ATTACHMENT

Dresden Station Unit 2
DPR-19

Proposed Technical Specification Changes

Revised Pages:

23
24
29
30
38
39
47
48

3446N

TABLE 3.1.1

REACTOR PROTECTION SYSTEM (SCRAM) INSTRUMENTATION REQUIREMENTS

Minimum Number of Operable Inst. Channels per Trip (1) System	Trip Function	Trip Level Setting	Modes in Which Function Must Be Operable. Refuel (7)	Startup/Hot Standby	Run	Action*
1	Mode Switch in Shutdown		X	X	X	A
1	Manual Scram		X	X	X	A
	IRM					
2	High Flux	≤120/125 of Full Scale	X	X	X(5)	A
3	Inoperative		X	X	X(5)	A
	APRM					
2	High Flux	Specification 2.1.A.1	X	X(9)	X	A or B
2	Inoperative		X	X(9)	X	A or B
2	Downscale	≥5/125 of Full Scale	X(12)	X(12)	X(13)	A or B
* 2	High Flux (15% scram)	Specification 2.1.A.2	X	X	X(14	A
2	High Reactor Pressure	≤1060 psig	X(11)	X	X	A
2	High Drywell Pressure	≤2 psig	X(8), (10)	X(8), (10)	X(10)	A
2	Reactor Low Water Level	≥1 inch***	X	X	X	A
2	High Water Level in Scram Discharge Tank	≤50 gallons	X(2)	X	X	A
2	Turbine Condenser Low Vacuum	≥23 in. Hg Vacuum	X(3)	X(3)	X	A or C
2	Main Steamline High Radiatio	≤3 X Normal Full Power Background	X(3)	X(3)	X (15	A or C
4 (6)	Main Steamline Isolation Valve Closure	≤10% Valve Closure	X(3)	X(3)	X	A or C
2	Generator Load Rejection	****	X(4)	X(4)	X(4)	A or C
2	Turbine Stop Valve Closure	≤10% Valve Closure	X(4)	X(4)	X(4)	A or C
* 2	Turbine Control-Loss of control oil pressure	Greater than or equal to 900 psig	X	X	X	A or C

The control rod drive scram system is designed so that all of the water which is discharged from the reactor by a scram can be accommodated in the discharge piping. A part of this piping is an instrument volume (u-tube in the piping) which accommodates in excess of 50 gallons of water and is the low point in the piping. No credit was taken for this volume in the design of the discharge piping as concerns the amount of water which must be accommodated during a scram. During normal operation the discharge volume is empty; however, should it fill with water, the water discharged to the piping from the reactor could not be accommodated which would result in slow scram times or partial or no control rod insertion. To preclude this occurrence, level switches have been provided in the instrument volume which alarm and scram the reactor when the volume of water reaches 50 gallons. As indicated above, there is sufficient volume in the piping to accommodate the scram without impairment of the scram times or amount of insertion of the control rods. This function shuts the reactor down while sufficient volume remains to accommodate the discharged water and precludes the situation in which a scram would be required but not be able to perform its function adequately.

Loss of condenser vacuum occurs when the condenser can no longer handle the heat input. Loss of condenser vacuum initiates a closure of the turbine stop valves and turbine bypass valves which eliminates the heat input to the condenser. Closure of the turbine stop and bypass valves causes a pressure transient, neutron flux rise, and an increase in surface heat flux. To prevent the clad safety limit from being exceeded if this occurs, a reactor scram occurs on turbine stop valve closure. The turbine stop valve closure scram function alone is adequate to prevent the clad safety limit from being exceeded in the event of a turbine trip transient with bypass closure. Ref. Section 4.4.3 SAR. The condenser low vacuum scram is a back-up to the stop valve closure scram and causes a scram before the stop valves are closed and thus the resulting transient is less severe. Scram occurs at 23" Hg vacuum, stop valve closure occurs at 20" Hg vacuum and bypass closure at 7" Hg vacuum.

High radiation levels in the main steamline tunnel above that due to the normal nitrogen and oxygen radioactivity is an indication of leaking fuel. A scram is initiated whenever such radiation level exceeds three times normal background. The purpose of this scram is to reduce the source of such radiation to the extent necessary to prevent excessive turbine contamination. Discharge of excessive amounts of radioactivity to the site environs is prevented by the air ejector off-gas monitors which cause an isolation of the main condenser off-gas line provided the limit specified in Specification 3.8 is exceeded.

During the one month Hydrogen Addition Test, the normal background Main Steam Line Radiation Level is expected to increase by as much as 800% at the maximum Hydrogen addition rate, as indicated in note 15 to Table 3.1.1. A Scram will be initiated at three times the new normal background radiation level.

The main steamline isolation valve closure scram is set to scram when the isolation valves are 10% closed from full open. This scram anticipates the pressure and flux transient, which would occur when the valves close. By scramming at this setting the resultant transient is insignificant.

A reactor mode switch is provided which actuates or bypasses the various scram functions appropriate to the particular plant operating status. Ref. Section 7.7.1.2 SAR.

The manual scram function is active in all modes, thus providing for a manual means of rapidly inserting control rods during all modes of reactor operation.

The IRM system provides protection against excessive power levels and short reactor periods in the start-up and intermediate power ranges. Ref. Sections 7.4.4.2 and 7.4.4.3 SAR. A source range monitor (SRM) system is also provided to supply additional neutron level information during start-up but has no scram functions. Ref. Section 7.4.3.2 SAR. Thus, the IRM is required in the "Refuel" and "Start/Hot Standby" modes. In the power range the APRM system provides required protection. Ref. Section 7.3.5.2 SAR. Thus, the IRM system is not required in the "Run" mode. The APRM's cover only the power range, the IRM's provide adequate coverage in the start-up and intermediate range.

The high reactor pressure, high drywell pressure, reactor low water level, and scram discharge volume high level scrams are required for Startup/Hot Standby and Run modes of plant operation. They are, therefore, required to be operational for these modes of reactor operation.

The requirement to have all scram functions except those listed in Note 8 of Table 3.1.1 operable in the Refuel mode is to assure that shifting to the Refuel mode during reactor power operation does not diminish the need for the reactor protection system.

The turbine condenser low vacuum scram is only required during power operation and must be bypassed to start up the unit. At low power conditions a turbine stop valve closure does not result in a transient which could not be handled safely by other scrams such as the APRM.

The requirement that the IRM's be inserted in the core when the APRM's read 5/125 of full scale assures that there is proper overlap in the neutron monitoring systems and thus, that adequate coverage is provided for all ranges of reactor operation.

TABLE 3.1.1 (cont)

Notes:

1. There shall be two operable or tripped trip systems for each function.
2. Permissible to bypass, with control rod block, for reactor protection system reset in refuel and shutdown positions of the reactor mode switch.
3. Permissible to bypass when reactor pressure is < 600 psig.
4. Permissible to bypass when first stage turbine pressure is less than that which corresponds to 45% rated steam flow.
5. IRM's are bypassed when APRM's are onscale and the reactor mode switch is in the run position.
6. The design permits closure of any one valve without a scram being initiated.
7. 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
8. Not required to be operable when primary containment integrity is not required.
9. Not required while performing low power physics tests at atmospheric pressure during or after refueling at power levels not to exceed 5 MW(t).
10. May be bypassed when necessary during purging for containment inerting or deinerting.
11. Not required to be operable when the reactor pressure vessel head is not bolted to the vessel.
12. The APRM downscale trip function is automatically bypassed when the reactor mode switch is in the refuel and startup/hot standby positions.
13. The APRM downscale trip function is automatically bypassed when the IRM instrumentation is operable and not high.

* 14. The APRM 15% scram is bypassed in the run mode.

* If the first column cannot be met for one of the trip systems, that trip system shall be tripped.
If the first column cannot be met for both trip systems, the appropriate actions listed below shall be taken:
   A. Initiate insertion of operable rods and complete insertion of all operable rods within four hours.
   B. Reduce power level to IRM range and place mode switch in the Startup/Hot Standby position within 8 hours.
   C. Reduce turbine load and close main steamline isolation valves within 8 hours.

** An APRM will be considered inoperable if there are less than 2 LPRM inputs per level or there are less than 50% of the normal complement of LPRM's to an APRM.

*** 1 inch on the water level instrumentation is ≥ 504" above vessel 0 (See Bases 3.2).

**** Trips upon actuation of the fast closure solenoid which trips the turbine control valves.

15. During the proposed Hydrogen Addition Test, the normal background radiation level will increase by the following rates:

Hydrogen Addition Rate (SCFM)	Radiation Level Increase (% Normal)
0	0
8	15
13	25
31	300
62	800

Therefore, the Main Steam Line Rad Monitor Trip Level will be raised to ≤ three times the increased rad levels.

Amendment No. 43

TABLE 3.2.1

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION FUNCTIONS

Minimum No. of Operable Inst. Channels per Trip System (1)	Instruments	Trip Level Setting	Action (3)
2	Reactor Low Water	>144" above top of active fuel *	A
2	Reactor Low Low Water	≥ 84" above top of active fuel *	A
2	High drywell pressure	≤2 psig rated (4), (5)	A
2 (2)	High Flow Main Steam line	≤120% of rated steam flow	B
2 of 4 in each of 4 sets	High Temperature Main Steam Line Tunnel	≤200°F	B
2	High Radiation Main Steam Line Tunnel (6) (7)	≤ 3 times normal rated power background	B
2	Low Pressure Main Steamline	≥850 psig	B
	High Flow Isolation Condenser Line		
1	Steamline Side	≤20 psi diff. on steamline side	C
1	Condensate Return Side	≤ 32" water diff. on condensate return side	C
2	High Flow HPCI Steam Line	≤150" water	D
4	High Temperature HPCI Steam Line Area	≤200°F	D

Notes:

1. Whenever primary containment integrity is required, there shall be two operable or tripped trip systems for each function, except for low pressure main steamline which only need be available in the RUN position.
2. Per each steamline.
3. Action: If the first column cannot be met for one of the trip systems, that trip system shall be tripped.

*Top of active fuel is defined as 360" above vessel zero for all water levels used in the LOCA Analysis (See Bases 3.2).

TABLE 3.2.1 (cont)

If the first column cannot be met for both trip systems, the appropriate actions listed below shall be taken:

A. Initiate an orderly shutdown and have reactor in cold shutdown condition in 24 hours.

B. Initiate an orderly load reduction and have reactor in Hot Standby within 8 hours.

C. Close isolation valves in isolation condenser system.

D. Close isolation valves in HPCI subsystem.

4. Need not be operable when primary containment integrity is not required.

5. May be bypassed when necessary during purging for containment inerting and deinerting.

28/19 6. An alarm setting of 1.5 times normal background at rated power shall be established to alert the operator to abnormal radiation levels in the primary coolant.

7. The trip level setting will be maintained at ≤ 3 times normal rated power background. See note 15 to Table 3.1.1 for trip level settings during the one month Hydrogen Addition Test.

The instrumentation also covers the full range or spectrum of breaks and meets the above criteria.

The high drywell pressure instrumentation is a back-up to the water level instrumentation and in addition to initiating ECCS it causes isolation of Group 2 isolation valves. For the breaks discussed above, this instrumentation will initiate ECCS operation at about the same time as the low low water level instrumentation; thus the results given above are applicable here also. Group 2 isolation valves include the drywell vent, purge, and sump isolation valves. High drywell pressure activates only these valves because high drywell pressure could occur as the result of non-safety related causes such as not purging the drywell air during startup. Total system isolation is not desirable for these conditions and only the valves in Group 2 are required to close. The low low water level instrumentation initiates protection for the full spectrum of loss of coolant accidents and causes a trip of Group 1 primary system isolation valves.

Venturis are provided in the main steamlines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steamline break accident. In addition to monitoring steam flow, instrumentation is provided which causes a trip of Group 1 isolation valves. The primary function of the instrumentation is to detect a break in the main steamline, thus only Group 1 valves are closed. For the worst case accident, main steamline break outside the drywell, this trip setting of 120% of rated steam flow in conjunction with the flow limiters and main steamline valve closure, limit the mass inventory loss such that fuel is not uncovered, fuel temperatures remain less than 1500°F and release of radioactivity to the environs is well below 10 CFR 100 guidelines. Ref. Section 14.2.3.9 and 14.2.3.10 SAR.

Temperature monitoring instrumentation is provided in the main steamline tunnel to detect leaks in this area. Trips are provided on this instrumentation and when exceeded cause closure of Group 1 isolation valves. Its setting of 200°F is low enough to detect leaks of the order of 5 to 10 gpm; thus, it is capable of covering the entire spectrum of breaks. For large breaks, it is a back-up to high steam flow instrumentation discussed above, and for small breaks with the resultant small release of radioactivity, gives isolation before the guidelines of 10 CFR 100 are exceeded.

High radiation monitors in the main steamline tunnel have been provided to detect gross fuel failure. This instrumentation causes closure of Group 1 valves, the only valves required to close for this accident. With the established setting of 3 times normal background, and main steamline isolation valve closure, fission product release is limited so that 10 CFR 100 guidelines are not exceeded for this accident. Ref. Section 14.2.1.7 SAR. The performance of the process radiation monitoring system relative to detecting fuel leakage shall be evaluated during the first five years of operation. The conclusions of this evaluation will be reported to the Atomic Energy Commission.

During the one month Hydrogen Addition Test, the normal background Main Steam Line Radiation Level is expected to increase by as much as 800% at the maximum Hydrogen addition rate, as indicated in note 15 to Table 3.1.1. The Group I isolation will be initiated at three times the new normal background radiation level.

Pressure instrumentation is provided which trips when main steamline pressure drops below 850 psig. A trip of this instrumentation results in closure of Group 1 isolation valves. In the "Refuel" and "Startup/Hot Standby" mode this trip function is bypassed. This function is provided primarily to provide protection against a pressure regulator malfunction which would cause the control and/or bypass valves to open. With the trip set at 950 psig inventory loss is limited so that fuel is not uncovered and peak clad temperatures are much less than 1500°F; thus, there are no fission products available for release other than those in the reactor water. Ref Section 11.2.3 SAR.

Two sensors on the isolation condenser supply and return lines are provided to detect the failure of isolation condenser line and actuate isolation action. The sensors on the supply and return sides are arranged in a 1 out of 2 logic and, to meet the single failure criteria, all sensors and instrumentation are required to be operable. The trip settings of 20 psig and 32" of water and valve closure time are such as to prevent uncovering the core or exceeding site limits. The sensors will actuate due to high flow in either direction.

The HPCI high flow and temperature instrumentation are provided to detect a break in the HPCI piping. Tripping of this instrumentation results in actuation of HPCI isolation valves, i.e., Group 4 valves. Tripping logic for this function is the same as that for the isolation condenser and thus all sensors are required to be operable to meet the single failure criteria. The trip settings of 200°F and 300% of design flow and valve closure time are such that core uncovery is prevented and fission product release is within limits.

The instrumentation which initiates ECCS action is arranged in a dual bus system. As for other vital instrumentation arranged in this fashion the Specification preserves the effectiveness of the system even during periods when maintenance or testing is being performed.

The control rod block functions are provided to prevent excessive control rod withdrawal so that MCPR does not go below the MCPR fuel cladding integrity safety limit. The trip logic for this function is 1 out of n; e.g., any trip on one of the six APRM's, 8 IRM's, or 4 SRM's will result in a rod block. The minimum instrument channel requirements assure sufficient instrumentation to assure the single failure criteria are met. The minimum instrument channel requirements for the RBM may be reduced by one for a short period of time to allow for maintenance, testing, of calibrati[illegible] This time period is only ~3% of the operating time in a month and does not significantly increase the risk of preventing an inadvertent control rod withdrawal.

The APRM rod block function is flow biased and prevents a significant reduction in MCPR expecially during operation at reduced flow. The APRM provides gross core protection; i.e., limits the gross withdrawal of control rods in the normal withdrawal sequence.

In the refuel and startup/hot standby modes, the APRM rod block function is set at 12% of rated power. This control rod block provides the same type of protection in the Refuel and Startup/Hot Standby mode as the APRM flow biased rod block does in the run mode; i.e.,

prevents control rod withdrawal before a scram is reached.

The RBM rod block function provides local protection of the core, i.e., the prevention of transition boiling in a local region of the core, for a single rod withdrawal error from a limiting control rod pattern. The trip point is flow biased. The worst case single control rod withdrawal error is analyzed for each reload to assure that with the specific trip settings, rod withdrawal is blocked before the MCPR reaches the MCPR fuel cladding integrity safety limit.

Below 30 percent power, the worst case withdrawal of a single control rod without rod block action will not violate the MCPR fuel cladding integrity safety limit. Thus, the RBM rod block function is not required below this power level.