2.3 Operation During Extended Power Outages

2.3.1 General

The Savoy on Palm is equipped with a 350 Kilowatt, diesel-powered Kohler Corp. electrical generator set located in a room on the ground floor at the northeast corner of the building. It may be accessed via a double door from the 1st floor garage area. The generator, when activated, supplies power to electrical circuits in the building that terminate in circuit breaker panels with the label "E" for emergency. This connection is via an automatic transfer switch that operates when commercial electrical power is cut off for any reason. This is most likely to happen in the wake of a hurricane landfall in the area and could last for several days or more. The activation of the generator and transfer to selected building circuits may be initiated manually for test purposes. The motor-generator set has successfully operated during a power outage of several hours when the aerial high voltage power line across Palm Ave. from the building fell down in June, 2008. Later that month the generator was successfully tested with a simulated 80% of full load. There are two fuel tanks, primary (350 gallons) and auxiliary (490 gallons), in the generator room supplying fuel oil to the diesel engine. Fuel is transferred from the auxiliary tank to the primary tank through a manual procedure, described below. Only the primary tank is directly connected to the engine. The primary tank is located under the motor-generator set.

The generator is automatically activated weekly on Monday afternoons and run for about 30 minutes during a no-load test. Photos of the motor-generator set follow:

Figure 2.3.1 Savoy Motor-Generator Set-Front View

Figure 2.3.2 Savoy Motor Generator Set-Right Side View

Figure 2.3.3 Savoy Motor Generator Set-Left Side View

The motor-generator set may be operated manually, if necessary. An operating Manual is located in the office behind the Concierge Desk.

2.3.2 Generator Operation During Commercial Power Outage

After loss of commercial power, the generator will automatically start after a 3 second delay. After an additional few seconds during which the generator circuitry checks for correct voltage and frequency, the power relay will transfer the E panel load to the generator output. All the elevators will descend to the ground floor and the doors will open. The elevator controls need about 10 minutes to reset before the elevators can be used. Two outlets in each unit of the Savoy are connected to E-panels: the outlet supplying power to the refrigerator and 2) a convenience outlet in the laundry room. This means that the refrigerator and freezer will continue to operate during a power failure but the air conditioning will not operate.

Other standard circuits that receive power from the generator set include all emergency egress, garage, and elevator lobby lighting, all building alarm systems and panels, and outlets supplying power to front desk telephone and computer. Other circuits that have been connected to the E-panel include two A/C compressors and air handlers that serve the 3rd floor meeting room and library areas. The catering kitchen and convenience outlets in the meeting room are also included. These 3rd floor areas are meant to be a temporary "haven" for residents during long duration commercial power outages. After commercial power has been restored, transfer back to commercial power is completed in about 15 minutes.

2.3.2.1 Manual Operation of the Generator

The following shows how to manually start and stop the generator should it be required to do so (please refer to the photos):

The operation switch (see photo below) is normally in the "Auto" position. This enables the generator to start automatically in response to a loss of commercial power and to transfer the Emergency ("E") panel circuits to the generator outputs.

In order to stop and restart the generator manually in the absence of commercial power, perform the following steps in the generator room:

a. To stop the generator under load, locate the generator circuit breakers (see photo below). Manually switch off the two breakers. Wait 5 minutes for the generator to cool down a bit and then move the Operation Switch to the "Off" position.

b. To restart generator, move the Operation Switch back to the Auto position. Turn on circuit breakers.

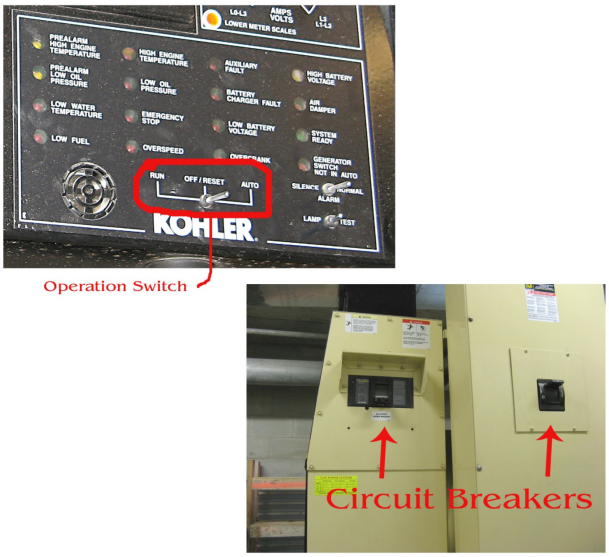


Figure 2.3.4 Generator Operation Switch and Circuit Breakers

2.3.2.2 Manual Operation of the Transfer Switch

Refer to the photo below regarding manual operation of the transfer switch. If the transfer of E panel circuits does not take place automatically within 5 minutes of the loss of commercial power but the generator engine is running the transfer switch may be operated manually as follows:

a. Proceed to the Electrical Room on the first floor. Locate the Transfer Panel and open the door.

b. Check to make sure that the transfer switch has not operated by checking the indicators to the right of the switch.

c. If the switch has not operated, find the switch handle stored to the left of the switch as shown in the photo below. Remove the handle, insert it in the manual lever socket and pull down with a rapid motion. The transfer switch will now have been operated.

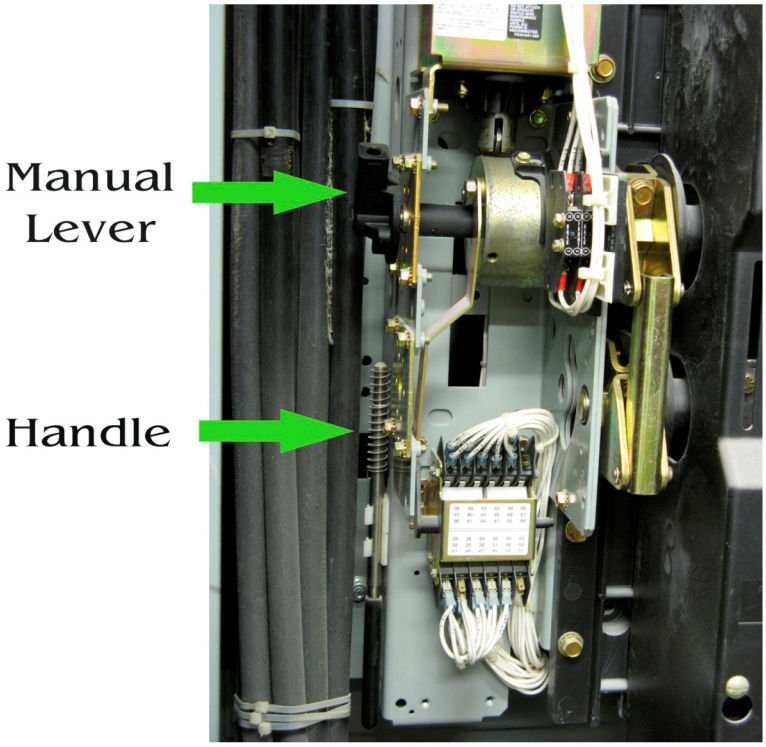
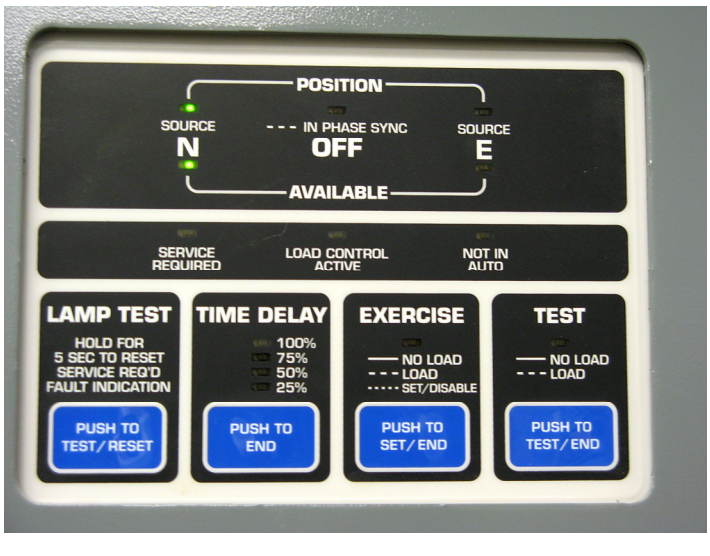


Figure 2.3.5 Manual Transfer Switch Access

2.3.3.3 Checking the Generator for Problems

The following material illustrates how to check the generator set should the engine shut down:



Time Delay Button:- Press to transfer power NOW.

Test Button:- Hold for 3 seconds to run house load test of

generator. Be sure to notify all owners that you are testing.
Press again to end test.

Lamp Test Button:- Checks bulbs and resets any faults or service required fault.

Figure 2.3.6 Transfer Switch Control Panel

1) Check water tank level.
2) Check water temperature.
3) Check oil pressure indicator.
4) Check field excitation breakers
5) Check all breakers.

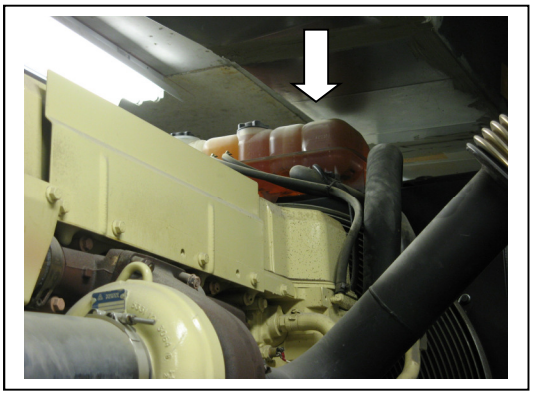


Figure 2.3.7 Water Tank

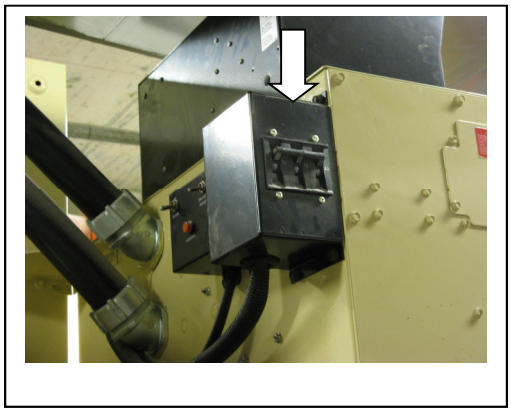


Figure 2.3.8 Field Excitation Breakers

See Operations Manual 9001 TP06161 pp 5-14.

2.3.3 Diesel Fuel Tank Operation

As stated above, there are two fuel tanks for the diesel powered generator set: 1)Primary tank with 350 gallons capacity installed under the motor-generator set and 2)Auxiliary tank with about 490 gallons capacity installed on the east end of the generator. With an assumed load of less than 50 kilowatts under emergency conditions the diesel engine should use about 3 to 4 gallons of fuel per hour. If both tanks are filled at the start of emergency operations, the generator should have enough fuel to run for about 5 days to a week. In the event that the primary tank runs low on fuel the following material discusses how to transfer fuel from the auxiliary tank to the primary tank. This is a manual operation.

2.3.3.1 Filling Instructions

Filling the primary tank from the auxiliary tank is done as follows (refer to the composite photos below):

a. Remove the primary tank fill pipe cap. Have a flashlight ready to be able to observe primary tank fill level by shining flashlight into fill pipe. (See photo (4) below)

b. Open the ball valve next to the fuel pump. (photo (1) below)

c. Turn on the fuel pump power switch (photo (2) below)

d. Lift the pump switch upward to pump fuel (photo(2) below)

e. Observe fuel level in primary tank via the fill pipe. Fill the tank to within about ½ inch of the bottom of the fill pipe and no higher.

f. Turn off the pump switch and the fuel pump power switch. (Photo (2)) Close the ball valve (photo (1))

g. Replace fill pipe cap.

h. The auxiliary tank should be replenished after the above operation. It should be filled no higher than ½ inch from the bottom of its fill pipe.

Figure 2.3.9 Fuel Tank Filling Details

2.3.4 Generator Set Maintenance

The generator set is maintained under contract by Tampa Armature Works, Inc., 440 S. 78th St., Tampa, FL 33616; telephone 813-621-5661.