

- (4) Minimum allowed setting is 3740 v. Maximum allowed setting is 3773 v.
- (5) Minimum allowed time is 8 sec. maximum allowed time is 12 sec.
- (6) Minimum allowed setting is 2200 volts, maximum allowed setting is 2860 volts
- (7) Minimum allowed time is 1.0 second, maximum allowed time is 2.0 seconds.

### Bases

#### High Reactor Building Pressure

The basis for the 30 psig and 4 psig setpoints for the high pressure signal is to establish a setting which would be reached in adequate time in the event of a LOCA, cover a spectrum of break sizes and yet be far enough above normal operation maximum internal pressures to prevent spurious initiation (Reference 1).

#### Low Reactor Coolant System Pressure

The basis for the 1600 and 500 psig low reactor coolant pressure setpoint for high and low pressure injection initiation is to establish a value which is high enough such that protection is provided for the entire spectrum of break sizes and is far enough below normal operating pressure to prevent spurious initiation. Bypass of HPI below 1775 psig and LPI below 925 psig, prevents ECCS actuation during normal system cooldown (References 1 and 2).

#### 4.16 KV ES Bus Undervoltage Relays

The basis for the degraded grid voltage relay setpoint is to protect the safety related electrical equipment from loss of function in the event of a sustained degraded voltage condition on the offsite power system. The timer setting prevents spurious transfer to the onsite source for transient conditions.

The loss of voltage relay and timers detect loss of offsite power condition and initiate transfer to the onsite source with minimal time delay.

**The minimum and maximum degraded voltage setpoint are "as found" readings.**

### References

- (1) UFSAR, Table 7.1-3
- (2) UFSAR, Section 14.1.2.10 - "Steam Generator Tube Failure"

### 3.7 UNIT ELECTRIC POWER SYSTEM

#### Applicability

Applies to the availability of electrical power for operation of the unit auxiliaries.

#### Objective

To define those conditions of electrical power availability necessary to ensure:

- a. Safe unit operation
- b. Continuous availability of engineered safeguards

#### Specification

3.7.1 The reactor shall not be made critical unless all of the following requirements are satisfied:

- a. All engineered safeguards buses, engineered safeguards switchgear, and engineered safeguards load shedding systems are operable.
- b. One 7200 volt bus is energized.
- c. Two 230 kV lines are in service.
- d. One 230 kV bus is in service.
- e. Engineered safeguards diesel generators are operable and at least 25,000 gallons of fuel oil are available in the storage tank.
- f. Station batteries are charged and in service. Two battery chargers per battery are in service.

3.7.2 The reactor shall not remain critical unless all of the following requirements are satisfied:

- a. Offsite Sources:
  - (i.) Two 230 kV lines are in service to provide auxiliary power to Unit 1, except as specified in Specification 3.7.2e below.
  - (ii.) The voltage on the 230 kV grid is sufficient to power the safety related ES loads, except as specified in Specification 3.7.2.h below.
- b. Both 230/4.16 kV unit auxiliary transformers shall be in operation except that within a period not to exceed eight hours in duration from and after the time one Unit 1 auxiliary transformer is made or found inoperable, two diesel generators shall be operable, and one of the operable diesel generator will be started and run continuously until both unit auxiliary transformers are in operation. This mode of operation may continue for a period not exceeding 30 days.

- c. Both diesel generators shall be operable except that from the date that one of the diesel generators is made or found to be inoperable for any reason, reactor operation is permissible for the succeeding seven days provided that the redundant diesel generator is:
1. verified to be operable immediately;
  2. within 24 hours, either:
    - a. determine the redundant diesel generator is not inoperable due to a common mode failure; or,
    - b. test redundant diesel generator in accordance with surveillance requirement 4.6.1.a.

In the event two diesel generators are inoperable, the unit shall be placed in HOT SHUTDOWN in 12 hours. If one diesel is not operable within an additional 24 hour period the plant shall be placed in COLD SHUTDOWN within an additional 24 hours thereafter.

With one diesel generator inoperable, in addition to the above, verify that: All required systems, subsystems, trains, components and devices that depend on the remaining OPERABLE diesel generator as a source of emergency power are also OPERABLE or follow specifications 3.0.1.

- d. If one Unit Auxiliary Transformer is inoperable and a diesel generator becomes inoperable, the unit will be placed in HOT SHUTDOWN within 12 hours. If one of the above sources of power is not made operable within an additional 24 hours the unit shall be placed in COLD SHUTDOWN within an additional 24 hours thereafter.
- e. If Unit 1 is separated from the system while carrying its own auxiliaries, or if only one 230 kV line is in service, continued reactor operation is permissible provided one emergency diesel generator shall be started and run continuously until two transmission lines are restored.
- f. The engineered safeguards electrical bus, switchgear, load shedding, and automatic diesel start systems shall be operable except as provided in Specification 3.7.2c above and as required for testing.
- g. One station battery may be removed from service for not more than eight hours.
- h. If it is determined that a trip of the Unit 1 generator, in conjunction with LOCA loading, will result in a loss of offsite power to Engineered Safeguards buses, the plant shall begin a power reduction within 24 hours and be in HOT SHUTDOWN in an additional 6 hours, except as provided in Specification 3.7.2.e above.

## Bases

The Unit Electric Power System is designed to provide a reliable source of power for balance of plant auxiliaries and a continuously available power supply for the engineered safeguards equipment. The availability of the various components of the Unit Electric Power System dictates the operating mode for the station.

Verification of emergency diesel generator and station battery operability normally consists of verifying that the surveillance is current, and that other available information does not indicate inoperability.

It is recognized that while testing the redundant emergency diesel generator (EDG) in accordance with surveillance requirement 4.6.1.a, the EDG will not respond to an automatic initiation signal. In this situation, the 12 hour time clock will not be entered per the provisions of section 3.7.2.f. due to the low probability of an event occurring while the EDG is being tested.

Trip of TMI-1 could result in a change in the 230 kV system (Grid) voltage at the TMI substation. The predicted voltage following a loss of the unit is referred to as the Post-Contingency voltage for trip of TMI-1. The transmission system operator monitors 230 kV system conditions for Post Contingency voltages. If the Post-Contingency voltage is less than the value required to support safety related ES loads, the transmission system operator will notify the TMI Unit 1 control room. The required voltage setpoint values for dual or single auxiliary transformer operation are specified by degraded grid calculations. The appropriate setpoint for the current plant condition(s) is provided to the Grid operator. The required voltage setpoint is based on the Large Break LOCA loading which results in the greatest ES loads.

Upon receipt of a valid Post-Contingency voltage Alarm for Loss of TMI-1, TMI will implement the Low System (Grid) Voltage Procedure. An allowed action time of 24 hours provides the transmission system operator time to take actions to reconfigure the 230 kV system for improved voltage support. The time allowed has been evaluated for the level of risk associated with the increased reliance on use of the onsite sources.

TABLE 4.1-1 (Continued)

	<u>CHANNEL DESCRIPTION</u>	<u>CHECK</u>	<u>TEST</u>	<u>CALIBRATE</u>	<u>REMARKS</u>
38.	OTSG Full Range Level	W	NA	R	
39.	Turbine Overspeed Trip	NA	R	NA	
40.	BWST/NaOH Differential Pressure Indicator	NA	NA	F	
41.	Sodium Hydroxide Tank Level Indicator	NA	NA	F	
42.	Diesel Generator Protective Relaying	NA	NA	R	
43.	4 KV ES Bus Undervoltage Relays (Diesel Start)				
	a. Degraded Grid	NA	M(1)	A	(1) Relay operation will be checked by local test pushbuttons.
	b. Loss of Voltage	NA	M(1)	R	(1) Relay operation will be checked by local test pushbuttons.
44.	Reactor Coolant Pressure DH Valve Interlock Bistable	S(1)	M	R	(1) When reactor coolant system is pressurized above 300 psig or $T_{ave}$ is greater than 200°F.
45.	Loss of Feedwater Reactor Trip	S(1)	M(1)	R	(1) When reactor power exceeds 7% power.
46.	Turbine Trip/Reactor Trip	S(1)	M(1)	F	(1) When reactor power exceeds 45% power.
47.	a. Pressurizer Code Safety Valve and PORV Tailpipe Flow Monitors	S(1)	NA	F	(1) When $T_{ave}$ is greater than 525°F.
	b. PORV - Acoustic/Flow	NA	M(1)	R	(1) When $T_{ave}$ is greater than 525°F.
48.	PORV Setpoints	NA	M(1)	R	(1) Per Specification 3.1.12 excluding valve operation.

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