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 injection sys.

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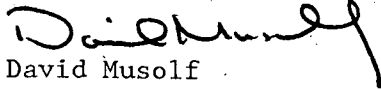
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MONTICELLO NUCLEAR GENERATING PLANT
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Anticipated Transients Without Scram
Alternate Rod Injection System Supplemental Documentation

Reference: (a) Letter from D M Musolf (NSP) to the Director of NRR dated August 3, 1987, "Anticipated Transients Without Scram, Alternate Rod Injection System Documentation".

Attachment 1 to this letter provides supplemental documentation to Reference (a) as requested by Mr. Hulbert Li of the NRC Staff. This documentation is being provided as required by 10 CFR Part 50, Section 50.62(c)(6) to demonstrate compliance with the ATWS Rule for the Alternate Rod Injection System (ARI).


David Musolf

Manager - Nuclear Support Services

DMM/TAP

c: Regional Administrator - III, NRC
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Attachment

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Response to NRC Staff Concerns on the
Monticello Nuclear Generating Plant
ATWS Alternate Rod Injection System Design

General Background:

The Monticello Alternate Rod Injection (ARI) System was installed during the 1980 refueling outage, approximately four years prior to issuance of the final ATWS Rule. Its design goes well beyond the requirements contained in the ATWS rule in that it provides completely independent sensors from those utilized to initiate the existing reactor protection system, it provides completely redundant channels for accomplishing the ARI function and it has been designed to meet single failure criteria. In addition, the Appendix B Quality Assurance Program was applied to all phases of the design, procurement and installation of the ARI System.

1. Question:

Is the Monticello ARI System a safety related system or not? If it is a safety related system, it should meet IEEE Standard 279 in all applicable areas. If it is not a safety-related system, then the qualified isolators should be used for ARI system interface with safety related systems.

Response:

The guidance regarding system and equipment specifications contained in the the Statement of Considerations to the ATWS Rule under the category of Safety Related for the Diverse Reactor Trip System stated, "Not required, but the implementation must be such that the existing protection system continues to meet all applicable safety related criteria." This guidance requires, where the ARI system interfaces with the existing protection system, that the applicable safety related criteria be applied so that the integrity of the protection system will not be compromised by the non-safety related ARI system. The ARI system has no interface with the existing Reactor Trip System. It does however interface with other safety related systems where the safety related systems are supplied power from the same source which supplies the ARI system. Proper isolation of the ARI system from the safety related power source is provided in accordance with the original plant design basis as described in Question #3 of this attachment. The integrity of those safety related systems was ensured by applying the Appendix B Quality Assurance Program and the applicable criteria throughout the design, procurement and installation of the ARI system.

2. Question:

Please clarify your statement on checklist item (6) which states that "Physical separation from the existing Reactor Trip System (RTS) is in accordance with original plant criteria.". Are the original plant criteria in conformance with Regulatory Guide 1.75? Describe the separate arrangement between ARI system and the RTS at the Monticello Plant. Identify any deviation from Regulatory Guide 1.75 criteria.

Response:

The guidance regarding system and equipment specifications contained in the the Statement of Considerations to the ATWS Rule under the category of Physical Separation from existing Reactor Trip System (RTS) for the Diverse Reactor Trip System stated, "Not required, unless redundant divisions and channels in the existing reactor trip system are not physically separated. The implementation must be such that separation criteria applied to the existing protection system are not violated." This guidance requires physical separation of the ARI system and the RTS if the redundant divisions and channels in the existing reactor trip system are not physically separated. As was stated in the BWR Owners' Group Licensing Topical Report NEDE-31096-P-A, Page A-7, "The GE-BWR RPS redundant divisions and channels are physically separated. The ARI logic does not violate this separation." The Monticello Updated Safety Analysis Report (USAR) states in Paragraph 7.6.1.1(f), "There is sufficient electrical and physical separation between trip channels and between trip logics monitoring the same variable to prevent credible environmental factors, electrical transients, and physical events from impairing the ability of the system to respond correctly." Based on the above information, physical separation of the Monticello RPS and ARI system is not required by the ATWS Rule. However, physical separation has been provided between the Monticello RPS and ARI system consistent with the original plant design basis which predates Regulatory Guide 1.75.

A related question was also asked by Mr. Li of the NRC Staff regarding the physical separation of the components which manually actuate the ARI system from the components which initiate a manual scram in the Control Room. The components are located in the same panel. The original plant design basis separation criteria called for separation of redundant components in panels by at least six inches. This criteria has been met. The components which can be used to manually actuate the ARI system are separated by approximately three feet from the components which initiate a manual scram.

3. Question:

Note 2 to checklist item 5(b) is not in conformance with BWR Owners' Group ATWS Licensing topical report requirement. Your justification is not acceptable. Please provide two fuses in series or a combination of one fuse and one breaker in series for proper isolation.

Response:

The guidance regarding system and equipment specifications contained in the the Statement of Considerations to the ATWS Rule under the category of Electrical Independence from existing Reactor Trip System (RTS) for the Diverse Reactor Trip System stated, "Required from sensor output to the final actuation device at which point non-safety related circuits must be isolated from safety related circuits." The BWR Owners' Group Licensing Topical Report NEDE-31096-P-A, Page A-13, states, "Safety-related power supplies, separate from the RPS power source and available during LOOP, are acceptable (but not required) for powering ARI if the ARI system is 1E, or if the ARI system is properly isolated from the safety-related power supply." Item (9), Section 6.2 of the NRC staff's Safety Evaluation Report for the BWR Owners' Group Licensing Topical Report NEDE-31096-P-A, states, "If the ARI system has to use a safety related power supply through "proper isolation," then two qualified Class 1E breakers* in series with proper relay coordination should be provided for that isolation function. (*Two fuses in series or a combination of one fuse and one breaker will also be acceptable.)".

While the guidance provided in the Statement of Considerations to the ATWS Rule requires proper isolation it also provides under the category, Safety Related for the Diverse Reactor Trip System, that the implementation must be such that the existing protection system continues to meet all applicable safety related criteria. The installation and use of a single fuse for a non-safety related system from a safety related power source is consistent with the original Monticello design basis and therefore meets the guidance provided in the Statement of Considerations for the ATWS rule.

4. Question:

Please describe the ARI system testing arrangement while plant is at power operation. Surveillance testing should not prevent the ARI system from responding to an automatic ARI initiation signal. Provide the ARI system elementary diagrams which will assist the staff to understand your testing method.

Response:

The Monticello ARI System utilizes redundant SCRAM Air Header exhaust valves and redundant initiation logic. The system also meets single failure criteria. This goes well beyond the requirements of the ATWS Rule. This arrangement allows one division to be removed from service for testing while the other division remains in-service providing the automatic ARI function.

In addition to the above questions, Mr. Li asked for information regarding the annunciators and alarms available to the operator in the control room for monitoring the status of the ARI system. The following annunciators and alarms are available in the control room: 1) ATWS Channel A Trip, 2) ATWS Channel B Trip, 3) ATWS Channel A Push Button Armed, 4) ATWS Channel B Push Button Armed, 5) ATWS Cabinet 9-95 Trouble, and 6) ATWS Cabinet 9-96 Trouble. The ATWS Cabinet Trouble annunciator is an indication that either transmitter failure has occurred, the trip unit card is unplugged from the file, or there has been a power supply failure.