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GEORGIA POWER  
POWER GENERATION DEPARTMENT  
VOGTE ELECTRIC GENERATING PLANT

## INSTRUCTIONAL UNIT

TITLE: EMERGENCY STOP THE DIESEL GENERATOR LOCALLY (MANUALLY) NUMBER: ML-IU-11:05-006-01-C

PROGRAM: OUTSIDE AREA OPERATOR REVISION: 1

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REFERENCES:

VOGTE PROCEDURE 13145-1, DIESEL GENERATOR (REV 17)

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PERFORMANCE OBJECTIVE

Given a directive from the control room, emergency stop the diesel generator (locally) manually.

All communication and activities must be performed in accordance with current, approved procedures. The activity must be reported to the control room after the engine stops.

INFORMATION

Stopping the diesel engine under emergency conditions can be performed in the control room or at the diesel generator engine control board.

An emergency stop differs from a normal stop in that the LOCAL/REMOTE switch can be in either the LOCAL or REMOTE position, whereas a normal stop would require placing the control in the LOCAL position. Additionally, after an emergency stop has been performed, the diesel generator is inoperable, since it will not start on an emergency start, SIAS, or any other signal, until after the emergency stop has been reset.

Good judgement must be used to determine when the diesel engine must be emergency stopped. Some circumstances do not permit the time to call the control room or to stop the engine using the normal procedure. Keep the following situations in mind:

1. Sudden Fuel Oil Leak

A potential for a fire exists if fuel oil is on the diesel engine or extremely close to the running diesel.

2. Injury to Personnel

If it appears that someone may be injured due to the running diesel, emergency stop the engine.

3. Uncontrollable Fire

If there is a fire on the engine and/or generator, or in close proximity to the engine, emergency stop the engine.

4. Upon the Direction of the Control Room Operator

Under certain conditions the control room may not be able to emergency stop the engine from the control room. The control room operator may

issue instructions to stand by to emergency stop the engine in case a normal stop has failed.

#### NORMAL EMERGENCY STOP

##### DEPRESS THE EMERGENCY STOP PUSHBUTTON

Identify the EMERGENCY STOP pushbutton and depress the button.

The 1-HS-4567A(4568A) EMERGENCY STOP push button is located on the left side of the engine control panel. At this time, locate the EMERGENCY START pushbutton. It is imperative that these two buttons are not confused with one another.

The engine will begin to slow down if the emergency stop was successful. If the engine does not stop, attempt to stop the engine by an alternate method.

##### VERIFY THE RED EMERGENCY STOP LAMP ILLUMINATES

The red EMERGENCY STOP lamp will illuminate if the emergency stop was successful.

##### DEPRESS THE EMERGENCY STOP RESET PUSHBUTTON

Press EMERGENCY STOP RESET pushbutton 1-HS-4581(4582) at the engine control panel after the diesel generator has come to a halt and the "distress situation" is under control. Verify that the red EMERGENCY STOP lamp extinguishes. The diesel generator is inoperable until the emergency stop is reset.

In addition to a local emergency stop, an emergency stop from the following conditions must also be reset using 1-HS-4581(4582):

1. Emergency stop from the control room
2. Emergency stop from 186GA (differential trip and lockout relay)
3. Overspeed emergency auto stop
4. Low lube oil pressure emergency auto stop
5. High jacket water temperature emergency auto stop

The emergency stop reset pushbutton must be depressed only after the problem causing the emergency stop has been corrected and the control room operator issues a directive to reset.

#### ALTERNATE EMERGENCY STOPPING METHODS

The OAO will not be responsible for demonstrating the alternate methods of emergency stopping the diesel generator, but will be required to describe the methods. These alternate methods are not listed in Procedure 13145-1

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as ways to stop the engine in an emergency, and are not expected to be used to shut down the diesel since normal stopping and emergency stopping methods should work. The OAOs are responsible for local operation of the diesel engine and must be aware of the capabilities of the diesel engine. If the following methods must be used, approval must be obtained from a licensed operator.

The reasons for shutting down the diesel generator, versus leaving it running, must be weighed.

If the normal stop didn't stop the diesel generator, it could be something as simple as a switch configuration (such as having the Local/Remote switch in Remote, yet trying a normal stop locally). The correct use of plant procedures should preclude this. Control air pressure must be available for a normal stop.

If the control room operator had tried an emergency stop, yet the DG continued to run, again the cause may be due to the local/remote switch being in local, or no control air being supplied to the fuel and combustion air shutdown cylinders.

The local/remote switch positions should not prevent a local emergency stop from occurring (breakglass); however, control air must be available for shutdown. Control air must also be available to shut down the diesel generator for any automatic trip.

RESTORE CONTROL AIR SUPPLY TO THE FUEL AND COMBUSTION AIR SHUTDOWN CYLINDERS

If there is no reason to immediately shut down the diesel generator, restoration of the normal shutdown methods first is desirable, then shutting down using the usual shutdown methods (normal stop).

Should control air be available, yet stopping attempts from the control room and engine control panel fail, the following two methods may work:

DEPRESS THE PUSH TO STOP/PULL TO RUN KNOB

This knob is located on the front, left side of the diesel generator. Depressing this control knob will cause the diesel generator breaker to trip, and the engine will shut down due to the fuel rack shutdown cylinder extending to the NO FUEL position.

NOTE: The next method would have the PED in a potentially dangerous location. The overspeed trip mechanism is located on the diesel engine front, to the right of the governor. To get to this location, climb over the lube oil heat exchanger (which is hot) or over the

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jacket water heat exchanger, where no easy access exists. The area is located beneath the turbochargers and near operating pumps.

MANUALLY TRIP THE OVERSPEED DEVICE

This will extend the fuel rack shutdown cylinder to the NO FUEL position. The combustion air valves will close rapidly, starving the engine of air. The generator output breaker will trip. To manually trip the overspeed device, push upwards on the linkage arm which strikes two tabs on the overspeed device causing the trip to occur. The diesel generator is inoperable if the overspeed circuits are tripped.

TURN THE GOVERNOR'S SPEED SET KNOB FULLY COUNTERCLOCKWISE

This can shut down the diesel engine, even if control air is not available. The diesel generator's operability will be affected when this is done.

ISOLATE FUEL OIL TO THE DIESEL ENGINE

Isolate fuel oil to the diesel engine by unlocking and closing valve 1-2403-U4-031 (032), which is normally locked open. This method will not directly cause the generator output breaker to open, and is not listed by the manufacturer as a method of stopping the diesel engine. It could also result in having to reprime fuel oil to the engine and damage to the injection pumps due to lack of lubrication. The engine will stop even if control air pressure is available.

CAUTION: The methods listed in the above are unorthodox methods. Preplan these methods with the SRO, who will weigh the consequences of using these methods. Again, the normal stop methods and the emergency stop procedure are the approved methods of shutting down the engine.

NOTIFY THE CONTROL ROOM

Notify the control room and the Shift Supervisor that the diesel engine has been emergency stopped.

LOG THE ACTIVITY.

PERFORMANCE GUIDE

Follow these steps to emergency stop the diesel generator.

NORMAL EMERGENCY STOP

1. Depress the EMERGENCY STOP pushbutton.
2. Verify that the red EMERGENCY STOP lamp illuminates.
3. Depress the EMERGENCY STOP RESET pushbutton.
4. Notify the control room.
5. Log the activity.

ALTERNATE EMERGENCY STOPPING METHODS

1. Restore control air supply to the fuel and combustion air shutdown cylinders.
2. Push the PUSH TO STOP/FULL TO RUN knob.
3. Manually trip overspeed device.
4. Turn the governor's speed set knob fully counterclockwise.
5. Isolate Fuel oil to the diesel engine.
6. Notify the control room.
7. Log the activity.

SELF-TEST

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

1. How does a manual emergency stop differ from a normal manual stop?
2. Which of the following may require a manual emergency stop?
  - a. Sudden fuel oil leak
  - b. Injury to personnel
  - c. Uncontrollable fire
  - d. Upon the direction of the control room operator
  - e. All of the above
3. Of the following alternate methods of shutting down the diesel engine presented in this IU, state two which require control air pressure, and two which do not.
  - (a) Isolate fuel oil manually
  - (b) Push the push to stop/pull to run knob
  - (c) Manually trip the overspeed device
  - (d) Turn the governor speed set knob fully counterclockwise

ANSWERS

1. An emergency stop differs from a normal stop in that the LOCAL/REMOTE switch can be in either the LOCAL or REMOTE position, whereas a normal stop would require you to place the control in the LOCAL position.
2. e. All of the above
3. a. Air not required  
b. Air required  
c. Air required  
d. Air not required



TASK PRACTICE

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

1. Review Procedure 13145-1. Be sure that you understand all precautions, limitations, and steps associated with emergency stopping the DG 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 emergency stopping the DG locally.
3. In the diesel generator building, walk through the task of emergency stopping the DG 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 emergency stopping the DG locally. If you had any difficulty, ask your instructor for help.
3. You should have walked through the steps necessary to emergency stop the DG locally. If you had any difficulty, re-read the pertinent sections of this instructional unit and the procedure. Resolve any questions with your instructor.