Proposed Change RTS-168
to the
Duane Arnold Energy Center
Technical Specifications

The holders of license DPR-49 for the Duane Arnold Energy Center propose to amend Appendix A (Technical Specifications) of said license by deleting current pages and replacing them with the attached, new pages. A list of the affected pages is given below.

The DAEC reactor receives scram signals upon closure of the turbine stop valves or loss of hydraulic oil pressure to the turbine control valves, which result from a turbine trip and generator load rejection, respectively. Below a certain power level, these scram signals are bypassed to reduce the number of challenges to the primary safety systems while the turbine and generator are brought on-line during plant restarts. The FSAR reports analysis of a turbine trip transient with the direct scram signal bypassed, as the turbine trip is the more limiting of the two events. The results of this analysis show that, below 30% of rated core power, the reactor is adequately protected by other scram signals which are generated on high reactor pressure and high neutron flux. Therefore, the reactor trips generated by turbine valve closures can be bypassed below 30% of rated core power. The reactor vendor recommends measuring core power by turbine first stage pressure; this measurement is diverse from the in-core neutron monitors which supply a redundant scram signal.

While the engineering design change package for the Power Uprate Program was being prepared, we discovered a discrepancy within original design documentation supporting this instrument setpoint. Subsequent investigations determined that certain information was incorrect and, due to the error, this instrument was set at a turbine first stage pressure which corresponds to 30% of turbine power instead of 30% of rated core power. Thirty percent of turbine power corresponds to approximately 35% of core power; therefore, the instrument was set in a non-conservative manner.

The purpose of this change is to correct the value of turbine first stage pressure given in the Technical Specifications to correspond to 30% of core power instead of the present 30% of turbine power.

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TABLE 3.1-1 (Continued)

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENT

Minimum No. of Operable instrument Channels for Trip System (1)	Trip Function	Trip Level Setting	Modes in Which Function Must be Operable			Number of Instrument Channels Provided By Design	Action (1)
			Refuel (6)	Startup	Run		
2	High Drywell Pressure	$\leq$ 2.0 psig	X(7)	X(8)	X	4 Instrument Channels	A
2	Reactor Low Water Level	> +170" Indicated Level (15)	X	X	X	4 Instrument Channels	A
2	High Water Level in Scram Discharge Volume	$\leq$ 60 Gallons	X(2)	X	X	4 Instrument Channels	A
2	Main Steam Line High Radiation	< 3 x Normal Rated Power Background*	X	X	X	4 Instrument Channels	A
4	Main Steam Line Isolation Valve Closure	$\leq$ 10% Valve Closure	X (3)(13)	X (3)(13)	X(13)	8 Instrument Channels	A or C
2	Turbine Control Valve Fast Closure (Loss of Control Oil Pressure)	Within 30 milliseconds of the Start of Control Valve Fast Closure			X(4)	4 Instrument Channels	A or D
4	Turbine Stop Valve Closure	$\leq$10% Valve Closure			X(4)	8 Instrument Channels	A or D
2	First Stage	Bypass below 155 psig	X	X	X	4 Instrument Channels	A or D

*Alarm setting $\leq$1.5 X Normal Rated Power Background

3. A main steam line isolation valve closure trip bypass is effective when the reactor mode switch is in the shutdown, refuel or startup positions.

4. Bypassed when turbine first stage pressure is less than 155 psig (corresponding to 30% of rated core power). This value of first stage pressure assumes that the second stage reheaters are not in-service below 30% of rated core power.

5. IRM's are bypassed when APRM's are on-scale and the reactor mode switch is in the run position.

6. When the reactor is subcritical and the reactor water temperature is less than 212°F, only the following trip functions need to be operable:

a. Mode switch in shutdown

b. Manual scram

c. High flux IRM

d. Scram discharge volume high level - may be bypassed in the refuel and shutdown modes for the purpose of resetting the scram.

e. APRM 15% flux

to the Refuel mode during reactor power operation does not diminish the protection provided by the reactor protection system.

Turbine stop valve closure trip occurs at approximately 10% of valve closure. Below 155 psig turbine first stage pressure (corresponding to 30% of rated core power), the scram signal due to turbine stop valve closure is by-passed because the flux and pressure scrams are adequate to protect the reactor below 30% of rated core power.

Turbine Control valve fast closure scram trip shall initiate within 30 milliseconds of the start of control valve fast closure. The trip level setting is verified by measuring the time interval from energizing the fast acting solenoid (from valve test switch) to pressure switch response; the measured result is compared to base line data taken during each refueling outage. Turbine control valve fast closure is sensed by measuring disc dump electro-hydraulic oil line pressure (Relay Emergency Trip Supply) which decreases rapidly upon generator load rejection. This scram is only effective when turbine first stage pressure is above 155 psig (corresponding to 30% of rated core power).

The requirement that the IRM's be inserted in the core when the APRM's read 5 as indicated on the scale in the Startup and Refuel modes assures that there is proper overlap in the neutron monitoring system functions and thus, that adequate coverage is provided for all ranges of reactor operation.