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GEORGIA POWER
POWER GENERATION DEPARTMENT
VOGTLE ELECTRIC GENERATING PLANT

INSTRUCTIONAL UNIT

TITLE: MANUALLY START THE DIESEL GENERATOR LOCALLY NUMBER: NL-IU-11205-002-01-C

PROGRAM: OUTSIDE AREA OPERATOR REVISION: 1

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REFERENCES:

VOGTLE PROCEDURE 13145-1, DIESEL GENERATORS (REV 17)

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PERFORMANCE OBJECTIVE

Given a directive from the control room, manually start the diesel generator locally.

The turbocharger bearings must be pre-lubed. Upon start, the diesel generator operating parameters must be monitored. All communication and activities must be performed in accordance with current, approved procedures. All data sheets must be completed, initialled, and returned to the Shift Supervisor.

INFORMATION

This task is performed after the following prerequisites have been met: The diesel has been prepared for startup in accordance with Plant Vogtle Procedure 13145-1, the Fuel Oil System has been aligned per Plant Vogtle Procedure 13146-1, the Lube Oil and Jacket Keep-Warm Systems are operating, and the generator heater is operating in the automatic mode. The NSCW is aligned to provide cooling water to the diesel generator jacket water cooler, and is in operation. The Diesel Generator Fuel Oil Transfer System is aligned per procedure 11146-1, and the fuel oil day tank is aligned for automatic filling per procedure 13146-1.

The diesel may have to be started locally for testing purposes or after prescheduled maintenance to test normal operation. The diesel may also be started locally and run to generate heat, if temperatures in the diesel generator building fall below 50 degrees F.

If more than four hours have elapsed since a cylinder moisture check has been performed, the control room operator will direct another check prior to the start. For this task, assume that four hours have not elapsed. The cylinder moisture check is covered in another Instructional Unit.

The diesel is aligned and in the STANDBY mode before it is started locally or remotely. The control room operator will issue a directive to start the diesel locally after it has been prepared for startup.

In this Instructional Unit, diesel generator train A numbers (valves, breakers, etc.) will be followed by train B numbers in parentheses where applicable.

CHECK THE TRAIN A AND TRAIN B DIESEL GENERATOR ROOMS FOR READINESS

During this task, the diesel generator will be required to be taken out of the STANDBY mode. This will render the train A diesel generator inoperable. The train B diesel generator must be operable in the event that train A is not. The control room is aware of the status of the train

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B diesel generator; however, checking both of the diesel generators ensures that this requirement is satisfied.

Clear the brief check of the other DGs room with your control room operator, in case the starting of the assigned engine is urgent.

Review Procedure 13145-1, "Diesel Generator" if you need further instruction on how to survey the diesel rooms for readiness.

1. Quickly check, in both the train A and train B diesel generator rooms, for obvious oil, air, or water leaks, and for alarms on the annunciator board on the engine control panel.
2. Make sure that the fire protection deluge valves are not isolated, and that there is pressure at the fire hose reel station. The fire protection deluge valve for the A train diesel generator room is in the B train diesel generator room, and the B train deluge valve is in the A train diesel generator room.
3. Verify that the UNIT AVAILABLE light is illuminated. This check of the train B diesel room should take no more than 2 or 3 minutes.
4. Perform a lamp check on the train A diesel control panel.
5. Check and log, in the diesel generator log book, the diesel generator fuel oil day tank level, the lube oil sump level, and the engine hourmeter reading.

REQUEST PERMISSION TO TAKE THE DIESEL GENERATOR OUT OF STANDBY

Notify the control room that the diesel generator is ready to be placed in the LOCAL control. (A cylinder moisture check has already been performed per 13145-1).

PLACE THE LOCAL/REMOTE SWITCH IN THE LOCAL POSITION

NOTE: The DG is inoperable the moment you do this.

Place the 1-HS-4516(4517) switch in the LOCAL position at the PDG1(3) diesel control panel.

Acknowledge the following alarms:

1. Acknowledge the ENGINE CONTROL IN LOCAL alarm on the PDG2(4) engine control panel. Call the control room and notify the operator of the cause of the alarm. In many instances, the control room operator will place the control room switch for the generator output breaker in the FULL TO LOCK position.
2. Acknowledge the DISABLED DG CKT BRKR INOPERABLE annunciator alarm when it occurs.

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NOTE: The control room operator cannot start the diesel generator at this time, and the diesel generator will not start automatically on a SIAS (safety injection actuation signal) or loss of offsite power signal.

PRE-LUBE THE TURBOCHARGER BEARINGS

The turbocharger bearings will require additional lube oil for the start up process.

Open the 1-2403-U4-130 (131) turbo lube oil orifice bypass valve. This should be done about 2 minutes prior to DG start time.

These orifices normally drip oil onto the turbocharger bearings. When the bypass valves are opened (1-2 minutes before starting the diesel generator), notice that the sightglasses darken as they fill with oil.

NOTE: The orifice bypass valves should be closed approximately 30 seconds after the engine reaches 450 rpm so the turbocharger is not flooded with lube oil.

ALERT PERSONNEL THAT ENGINE STARTUP IS COMMENCING

Check the diesel generator room and notify all personnel in the area to don hearing protection. Make an announcement using the plant communication system that the "1A diesel generator start is commencing." Call the control room and notify the operator that the diesel generator will be started immediately.

Walk around the perimeter of the diesel generator and the generator room, and make a visual check of the area to ensure no personnel are close to the diesel engine.

PRESS THE MANUAL START PUSHBUTTON

The control room will direct another QAO to assist in the startup. Don hearing protection. Use communication headphones or ear protection. Instruct the assistant QAO to stand at the front of the diesel engine, but still in view of the engine control panel, to look for obvious leaks that may occur on start. Push manual start button 1-HS-4569A(4570A). Note that the engine is starting and the starting air is being admitted to the cylinders.

CAUTION: Turbocharger oil pressure gauges 1-PI-19170 (19171) and 19170A (19171A) should be monitored during startup. If oil pressure is not indicated within 15 seconds, immediately terminate the startup using the STOP pushbutton.

ENSURE CLOSE THE TURBOCHARGER ORIFICE BYPASS VALVE IS CLOSED

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Signal the assistant QAO to close the 1-2403-U4-130 turbo lube oil orifice bypass valves after the engine has been running for 30 seconds. Its closing must be independently verified.

INITIATE PLANT VOGTLE PROCEDURE 11885-C, "DIESEL GENERATOR OPERATING LOG"
The readings listed on the log sheet are taken prior to starting, 1/2 hour after the diesel generator is loaded, and every hour thereafter.

Use the DORIC temperature indicator to trend the temperature readings.

NOTE: The exhaust stack temperatures will be low, as well as the cylinder exhaust temperatures, since the generator is not loaded to the bus.

Crankcase vacuum should be 2 to 3 inches water negative. The right-hand side of the manometer will be reading higher than the left. Read the difference.

The phase A, B, and C current reading should be zero amperes.

Combustion air pressure (blower discharge pressure) will be very low when unloaded, possibly just above zero inches Hg. Engine speed and generator voltage are adjustable from the generator control panel.

Complete, sign, time, and date each portion of Procedure 11885 as performed. Report any problems to the control room operator.

CHECK INDICATING LAMPS AT THE 480 AC 1NBI(1NBO) MCC

1. The generator space heater red indicating lamp is extinguished.
2. The jacket water circulating pump green indicating lamp is illuminated
3. The lube oil circulating pump green indicating lamp is illuminated.

MONITOR THE TRAIN A(B) DIESEL GENERATOR OPERATION PARAMETERS AS PER PLANT VOGTLE PROCEDURE 11855-C

The procedure lists the items to be monitored to verify normal operation of the diesel generator.

RETURN THE DATA SHEETS TO THE CONTROL ROOM AND LOG THE ACTIVITY

The logging procedure is the same as for other procedures. Be sure to use the proper logbook.

PERFORMANCE GUIDE

Follow these steps to manually start diesel generator locally.

1. Check the train A and train B diesel generator rooms for readiness.
2. Request permission to take the train A diesel generator out of AUTOMATIC.
3. Place the LOCAL/REMOTE switch in the LOCAL position. Acknowledge the following alarms:
 - a. ENGINE CONTROL IN LOCAL alarm on the PDG2(4) engine control panel.
 - b. DISABLED DG CKT BRKR INOPERABLE
4. Pre-lube the turbocharger bearings.
5. Alert personnel that engine startup is commencing.
6. Press the MANUAL START push button.
7. Ensure the turbocharger orifice bypass valve is closed.
8. Initiate Plant Vogtle Procedure 11885-C, "Diesel Generator Operating Log"
9. Check the following indications at the 480 AC 1NBI(1NB0) MCC:
 - a. The generator space heater red indicating lamp is extinguished.
 - b. The jacket water circulating pump green indicating lamp is illuminated.
 - c. The lube oil circulating pump green indicating lamp is illuminated.
10. Monitor the train A(B) diesel generator operation parameters as per Plant Vogtle Procedure 11885-C.
12. Return the data sheets to the control room and log the activity.

SELF-TEST

Before proceeding to the Task Practice, answer the following questions.

1. You must request permission to take the diesel generator out of the AUTOMATIC position.
 - a. True
 - b. False
2. What alarm annunciates after the LOCAL/REMOTE switch is placed in LOCAL on the generator control panel? Is the DG still operable?
3. Which of the following must you do prior to starting the diesel generator?
 - a. Check the diesel generator room and notify all personnel in the area to don hearing protection.
 - b. Make an announcement using the plant communication system that the "1A diesel generator start is commencing."
 - c. Call the control room and notify the operator that the diesel generator will be started immediately.
 - d. Walk around the perimeter of the diesel generator and the generator room, and make a visual check of the area to ensure that there are no personnel close to the diesel engine.
 - e. All of the above
4. The orifice bypass valves should be closed after the engine reaches rated speed (450 rpm) so the turbocharger is not flooded with lube oil.
 - a. True
 - b. False
5. After the engine is running, if the lube oil, jacket water, or fuel oil pressure gauges indicate no pressure, or if the pressure drops to a no pressure indication, call the control room immediately.
 - a. False
 - b. True

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ANSWERS

1. b. False, there is no AUTO position.
2. The DG1A DISABLED ENGINE CONTROL IN LOCAL alarm will annunciate on the engine annunciator panel the DG is not operable when in LOCAL.
3. e. All of the above
4. a. True
5. a. False. After the engine is running, if the lube oil, jacket water, or fuel oil pressure gauges indicate no pressure, or if the pressure drops to a no pressure indication, push the STOP button immediately.

TASK PRACTICE

Before proceeding to the Performance Test, complete the following Task Practice exercise(s).

1. Review Procedure 13145-1. Be sure that you understand all precautions, limitations, and steps associated with manually starting the diesel generator locally.
2. Take this instructional unit and Procedure 13145-1 to the diesel generator building. Be sure that you can locate all local components and instrumentation associated with manually starting the diesel generator locally.
3. In the diesel generator building, walk through the task of manually starting the diesel generator locally. If possible, have a fellow trainee evaluate your performance using Procedure 13145-1 and this instructional unit.

FEEDBACK ON TASK PRACTICE

1. If you have any questions about the precautions, limitations, or steps in Procedure 13145-1, ask your instructor.
2. You should have been able to locate all local components and instrumentation associated with manually starting the diesel generator locally. If you had any difficulty, ask your instructor for help.
3. You should have walked through the steps necessary to manually start the diesel generator locally. If you had any difficulty, re-read the pertinent sections of this instructional unit and the procedure. Resolve any questions with your instructor.