

B. During power operation, the following components may be inoperable:

1. Power operation may continue for seven days provided the 138 kV and the 13.8 kV sources of offsite power are available in compliance with 3.7.A with any combination of or all of the following inoperable:
 - a. One diesel generator unavailable provided the remaining diesel generators with their associated fuel oil systems and the required engineered safety features associated with these diesel generator buses are operable,
 - b. One diesel generator fuel oil system unavailable. This system consists of a fuel oil storage tank with 6,334 gallons of fuel available, a fuel oil transfer pump and associated piping, valves and instrumentation, or
 - c. One diesel fuel oil supply header unavailable.

If a diesel generator becomes inoperable due to any cause other than planned maintenance or testing, the remaining diesel generators shall be tested to ensure operability.

2. Power operation may continue for 72 hours provided the 138 kV power source from Buchanan Substation is supplying 6.9 kV buses 5 and 6 through the 138/6.9 kV Station Auxiliary Transformer and the three diesel generators are operable with only one 138 kV line from an offsite source to Buchanan Substation operable (excluding the Refuse Energy Services Company plant).

This operation may be extended beyond 72 hours provided the limiting condition is reported to the NRC within the subsequent 24-hour period with an outline of the plans for restoration of an offsite 138 kV supply line.

3. Power operation may continue for 24 hours, if the entire 138 kV or the entire 13.8 kV source of power is lost, provided the three diesel generators are operable. This operation may be extended beyond 24 hours provided the limiting condition is reported to the NRC within the subsequent 24-hour period with an outline of the plans for restoration of offsite power.

4. When 6.9 kV buses 5 and 6 are supplied through a 13.8/6.9 kV transformer, in addition to satisfying the requirements of Specification 3.7.B.3 above, the 6.9 kV bus tie breaker control switches 1-5, 2-5, 3-6, and 4-6 in the CCR shall be placed in the "pull-out" position and tagged to prevent an automatic transfer of the 6.9 kV buses 1, 2, 3 and 4.
 5. One battery may be inoperable for 24 hours provided the other batteries and four battery chargers remain operable with one battery charger carrying the dc load of the failed battery's supply system.
 6. One battery charger may be inoperable for 24 hours provided the following conditions are satisfied:
 - a. The other three battery chargers and their associated batteries are operable; and
 - b. The affected battery shall have the Specification 4.6.C.1 surveillance initiated within one hour of the time the battery charger is determined to be inoperable and the surveillance shall be repeated every eight hours thereafter to determine battery operability. This surveillance frequency shall be maintained until the battery is declared inoperable or until the battery charger is declared operable.
- C. Whenever the reactor is critical, the circuit breaker on the electrical feeder to emergency lighting panel 218 inside containment shall be locked open except when containment access is required.

Basis

The electrical system equipment is arranged so that no single contingency can inactivate enough safeguards equipment to jeopardize plant safety. The 480-volt equipment is arranged in four buses. The 6.9 kV equipment is supplied from six buses.

In addition to the unit transformer, three separate sources supply station service power to the plant⁽¹⁾.

There are three sources of 138 kV offsite power to Buchanan Substation. These sources consist of two 138 kV feeders from Con Edison's Millwood 138 kV substation and one connection from the Buchanan 345 kV substation through a 345/138 kV transformer. These 138 kV sources are each capable of supplying all auxiliaries for Indian Point 1, 2 and 3 as well as the Buchanan Substation customer load and can be used to satisfy 3.7.A.1. There is also an additional 138 kV connection to Buchanan Substation from the Westchester Refuse Energy Services Company (RESCO) plant. The RESCO plant alone does not have the capability to supply all expected loads for Indian Point 2 and 3 and connected customer loads supplied by the Buchanan 13.8 kV substation. Therefore, the RESCO plant can not be used to satisfy 3.7.A.1 or 3.7.B.2.a.

The plant auxiliary equipment is arranged electrically so that multiple items receive their power from different sources. The charging pumps are supplied from the 480-volt buses Nos 3A, 5A, and 6A. The five containment fans are divided among the 480-volt buses. The two residual heat pumps are on separate 480-volt buses. Valves are supplied from separate motor control centers.

The station auxiliary transformer is capable of providing sufficient power for plant startup. The station auxiliary transformer can supply the required plant auxiliary power during normal operation.

There are two 13.8/6.9 kV transformers which can be used to supply 6.9 kV power to Indian Point 2. One transformer is associated with Feeder 13W92 and Indian Point 2, the other is associated with Feeder 13W93 and Indian Point 3. Each transformer is capable of supplying maximum safeguards loads and safe shutdown loads for both Indian Point 2 and 3 taken simultaneously. While during normal operation each unit will take credit for its associated transformer, during the time frame required to perform scheduled maintenance or to replace failed equipment both units may take credit for the same 13.8/6.9 kV transformer. Neither 13.8/6.9 kV transformer is capable of supplying all auxiliaries for either unit. Therefore, the automatic transfer of 6.9 kV buses 1, 2, 3 and 4 is defeated when the 13.8 kV source is supplying power to buses 5 and 6.

The bus arrangements specified for operation ensure that power is available to an adequate number of safeguards auxiliaries. With additional switching, more equipment could be out of service without infringing on safety.

Two diesel generators have sufficient capacity to start and run, within design ratings, the minimum required equipment. If one diesel is inoperable, the minimum required equipment associated with the remaining two diesels must be operable. Equipment that is not required such as a third non-essential service water pump, a third charging pump or a third component cooling water pump associated with the remaining two diesels is not required to be operable when a diesel is inoperable as long as the remaining two diesels can not be overloaded by this configuration. Component Cooling Pump 22 cannot be inoperable while either Diesel Generator 21 or 23 is out of service because this configuration would overload one of the remaining two diesels.

The basis for the minimum total required fuel oil quantity is to provide for operation of two diesel generators for 7 days. The specified minimum quantity of fuel oil is based on operation of two diesel generators for 7 days at the maximum load profile permitted by the diesel generator rating. Each diesel is rated for operation for 0.5 hours of operation out of any 24 hours at 2300 kW plus 2.0 hours of operation out of any 24 hours at 2100 kW with the remaining 21.5 hours of operation out of any twenty four hours at 1750 kW. Operation of the diesel generators at the maximum load profile ratings bounds the postulated accident load profile. Using this maximum load profile and the associated fuel consumption rates, the total fuel oil consumed by 2 diesel generators for 168 hours is approximately 43,500 gallons. This quantity of fuel oil necessary to operate two diesel generators is conservatively less than the specified minimum fuel oil requirement of 48,000 gallons by approximately 4,500 gallons.

There are three onsite fuel oil storage tanks adjacent to the diesels. Each tank has an associated fuel oil transfer pump, which has the capability to automatically feed two of the three diesels through either of two redundant supply headers. If one of the three storage tanks is not available, there is sufficient fuel oil available in the remaining two tanks to run two diesels at the maximum load profile for at least 45 hrs. Similarly, if three diesels are available, there is sufficient fuel oil in the three associated storage tanks for at least 45 hours of operation at the maximum load profile. Additional fuel oil suitable for use in the diesel generators will be stored either onsite or at the Buchanan Substation. If one EDG storage tank or transfer pump is unavailable, the remaining tanks or pumps with the additional 29,000 gallons of fuel oil can supply the two diesels if required to supply at least minimum engineered safeguards equipment for at least 160 hours.⁽²⁾ Commercial oil supplies and trucking facilities exist to assure deliveries within one day's notice.

If a diesel generator is out of service due to planned maintenance or testing, testing of the remaining diesel generators is not required. In this case, testing is not required because a planned emergency diesel generator maintenance or testing outage does not directly affect the availability or reliability of the remaining emergency diesel generators and is not indicative of a potential failure in the remaining emergency diesel generators.

One battery charger shall be in service on each battery so that the batteries will always be at full charge in anticipation of a loss-of-ac power incident. This ensures that adequate dc power will be available for starting the emergency diesel generators and other emergency uses.

The plant can be safely shut down without the use of offsite power since all vital loads (safety systems, instruments, etc.) can be supplied from the emergency diesel generators.

Any two of three diesel generators, the station auxiliary transformer or the separate 13.8 to 6.9 kV transformer are each capable of supplying the minimum safeguards loads and therefore provide separate sources of power immediately available for operation of these loads. Thus, the power supply system meets the single failure criteria required of the safety systems.

As a result of an investigation of the effect components, that might become submerged following a LOCA, may have on ECCS, containment isolation, and other safety-related functions, a fuse and a locked-open circuit breaker were provided on the electrical feeder to emergency lighting panel 218 inside containment. With the circuit breaker in the open position, containment electrical penetration H-70 is de-energized during the accident condition. Personnel access to containment may be required during power operation. Since it is highly improbable that a LOCA would occur during this short period of time, the circuit breaker may be closed during that time to provide emergency lighting inside containment for personnel safety.

When the 138 kV source of offsite power is out of service, the automatic transfer of 6.9 kV Buses 1, 2, 3 and 4 to offsite power after a unit trip could result in overloading of the 20 MVA 13.8 kV/6.9 kV auto-transformer. Accordingly, the intent of Specification 3.7.B.4 is to prevent the automatic transfer when only the 13.8 kV source of offsite power is available. However, this specification is not intended to preclude subsequent manual operations or bus transfers once sufficient loads have been stripped to assure that the 20 MVA auto-transformer will not be overloaded by these manual actions.

References

- (1) UFSAR Section 8.2.1
- (2) UFSAR Section 8.2.3

B. DIESEL FUEL TANKS

A minimum oil storage of 48,000 gallons will be maintained for the station at all times.

C. STATION BATTERIES (NOS. 21, 22, 23, & 24)

1. Every month, the voltage of each cell, the specific gravity and temperature of a pilot cell in each battery and each battery voltage shall be measured and recorded.
2. Every 3 months, each battery shall be subjected to a 24-hour equalizing charge, and the specific gravity of each cell, the temperature reading of every fifth cell, the height of electrolyte, and the amount of water added shall be measured and recorded.
3. Each time data is recorded, new data shall be compared with old to detect signs of abuse or deterioration.
4. At least once every Refueling Interval (R#) each battery shall be subjected to a load test and a visual inspection of the plates.

Basis

The tests specified in Specifications 4.6.A, 4.6.B and 4.6.C are designed to demonstrate that the diesel generators will provide power for operation of equipment. They also assure that the emergency diesel generator system controls and the control systems for the safeguards equipment will function automatically in the event of a loss of all normal 480v ac station service power.

The testing frequency specified will be often enough to identify and correct any mechanical or electrical deficiency before it can result in a system failure. The fuel supply is continuously monitored. An abnormal condition in these systems would be signaled without having to place the diesel generators themselves on test.

Each diesel generator has a continuous rating of 1750 kW with a 2 hours within an 24 hour period rating of 2100 kW and a 1/2 hour within any 24 hour period rating of 2300 kW. Two diesels operating within these ratings can power the minimum safeguards loads. A minimum oil storage of 48,000 gallons will provide for operation of the minimum required engineered safeguards on emergency diesel power for a period of 168 hours.

Station batteries will deteriorate with time, but precipitous failure is extremely unlikely. The surveillance specified is that which has been demonstrated over the years to provide an indication of a cell becoming unserviceable long before it fails. The periodic equalizing charge will ensure that the ampere-hour capability of the batteries is maintained.

The Refueling Interval load test for each battery, together with the visual inspection of the plates, will assure the continued integrity of the batteries.

The batteries are of the type that can be visually inspected, and this method of assuring the continued integrity of the battery is proven standard power plant practice.

Reference

UFSAR Section 8.2