at DG switchgear and record.**		**Phase sequence of DG matches phase sequence of 13.8kV L&P Bus 3 such that DG can be synchronized to L&P Bus 3 properly.** **Phase sequence of DG matches phase sequence of 6.9kV Buses 5 and 6 such that equipment operates properly when powered from DG.**

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Item #17 C	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Energize all DG switchgear. Measure the voltages of the switchgear. Compare data against design criteria and similar load conditions. Evaluate any adverse trends. Applicable to:** **DG output breaker SBO/ASS** **Switchgear breaker SBOH** **Switchgear breaker SBOL** **Switchgear breaker ASS** **Switchgear breaker OSP** **Verify the following:** **- Check transformer for abnormal noises, excessive vibration, arcing, or other evidence of problems.** **- Verify that there are no abnormal operating characteristics (e.g., temperature changes) for a 2-hour period before loading the secondary of the transformer, if applicable.** **Applicable to: 13.8kV/6.9kV Transformer & 13.8kV/480V Transformer**	Voltages within acceptable range (±5%). No adverse trends. ~~**DG output breaker SBO/ASS** - 13.8kV (+/- 5%)~~ ~~**Switchgear breaker SBOH** - 13.8kV (+/- 5%)~~ ~~**Switchgear breaker SBOL** - 6.9kV (+/- 5%)~~ ~~**Switchgear breaker ASS** - 13.8kV (+/- 5%)~~ ~~**Switchgear breaker OSP –** 6.9kV (+/- 5%)~~ **No abnormal noises, excessive vibration, arcing, or other evidence of problems. No abnormal operating characteristics (e.g., temperature).** **Voltmeter Locations:** **1) DG Operator / Control Panel (Digital Bargraph) Reading 13.8kV** **2) SBO/App R SWGR. 13.8kV Bus Unit 1 Incoming Cubicle (Analog w/ Select Sw.) Reading 13.8kV**
Item # 18	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the Diesel Generator Set manually starts and energizes auxiliaries during a simulated station blackout condition with **MCC 22 feed de-energized.** ~~**and** the Diesel Generator (DG) set manual transfer switch (MCC 214) in the diesel generator output position~~. Applicable to: **Appendix R Diesel Generator and Auxiliaries**		Verify that Diesel Generator (DG) set manually starts and the DG auxiliaries are energized. Verify that the DG Set Output Breaker closes on the 13.8 kV Bus.
Item # 19	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the Switchgear operates freely with no overheating, or other abnormalities occurring during the tests conducted with the load connected. Applicable to: **DG output breaker SBO/ASS** **Switchgear breaker SBOH** **Switchgear breaker SBOL** **Switchgear breaker ASS** **Switchgear breaker OSP**		Switchgear operates freely with no overheating, or other abnormalities.

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Item # 20	☒ Construction **(IPEC I&C)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the interlock and control circuits for the component operate in accordance with vendor or design requirements. Conduct testing which operates the control switch and associated circuitry in all possible modes. Check to determine that the associated components function according to design requirements. Verify that the normal switch position is according to the design documentation and that all indication is correct, no burned out lights occur, and indication is not reversed. Applicable to: **DG output breaker SBO/ASS** **Unit / Parallel Mode Switch** **Switchgear breaker SBOH** **Switchgear breaker OSP**		Interlock and control circuits for the component operate according to design requirements. Normal switch position is according to the design documentation and all indication is correct.
Item # 21	☒ Construction **(IPEC I&C)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the interlock and control circuits for the component operate in accordance with vendor or design requirements. Conduct testing which operates the control switch and associated circuitry in all possible modes. Check to determine that the associated components function according to design requirements. Verify that the normal switch position is according to the design documentation and that all indication is correct, no burned out lights occur, and indication is not reversed. Applicable to: **Switchgear 6.9KV breaker SBOL**		Normal switch position is according to the design documentation and all indication is correct. Local control and interlock circuits operate properly. When the Gas Turbine #1 Auto Transformer Differential Lockout Relay LOR actuates, verify that the SBOL breaker trips remotely. Verify that the SBOL breaker cannot be closed locally as long as the remote trip condition exists, but can be re-closed locally when the remote trip condition clears

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Item # 22	☒ Construction **(IPEC I&C)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the interlock and control circuits for the component operate in accordance with vendor or design requirements. Conduct testing which operates the control switch and associated circuitry in all possible modes. Check to determine that the associated components function according to design requirements. Verify that the normal switch position is according to the design documentation and that all indication is correct, no burned out lights occur, and indication is not reversed. Applicable to: **Switchgear 13.8KV breaker ASS**		Normal switch position is according to the design documentation and all indication is correct. Local control and interlock circuits operate properly. When the MC3A Relay actuates, verify that the ASSS breaker trips remotely. Verify that the ASSS breaker cannot be closed locally as long as the remote trip condition exists, but can be re-closed locally when the remote trip condition clears
Item # 23	☐ Construction ☒ ~~Functional~~ ☐ EC Assumption ☐ Operations ☐ Post Return to Service	~~During operational testing, verify acceptable operating parameters with the diesel generator supplying power to the bus.~~ **~~SBO/App R Diesel generator:~~** ~~– Bearing temperature increase.~~ ~~– Winding temperature. – Running direction. .~~ ~~– Running current – Bus supply and generator terminal voltages.~~ ~~– Voltage imbalance.~~		~~Operating parameters are within design values per the vendor operating manual or satisfactory completion of the vendor site acceptance test.~~
Item # 24	☐ Construction ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Moved to Item 4.**		
Item # 25	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the local temperature indication operates in accordance with vendor requirements. Applicable to: **13.8kV/6.9kV Transformer**		Local temperature indication is functional.
Item # 26	☒ Construction **(POWELL)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Conduct resistance measurements, ratio test, and insulation resistance test**. Applicable to: **13.8kV/6.9kV Transformer & 13.8kV/480V Transformer**		**Test per ANSI C57.12.01 Section 8.0 following guidelines provided in ANSI C57.12.91. Test results are to be evaluated by Engineering for acceptability.**

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Item # 27	☒ Construction **(POWELL)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the tap positions are correct to provide the voltage transformation required. Applicable to: **13.8kV/6.9kV Transformer**		Tap position is set at nominal (13.8kV/6.9kV).
Item # 28	☐ Construction ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Moved to Item 17C.**		
Item # 29	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the correct polarities have been connected to the battery charger. Applicable to: **Batteries and Battery Charger**		Cell polarities are correct charger connections are correct.. ~~**Vendor verified by satisfactory completion of Vendor Site Acceptance Test.**~~
Item # 30	☒ Construction **(SHAW)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that continuity exists between the battery charger mounting and station ground. Applicable to: **Batteries and Battery Charger**		Verify continuity exists between the battery charger mounting and station ground. ~~**Vendor site acceptance test will verify for acceptable cable terminations and grounding.**~~
Item # 31	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform a battery capacity and service discharge test (Load Profile). Verified by visual display at the Power Command Control Unit (see menu). Applicable to: **Batteries**		Battery capacity and discharge tests performed by the Power Command Control Unit will indicate acceptable performance.
Item # 32	☐ **Construction** ☒ ~~**Functional**~~ ☐ **EC Assumption** ☐ **Operations** ☐ **Post Return to Service**	~~**Perform endurance run of DG set for approximately 50 hours.**~~ **SEE ITEM 45**		~~**Verify no significant engine, generator, or auxiliary component problems (Leaks, excessive vibration, temperature, etc.)**~~

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Item # 33	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the alarm and indication circuits associated with the battery charger operate in accordance with vendor requirements. Applicable to: **Battery Charger**		Satisfactory completion of the Power Command Control Unit self-diagnostic test.
Item # 34	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform the following tests by operating the battery charger with the batteries connected: – Verify that DC voltage in float charge mode is correct. – Verify that the charger output current is correct. – Verify that DC voltage in equalizing charge mode is correct. – Verify charging times for worst-case battery conditions meet design criteria. – Verify that the charger re-activates after power is supplied. Applicable to: **Batteries and Battery Charger**		Satisfactory completion of the Power Command Control Unit self-diagnostic test.
Item # 35	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Energize the space heater(s) and verify the following: – That the heaters operate via the thermostats. Applicable to: **DG output breaker, with attached units** **13.8 KV Switchgear units** **6.9 KV Switchgear units** **MCC space heaters**		Raise thermostat setting above ambient temperature and verify heater operates. After test, set thermostats to 60F.
Item # 36	☐ Construction ☒ ~~Functional~~ ☐ EC Assumption ☐ Operations ☐ Post Return to Service	~~Perform a localized simulated blackout test to the Diesel Generator Set. Switch Diesel Generator auxiliaries to Diesel Generator Output prior to manual start of the Diesel Generator Set.~~ ~~Applicable to: **Diesel Generator Set and Auxiliaries**~~ **SEE ITEM 18**		~~Diesel Generator starts with auxiliaries de-energized. After Diesel Generator start, the generator energizes auxiliary loads and generator output breaker closes~~.
Item # 37	☒ Construction **(IPEC I&C)** ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the control circuits associated with the component operate in accordance with vendor or design requirements. Applicable to: **Overload/Overcurrent Relays 50/51 in Circuit Breakers SBO/ASS, SBOH, SBOL and ASS**		Control circuits operate in accordance with vendor or design requirements. **Relay settings per EC5000033794 Attachment 7.31**

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Item # 38	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the "Push to Test" switch turns lights on. Verify lights are aimed in the proper direction. ~~**and that the candlepower output of the emergency light in accordance with vendor or Design Specification during an 8-hour discharge test.**~~ Perform blackout test. Turn off normal area lights (either by de-energizing or simulating loss of power) and verify that the emergency lights come on and adequate light exists to support operator access/egress and/or operator action. Load Test circuit from lighting distribution panel with normal load plus emergency light load and verify proper equipment function. See drawing **400428** for fixture locations **and components to be illuminated**. Applicable to **Emergency Lighting circuits**	"Push to Test" switch turns lights on. Lights are aimed in the proper direction ~~**and candlepower output of the emergency light is correct**~~. Blackout test successful. Load Test verifies no breaker trips on LP due to additional EBL load.
Item # 39	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Apply power to the annunciator circuit. Push test button for 30 seconds and verify that system does not trip or overheat. Applicable to **Annunciator CCR Panel 1FAF**	System does not trip or overheat.
Item # 40	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Momentarily toggle, jumper, or lift (as appropriate) the field input and verify the output changes state relative to actual condition (e.g. windows flash, horns sound, etc.). Then verify that the alarm can be acknowledged, if applicable. Restore or change the input condition by toggle, jumper, or lifted lead (as appropriate) to verify that the output again changes state. Then verify that the alarm can be cleared, if applicable. Applicable to **Annunciator CCR Panel 1FAF and DG Operator Panel**	On any arbitrary alarm at the DG Operator Panel, the common trouble alarm is repeated to the CCR Panel 1FAF. CCR and local alarm can be acknowledged and silenced. Alarm can be cleared.

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Item # 41	☐ Construction ☒ Functional **(CUMMINS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Verify that the alarm, interlock, control, and indication circuits operate in accordance with vendor or design requirements. Applicable to: **DG Jacket Water Surge Tank level switch** **DG Aftercooler Surge Tank level switch** **DG Jacket Water Surge Tank level sensor**		**Jacket Water Surge Tank and Aftercooler Surge Tank low level switches causes Operator Panel alarm and CCR alarm.** **Jacket Water Surge Tank Level Sensor is a DG start permissive or DG shutdown per the DG vendor's design.** Approximately 15 seconds after low level warning, the DG set to receive shutdown signal **via level sensor**.
Item # 42	☒ ~~Construction~~ ☐ Functional ☐ EC Assumption ☐ Operations ☐ Post Return to Service	~~Verify device calibration per vendor requirements. Verify that all fluid pressure boundaries are not leaking.~~ Applicable to ~~**DG pressure and temperature sensors**~~		~~Devices are calibrated. No pressure boundary leakage. Verify per satisfactory completion of vendor site acceptance test.~~

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		Test Requirement(s)		**Acceptance Criteria**
Item # 43	☐ Construction ☒ ~~Functional~~ ☐ EC Assumption ☐ Operations ☐ Post Return to Service	~~Verify that DG functional control and indication logic, software version, and all trip settings are documented by the vendor as tested at the factory and are available for comparison with actual system responses during site testing.~~ ~~Load and run all available system diagnostics. Verify that administrative and security features, e.g. passwords, operator permissions, etc. are functional per vendor design.~~ ~~Verify that the Operator Panel provides all Human Machine Interfaces (HMI) required to operate the DG and its breaker under all normal and fault conditions.~~ ~~Verify that all analog sensor parameters (temperatures, pressures, levels, speed, voltages, currents, etc) from the engine, alternator, controls, battery, and output breaker (as applicable), can be displayed at the Operator Panel, and that the present value is reasonable, considering the DG status.~~ ~~Verify that the current status of all contact inputs from the engine, day tank, jacket water expansion tank, battery charger, breaker, etc. can be displayed at the Operator Panel, and that the current status is correct, considering the current equipment status.~~ ~~Verify that the alarm, interlock, control, and indication circuits associated with the component operate in accordance with vendor or design requirements.~~ ~~Applicable to **DG Control Panel, Operator Panel, and associated software**~~ **SEE ITEM 4**	~~DG functional control and indication logic, software version, and all trip settings are documented by the vendor and are available during site testing.~~ ~~Diagnostics test is satisfactory. Administrative and security features function properly.~~ ~~The Operator Panel provides all HMI required to operate the DG and its breaker.~~ ~~Analog sensor parameters can be displayed at the Operator Panel, and values are reasonable.~~ ~~Current status of all contact inputs can be displayed at the Operator Panel, and is correct, considering the current equipment status.~~ ~~DG alarm, interlock, control, and indication circuits operate properly.~~ ~~***All testing acceptance criteria are based on satisfactory Vendor Site Acceptance Test completion.**~~
Item # 44	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**After installation of sprinkler heads perform hydro test on the wet sprinkler system using system pressure for 2 hours. (Close valve FP-64 and drain system by opening drain valve FP-1009. After sprinklers are installed close drain valve FP-1009 and open FP-64 to flood system)**		**After a two hour (min) period with FP-64 open and system flooded no leaks are observed.**

EC # 5000033794		**Rev** 1.	**Title** Station Blackout and Appendix R Diesel Generator Set	
		Test Requirement(s)		**Acceptance Criteria**
Item # 45	☐ **Construction** ☒ Functional**(IPEC OPS)** ☐ **EC Assumption** ☐ **Operations** ☐ **Post Return to Service**	**START DG and operate:** **20 – 30 hours of non-continuous shakedown runs at approximately 2045kW to identify and correct problems such as piping and exhaust leaks and electrical wiring and control issues.** **During and after shakedown runs System Engineer will perform an inspection and look for cracks at the Turbocharger support brackets, exhaust, etc.** **24 hour continuous operations run at 2045kW. Following run and an 8 to 12 hour cool down period System Engineer will perform an inspection and look for cracks at the Turbocharger support brackets, exhaust, etc.** **If the inspections do not find any issues PMTP Item 49 is ready to be performed.**	**Objective is identifying problem areas requiring corrective action during initial operation. This sequence is based on Cummins user operating experience.**
Item # 46	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	Perform **functional check** of Day Tank Control devices. Applicable to **Day Tank**	Hi Level Shutoff - 100% Lo Level Lead Pump **(#12)** Start - 86% Lo Level Lag Pump **(#11)** Start – 82%
~~**Item # 47**~~	☒ ~~Construction **(IPEC I&C)**~~ ☐ ~~Functional~~ ☐ ~~EC Assumption~~ ☐ ~~Operations~~ ☐ ~~Post Return to Service~~	~~**Perform calibration of CWST Low Level Alarm Switch M147-LAS, for new setpoint.**~~	~~**Alarm actuates at CWST level of 22.5 (+/- 1.2) ft. (above tank bottom) decreasing, and resets at CWST level of approximately 28 ft. (above tank bottom) increasing.**~~
Item # 48	☒ **Construction (IPEC MTC)** ☐ **Functional** ☐ **EC Assumption** ☐ **Operations** ☐ **Post Return to Service**	**Verify that the double check valves in the backflow preventer UW-846 prohibits flow from the service water to the city water side. Testing per 0-VLV-435-CWS, by an outside contractor licensed to test backflow preventers.**	**Per 0-VLV-435-CWS**

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		Test Requirement(s)		**Acceptance Criteria**
Item # 49	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Perform transition plan to prepare DG to assume functional role of GT's prior to GT retirement. The transition plan includes the following:** **Perform 19 monitored starts of the DG of 1 hour duration each at load of approximately 2045kW. Starting timeframe to be no less than 8 hours between starts.** **Perform 2 hour continuous operation run at approximately prime rating (2335 – 2435kW).** **Perform maintenance check and run on DG, correct any issues revealed from other PMTP test items.** **Perform final monitored start of the DG of 1 hour duration at load of approximately 2045kW.**		**19 successful starts out of 20 monitored attempts for a reliability of 0.95 per demand as defined in NUMARC 87-00, Appendix B for Standby Systems.** **No significant operating issues during 2 hour continuous run at approximately prime rating.**
Item # 50	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Demonstrate the ability to line up and provide power from the SBO/APP R DG to the 12FD3 & 12RW3 loads via ASS.** **(simulated test)**		**Complete within 1 Hour**
Item # 51	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Demonstrate the ability to line up and provide power from the SBO/APP R DG to the 6A or 5A loads via SBOL.** **(simulated test)**		**Complete within 1 Hour**
Item # 52	☐ Construction ☒ Functional**(IPEC OPS)** ☐ EC Assumption ☐ Operations ☐ Post Return to Service	**Perform manual start in Unit mode to an isolated system. Start Alternate Safe Shutdown loads and reduce load leaving the largest load running. Perform a Load Reject test by opening the load breaker of the largest load and verify proper engine response.**		**The SBO / App R DG is stable and does not over speed or stall.**