Duke Power Company

Oconee Nuclear Station

Attachment 1

Proposed Technical Specification Revision

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3.5 INSTRUMENTATION SYSTEMS

3.5.1 Operation Safety Instrumentation

Applicability

Applies to unit instrumentation and control systems.

Objective

To delineate the conditions of the unit instrumentation and safety circuits necessary to assure reactor safety.

Specifications

3.5.1.1 The reactor shall not be in a startup mode or in a critical state unless the requirements of Table 3.5.1-1, Column C are met.

3.5.1.2 In the event that the number of protective channels operable falls below the limit given under Table 3.5.1-1, Column C; operation shall be limited as specified in Column D.

3.5.1.3 For on-line testing or in the event of a protective instrument or channel failure, a key-operated channel bypass switch associated with each reactor protective channel may be used to lock the channel trip relay in the untripped state. Status of the untripped state shall be indicated by a light. Only one channel bypass key shall be accessible for use in the control room. Only one channel shall be locked in this untripped state or contain a dummy bistable at any one time.

3.5.1.4 For on-line testing or maintenance during reactor power operation, a key-operated shutdown bypass switch associated with each reactor protective channel may be used in conjunction with a key-operated channel bypass switch as limited by 3.5.1.3. Status of the shutdown bypass switch shall be indicated by a light.

3.5.1.5 During startup when the intermediate range instruments come on scale, the overlap between the intermediate range and the source range instrumentation shall not be less than one decade. If the overlap is less than one decade, the flux level shall not be greater than that readable on the source range instruments until the one decade overlap is achieved.

Bases

Every reasonable effort will be made to maintain all safety instrumentation in operation. A startup is not permitted unless three power range neutron instrument channels and three channels each of the following are operable: reactor coolant temperature, reactor coolant pressure, pressure-temperature, flux-imbalance flow, power-number of pumps, and high reactor building pressure. The engineered safety features actuation system must have three analog channels and two digital channels functioning correctly prior to a startup. Additional operability requirements are provided by Technical Specifications 3.1.12 and 3.4 for equipment which are not part of the RPS or ESFAS.

Operation at rated power is permitted as long as the systems have at least the redundancy requirements of Column C (Table 3.5.1-1). This is in agreement with redundancy and single failure criteria of IEEE-279 as described in FSAR Section 7.

There are four reactor protective channels. A fifth channel that is isolated from the reactor protective system is provided as a part of the reactor control system. Normal trip logic is two out of four. Required trip logic for the power range instrumentation channels is two out of three. Minimum trip logic on other channels is one out of two. A tripped channel is considered to be operable.

The four reactor protective channels were provided with key operated bypass switches to allow on-line testing or maintenance on only one channel at a time during power operation. Each channel is provided alarm and lights to indicate when that channel is bypassed. There will be one reactor protective system bypass switch key permitted in the control room. That key will be under the administrative control of the Shift Supervisor. Spare keys will be maintained in a locked storage accessible only to the station Manager.

Each reactor protective channel key operated shutdown bypass switch is provided with alarm and lights to indicate when the shutdown bypass switch is being used. There are four shutdown bypass keys in the control room under the administrative control of the Shift Supervisor. The use of a key operated shutdown bypass switch for on-line testing or maintenance during reactor power operation has no significance when used in conjunction with a key operated channel bypass switch since the channel trip relay is locked in the untripped state. The use of a key operated shutdown bypass switch alone during power operation will cause the channel to trip. When the shutdown bypass switch is operated for on-line testing or maintenance during reactor power operation, reactor power and RCS pressure limits as specified in Table 2.3-1A, B, or C are not applicable.

The source range and intermediate range nuclear instrumentation overlap by one decade of neutron flux. This decade overlap will be achieved at 10^{-10} amps on the intermediate range instrument.

Power is normally supplied to the control rod drive mechanisms from two separate parallel 600 volt sources. Each voltage source and its associated breakers and SCR control relays comprise a trip system. Thus, the two trip systems and their associated trip devices form a 1-out-of-2 logic used twice which is referred to as a 1-out-of-2x2 logic.

A logic channel refers to the output of a reactor trip module (RTM). Logic channel A controls CRD Breaker Unit 10, logic channel B controls CRD Breaker Unit 11, logic channel C controls CRD Breakers CB1 and CB2 and SCR Control Relay E, and logic channel D controls CRD Breaker CB3 and CB4 and SCR Control Relay F. If any logic channel or its associated breakers and/or relays fails to perform its function, operation is limited as specified by Notes (f), (i) and (j) of Table 3.5.1-1.

Because of the diverse shunt trip and undervoltage features of the reactor trip breakers, Table 3.5.1-1 allows up to 48 hours to repair a shunt trip device or undervoltage device before the associated breaker must be placed in the tripped condition. However, if a failure unrelated to the shunt trip or undervoltage devices occurs in a reactor trip breaker, the power supplied to the control rod drive mechanisms through the failed breaker must be removed within one hour.

Within each trip system there are four SCR control relays which provide a redundant means to trip the regulating rods (Groups 5-8). A fifth SCR control relay, which is associated with the auxiliary power supply in the Rod Drive Control System, is not considered in the operability requirements of Table 3.5.1-1. Thus, SCR Control Relay E refers to the four SCR control relays associated with the main voltage bus trip system and SCR Control Relay F refers to the four SCR control relays associated with the secondary voltage bus trip system. A failure of SCR Control Relays E or F would only affect the ability of the RPS to trip the regulating rods. Since the AC breaker connected in series with the inoperable SCR control relays provides a redundant means to trip the regulating rods, Table 3.5.1-1 allows up to 48 hours to repair an inoperable SCR control relay. If the inoperable SCR control relay is not repaired within 48 hours, or if more than one SCR relay fail, power must be removed from the CRD mechanisms supplied by the inoperable relays within the next hour.

Containment isolation valves on non-essential systems are isolated by diverse signals from high containment pressure and low reactor coolant system pressure devices. The systems considered to be non-essential include:

1. Letdown line
2. RC Pump seal return line
3. Quench Tank sample line
4. Quench Tank gaseous vent
5. Reactor Building purge lines
6. Reactor Building sump drain line
7. Reactor Building atmosphere sample line
8. Pressurizer sample line
9. OTSG sample line
10. OTSG drain line

Containment isolation valves on essential systems are isolated by high containment pressure only. The systems considered to be essential include:

1. Component cooling to RC pumps
2. Low pressure service water cooling to RC pump motor

REFERENCE

FSAR, Section 7.1

TABLE 3.5.1-1
INSTRUMENTS OPERATING CONDITIONS (cont'd)

FUNCTIONAL UNIT	(A) TOTAL NO. OF CHANNELS	(B) CHANNELS TO TRIP	(C) MINIMUM CHANNELS OPERABLE	(D) Operator Action If Conditions Of Column C Cannot Be Met
15. ESF Reactor Building Spray System				
a. Analog Reactor Building High Pressure Instrument Channel	3	2	3	Bring to hot shutdown within 12 hours (e)
b. Digital Logic Manual Pushbutton	2	1	2	Bring to hot shutdown within 12 hours (e)
c. Digital Logic Channels (7 and 8)	2	1	2	Bring to hot shutdown within 24 hours (e)
16. Turbine Stop Valves Closure	2	1	2	Bring to hot shutdown within 24 hours (e)
17. Protective Channel Coincidence Logic in the Reactor Trip Modules	4 logic channels; A, B, C, and D	AB or AD or BC or CD	4	See Note (f)
18. CRD Breakers	1 AC Breaker and 2 DC Breakers per trip system		1 AC Breaker and 2 DC Breakers per trip system	See Note (i)
19. SCR Control Relays E and F	4 SCR Control Relays per trip system		4 SCR Control Relays per trip system	See Note (j)

TABLE 3.5.1-1

INSTRUMENTS OPERATING CONDITIONS (cont'd)

NOTES:

(a) For channel testing, calibration, or maintenance, one of the three minimum operable channels may be put into manual bypass leaving a one out of two trip logic for a maximum of four hours.

(b) When 2 of 4 power range instrument channels are greater than 10% rated power, hot shutdown is not required.

(c) When 1 of 2 intermediate range instrument channels is greater than 10^{-10} amps, hot shutdown is not required.

(d) (Deleted)

(e) If minimum conditions are not met within 48 hours after hot shutdown, the unit shall be in the cold shutdown within 24 hours.

(f) 1. Place the inoperable Reactor Trip Module output in the tripped condition within one hour or

2. Remove the power supplied to the control rod trip devices associated with the inoperable Reactor Trip Module within one hour.

(g) (deleted)

(h) The RCP monitors provide input to this logic. For operability to be met either all RCP monitor channels must be operable or 3 operable with the remaining channel in the tripped state.

(i) 1. The power supplied to the control rod drive mechanisms through the failed CRD Trip Breaker shall be removed within one hour or

2. With one of the CRD Trip Breaker diverse features (undervoltage or shunt trip device) inoperable, restore it to OPERABLE status in 48 hours or place the breaker in trip in the next hour.

(j) 1. With one SCR Control Relay inoperable in logic channel C or D, restore the inoperable SCR Control Relay to OPERABLE status in 48 hours or remove power from the CRD mechanisms supplied by the inoperable channel's SCR Control Relay within the next hour.

2. With two or more SCR Control Relays inoperable in logic channel C or D, remove power from the CRD mechanisms supplied by the inoperable channel's SCR Control Relay within one hour.

Table 4.1-1
INSTRUMENT SURVEILLANCE REQUIREMENTS

Channel Description	Check	Test	Calibrate	Remarks
1. Protective Channel Coincidence Logic in the Reactor Trip Modules	NA	MO	NA	
2. Control Rod Drive Trip Breakers, SCR Control Relays E and F	NA	MO(1)	NA	(1) This test shall independently confirm the operability of the shunt trip device and the undervoltage device.
3. Power Range Amplifier	ES(1)	NA	(1)	(1) Heat balance check each shift. Heat balance calibration whenever indicated cated core thermal power exceeds neutron power by more than 2 percent.
4. Power Range	ES	MO	MO(1)(2)	(1) Using incore instrumentation. (2) Axial offset upper and lower chambers after each startup if not done previous week.
5. Intermediate Range	ES(1)	PS	NA	(1) When in service.
6. Source Range	ES(1)	PS	NA	(1) When in service.
7. Reactor Coolant Temperature	ES	MO	RF	
8. High Reactor Coolant Pressure	ES	MO	RF	
9. Low Reactor Coolant Pressure	ES	MO	RF	
10. Flux-Reactor Coolant Flow Comparator	ES	MO	RF	
11. Reactor Coolant Pressure Temperature Comparator	ES	MO	RF	

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Attachment 2

No Significant Hazards Consideration Evaluation

No Significant Hazards Consideration Evaluation

Description of Amendment Request:

The proposed Technical Specification revision is being submitted in response to Generic Letter 85-10 dated May 23, 1985. Specifically, Generic Letter 85-10 requires submittal of Technical Specifications for Generic Letter 83-28, Items 4.3 and and 4.4. Item 4.3 of Generic Letter 83-28 "Required Actions Based on Generic Implications of Salem ATWS Events", established the requirement for the automatic actuation of shunt and undervoltage trip attachments of the reactor trip breakers for B&W plants. Item 4.4 of Generic Letter 83-28 requires that the appropriate surveillance and test sections of the technical specifications also be revised to include testing of the silicon controlled rectifiers (SCRs) used to interrupt power to control rods.

Generic Letter 85-10 requires that proposed technical specification changes be submitted to reflect independent testing of the shunt and undervoltage trip attachments and SCRs consistent with the design of the test features provided and responsive to the guidance noted in the enclosure to Generic Letter 85-10. Further clarification and guidance with respect to the operability of the SCRs requirements was provided by the NRC letter dated December 6, 1985.

The proposed technical specifications are in response to the requirements of Generic Letter 85-10. The format of the proposed Technical Specifications is different from Standard Technical Specifications recommended by Generic Letter 85-10. However, the content of the proposed Technical Specifications meet the intent and requirements of Generic Letter 85-10.

By a letter dated September 17, 1985 Duke Power Company submitted an amendment request in response to Generic Letter 85-10 and the NRC letter dated February 11, 1985. That submittal included a proposed revision to Table 4.1-1 of the Oconee Technical Specifications to specifically note that the shunt and undervoltage trip attachments are independently tested. Duke Power Company also indicated that additional Technical Specification changes in response to Generic Letter 85-10 will be submitted as they become available.

The attached proposed Technical Specifications are intended to supplement our previous submittal dated September 17, 1985. The proposed changes in Table 4.1-1 are slightly different from our September 17, 1985 submittal. The difference is due to editorial corrections and does not alter the intent of the proposed change in Table 4.1-1.

Most of the proposed Technical Specification revisions are in response to the guidance set forth in Generic Letter 85-10. However, the proposed operability action statements for the SCR relays are different than the operability action statements recommended by the NRC. A failure of one SCR relay only affects the redundancy of the reactor trip system for the associated regulating group. For example, if the SCR relay in logic

channel C associated with Group 5 fails, the AC breaker connected in series with the inoperable SCR relay would provide a redundant means to trip the Group 5 regulating rods. The safety groups and the remaining regulating rods are unaffected. Thus, the action statement for inoperable SCR relays recommended by Generic Letter 85-10 is felt to be unnecessarily restrictive.

In the judgement of the B&W Owners Group, the SCR relay Technical Specification changes recommended by Generic Letter 85-10 will significantly increase the likelihood of inadvertent rod drops resulting in unneeded challenges to other plant safety systems. Therefore, in contrast to the one hour recommended by Generic Letter 85-10, the proposed action statement allows up to 48 hours to repair in inoperable SCR relay before the associated channel must be placed in trip. However, when more than one SCR relay fail, the proposed action statement requires the power to be removed from the regulating rods associated with the inoperable SCR relays within one hour.

Basic For No Significant Hazards Considerations:

Duke Power Company (Duke) has made the determination that this amendment request involves a No Significant Hazards Consideration by applying the standards established by the Commission's regulations in 10 CFR 50.92. This ensures that operation of the facility in accordance with the proposed amendment would not:

(1) involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed amendment request is in response to the requirements of Generic Letter 85-10. The proposed Technical Specifications provide for surveillance tests to independently verify the operability of the SCRs and shunt and undervoltage trip features of the reactor trip breakers. Furthermore, the proposed Technical Specifications include additional limiting conditions for operation and surveillance requirements not presently included in the Oconee Technical Specifications. The addition of new requirements would enhance the degree of confidence that the diverse trip features would be capable of initiating a reactor trip. Therefore, this change is an improvement in the margin of safety and will not increase the probability or consequences of an accident.

(2) create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed amendment would impose additional surveillance requirements and limiting conditions for operation to assure the operability of reactor trip features should one of these features become inoperable. The independent testing and surveillance of diverse reactor trip features ensures that the failure of one device will not affect the operability of other trip devices. Therefore, the possibility of a new or different kind of accident is not created.

(3) involve a significant reduction in a margin of safety. The proposed Technical Specifications are in response to Generic Letter 85-10, clearly an improvement in the reactor trip system, to prevent ATWS events similar to those that occurred at Salem. Therefore, the proposed amendment is considered an enhancement of the overall safety and does not involve a significant reduction in margin of safety.

The Commission has provided guidance concerning the application of these standards by providing certain examples (48 FR 14870). Examples (ii) and (vii) of the types of amendments considered not likely to involve significant hazards consideration are applicable to this amendment request. These specific examples involve amendment requests that are considered to be a change that constitutes an additional limitation, or control not presently included in the technical specifications and, a change to make a license conform to changes in the regulations, where the license change results in very minor changes to facility operations clearly in keeping with the regulations, respectively.

The proposed technical specification amendment addressed in this submittal has been determined by Duke to be a more stringent requirement and a change in conformance to the changes in regulations. Briefly, the proposed amendment is in response to the requirements of Generic Letter 85-10. The proposed amendment would revise Technical Specification 3.5.1 and Table 3.5.1-1 and 4.1-1 to reflect independent testing of the SCRs and shunt trip and undervoltage trip attachments. This results in a very minor change to facility operations and is clearly in keeping with the regulations.

Duke has determined, based on consideration that the requested amendment is a conformatory change in nature, that the revision does not involve a significant increase in the probability or consequences of accidents previously considered, nor create the possibility of a new or different kind of accident, and will not involve a significant decrease in a safety margin. Therefore, Duke concludes that the proposed amendment does not involve a significant hazards consideration.