NO SIGNIFICANT HAZARDS CONSIDERATIONS
GENERIC EVALUATIONS

"R" - Relocation of requirements:

Relocating requirements which do not meet the Technical Specification selection criteria to documents with an established control program allows the Technical Specifications to be reserved only for those conditions or limitations upon reactor operation which are necessary to adequately limit the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety, thereby focusing the scope of Technical Specifications.

Therefore, requirements which do not meet the Technical Specification selection criteria in 10 CFR 50.36 have been relocated to other controlled license basis documents. This regulation addresses the scope and purpose of Technical Specifications. In doing so, it establishes a specific set of objective criteria for determining which regulatory requirements and operating restrictions should be included in Technical Specifications. These criteria are as follows:

Criterion 1: Installed instrumentation that is used to detect and indicate in the control room a significant abnormal degradation of the reactor coolant pressure boundary.

Criterion 2: A process variable that is an initial condition of a design basis accident (DBA) or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Criterion 3: A structure, system or component that is part of the primary success path and which functions or actuates to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission barrier.

Criterion 4: A structure, system or component which operating experience or probabilistic safety assessment has shown to be significant to public health and safety.

The application of these criteria is provided in the "Application of Selection Criteria to the ANO-1 Technical Specifications." Requirements which met the criteria have been included in the proposed improved Technical Specifications. Entergy Operations proposes to remove the requirements which do not meet the criteria from the Technical Specifications and relocate the requirements to a suitable owner controlled document. The requirements in the relocated Specifications will not be affected by this Technical Specification change. Entergy Operations will initially continue to perform the required operation and maintenance to assure that the requirements are satisfied. Relocating specific requirements for systems or variables will have no impact on the system's operability or the variable's maintenance, as applicable.

NO SIGNIFICANT HAZARDS CONSIDERATIONS
GENERIC EVALUATIONS

License basis document control mechanisms, such as 10 CFR 50.59, 10 CFR 50.54(a)(3), and ITS Section 5, "Administrative Controls," will be utilized for the relocated Specifications as they will be placed in other controlled license basis documents. This would allow Entergy Operations to make changes to these requirements, without NRC approval, as allowed by the applicable regulatory requirements. These controls are considered adequate for assuring structures, systems and components in the relocated Specifications are maintained operable and variables in the relocated Specifications are maintained within limits.

Entergy Operations has evaluated this proposed Technical Specification change and has determined that it involves no significant hazards consideration. This determination has been performed in accordance with the criteria set forth in 10 CFR 50.92(c) as indicated below:

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change relocates requirements and surveillances for structures, systems, components or variables which did not meet the criteria for inclusion in Technical Specifications as identified in the Application of Selection Criteria to the ANO-1 Technical Specifications. The affected structures, systems, components or variables are not assumed to be initiators of analyzed events and are not assumed to mitigate accident or transient events. The requirements and surveillances for these affected structures, systems, components or variables will be relocated from the Technical Specifications to an appropriate administratively controlled license basis document and maintained pursuant to the applicable regulatory requirements. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or change in parameters governing normal plant operation. The proposed change will not impose any different requirements and adequate control of information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does this change involve a significant reduction in a margin of safety?**

   The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the affected requirement will be relocated to an owner controlled license basis document for which future changes will be evaluated pursuant to the requirements of the applicable regulatory requirements. Therefore, this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS
GENERIC EVALUATIONS

"A" - Administrative changes to requirements:

Reformatting and rewording the remaining requirements in accordance with the style of the improved Babcock & Wilcox Standard Technical Specifications in NUREG-1430 will make the Technical Specifications more readily understandable to plant operators and other users. Application of the format and style will also assure consistency is achieved between specifications. As a result, the reformatting and rewording of the Technical Specifications has been performed to make them more readily understandable by plant operators and other users. During this reformatting and rewording process, no technical changes (either actual or interpretational) to the Technical Specifications were made unless they were identified and justified.

Entergy Operations has evaluated this proposed Technical Specification change and has determined that it involves no significant hazards consideration. This determination has been performed in accordance with the criteria set forth in 10 CFR 50.92(c) as indicated below:

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change involves reformatting and rewording of the existing Technical Specifications. The reformatting and rewording process involves no technical changes to existing requirements. As such, this change is administrative in nature and does not impact initiators of analyzed events or assumed mitigation of accident or transient events. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any different requirements. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does this change involve a significant reduction in a margin of safety?**

   The proposed change will not significantly reduce the margin of safety because it has no impact on any safety analysis assumptions. This change is administrative in nature. As such, there is no technical change to the requirements and therefore, there is no significant reduction in the margin of safety.

"LA" - Less restrictive, Administrative deletion of requirements:

Portions of some Specifications provide information that is descriptive in nature regarding the equipment, system(s), actions or surveillances. This information is proposed to be deleted from the specification and relocated to other license basis documents which are under licensee control. These documents include the TS Bases, Safety Analysis Report (SAR), Technical Requirements Manual, and Programs and Manuals identified in ITS Section 5, "Administrative Controls." The removal of descriptive information is permissible, because the documents containing the relocated information will be controlled through the applicable process provided by the regulatory requirements, e.g., 10 CFR 50.59, 10 CFR 50.54(a)(3), and ITS Section 5, "Administrative Controls." This will not impact the actual requirements but may provide some flexibility in how the requirement is conducted. Therefore, the descriptive information that has been moved continues to be maintained in an appropriately controlled manner.

Entergy Operations has evaluated this proposed Technical Specification change and has determined that it involves no significant hazards consideration. This determination has been performed in accordance with the criteria set forth in 10 CFR 50.92(c) as indicated below:

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change relocates requirements from the Technical Specifications to other license basis documents which are under licensee control. The documents containing the relocated requirements will be maintained using the provisions of applicable regulatory requirements. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will not impose any different requirements and adequate control of the information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The proposed change will not reduce a margin of safety because it has no impact on any safety analysis assumptions. In addition, the requirements to be transposed from the Technical Specifications to other license basis documents, which are under licensee control, are the same as the existing Technical Specifications. The documents containing the relocated requirements will be maintained using the provisions of applicable regulatory requirements. Therefore, this change does not involve a significant reduction in a margin of safety.

"M" - More restrictive changes to requirements:

The ANO-1 Technical Specifications are proposed to be modified in some areas to impose more stringent requirements than previously identified. These more restrictive modifications are being imposed to be consistent with the improved Babcock & Wilcox Standard Technical Specifications. Such changes have been made after ensuring the previously evaluated safety analysis was not affected. Also, other more restrictive technical changes have been made to achieve consistency, correct discrepancies, and remove ambiguities from the specification.

The modification of the ANO-1 Technical Specifications and the changes made to achieve consistency within the specifications have been performed in a manner such that the most stringent requirements are imposed, except in cases which are individually evaluated.

Entergy Operations has evaluated this proposed Technical Specification change and has determined that it involves no significant hazards consideration. This determination has been performed in accordance with the criteria set forth in 10 CFR 50.92(c) as quoted below:

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change provides more stringent requirements for the ANO-1 Technical Specifications. These more stringent requirements are not assumed to be initiators of analyzed events and will not alter assumptions relative to mitigation of accident or transient events. The change has been confirmed to ensure no previously evaluated accident has been adversely affected. The more stringent requirements are imposed to ensure process variables, structures, systems and components are maintained consistent with the safety analyses and licensing basis. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change does impose different requirements. However, these changes do not impact the safety analysis and licensing basis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated for ANO-1.

3. Does this change involve a significant reduction in a margin of safety?

The imposition of more stringent requirements prevents a reduction in the margin of plant safety by:

a) Increasing the analytical or safety limit,
b) Increasing the scope of the specification to include additional plant equipment,
c) Increasing the applicability of the specification,
d) Providing additional actions,
e) Decreasing restoration times,
f) Imposing new surveillances, or
g) Decreasing surveillance intervals.

The change is consistent with the safety analysis and licensing basis. Therefore, this change does not involve a reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS STATEMENTS

ITS Section 3.3D: Instrumentation - MISC.

Entergy Operations has evaluated these proposed Technical Specification changes and has determined that they involve no significant hazards consideration. This determination has been performed in accordance with the criteria set forth in 10CFR 50.92(c) as indicated below:

3.3D L1

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The change in the Required Actions for inoperable DG LOPS instrumentation does not result in any hardware changes. The change also does not significantly increase the probability of occurrence for initiation of any analyzed event since the function of the equipment does not change (and therefore any initiation scenarios are not changed) and the proposed Completion Time is short (and therefore limits the impact on probability). Further, the change of Required Actions does not significantly increase the consequences of any accident previously evaluated because the change does not affect the assumed response of the equipment in performing its specified mitigation function from that considered during the accident analysis.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure corrective actions are taken to restore plant systems to OPERABLE status, as assumed in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

This change does not involve a significant reduction in a margin of safety since the OPERABILITY of the equipment and loss of function continue to be evaluated in the same manner. The increase in time allowed for such an evaluation and restoration is minimal and provides additional potential for the preferred action of restoration of the equipment to OPERABLE status, rather than requiring a shutdown transient.

3.3D L2

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The change in the Required Action does not result in any hardware changes. The change also does not significantly increase the probability of occurrence for initiation of any analyzed event since the function of the equipment does not change (and therefore any initiation scenarios are not changed) and the proposed time for allowing testing is short (and therefore limits the impact on probability). The proposed changes allow time for testing the equipment which is less than the time allowed for restoration of the equipment if it were discovered to be inoperable. Since some time is currently allowed for operation with the equipment unavailable, this change does not involve an increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure corrective actions are taken to restore plant systems to the OPERABLE status assumed in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for the automatic start function for AC Sources is provided by the design requirements and assumed analysis response parameters. The design requirements and assumed analysis response parameters are not affected by a short allowance for unavailability to perform testing. Further, the proposed time for unavailability is less than is currently allowed for the equipment if it is discovered to be inoperable. Therefore, this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS STATEMENTS

3.3D L3

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The Borated Water Storage Tank (BWST) Level instrumentation is utilized as a post accident monitor (PAM). Therefore, it is used to support mitigation of the consequences of an accident, but it is not considered as initiator of any previously evaluated accident. As such the proposed revision of the Applicability does not significantly increase the probability of any accident previously evaluated. Since the PAM function of the BWST Level continues to be verified OPERABLE for any MODE in which previously evaluated events may require the PAM, the proposed revision of Applicability does not reduce the capability of required equipment to support mitigation of the event. Therefore, this change does not involve a significant increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure proper availability of the PAM for the MODES of operation of the unit during which a design basis event is considered credible. The other operating MODES are not considered in the safety analysis as likely to require the PAM functions due to the significantly reduced unit operating conditions. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs continue to be confirmed with the required Surveillances. The revision of the Applicability still provides assurance that the PAM function will perform its required function when needed. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L4

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow startup with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event since the function of the equipment does not change (and therefore any initiation scenarios are not changed). Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L5

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L6

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L7

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L8

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS STATEMENTS

3.3D L9

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L10

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The PAMs are used to support mitigation of the consequences of an accident; however, they are not considered the initiator of any previously analyzed accident. As such, the proposed revision of the Surveillance Frequency of the PAMs does not significantly increase the probability of any accident previously evaluated. Since the function of the PAMs continues to be verified, and continues to be required to be OPERABLE, the change of the Surveillance Frequency will not reduce the capability of required equipment to mitigate the event. Therefore, this change does not involve a significant increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure proper surveillances are required for the equipment considered in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The Frequency is based on unit operating experience that demonstrates channel failure is rare, and on the use of less formal but more frequent checks of channels during normal operational use of the displays associated with the required channels. Therefore, the availability and capability of the PAMs continues to be assured by the proposed Surveillance Frequency and this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS STATEMENTS

3.3D L11

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any hardware changes, but does allow additional continued operation with inoperable PAM functions. The PAMs provide indication only and are not considered as initiators of any analyzed event. Therefore, the change does not significantly increase the probability of occurrence of any previously analyzed event. Neither will the change result in a significant increase in the consequences of any accident previously evaluated since the consequences of an event occurring during the proposed operation of the unit during the proposed Completion Times are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, the proposed change does not involve a significant increase to the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed). The equipment function has not changed, nor has its interface with other equipment. The proposed change will still ensure proper actions are required, consistent with applicable regulatory guidance. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The availability and capability of the PAMs may be affected but is not considered to be significant due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L12

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The PAMs are used to support mitigation of the consequences of an accident; however, they are not considered the initiator of any previously analyzed accident, nor do they provide any automatic actuation functions. As such, the proposed revision to omit the Surveillance Requirement for functional testing of the PAMs does not increase the probability of any accident previously evaluated. Since the capability of the PAMs to provide the required information continues to be verified, and continues to be required to be OPERABLE, the change will not reduce the capability of required equipment to mitigate the event. Therefore, this change does not involve a significant increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure proper surveillances are required for the equipment considered in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for PAMs is based on availability and capability of the instrumentation to provide the required information to the operator. The Frequency is based on unit operating experience that demonstrates channel failure is rare, and on the use of less formal but more frequent checks of channels during normal operational use of the displays associated with the required channels. Therefore, the availability and capability of the PAMs continues to be assured by the proposed Surveillance Requirements and this change does not involve a significant reduction in a margin of safety.

3.3D L13

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

The control room area radiation monitor is used to support mitigation of the consequences of an accident; however, it is not considered the initiator of any previously analyzed accident. Also, the addition of the Note to allow time for testing reduces the potential for initiation of a previously analyzed accident due to reduced potential for shutdowns and startups due to incomplete or missed surveillances. As such, the proposed revision to omit the check of the self-checking feature from the Surveillance Requirement for functional testing and to include an allowance for testing does not significantly increase the probability of any accident previously evaluated. This change does not result in any hardware changes, but does allow operation for a limited time with an inoperable monitor for the purposes of testing. Since the capability of the control room area radiation monitor to provide the required information continues to be verified, and the time allowed for inoperability for testing is short, the change will not reduce the capability of required equipment to mitigate the event. Also, the consequences of an event occurring during the proposed operation of the unit during the allowed inoperability for testing are the same as the consequences of an event occurring while operating under the current ACTIONS. Therefore, this change does not involve a significant increase in the consequences of any accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will still ensure proper surveillances are required for the equipment considered in the safety analysis. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety for the control room area radiation monitor is based on availability and capability of the instrumentation to provide the required information to the operator. The Frequency is based on unit operating experience that demonstrates channel failure is rare, and on the use of less formal but more frequent checks of channels during normal operational use of the displays associated with the required channels. Therefore, the availability and capability of the control room area radiation monitor continues to be assured by the proposed Surveillance Requirements and this change does not involve a significant reduction in a margin of safety.

NO SIGNIFICANT HAZARDS CONSIDERATIONS STATEMENTS

3.3D L14

1. Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?

This change does not result in any changes in hardware or methods of operation. The change in date for submittal of "after the fact" information is not considered in the safety analysis, and cannot initiate or affect the mitigation of an accident in any way. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or changes in parameters governing normal plant operation. The proposed change will impact only the administrative requirements for submittal of information and do not directly impact the operation of the plant. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does this change involve a significant reduction in a margin of safety?

The margin of safety is not dependent on the submittal of information. Therefore, this change does not involve a significant reduction in a margin of safety.

3.3D L15

1. **Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   The proposed change removes non-Type A, non-Category 1 post accident monitor (PAM) requirements from the ANO-1 Technical Specifications. This instrumentation is not assumed to be the initiator of any analyzed event and is not assumed to function to mitigate any previously evaluated accident. Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?**

   The proposed change does not necessitate a physical alteration of the plant (no new or different type of equipment will be installed) or change in parameters governing normal plant operation. The proposed change will not impose any different requirements and adequate control of information will be maintained. Thus, this change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. **Does this change involve a significant reduction in a margin of safety?**

   The proposed change will not reduce a margin of safety because the operation of the instrumentation is not considered in any safety analysis assumptions. Therefore, this change does not involve a significant reduction in a margin of safety.

ITS DISCUSSION OF DIFFERENCES
ITS Section 3.3D: Instrumentation - MISC.

Note: The ITS Section 3.3D package addresses the following NUREG-1430 RSTS:

RSTS 3.3.8 Diesel Generator (DG) Loss of Power Start (LOPS)
RSTS 3.3.15 Reactor Building Purge Isolation - High Radiation
RSTS 3.3.16 Control Room Isolation - High Radiation
RSTS 3.3.17 Post Accident Monitoring (PAM) Instrumentation
RSTS 3.3.18 Remote Shutdown System

1 NUREG 3.3.8 - The title of this instrumentation Specification is revised to omit the term "emergency" when referring to the diesel generators for consistency with the Section 3.8 Specifications, and "EDG" is revised to "DG." This change is consistent with both CTS and the majority of the NUREG, and is considered to be editorial in nature. This change is identified only in the title of the Section of the Specification and of the Bases, but not for each occurrence in the markup.

2 NUREG 3.3.8 - The Frequency for performance of CHANNEL CHECKS (SR 3.3.8.1) and CHANNEL CALIBRATIONS (SR 3.3.8.2) for DG LOPS instrumentation has been changed to 7 days and 18 months, respectively. This change is being made to maintain consistency with CTS Table 4.1-1, Item 37. There are no indications on the relays upon which to base a more frequent CHANNEL CHECK. The available indications consist only of power available lights and drop flags. Unit experience has indicated that the CTS Frequency of 18 months for the CHANNEL CALIBRATION is sufficient. The CHANNEL FUNCTIONAL TEST requirements are omitted as a specific line item in the ITS. However, this results in no change in requirements since the CTS CHANNEL FUNCTIONAL TEST requirements for the CTS Degraded Voltage Monitoring Functions in CTS Table 4.1-1 are required on the same Frequency, 18 months, as the CHANNEL CALIBRATION. Since the CHANNEL FUNCTIONAL TEST is required as part of the CHANNEL CALIBRATION, both surveillances continue to be performed. However, the discussion of CHANNEL FUNCTIONAL TEST has not been retained as this information duplicates the information provide in the Definition of CHANNEL CALIBRATION. The NOTE is retained to allow the testing to be performed at power, if necessary.

3 NUREG 3.3.8 - The ANO-1 Diesel Generator Loss of Power Start Functions consist of the following for each DG: 1) two loss of voltage relays in a one out of two logic configuration, and 2) two degraded voltage relays in a two out of two configuration. The number of channels indicated in ITS LCO 3.3.8 was changed to indicate this ANO-1 specific design. This design additionally required the indicated changes to the ACTIONS of ITS 3.3.8 and to the Note in SR 3.3.8.2. The Bases are also significantly revised to reflect the unit design.

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4 NUREG 3.3.8 - The word "per" was replaced by the phrase "for one or more" in ITS 3.3.8 Condition A. This change represents a site specific wording preference. This change is being made to ensure that the proper Condition and Required Actions are entered in the event that a Loss of Power Start Function, affecting only one Diesel Generator, is inoperable.

5 NUREG 3.3.8 - The detail of setpoint Allowable Values for degraded voltage and loss of voltage functions has been revised consistent with CTS 3.5.1.8. References to Allowable Values have been deleted for consistency with the CTS (which discusses "setpoints", not "Allowable Values"). The DG LOPS signals are not parameters explicitly modeled in the plant safety analysis. However, the function of the loss of voltage start signal is implicitly assumed to function in response to a loss of offsite power. The degraded voltage diesel generator start signal is assumed for the protection and OPERABILITY of equipment supplied by the respective ES bus. Accordingly, the Bases Background and LCO discussion is revised to omit the paragraph relating compliance with the Allowable Values to compliance with the Safety Limits. This discussion is not directly related to the DG LOPS setpoints since they are checked only against the previously documented analysis for consistency with the assumptions and results; not as direct inputs to confirm Safety Limit conformance.

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6 NUREG 3.3.15 - The Reactor Building (RB) Purge Isolation - High Radiation" requirements are not adopted. The ANO-1 RB Purge System is required to remain isolated during operation in MODES 1, 2, 3, and 4. Further, the ANO-1 design does not include automatic isolation of the RB Purge System on a high radiation signal during any operating conditions. These valves may be closed by an operator from the control room following receipt of indication that a high radiation level exists in the RB, or based on other indications of need to isolate the RB Purge System.

7 NUREG 3.3.18 - The Remote Shutdown System requirements are not adopted. The ANO-1 CTS does not include any requirements related to shutdown from outside the control room.

8 NUREG 3.3.16 - The ANO control room is shared by the two units and isolation is provided by one channel primarily, but not completely, associated with each unit. The channel associated with each unit initiates the control room emergency ventilation system (CREVS) for that unit, but provides isolation for both unit's control rooms since they are a shared facility. Since there are two channels, appropriate ACTIONS are included. The Bases were also revised to reflect this change.

9 NUREG 3.3.16 - The ANO CREVS emergency recirculation mode is essentially the same as the toxic gas protection mode. Therefore, the Note in NUREG LCO 3.3.16 Required Action A.1 is not required.

10 NUREG 3.3.16 - The Frequency for the CHANNEL FUNCTIONAL TEST of the CREVS initiation instrumentation (i.e., SR 3.3.16.2) is revised to be consistent with unit specific information as provided in CTS Table 4.1-1, item 28.b, and in the ANO-2 CTS (Table 4.3-3). The Bases were also revised to reflect this change.

11 NUREG 3.3.16 - The Allowable Value is not included in ITS for this function. Therefore, this portion of SR 3.3.16.3 is not adopted. The setpoint for this instrumentation is not based on a specific safety analysis assumption or result, but is chosen to assure control room habitability and to prevent spurious actuations. The Bases were also revised to reflect this change.

12 NUREG 3.3.17 - Renumbered and moved to ITS 3.3.15. This is an administrative change only. The DOD reference is only provided at the first occurrence.

13 NUREG 3.3.17 - Required Actions B.1 and G.1 provide reference to the - The NUREG reporting requirements (NUREG 5.6.8) related to post accident monitor inoperability. These are not specifically identified in the ITS. A Special Report will continue to be required by the ACTIONS for the Post Accident Monitoring Instrumentation LCO, but details for content of the report will be provided only in the associated Bases for the Required Actions. These controls are considered sufficient since they are not directly pertinent to obviate the possibility of an abnormal situation or event giving rise to an immediate threat to the public health and safety. Since the details of the report are also not necessary to fulfill the pertinent regulatory requirement, they are not mandated by 10 CFR 50.36, and they do not meet the criteria in 10 CFR 50.36, they can be appropriately retained in licensee controlled documents without a significant impact on safety. Retaining these requirements in controlled documents also provides adequate assurance that they will be maintained. Changes to the Bases are controlled by the proposed program in the Administrative Controls Section of the ITS. Additionally, this change is consistent with previously approved ITS for other ENTERGY stations, i.e., Grand Gulf and River Bend. (See also DOD 20 for Section 5.0.)

14 NUREG 3.3.17 - NUREG Table 3.3.17-1, Function 2, is revised such that the number of Required Channels is reduced from "2 per loop" to "2." There is only one PAM RCS Hot Leg Temperature monitoring channel per loop for this unit.

15 NUREG 3.3.17 - NUREG Table 3.3.17-1, Function 3, RCS Cold Leg Temperature, is not included in ITS since it is not a Type A or Category 1 post accident monitoring variable for this unit.

16 NUREG 3.3.17 - RCS Hot Leg Level is included in ITS Table 3.3.15-1 as Function 3 since this is a Type B, Category 1 post accident monitoring variable for this unit. This Function is currently required as item 16 in the "OTHER SAFETY RELATED SYSTEMS" portion of CTS Table 3.5.1-1 and as item 64 in CTS Table 4.1-1.

17 NUREG 3.3.17 - NUREG Table 3.3.17-1, Functions 6, 7, 8, 9, and 10, are revised consistent with the unit specific terminology of "Reactor Building" in lieu of the term "Containment." This is an administrative change only.

18 NUREG 3.3.17 - NUREG Table 3.3.17-1, Function 8, is revised (as ITS Function 8) to include the term "Automatic" since many non-automatic penetration isolation barriers do not include position indication. This is consistent with approved unit specific design.

The Table is also revised to incorporate TSTF-295.

19 NUREG 3.3.17 - NUREG Table 3.3.17-1, Function 12, is revised (as ITS Function 12a-d) to identify, as separate Functions, the Low Range and High Range of SG water level instrumentation for each SG. These Functions are Type A, Category 1 variables for this unit. Although the Low Range instrumentation is currently included in CTS Table 3.5.1-1, as item 1b in the "EMERGENCY FEEDWATER INITIATION AND CONTROL SYSTEM" portion of the table and as item 53b in CTS Table 4.1-1, the High Range is not included in the CTS and neither are specifically identified as post accident monitors. These are provided as separate Functions for clarity only and is an administrative change.

20 NUREG 3.3.17 - SG Pressure is included in ITS Table 3.3.15-1 as Function 13 since this is a Type A, Category 1 post accident monitoring variable for this unit. This Function is currently required as item 1b in the "EMERGENCY FEEDWATER INITIATION AND CONTROL SYSTEM" portion of CTS Table 3.5.1-1 and as item 53c in CTS Table 4.1-1. ITS Function 13 is identified as separate Functions for the pressure variable in each SG for clarity only and is an administrative change. The subsequent Functions in the Table are renumbered as appropriate.

21 NUREG 3.3.17 - Borated Water Storage Tank Level is included in ITS Table 3.3.15-1 as Function 15 since this is a Type A, Category 1 post accident monitoring variable for this unit. This Function is currently required by Specification 3.3.1(F), with Actions identified by 3.3.6 and 3.3.7(A), and as item 34 in CTS Table 4.1-1.

22 NUREG 3.3.17 - NUREG Table 3.3.17-1, Function 15, is revised (as ITS Function 17a&b) to identify, as separate Functions, the Emergency Feedwater Flow instrumentation to each SG. These Functions are Type D, Category 1 variables for this unit. There are 4 indicators of emergency feedwater flow for the unit with one indicator for the flow path from each emergency feedwater pump to each steam generator. Therefore, two are associated with each SG. This instrumentation is currently included in CTS Table 3.5.1-1, as item 3 in the "OTHER SAFETY RELATED SYSTEMS" portion of the table and as item 46 in CTS Table 4.1-1. These are provided as separate Functions for clarity only and is an administrative change.

23 NUREG 3.3.17 - High Pressure Injection Flow, Low Pressure Injection Flow, and Reactor Building Spray Flow are included in ITS Table 3.3.15-1 as Functions 18, 19, and 20, respectively, since these are Type A, Category 1 post accident monitoring variables for this unit. The HPI and LPI flow Functions are currently required as item 29 in CTS Table 4.1-1. RB Spray Flow is not required by CTS.

24 NUREG Bases 3.3.16 - The Bases were revised to reflect unit specific analysis, terminology, and design. For example, the "comparison" discussion for the CHANNEL CHECK of SR 3.3.16.1 is not applicable since there is no other channel with which to compare.

25 NUREG 3.3.8 - The Applicability requirements for ITS LCO 3.3.8 are revised to exclude the requirements for an automatic DG LOPS in MODES 5 and 6. Events occurring in these MODES are slowly evolving events which provide time for operator action to start the DG if necessary. Further, such starts are not required by the ANO-1 safety analyses, nor are such requirements included in the CTS. CTS Table 3.5.1-1, Note 14 requires the unit to be placed in cold shutdown (ITS MODE 5) when the DG LOPS function is not OPERABLE. There are no additional restrictions once the unit is in cold shutdown or refueling.

26 NUREG Bases 3.3.17 - The Bases for ITS LCO 3.3.15 are revised as necessary to reflect unit design and analyses.

27 NUREG 3.3.17 - ITS Table 3.3.15-1 Function 16, Core Exit Temperature, is revised to identify the Required Channels as "2 core exit thermocouples (CETs) per quadrant" and to delete the unnecessary Table Note (c). This editorial change is consistent with CTS Table 3.5.1-1, OTHER item 13, and consistent with the original generic requirements as provided in Generic Letter 83-37. The Table is also revised to move the designations of "(CETs) per quadrant" from the Required Channels column to the Function column in order to clearly preserve the intention of the ACTIONS Note which allows separate Condition entry for each "Function." With a Function designation of Core Exit Temperature (Core Exit Thermocouples per quadrant), then the Note would not be clear as to its intention when a second CET in a separate core quadrant becomes inoperable after the Condition has already been entered for a previous inoperable CET. Moving the "CETs per quadrant" to the Function Column clearly identifies the Function is on a core quadrant basis.

28 Not used.

29 NUREG 3.3.8 - Required Action C.1 is revised from "Enter applicable Condition(s) and Required Action for EDG made inoperable by EDG LOPS" to "Declare affected DG(s) inoperable." The NUREG uses a consistent convention for "Declare..." and "Enter..." statements with the exception of LCO 3.3.8 (and LCO 3.8.10). Generally, a "Declare..." statement is used as a Required Action to clarify that the equipment is inoperable, to provide a delay time before implementing the ACTIONS of the supported Specification, and/or to transfer ACTIONS from the supporting Specification to the supported Specification. An "Enter..." statement is typically used as a Note to ensure that ACTIONS for the supporting Specification and the supported Specification are implemented concurrently when certain conditions exist and no delay time is provided. The need in the ACTIONS for LCO 3.3.8 is to transfer ACTIONS from the supporting Specification to the supported Specification. Per the above convention, this should be a "Declare..." format. Since the result is the same, this change is an administrative change only.

30 NUREG Bases 3.3.17 - Incorporates TSTF-019, Rev. 1.

31 NUREG 3.3.8 Bases - The Bases have been generally revised to reflect unit specific design, analysis, and operating practices, or to provide descriptions consistent with other unit specific documents and terminology. Some specific revisions are as follows:

-LCO-
Discussion was revised to remove an example. This example does not include any information that is necessary to identify or clarify what is required to be OPERABLE by this LCO. Hence this is unnecessary information and can be removed with no impact.
Discussion was edited to remove detailed information regarding the determination of setpoints which is not applicable to ANO-1.

-Surveillance Requirements-
General discussion, in NUREG SR 3.3.8.1, was edited to match the specific design of the instrumentation to which this SR is applicable. A 2 out of 2 logic does not require two failures, and there is no normal operational use of the associated displays.
Discussion of performance of CHANNEL CALIBRATION revised to omit reference to SAR since it does not describe the identified single point verification.
CHANNEL CALIBRATION Frequency discussion revised to reflect that some calculations assume longer than 18 months between calibrations.

32 NUREG Bases 3.3.8 – The Bases for SR 3.3.8.2 are revised to reflect the actual wording of the Note.

33 NUREG Bases - The Criterion statement at the conclusion of the Applicable Safety Analysis section was modified at each occurrence to refer to 10 CFR 50.36 instead of the NRC Policy Statement. This is an editorial change associated with the implementation of the 10 CFR 50.36 rule changes after NUREG-1430, Revision 1 was issued.

The 10 CFR 50.36 Criterion satisfied by the ITS LCOs was modified to preserve consistency with the ANO-1 license basis. The NUREG Criterion specified were modified to be consistent with the analysis assumptions regarding equipment availability and operating condition (i.e., MODE).

34 NUREG 3.3.8 Bases and 3.3.16 Bases were revised to reflect the unit specific methodology associated with the determination of instrument uncertainty. In addition, the Bases have been revised to correct terminology used to describe uncertainties with terminology used at ANO. These changes are considered to be administrative in nature.

ITS 3.3.15, PAMs - CTS Cross References

The NUREG Markups typically show the CTS source in the right margin of the NUREG Specification pages. However, since there are 20 Post Accident Monitors (PAMs) each item of the Specification may have as many as 20 different sources. Obviously, there is not room in the margin to show all the sources. Rather than include each page for each Function, a Table has been constructed which identifies the CTS sources for each part of the ITS for each ITS Function. The KEY to reading this CTS Cross References table is provided below.

KEY:

Each ITS 3.3.15 PAM Function is listed in a separate column by ITS PAM Function number (1 through 20) along with an abbreviated Function identification to provide a CTS source for each item in the ITS. For example, 1- N flux is the Neutron flux Function, 2- HL T is the Hot Leg Temperature function, etc.)

Each ITS 3.3.15 item is listed in the first column of the 4 tables, with 5 PAM functions addressed in each table. These separate ITS items include: LCO, APPLICABILITY, ACTIONS Notes 1 and 2, each Required Action, each Note identified in the Conditions column, the SR Note, each SR, and the Table 3.3.15-1 Notes a, b, & c.

For each item, the corresponding DOC(s) are then listed to identify the pertinent justification for adding.

~~ - A double tilde indicates that the source was EQUIVALENT to the resulting ITS and no DOC was needed.

--- - Three hyphens indicate that this ITS item is NOT APPLICABLE for this ITS PAM Function.

new – indicates that this item was not directly addressed in the CTS and is ADDED as a new item for ITS.

OTHER - CTS Table 3.5.1-1 is divided into 4 parts for RPS, ESAS, EFIC SYSTEM, and OTHER SAFETY RELATED SYSTEMS. A CTS source of OTHER ## indicates this item is from the OTHER SAFETY RELATED SYSTEMS section of the Table. For example, Other 16, indicates that this ITS PAM Function is addressed in CTS Table 3.5.1-1, item number 16 in the OTHER SAFETY RELATED SYSTEMS section of the table.

N## - This refers to Note number ## of Table 3.5.1-1

#.#.# - Where complete CTS items are the source, they are provided as the reference. For example, CTS 3.5.1.12 provides the source for the Reactor Building High Radiation Function LCO of ITS 3.3.15, Table 3.3.15-1, Function #9.

- For SRs, a simple number refers to the item as listed in CTS Table 4.1-1. For example, 64 refers to item 64 of Table 4.1-1.

ITS 3.3.15, PAMs - CTS Cross References

PAM	1 - N flux	2 - HL T	3 - HL L	4 - RCS P	5 - RV L
LCO	new - M7	new - M7	Other 16 - ~~	ESAS 1a - M7 ESAS 2a - M7	Other 15 - ~~
APPL	new - M7	new - M7	new - M8	new - M7	new - M8
ACT N1	new - M7,L4	new - M7,L4	new - L4	new - M7,L4	new - L4
ACT N2	new - M7,A6	new - M7,A6	new – A6	new - M7,A6	new – A6
RA A.1	new - M7	new - M7	N28 - L8	new - M7	N28 - L8
Cond B N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA B.1	new - M7	new - M7	N28 - L8	new - M7	N28 - L8
Cond C N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA C.1	new - M7	new - M7	N29 - L8	new - M7	N29 - L8
RA D.1	---	---	---	---	---
RA E.1	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA F.1	new - M7	new - M7	---	new - M7	---
RA F.2	new - M7	new - M7	---	new - M7	---
Cond G N	---	---	new - A1	---	new - A1
RA G.1	---	---	N29 - L8	---	N29 - L8
SR N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
SR 1	new - M7	new - M7	64 - L10	15a,17a - M7	63 - L10
SR 2	new - M7	new - M7	64 - ~~	15a,17a - M7	63 - ~~
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)	---	---	---	---	---

PAM	6 - RB Wat L	7 - RB P	8 - RBIVs	9 - RB hi rad	10 - H2 Conc
LCO	Other 12 - ~~	Other 11 - ~~	new - M7	3.5.1.12 - ~~ Other 10 - ~~	3.14.3 - ~~
APPL	new - M8	new - M8	new - M7	new – A15	new - M8
ACT N1	new - L4	new - L4	new - M7,L4	new - L4	new - L4
ACT N2	new – A6	new – A6	new - M7,A6	new – A6	new – A6
RA A.1	N21 - L7/M10	N21 - L7/M10	new - M7	N20 - L6	3.14.4 – L9
Cond B N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA B.1	new - L7	new - L7	new - M7	N20 - L6	new - L9
Cond C N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA C.1	N21 - L7/M10	N21 - L7/M10	new - M7	N20 - L6	---
RA D.1	---	---	---	---	new - L9
RA E.1	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA F.1	N21 - L7/M10	N21 - L7/M10	new - M7	---	new - L9
RA F.2	new - L7/M10	new - L7/M10	new - M7	---	new - M11
Cond G N	---	---	---	new - A1	---
RA G.1	---	---	---	N20 - L6	---
SR N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
SR 1	59 - L10	58 - L10	new - M7	57 - L10	new – M2
SR 2	59 - ~~	58 - ~~	new - M7	57 - ~~	4.12.2 - ~~
T N(a)	---	---	new - M7	---	---
T N(b)	---	---	new - M7	---	---
T N(c)	---	---	---	---	---

ITS 3.3.15, PAMs - CTS Cross References

PAM	11 - Pzr L	12 - SG L	13 - SG P	14 - CST L	15 - BWST L
LCO	Other 2 - ~~	EFIC 1b - M7	EFIC 1c - M7	new - M7	3.3.1(F) - ~~
APPL	new - M8	new - M7	new - M7	new - M7	3.3.1 - L3/M6
ACT N1	new - L4	new - M7,L4	new - M7,L4	new - M7,L4	new - L4
ACT N2	new – A6	new - M7,A6	new - M7,A6	new - M7,A6	new – A6
RA A.1	N10 - L5/M10	new - M7	new - M7	new - M7	3.3.7(A) - L11
Cond B N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA B.1	new - L5/M10	new - M7	new - M7	new - M7	New - L11
Cond C N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA C.1	new - L5/M10	new - M7	new - M7	new - M7	New - L11
RA D.1	---	---	---	---	---
RA E.1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA F.1	new - L5/M10	new - M7	new - M7	new - M7	3.3.6 - L11/M10
RA F.2	new - L5/M10	new - M7	new - M7	new - M7	3.3.6 - L11/M10
Cond G N	---	---	---	---	---
RA G.1	---	---	---	---	---
SR N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
SR 1	26,51 - L10	53b - M7,L10	53c - M7,L10	new - M7	34 - L10
SR 2	26,51 - ~~	53b - M7	53c - M7	new - M7	34 - ~~
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)	---	---	---	---	---

PAM	16 - CETs	17 - EFW flo	18 - HPI flo	19 - LPI flo	20 - RB S flo
LCO	Other 13 - ~~	Other 3 - ~~	new - M7	new - M7	new - M7
APPL	new - M8	new - M8	new - M7	new - M7	new - M7
ACT N1	new - L4	new - L4	new - M7,L4	new - M7,L4	new - M7,L4
ACT N2	new – A6	new – A6	new - M7,A6	new - M7,A6	new - M7,A6
RA A.1	N22 - L5/M10	N10 - L5/M10	new - M7	new - M7	new - M7
Cond B N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA B.1	new - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
Cond C N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA C.1	N22 - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
RA D.1	---	---	---	---	---
RA E.1	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA F.1	N22 - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
RA F.2	new - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
Cond G N	---	---	---	---	---
RA G.1	---	---	---	---	---
SR N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
SR 1	61 - L10	46 - L10	new - M7	new - M7	new - M7
SR 2	61 - ~~	46 - ~~	29 - ~~	29 - ~~	new - M7
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)		---	---	---	---

CTS

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3.3 INSTRUMENTATION

3.3.8 Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)

LCO 3.3.8 Three channels of loss of voltage Function and three channels of degraded voltage Function EDG LOPS instrumentation per EDG shall be OPERABLE.

T3.5.1-1 OTHER # 8.a # 8.b, 3.7.1.F

APPLICABILITY: MODES 1, 2, 3, and 4, When associated EDG is required to be OPERABLE by LCO 3.8.2 "AC Sources—Shutdown."

NA

25

ACTIONS

NOTE
Separate Condition entry is allowed for each Function.

NA

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one channel per EDG inoperable.	A.1 Place channel in trip.	1 hour
A. B. One or more Functions with two or more channels per EDGs inoperable.	A. B.1 Restore all but one channel to OPERABLE status.	1 hour
B. B.1 Required Action and associated Completion Time not met.	B. B.1 Enter applicable Condition(s) and Required Action for EDG made inoperable by EDG LOPS.	Immediately

3 3 T3.5.1-1 Notes 13 & 14 3

4

NA

29

Declare affected DG(s) inoperable.

RAI 3.3.8-02

(1) CTS

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK.	~~12 hours~~ 7 days (2)
SR 3.3.8.2	----------NOTE---------- When ~~EDG~~ LOPS instrumentation is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed ~~as follows: (a) up to 4 hours for the degraded voltage Function, and (b)~~ up to 4 hours for the loss of voltage Function, provided the ~~two~~ channels monitoring the Function for the bus ~~are~~ is OPERABLE ~~or tripped~~. ---------- Perform ~~CHANNEL FUNCTIONAL TEST~~.	(3) one remaining relay ~~18 months 31 days~~
~~SR 3.3.8.3~~	~~Perform~~ CHANNEL CALIBRATION with setpoint ~~Allowable Value~~ as follows: a. Degraded voltage ≥ [ ] and ≤ [ ] V with a time delay of [ ] seconds ± [ ] seconds at [ ] V, and b. Loss of voltage ≥ [ ] and ≤ [ ] V with a time delay of [ ] seconds ± [ ] seconds at [ ] V.	~~18 months~~ (5)

(2)

T4.1-1 #37

NA

RAI 3.8-12

ANO-359

T4.1-1 #37

3.5.1.8

3.3 INSTRUMENTATION

3.3.15 Reactor Building (RB) Purge Isolation—High Radiation

LCO 3.3.15 [One] channel of Reactor Building Purge Isolation—High Radiation shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4,
During CORE ALTERATIONS,
During movement of irradiated fuel assemblies within the RB.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One channel inoperable in MODE 1, 2, 3, or 4.	A.1	Place and maintain RB purge valves in closed positions.	1 hour
B. Required Action and associated Completion Time of Condition A not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 5.	36 hours
C. One channel inoperable during CORE ALTERATIONS or during movement of irradiated fuel assemblies within the RB.	C.1	Place and maintain RB purge valves in closed positions.	Immediately
	OR		
	C.2.1	Suspend CORE ALTERATIONS.	Immediately
	AND		

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. (continued)	C.2.2 Suspend movement of irradiated fuel assemblies within the RB.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.15.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.15.2	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.15.3	Perform CHANNEL CALIBRATION with setpoint Allowable Value ≤ [25] mR/hr.	[18] months

3.3 INSTRUMENTATION

3.3.16 Control Room Isolation—High Radiation

LCO 3.3.16 Two ~~One~~ channels of Control Room Isolation—High Radiation shall be OPERABLE.

(8) 3.5.1.17 T3.5.1-1 Other #18

APPLICABILITY: MODES 1, 2, 3, and 4, ~~[5, and 6,] [During CORE ALTERATIONS,]~~ and During movement of irradiated fuel assemblies.

3.5.1.17

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. ~~One~~ Two channels inoperable in MODE 1, 2, 3, or 4.	B.1 ~~--------NOTE---------- Place in toxic gas protection mode if automatic transfer to toxic gas protection mode is inoperable. ----------~~ Place one OPERABLE Control Room Emergency Ventilation System (CREVS) train in the emergency recirculation mode.	1 hour
C. Required Action and associated Completion Time of Condition A not met. or B	C.1 Be in MODE 3. AND C.2 Be in MODE 5.	6 hours 36 hours

(8) (9) T3.5.1-1 Note 17

(8) NA

INSERT New Condition A. (continued)

A. One channel inoperable in MODE 1, 2, 3, or 4.	A.1 (Same as proposed RA B.1)	7 days

(8) T3.5.1-1 Note 18

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or two channels inoperable during [CORE ALTERATIONS or] during movement of irradiated fuel.	D.1 Place one OPERABLE CREVS train in emergency recirculation mode.	Immediately
	OR	
	C.2.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	D.2 [2] Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.16.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.16.2	----------NOTE---------- When the Control Room Isolation—High Radiation instrumentation is placed in an inoperable status solely for performance of this Surveillance, entry into associated Conditions and Required Actions may be delayed for up to 3 hours. ---------- Perform CHANNEL FUNCTIONAL TEST.	31 (92) days
SR 3.3.16.3	Perform CHANNEL CALIBRATION with setpoint Allowable Value ≤ [25] mR/hr.	[18] months

ITS 3.3.15, PAMs - CTS Cross References

The NUREG Markups typically show the CTS source in the right margin of the NUREG Specification pages. However, since there are 20 Post Accident Monitors (PAMs) each item of the Specification may have as many as 20 different sources. Obviously, there is not room in the margin to show all the sources. Rather than include each page for each Function, a Table has been constructed which identifies the CTS sources for each part of the ITS for each ITS Function. The KEY to reading this CTS Cross References table is provided below.

KEY:

Each ITS 3.3.15 PAM Function is listed in a separate column by ITS PAM Function number (1 through 20) along with an abbreviated Function identification to provide a CTS source for each item in the ITS.
For example, 1- N flux is the Neutron flux Function, 2- HL T is the Hot Leg Temperature function, etc.)

Each ITS 3.3.15 item is listed in the first column of the 4 tables, with 5 PAM functions addressed in each table.
These separate ITS items include: LCO, APPLICABILITY, ACTIONS Notes 1 and 2, each Required Action, each Note identified in the Conditions column, the SR Note, each SR, and the Table 3.3.15-1 Notes a, b, & c.

For each item, the corresponding DOC(s) are then listed to identify the pertinent justification for adding.

~~ - A double tilde indicates that the source was EQUIVALENT to the resulting ITS and no DOC was needed.

--- - Three hyphens indicate that this ITS item is NOT APPLICABLE for this ITS PAM Function.

new - indicates that this item was not directly addressed in the CTS and is ADDED as a new item for ITS.

other - CTS Table 3.5.1-1 is divided into 4 parts for RPS, ESAS, EFIC SYSTEM, and OTHER SAFETY RELATED SYSTEMS. A CTS source of OTHER ## indicates this item is from the OTHER SAFETY RELATED SYSTEMS section of the Table. For example, Other 16, indicates that this ITS PAM Function is addressed in CTS Table 3.5.1-1, item number 16 in the OTHER SAFETY RELATED SYSTEMS section of the table.

N## - This refers to Note number ## of Table 3.5.1-1

#.#.# - Where complete CTS items are the source, they are provided as the reference. For example, CTS 3.5.1.12 provides the source for the Reactor Building High Radiation Function LCO of ITS 3.3.15, Table 3.3.15-1, Function #9.

- For SRs, a simple number refers to the item as listed in CTS Table 4.1-1. For example, 64 refers to item 64 of Table 4.1-1.

Insert after page 3.3-39
Page 1 of 3

ITS 3.3.15, PAMs - CTS Cross References

PAM	1 - N flux	2 - HL T	3 - HL L	4 - RCS P	5 - RV L
LCO	new - M7	new - M7	Other 16 - ~~	ESAS 1a - M7 ESAS 2a - M7	Other 15 - ~~
APPL	new - M7	new - M7	new - M8	new - M7	new - M8
ACT N1	new - M7,L4	new - M7,L4	new - L4	new - M7,L4	new - L4
ACT N2	new - M7,A6	new - M7,A6	new – A6	new - M7,A6	new – A6
RA A.1	new - M7	new - M7	N28 - L8	new - M7	N28 - L8
Cond B N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA B.1	new - M7	new - M7	N28 - L8	new - M7	N28 - L8
Cond C N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA C.1	new - M7	new - M7	N29 - L8	new - M7	N29 - L8
RA D.1	---	---	---	---	---
RA E.1	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
RA F.1	new - M7	new - M7	---	new - M7	---
RA F.2	new - M7	new - M7	---	new - M7	---
Cond G N	---	---	new - A1	---	new - A1
RA G.1	---	---	N29 - L8	---	N29 - L8
SR N	new - M7,A1	new - M7,A1	new - A1	new - M7,A1	new - A1
SR 1	new - M7	new - M7	64 - L10	15a,17a - M7	63 - L10
SR 2	new - M7	new - M7	64 - ~~	15a,17a - M7	63 - ~~
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)	---	---	---	---	---

==========

PAM	6 - RB Wat L	7 - RB P	8 - RBIVs	9 - RB hi rad	10 - H2 Conc
LCO	Other 12 - ~~	Other 11 - ~~	new - M7	3.5.1.12 - ~~ Other 10 - ~~	3.14.3 - ~~
APPL	new - M8	new - M8	new - M7	new – A15	new - M8
ACT N1	new - L4	new - L4	new - M7,L4	new - L4	new - L4
ACT N2	new – A6	new – A6	new - M7,A6	new – A6	new – A6
RA A.1	N21 - L7/M10	N21 - L7/M10	new - M7	N20 - L6	3.14.4 – L9
Cond B N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA B.1	new - L7	new - L7	new - M7	N20 - L6	new - L9
Cond C N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA C.1	N21 - L7/M10	N21 - L7/M10	new - M7	N20 - L6	---
RA D.1	---	---	---	---	new - L9
RA E.1	new - A1	new - A1	new - M7,A1	new - A1	new - A1
RA F.1	N21 - L7/M10	N21 - L7/M10	new - M7	---	new - L9
RA F.2	new - L7/M10	new - L7/M10	new - M7	---	new - M11
Cond G N	---	---	---	new - A1	---
RA G.1	---	---	---	N20 - L6	---
SR N	new - A1	new - A1	new - M7,A1	new - A1	new - A1
SR 1	59 - L10	58 - L10	new - M7	57 - L10	new – M2
SR 2	59 - ~~	58 - ~~	new - M7	57 - ~~	4.12.2 - ~~
T N(a)	---	---	new - M7	---	---
T N(b)	---	---	new - M7	---	---
T N(c)	---	---	---	---	---

ITS 3.3.15, PAMs - CTS Cross References

PAM	11 - Pzr L	12 - SG L	13 - SG P	14 - CST L	15 - BWST L
LCO	Other 2 - ~~	EFIC 1b - M7	EFIC 1c - M7	new - M7	3.3.1(F) - ~~
APPL	new - M8	new - M7	new - M7	new - M7	3.3.1 - L3/M6
ACT N1	new - L4	new - M7,L4	new - M7,L4	new - M7,L4	new - L4
ACT N2	new – A6	new - M7,A6	new - M7,A6	new - M7,A6	new – A6
RA A.1	N10 - L5/M10	new - M7	new - M7	new - M7	3.3.7(A) - L11
Cond B N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA B.1	new - L5/M10	new - M7	new - M7	new - M7	New - L11
Cond C N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA C.1	new - L5/M10	new - M7	new - M7	new - M7	New - L11
RA D.1	---	---	---	---	---
RA E.1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
RA F.1	new - L5/M10	new - M7	new - M7	new - M7	3.3.6 - L11/M10
RA F.2	new - L5/M10	new - M7	new - M7	new - M7	3.3.6 - L11/M10
Cond G N	---	---	---	---	---
RA G.1	---	---	---	---	---
SR N	new - A1	new - M7,A1	new - M7,A1	new - M7,A1	New - A1
SR 1	26,51 - L10	53b - M7,L10	53c - M7,L10	new - M7	34 - L10
SR 2	26,51 - ~~	53b - M7	53c - M7	new - M7	34 - ~~
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)	---	---	---	---	---

==========

PAM	16 - CETs	17 - EFW flo	18 - HPI flo	19 - LPI flo	20 - RB S flo
LCO	Other 13 - ~~	Other 3 - ~~	new - M7	new - M7	new - M7
APPL	new - M8	new - M8	new - M7	new - M7	new - M7
ACT N1	new - L4	new - L4	new - M7,L4	new - M7,L4	new - M7,L4
ACT N2	new – A6	new – A6	new - M7,A6	new - M7,A6	new - M7,A6
RA A.1	N22 - L5/M10	N10 - L5/M10	new - M7	new - M7	new - M7
Cond B N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA B.1	new - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
Cond C N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA C.1	N22 - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
RA D.1	---	---	---	---	---
RA E.1	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
RA F.1	N22 - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
RA F.2	new - L5/M10	new - L5/M10	new - M7	new - M7	new - M7
Cond G N	---	---	---	---	---
RA G.1	---	---	---	---	---
SR N	new - A1	new - A1	new - M7,A1	new - M7,A1	new - M7,A1
SR 1	61 - L10	46 - L10	new - M7	new - M7	new - M7
SR 2	61 - ~~	46 - ~~	29 - ~~	29 - ~~	new - M7
T N(a)	---	---	---	---	---
T N(b)	---	---	---	---	---
T N(c)		---	---	---	---

CTS

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3.3 INSTRUMENTATION

3.3.17 Post Accident Monitoring (PAM) Instrumentation
15

LCO 3.3.17 The PAM instrumentation for each Function in Table 3.3.17-1 shall be OPERABLE.
15 15

See cross reference Table

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

----------NOTES----------

1. LCO 3.0.4 is not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days
B. Required Action and associated Completion Time of Condition A not met.	B.1 Initiate action in accordance with Specification 5.6.8 to prepare and submit a Special Report.	Immediately
C. ---------NOTE--------- Not applicable to hydrogen monitor channels. ---------- One or more Functions with two required channels inoperable.	C.1 Restore one channel to OPERABLE status.	7 days

13

(continued)

CTS

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Two required hydrogen monitor channels inoperable.	D.1	Restore one required hydrogen monitor channel to OPERABLE status.	72 hours
E. Required Action and associated Completion Time of Condition C or D not met.	E.1	Enter the Condition referenced in Table 3.3.[illegible]-1 for the channel. (15)	Immediately
F. As required by Required Action E.1 and referenced in Table 3.3.[illegible]-1. (15)	F.1 AND	Be in MODE 3.	6 hours
	F.2	Be in MODE 4.	12 hours
G. As required by Required Action E.1 and referenced in Table 3.3.[illegible]-1. (15)	G.1	Initiate action in accordance with Specification 5.6.8 to prepare and submit a Special Report.	Immediately

See cross reference Table

(12) (12) (12) (13)

CTS

(15) (12)

SURVEILLANCE REQUIREMENTS

(15)

----------NOTE----------
These SRs apply to each PAM instrumentation Function in Table 3.3.(15)-1.

See cross reference Table

SURVEILLANCE		FREQUENCY
SR 3.3.(15).1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days (12)
SR 3.3.(15).2	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	(12) {18} months

CTS 12

Table 3.3.17-1 (page 1 of 1)
Post Accident Monitoring Instrumentation

FUNCTION	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1
1. Wide Range Neutron Flux	2	F
2. RCS Hot Leg Temperature	2 per loop	F
3. RCS Cold Leg Temperature	2 per loop	F
4. RCS Pressure (Wide Range)	2	F
5. Reactor Vessel Water Level	2	G
6. Containment Sump Water Level (Wide Range)	2	F
7. Containment Pressure (Wide Range)	2	F
8. Containment Isolation Valve Position	2 per penetration flow path(a)(b)	F
9. Containment Area Radiation (High Range)	2	G
10. Containment Hydrogen Concentration	2	F
11. Pressurizer Level	2	F
12. Steam Generator Water Level	2 per SG	F
13. Condensate Storage Tank Level	2	F
14. Core Exit Temperature	2 (CETs per quadrant) independent sets of CETs	F
15. Emergency Feedwater Flow	2	F

NOTE: Table 3.3.17-1 shall be amended for each unit as necessary to list all U.S. NRC Regulatory Guide 1.97, Type A instruments and all U.S. NRC Regulatory Guide 1.97, Category I, non-Type A instruments in accordance with the unit's U.S. NRC Regulatory Guide 1.97, Safety Evaluation Report.

(a) Not required for isolation valves whose associated penetration is isolated by at least one closed and deactivated automatic valve, closed manual valve, blind flange, or check valve with flow through the valve secured.

(b) Only one position indication channel is required for penetration flow paths with only one installed control room indication channel.

(c) The subcooling margin monitor takes the average of the five highest CETs for each of the ICCM trains.

INSERT 3.3-43A

INSERT 3.3-43B

INSERT 3.3-43C

INSERT 3.3-43D

Reactor Building

Penetration Flow Path Automatic

See cross reference Table

edit

edit

<INSERT 3.3-43A>

3.	RCS Hot Leg Level	2	G

<INSERT 3.3-43B>

12.	a. SG "A" Water Level - Low Range	2	F
	b. SG "B" Water Level - Low Range	2	F
	c. SG "A" Water Level - High Range	2	F
	d. SG "B" Water Level - High Range	2	F
13.	a. SG "A" Pressure	2	F
	b. SG "B" Pressure	2	F

<INSERT 3.3-43C>

15.	Borated Water Storage Tank Level	2	F

<INSERT 3.3-43D>

17.	a. Emergency Feedwater Flow to SG "A"	2	F
	b. Emergency Feedwater Flow to SG "B"	2	F
18.	High Pressure Injection Flow	2	F
19.	Low Pressure Injection Flow	2	F
20.	Reactor Building Spray Flow	2	F

3.3 INSTRUMENTATION

3.3.18 Remote Shutdown System

LCO 3.3.18 The Remote Shutdown System Functions in Table 3.3.18-1 shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

---NOTES---

1. LCO 3.0.4 is not applicable.
2. Separate Condition entry is allowed for each Function.

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One or more required Functions inoperable.	A.1	Restore required Function to OPERABLE status.	30 days
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	6 hours
	AND		
	B.2	Be in MODE 4.	12 hours

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.18.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.18.2	Verify each required control circuit and transfer switch is capable of performing the intended function.	[18] months
SR 3.3.18.3	----------NOTE---------- Neutron detectors are excluded from CHANNEL CALIBRATION. ---------- Perform CHANNEL CALIBRATION for each required instrumentation channel.	[18] months

Table 3.3.18-1 (page 1 of 1)
Remote Shutdown System Instrumentation and Controls

NOTE

This Table is for illustration purposes only. It does not attempt to encompass every function used at every unit, but does contain the types of functions commonly found.

FUNCTION/INSTRUMENT OR CONTROL PARAMETER	REQUIRED NUMBER OF FUNCTIONS
1. Reactivity Control	
a. Log Power Neutron Flux	[1]
b. Source Range Neutron Flux	[1]
c. Reactor Trip Circuit Breaker Position	[1 per trip breaker]
d. Manual Reactor Trip	[1]
2. Reactor Coolant System (RCS) Pressure Control	
a. Pressurizer Pressure or RCS Wide Range Pressure	[1]
b. Pressurizer Power Operated Relief Valve (PORV) Control and Block Valve Control	[1]
3. Decay Heat Removal via Steam Generators (SGs)	
a. Reactor Coolant Hot Leg Temperature	[1 per loop]
b. Reactor Coolant Cold Leg Temperature	[1 per loop]
c. Condensate Storage Tank Level	[1]
d. SG Pressure	[1 per SG]
e. SG Level or Emergency Feedwater (EFW) Flow	[1 per SG]
f. EFW Controls	[1]
4. RCS Inventory Control	
a. Pressurizer Level	[1]
b. Reactor Coolant Injection Pump Controls	[1]

B 3.3 INSTRUMENTATION

B 3.3.8 Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)

BASES

BACKGROUND

The EDGs provide a source of emergency power when offsite power is either unavailable or is insufficiently stable to allow safe unit operation of safety related loads. Undervoltage protection will generate a LOPS in the event a loss of voltage or degraded voltage condition occurs in the switchyard on unit vital buses. There are two LOPS Functions for each 4.16 kV vital bus.

Two three undervoltage relays with inverse voltage time characteristics are provided on each 4.16 kV Class 1E instrument bus for the purpose of detecting a sustained undervoltage condition of a loss of bus voltage. The relays are combined in a two-out-of-three logic to generate a LOPS if the voltage is below 75% for a short time or below 90% for a long time. The LOPS initiated ACTIONS are described in

INSERT B 3.3-72A

FSAR, Section 8.3 (Ref. 1) is further 8.3.1

Trip Setpoints and Allowable Value

The trip setpoints used in the bistables relays are based on the analytical limits presented in accident analysis in FSAR, Chapter 14 (Ref. 2) Section 8.3.1 (Ref. 1). The selection of these trip setpoints is such that adequate protection is provided when all sensor and processing time delays are taken into account. The actual nominal trip setpoint entered into the bistable is more conservative than that required by the unit specific setpoint calculations. A channel is inoperable if its actuation trip setpoint is not within its required Allowable Value range.

Setpoints in accordance with the Allowable Value will assure that limits of Chapter 2.0, "Safety Limits," in the Technical Specifications are not violated during anticipated operational occurrences (AOOs); that the consequences of accidents will be acceptable, providing the unit is operated from within the LCOs at the onset of the AOO or accident; and that the equipment functions as designed.

The undervoltage protection scheme has been designed to protect the unit from spurious trips caused by the offsite power source. This is made possible by the inverse voltage

(continued)

<INSERT B 3.3-72A>

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The relay settings are based on a maximum setting, which is below the lowest allowed motor terminal momentary voltage of 75% of motor voltage rating of 4000 V. The settings are adjusted to include channel uncertainties and calibration tolerances. Upon loss of power to either of these relays, in approximately 1.0 second, load shedding and starting of the associated DG are initiated. Isolation of the safety related buses is delayed approximately 2.0 seconds to allow an automatic transfer to offsite power. The safety related bus is isolated only if the transfer is unsuccessful.

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Two definite time undervoltage relays are provided on each safety related 480 V load center bus with a coincident trip logic (2 out of 2) for the purpose of detecting a sustained undervoltage condition. The undervoltage relays on the 480 V bus are based on long term motor voltage requirements plus the maximum feeder voltage drop allowance resulting in a nominal setting of 92% of the motor rated voltage of 460 V. The settings are adjusted to include channel uncertainties and calibration tolerances. Upon voltage degradation to 92% of 460 V and after a delay of approximately 8 seconds, both relays must operate to isolate the associated safety related 4.16 kV bus from offsite power, and start and connect the associated DG. The relays are delayed 8.0 seconds to prevent spurious operation of the relays when large motors start on the safety related 4.16 kV and 480 V buses.

BASES

BACKGROUND Trip Setpoints and Allowable Value (continued)

actuation by

time characteristics of the relays used. A complete loss of offsite power will result in approximately a [1]-second delay in LOPS actuation. The DG starts and is available to accept loads within a 15 second time interval on the Engineered Safety Feature Actuation System (ESFAS) or LOPS. Emergency power is established within the maximum time delay assumed for each event analyzed in the accident analysis (Ref. 2). in which a loss of offsite power is assumed

The DG LOPS With three protection channels in a two-out-of-three trip logic for each division of the 4.16 kV power supply, no single failure will cause or prevent protective system actuation. This arrangement meets IEEE-279-1971 criteria of (Ref. 3). as discussed in Ref. 1.

3

APPLICABLE SAFETY ANALYSES The DG LOPS is required for the Engineered Safeguards Safety Features (ESF) to function in any accident with a loss of offsite power. Its design basis is that of the ESFAS.

which assumes

Accident analyses credit the loading of the DG, based on the loss of offsite power, during a loss of coolant accident (LOCA). The actual DG start has historically been associated with the ESFAS actuation. The diesel loading has been included in the delay time associated with each safety system component requiring DG supplied power following a loss of offsite power. The analysis assumes a nonmechanistic DG loading, which does not explicitly account for each individual component of the loss of power assumed detection and subsequent actions. The total actuation time for the limiting systems, high pressure injection, and low pressure injection is 27 seconds. This delay time includes contributions from the DG Start, DG loading, and safety injection system component actuation. The response of the DG to a loss of power must be demonstrated to fall within this analysis response time when including the contributions of all portions of the delay.

assumed

edit

edit

The required channels of LOPS, in conjunction with the ESF systems powered from the EDGs, provide unit protection in the event of any of the analyzed accidents discussed in the accident analysis (Ref. 2), in which a loss of offsite power is assumed.

for

edit

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

The delay times assumed in the safety analysis for the ESF equipment include the 10 second EDG start delay and, if applicable, the appropriate sequencing delay. The response times for ESFAS actuated equipment in LCO 3.3.5, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," include the appropriate EDG loading and sequencing delay.

The EDG LOPS channels satisfy Criterion 3 of the NRC Policy Statement. 10 CFR 50.36 (Ref. 3).

<INSERT B 3.3-74B>

The LCO for the LOPS requires that three channels per bus of each LOPS instrumentation Function shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOPS supports safety systems associated with the ESFAS. In MODES 5 and 6, the three channels must be OPERABLE whenever the associated EDG is required to be OPERABLE to ensure that the automatic start of the EDG is available when needed.

<INSERT B 3.3-74A>

Loss of LOPS function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an AOO, the EDG powers the motor driven emergency feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump and an increased potential for a loss of decay heat removal through the secondary system.

The Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the unit specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculation. Each Allowable Value specified is more conservative than the analytical limit assumed in the transient and accident analysis in the safety analysis for the ESF equipment include the 10 second EDG start delay and, if applicable, the appropriate sequencing delay. The response times for ESFAS actuated equipment in LCO 3.3.5, "Engineered Safety Feature Actuation System (ESFAS) Instrumentation," include the appropriate EDG loading and sequencing delay. The EDG LOPS channels satisfy Criterion 3 of the NRC Policy Statement. 10 CFR 50.36 (Ref. 3). The LCO for the LOPS requires that three channels per bus of each LOPS instrumentation Function shall be OPERABLE in MODES 1, 2, 3, and 4 when the LOPS supports safety systems associated with the ESFAS. In MODES 5 and 6, the three channels must be OPERABLE whenever the associated EDG is required to be OPERABLE to ensure that the automatic start of the EDG is available when needed. Loss of LOPS function could result in the delay of safety systems initiation when required. This could lead to unacceptable consequences during accidents. During the loss of offsite power, which is an AOO, the EDG powers the motor driven emergency feedwater pumps. Failure of these pumps to start would leave only the one turbine driven pump and an increased potential for a loss of decay heat removal through the secondary system. The Only Allowable Values are specified for each Function in the LCO. Nominal trip setpoints are specified in the unit specific setpoint calculations. The nominal setpoints are selected to ensure that the setpoint measured by CHANNEL FUNCTIONAL TESTS does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within the Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculation. Each Allowable Value specified is more conservative than the analytical limit assumed in the transient and accident analysis to account for instrument uncertainties appropriate to the trip function. These uncertainties are defined in the "Unit Specific Setpoint Methodology" (Ref. 4).

(continued)

<INSERT B 3.3-74A>

3.3.8-02

and two relays per DG of the degraded voltage instrumentation Function shall be OPERABLE to ensure that the automatic 4.16 kV bus isolation capability and automatic start of the DG is available when needed. The degraded voltage relays may be bypassed for $\leq$ 30 seconds during reactor coolant pump start to prevent such starts from initiating spurious DG LOPS, separation of the ES busses from offsite power, and subsequent loading of the DG. Therefore, the automatic bypass and associated alarms are required functions for OPERABILITY of the DG LOPS instrumentation.

<INSERT B 3.3-74B>

There are no specific safety analyses for operation in MODES 2, 3, and 4. However, industry operating experience has identified DG LOPS as significant to public health and safety during these operating conditions. Therefore, in MODES 3 and 4, the DG LOPS channels satisfy Criterion 4 of 10 CFR 50.36.

BASES

LCO (continued)

Degraded Voltage LOPS

Voltage: The minimum Allowable Value includes an allowance for relay coil calibration error and is based on maintaining at least [90%] of rated voltage on the 480 V motor control centers, with a [4.1%] V drop across the [4160/480] V stepdown transformers. The [4.1%] V drop associated with these transformers is the maximum expected due to ESF bus loading, while the MCC contactors are considered to require at least [90%] V for proper operation.

INSERT B3.3-75A

The maximum Allowable Value is not based on equipment operability concerns, but rather avoidance of unnecessary EDG starts due to spurious channel trip.

Time Delay: The response time includes [5 seconds] for undervoltage relay actuation following detection of degraded ES bus voltage, [13 seconds] for the bus trip delay timer, and [3 seconds] for the dead bus timer. Note that the acceptance criteria of [21 seconds] does not account for the setpoint tolerance of [10%] or [± 2.1 seconds].

Loss of Voltage LOPS

Voltage and Response Time: The Allowable Value for the loss of voltage channels is ≥ 0 V. This Allowable Value and the associated channel response time are based on the physical characteristics of the loss of voltage sensing relays. The loss of voltage channels respond to a complete loss of ES bus voltage, providing automatic starting and loading of the associated EDG. However, their response time is not critical to the overall ES equipment response time following an actuation, since the degraded voltage LOPS instrumentation will also respond to the complete loss of voltage, and will do so earlier than the loss of voltage instrumentation. The loss of voltage channel response includes only the time response associated with the undervoltage relays, including the nominal setpoint of [7.8 seconds] and a tolerance of [7%] or [0.55 seconds].

APPLICABILITY The EDG LOPS actuation Function shall be OPERABLE in MODES 1, 2, 3, and 4 because ESF Functions are designed to provide protection in these MODES. Actuation is also not required.

be OPERABLE

Automatic

(continued)

<INSERT B 3.3-75A>

ANO-359

The LOPS relay settings are based on the short term starting voltage protection as well as long term running voltage protection. The 4.16 kV undervoltage relay setpoints are based on a maximum setting, which is below the lowest allowed motor terminal momentary voltage of 75% of motor rated voltage of 4000 V. The 480 V undervoltage relay setpoint is based on long term motor voltage requirements plus the maximum feeder voltage drop allowance resulting in a nominal 92% setting of the motor rated voltage of 460 V. The setpoints for both the 4.16 kV and 480 V relays include adjustments for channel uncertainties and calibration tolerances.

BASES

APPLICABILITY (continued)

required in MODES 5 or 6 since there is no ~~whenever the EDG is required to be OPERABLE by LCO 3.8.2, "AC Sources—Shutdown," so that the EDG can perform its~~ automatic protective function on a loss of power or degraded power to the vital bus.

ACTIONS

If a channel's trip setpoint is found nonconservative with respect to the Allowable Value, or the channel is found inoperable, then the function that the channel provides must be declared inoperable and the LCO Condition entered for the particular protection function affected. Since the required channel(s) are specified on a per EDG basis, the Condition may be entered separately for each EDG.

A Note has been added to the ACTIONS indicating that separate Condition entry is allowed for each Function.

A.1

With one or more channel(s) per EDG in one or more Functions for one or more DGs inoperable, it must be tripped within 1 hour. With a channel in trip, the LOPS channels are configured to provide a one-out-of-two logic to initiate a trip of the incoming offsite power. In trip, one additional valid actuation will cause a LOPS signal on the bus. The 1 hour Completion Time is reasonable to evaluate and to take action by correcting a degraded condition in an orderly manner and takes into account the low probability of an event requiring LOPS occurring during this interval.

B.1

Condition B applies when two or more undervoltage or two or more degraded voltage channels on a single bus are inoperable.

Required Action A.1 requires all but one inoperable channel of a Function to be restored to OPERABLE status within 1 hour. With two or more channels inoperable, the logic is not capable of providing an automatic EDG LOPS signal for valid loss of voltage or degraded voltage conditions. The 1 hour Completion Time is reasonable to evaluate and to take action by correcting the degraded condition in an orderly manner for the associated DG

(continued)

BASES

ACTIONS A.1 (continued)

and takes into account the low probability of an event requiring LOPS occurring during this interval.

B.1

Condition B applies if the Required Action of Condition A or Condition B and the associated Completion Time is not met.

Required Action B.1 ensures that appropriate Required Actions for affected diesel generator inoperabilities are initiated. Depending on unit MODE, the Actions specified in LCO 3.8.1, "AC Sources—Operating," or LCO 3.8.2, are required immediately.

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1

7 days provides reasonable assurance for prompt identification of

SR 3.3.8.1 is the performance of the CHANNEL CHECK once every 12 hours to ensure that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the unit staff based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

The Frequency, about once every shift, is based on operating experience that demonstrates channel failure is rare. Since

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.1 (continued)

the probability of two random failures in redundant channels in any 12 hour period is low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with this LCO's required channels.

7 day

this instrumentation,

SR 3.3.8.2

The Note allows channel bypass for testing of the loss of voltage Function without defining it as inoperable although during this time period it cannot actuate a diesel start. This allowance is based on the assumption that 4 hours is the average time required to perform channel Surveillance. The 4 hour testing allowance does not significantly reduce the probability that the EDG will start trip when necessary. It is not acceptable to routinely remove channels from service for more than 4 hours to perform required Surveillance testing.

without entering the associated Conditions and Required Actions,

without declaring the channel inoperable.

edit

A CHANNEL FUNCTIONAL TEST is performed on each required EDG LOPS channel to ensure the entire channel will perform the intended function. Any setpoint adjustments shall be consistent with the assumptions of the current unit specific setpoint analysis. The Frequency of 31 days is considered reasonable based on the reliability of the components and on operating experience that demonstrates channel failure is rare.

SR 3.3.8.3

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The setpoints and the response to a loss of voltage and a degraded voltage test shall include a single point verification that the trip occurs within the required delay time, as shown in Reference 1. CHANNEL CALIBRATION shall trip that measurement setpoint errors are within the assumptions of the unit specific setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the unit specific setpoint analysis in Reference 4.

verify

Setpoints

required ranges

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.8 (continued)

The Frequency is based on the reliability of the components, on operating experience which demonstrates channel failure is rare, and on consistency with the typical industry refueling cycle, and is justified by the assumption of an 18 month calibration interval in the determination of equipment drift at least.

REFERENCES

1. FSAR, Section [8.3]. 8.3.1.
2. FSAR, Chapter [14]. 6 and 14.
3. ~~IEEE-279-1971, April 1972.~~ 10 CFR 50.36.
4. ~~[[Unit Name] Unit Specific Setpoint Methodology].~~ ANO-1 Design Guide, IDG-001, "Instrument Loop Error Analysis and Setpoint Methodology Manual."

B 3.3 INSTRUMENTATION

B 3.3.15 Reactor Building (RB) Purge Isolation—High Radiation

BASES

BACKGROUND

The RB Purge Isolation—High Radiation Function closes the RB purge valves. This action isolates the RB atmosphere from the environment to minimize releases of radioactivity in the event an accident occurs. The high radiation signal indicates a failure of a barrier to the fuel radioactivity, and most likely a loss of coolant accident. The purge valves must begin to shut rapidly to ensure they reach a completely closed position prior to excessive pressures in the RB, against which the valves may not close.

The radiation monitoring system measures the activity in a representative sample of air drawn in succession through a particulate sampler, an iodine sampler, and a gas sampler. The LCO addresses only the gas sampler portion of this system. The sensitive volume of the gas sampler is shielded with lead and monitored by a Geiger-Mueller detector. The air sample is taken from the center of the purge exhaust duct through an isokinetic nozzle installed in the duct at a point selected for reduced turbulence.

If a gaseous activity flow rate of approximately 1E-2 μCi/sec (Kr-85) is exceeded, the monitor will alarm and initiate closure of the purge valves. This activity flow rate is selected on the basis of 50,000 scfm flow rate in the purge exhaust and on the basis of a gas monitor setpoint equal to two times the expected background at the location of the monitor, which will provide fast detection of any release. The alarm setpoints for the particulate and iodine channels indicate that an alarm is obtained after the monitor samples a maximum permissible concentration level for 8 hours. Therefore, a maximum of 1.3 mCi of Cs-137 or 67 μCi of DOSE EQUIVALENT I-131 will be released to the atmosphere during this period.

The closure of the purge valves ensures the RB remains as a barrier to fission product release. There is no bypass for this function. The closure of the purge valves provides an RB isolation assumed in the accident analysis.

(continued)

B 3.3 INSTRUMENTATION

B 3.3.16 Control Room Isolation—High Radiation

BASES

BACKGROUND

The principal function of the Control Room Isolation—High Radiation is to provide an enclosed environment from which the unit can be operated following an uncontrolled release of radioactivity. The high radiation isolation function provides assurance that under the required conditions, an isolation signal will be given. The noble gas monitors located in the station vent stack provide isolation and shutdown of the normal Control Room Emergency Ventilation System (CREVS).

The control room isolation signal is provided by a single channel containing an iodine monitor with a scintillation detector and a gaseous monitor with a Geiger-Mueller detector. The iodine channel includes a particulate prefilter with the charcoal cartridge. If a radioactivity concentration above normal background level is detected or if sampling capability is lost, the monitor will initiate a shutdown of the normal duty supply fans and will place the ventilation dampers in their recirculation mode, and start the unit's Control Room Emergency Ventilation System (CREVS) supply fan.

Trip Setpoints and Allowable Values

The trip setpoints are the nominal value at which the bistables are set. Any bistable is considered to be properly adjusted when the "as left" value is within the band for CHANNEL CALIBRATION accuracy (i.e., ± [rack calibration + comparator setting accuracy]).

The trip setpoints used in the bistables are based on the analytical limits derived from the FSAR, Section [14.1] (Ref. 1). The selection of these trip setpoints indicates that adequate protection is provided when all sensor and processing time delays are taken into account. To allow for calibration tolerances, instrumentation uncertainties, and instrument drift, Allowable Values specified in LCO 3.3.16 are conservatively adjusted with respect to the analytical limits. A detailed description of the methodology used to calculate the trip setpoints, including their explicit uncertainties, is provided in the "Unit Specific Setpoint Methodology" (Ref. 2). The actual nominal trip setpoint

(continued)

<INSERT B 3.3-133A>

two independent radiation monitoring systems; one associated with each unit. The Unit 1 radiation monitor is in the Unit 1 control room normal supply duct. The Unit 2 radiation monitor is in the Unit 2 control room normal supply duct.

<INSERT B3.3-133B>

The trip setpoints are chosen sufficiently below hazardous radiation levels to minimize operator exposure during an accident and sufficiently above normally experienced background levels to minimize spurious actuation. The habitability systems functional design basis are provided in the ANO Unit 2 SAR, Section 6.4 (Ref. 1).

BASES

BACKGROUND

Trip Setpoints and Allowable Values (continued)

entered into the bistable is more conservative than that specified by the Allowable Value to account for changes in random measurement errors that are detectable by a CHANNEL FUNCTIONAL TEST. One example of a change in measurement error is drift during the surveillance interval. A channel is inoperable if its actual trip setpoint is not within its required Allowable Value. (11)

APPLICABLE SAFETY ANALYSES

INSERT B 3.3-134A

The CREVS is isolated when a reactor building high pressure Engineered Safety Feature Actuation System signal or a high radiation signal is received. For the first 4 days following a loss of coolant accident, the CREVS is operated in the total recirculation mode. Four days after the start of the accident, the CREVS is started in the intake and recirculation mode and continues to operate in this mode for 30 days. This intake slightly pressurizes the control room. In both cases, the air flows through charcoal filters that are 95% efficient for elemental, particulate, and organic materials. The high radiation function only performs the initial isolation function to begin the recirculation mode of operation. (24)

The Control Room Isolation—High Radiation satisfies Criterion 3 of ~~the NRC Policy Statement.~~ 10 CFR 50.36 (Ref. 2). (33)

LCO

INSERT B3.3-134B

Only the Allowable Value is specified for each Control Room Isolation—High Radiation trip Function in the LCO. Nominal trip setpoints are specified in the unit specific setpoint calculations. The nominal setpoints are selected to ensure the setpoint measured by the CHANNEL FUNCTIONAL TEST does not exceed the Allowable Value if the bistable is performing as required. Operation with a trip setpoint less conservative than the nominal trip setpoint, but within its Allowable Value, is acceptable provided that operation and testing is consistent with the assumptions of the unit specific setpoint calculations. Each Allowable Value specified is more conservative than the analytical limit assumed in the safety analysis to account for instrument uncertainties appropriate to the trip function. These (24) (11)

procedures.

as-found

edit

edit

(11)

The trip setpoint for this parameter does not include additional allowances for instrument uncertainty. Therefore, the trip setpoint and Allowable Value are the same

(continued)

<INSERT B3.3-134A>

The control room must be maintained habitable during post accident operations and recovery. The CREVS is a shared system which provides a filtered makeup air source for the common control room habitability envelope from which the unit can be operated following an uncontrolled release of radioactivity. Upon receipt of a high radiation signal, the associated normal ventilation supply fans are shutdown, the control room isolation dampers are closed to isolate both normal outside air intakes, and the associated CREVS train emergency filtration function is initiated. Operator action is necessary to shut down one train of CREVS (if both actuate) in order to prevent operator doses greater than identified by the habitability analysis. Operator action is also necessary to verify that at least one door between the Unit 1 and Unit 2 control rooms is open to provide appropriate pressurization and recirculation.

In MODES 1, 2, 3, and 4, the radiation monitor isolation of the control room habitability envelope and actuation of the CREVS provides a habitable environment for the operators following a design basis accident or any event with a significant release of radioactivity.

During movement of irradiated fuel assemblies, the radiation monitor isolation of the control room habitability envelope and actuation of the CREVS provides a habitable environment for the operators following a fuel handling accident.

<INSERT B3.3-134B>

The LCO requires that instrumentation necessary to initiate the CREVS is OPERABLE. Two channels of Control Room Isolation-High Radiation are required to be OPERABLE to provide actuation capability from high radiation either entering the control room habitability envelope via the Unit 1 normal supply duct (2RITS-8001) or entering the control room habitability envelope via the Unit 2 normal supply duct (2RITS-8750-1).

BASES

LCO (continued)

uncertainties are defined in the "Unit Specific Setpoint Methodology" (Ref. 2).

At this unit, the basis for the Allowable Value is as follows:

APPLICABILITY

The control room isolation capability on high radiation shall be OPERABLE whenever there is a chance for an accidental release of radioactivity. This includes MODES 1, 2, 3, 4, [5, and 6] [and during CORE ALTERATIONS] and all MODES and conditions during movement of irradiated fuel assemblies. If a radioactive release were to occur during any of these conditions, the control room would have to remain habitable to ensure reactor shutdown and cooling can be controlled from the main control room.

ACTIONS

A.1

Condition A applies to failure of the Control Room Isolation—High Radiation function in MODE 1, 2, 3, or 4.

With one channel of Control Room Isolation—High Radiation inoperable, the CREVS must be placed in a condition that does not require the isolation to occur, i.e., to ensure that the ventilation system has been placed in a state equivalent to that which occurs after the high radiation isolation has occurred, one OPERABLE train of the CREVS is placed in the emergency recirculation mode of operation. Reactor operation can continue indefinitely in this state. The 1 hour Completion Time is a sufficient amount of time in which to take the Required Action.

The Required Action is modified by a Note, which requires the CREVS be placed in the toxic gas protection mode if automatic transfer to the toxic gas protection mode is inoperable, since the pressurization mode would increase vulnerability to toxic gas releases.

(continued)

<INSERT B3.3-135A>

With one channel of Control Room Isolation-High Radiation function inoperable, one channel remains OPERABLE to provide an automatic actuation function. Since the probability of an event which would be detected by only one of the radiation monitors is low, operation of the unit may continue for up to 7 days. If the CREVS actuation instrumentation is not returned to OPERABLE status, the unit ventilation system must be placed, within the 7 days, in a state equivalent to that which occurs after the high radiation actuation has occurred with one OPERABLE train of the CREVS in the emergency recirculation mode of operation. Reactor operation may then continue indefinitely in this state. The 7 day Completion Time is sufficient to restore most causes of inoperable actuation instrumentation.

B.1

Condition B applies to inoperability of both channels of the Control Room Isolation-High Radiation function in MODE 1, 2, 3, or 4.

BASES

ACTIONS (continued)

C.1 and C.2

If the CREVS cannot be placed into the emergency recirculation mode while in MODE 1, 2, 3, or 4, actions must be taken to minimize the chances of an accident that could lead to radiation releases. The unit must be placed in at least MODE 3 within 6 hours, with a subsequent cooldown to MODE 5 within 36 hours. This places the reactor in a low energy state that allows greater time for operator action if habitation of the control room is precluded. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1, D.2.1, and D.2.2

Required Action D.1 is the same as discussed earlier for Condition A, except for Completion Time. If the CREVS cannot be placed into recirculation mode during [CORE ALTERATIONS or] while moving irradiated fuel assemblies, then Required Action D.2.1 and Required Action D.2.2 suspend actions that could lead to an accident that could release radioactivity resulting from a fuel handling accident.

Required Action D.2.1 and Required Action D.2.2 places the core in a safe and stable configuration in which it is less likely to experience an accident that could result in a release of radioactivity. The reactor must be maintained in these conditions until the automatic isolation capability is returned to operation or when manual action places one train of the CREVS into the emergency recirculation mode. The Completion Time of "Immediately" for Required Action D.2.1 and Required Action D.2.2 is consistent with the urgency of the situation and accounts for the high radiation function, which provides the only automatic Control Room Isolation function capable of responding to radiation release due to a fuel handling accident. The Completion Time does not preclude placing any fuel assembly into a safe position before ceasing any such movement.

Note that in certain circumstances, such as fuel handling in the fuel building during power operation, both Condition A or B and Condition D may apply in the event of channel failure(s).

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

provides reasonable assurance for prompt identification of

SR 3.3.16.1

~~SR 3.3.16.1 is the~~ performance of a CHANNEL CHECK for the Control Room Isolation—High Radiation actuation instrumentation once every 12 hours ~~to ensure that~~ a gross failure of instrumentation ~~has not occurred.~~ A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious.

edit

24

edit

Performance of the CHANNEL CHECK helps ensure that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared with similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources operated from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

24

Acceptance

~~Agreement~~ criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties ~~including isolation, indication, and readability~~. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. The Frequency, ~~about once every shift,~~ is based on operating experience that demonstrates channel failure is rare. ~~[At this unit, the following administrative controls and design features (e.g., downscale alarms) immediately alert operators to loss of function.]~~

24

34

edit

SR 3.3.16.2

entering the associated Conditions and Required Actions

A Note ~~defines~~ allows a channel ~~is being~~ to be inoperable OPERABLE for up to 3 hours ~~while bypassed~~ for surveillance testing. ~~The Note allows channel bypass for testing~~ without ~~defining it as~~ inoperable, although during this time period it cannot actuate a control room isolation. This is based on the

edit

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.16.2 (continued)

average time required to perform channel surveillance. It is not acceptable to routinely remove channels from service for more than 3 hours to perform required surveillance testing without declaring the channel inoperable. edit

SR 3.3.16.2 is the performance of a CHANNEL FUNCTIONAL TEST once every 92 days to ensure that the channels can perform their intended functions. This test verifies the capability of the instrumentation to provide the automatic Control Room Isolation. Any setpoint adjustment shall be consistent with the assumptions of the current unit specific setpoint requirements. analysis. (31) (10) (11)

INSERT B3.3-138A → The justification of a 92 day Frequency, in view of the fact that there is only one channel, is Draft NUREG-1-66 (Ref. 3). (10)

SR 3.3.16.3

This SR requires the performance of a CHANNEL CALIBRATION with a setpoint Allowable Value of ≤ [25] mR/hr to ensure that the instrument channel remains operational with the correct setpoint. This test is a complete check of the instrument loop and the transmitter. (11) edit

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations to ensure that the channel remains operational between successive tests. CHANNEL CALIBRATION must be performed consistent with the unit specific setpoint analysis. requirements. (11)

The Frequency is based on the assumption of an at least [18] month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis and is consistent with the typical refueling cycle. (11)

(continued)

<INSERT B3.3-138A>

The 31 day Frequency is based on operating experience which indicates that the instrumentation usually passes the CHANNEL FUNCTIONAL TEST when performed on a monthly basis.

BASES (continued)

REFERENCES

1. ANO-2 ~~FSAR, Section [14.1]~~ 6.4.
2. ~~"Unit Specific Setpoint Methodology."~~ 10 CFR 50.36. (33) edit
3. ~~Draft NUREG-1366.~~ edit

B 3.3 INSTRUMENTATION (12)

B 3.3.17 (15) Post Accident Monitoring (PAM) Instrumentation

BASES

BACKGROUND

The primary purpose of the PAM instrumentation is to display unit variables that provide information required by the control room operators during accident situations. This information provides the necessary support for the operator to take the manual actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for Design Basis Events. (Accidents (DBAs)) edit edit

monitor and

The OPERABILITY of the accident monitoring instrumentation ensures that there is sufficient information available on selected unit parameters to monitor and to assess unit status and behavior following an accident.

The availability of accident monitoring instrumentation is important so that responses to corrective actions can be observed, and so that the need for and magnitude of further actions can be determined. These essential instruments are identified by [Unit Specific Documents] (Ref. 1) addressing the recommendations of Regulatory Guide 1.97 (Ref. 2) as required by Supplement 1 to NUREG-0737 (Ref. 3). edit

in SAR Table 7-11A

The instrument channels required to be OPERABLE by this LCO equate to two classes of parameters identified during unit specific implementation of Regulatory Guide 1.97 as Type A and Category I variables.

Type A variables are (specified) ~~included in this LCO~~ because they provide the primary information that permits the control room operator to take specific manually controlled actions that are required when no automatic control is provided and that are required for safety systems to accomplish their safety functions for ~~Design Basis Accidents (DBAs).~~ ~~Because the list of Type A variables widely differs between units, Table 3.3.17-1 in the accompanying LCO contains only those examples of Type A variables that may also be Category I.~~ edit edit

Category I variables are the key variables deemed risk significant because they are needed to:

- Determine whether systems important to safety are performing their intended functions;

(continued)

(12)

BASES

BACKGROUND (continued)

- Provide information to the operators that will enable them to determine the potential for causing a gross breach of the barriers to radioactivity release; and
- Provide information regarding the release of radioactive materials to allow for early indication of the need to initiate action necessary to protect the public and to estimate the magnitude of any impending threat.

(also) (in SAR Table 7-11A)

These key variables are identified by unit specific Regulatory Guide 1.97 analysis (Ref. 1). This analysis identifies the unit specific Type A and Category I variables and provides justification for deviating from the NRC proposed list of Category I variables.

edit

Reviewer's Note: Table 3.3.17-1 provides a list of variables typical of those identified by a unit specific Regulatory Guide 1.97 analysis (Ref. 1). Table 3.3.17-1 in unit specific Technical Specifications shall list all Type A and Category I variables identified by the unit specific Regulatory Guide 1.97 analysis, as amended by the NRC's Safety Evaluation Report (SER).

The specific instrument Functions listed in Table 3.3.17-1 (15) are discussed in the LCO Section.

edit

(Bases)

APPLICABLE SAFETY ANALYSES

The PAM instrumentation ensures the availability of information so that the control room operating staff can:

- Perform the diagnosis specified in the (abnormal and) emergency operating procedures. These variables are restricted to (include) preplanned actions for the primary success path of DBAs (e.g., loss of coolant accident (LOCA));
- Take the specified, preplanned, manually controlled actions, for which no automatic control is provided, which are required for safety systems to accomplish their safety functions;
- Determine whether systems important to safety are performing their intended functions;

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)

- Determine the potential for causing a gross breach of the barriers to radioactivity release;
- Determine if a gross breach of a barrier has occurred; and
- Initiate action necessary to protect the public and estimate the magnitude of any impending threat.

SAR Section 7.3.4 (Ref 4) documents the results of the ~~the unit specific~~ Regulatory Guide 1.97 analysis ~~documents~~ ~~the~~ process ~~that~~ identifies Type A and Category I non-Type A variables. (which) (d) edit

In MODE 1, 2, and 3, PAM instrumentation that meets the definition of Type A in Regulatory Guide 1.97 satisfies Criterion 3 of ~~the NRC Policy Statement~~. 10 CFR 50.36 (Ref. 5), Category I, non-type A, instrumentation must be retained in Technical Specifications because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category I, non-Type A variables are important for reducing public risk and satisfy Criterion 4 of 10 CFR 50.36 (Ref. 5). (33)

LCO

LCO 3.3.15 requires two OPERABLE channels for all but one Function to ensure no single failure prevents the operators from being presented with the information necessary to determine the status of the unit and to bring the unit to, and maintain it in, a safe condition following that accident.

Furthermore, provision of two channels allows a CHANNEL CHECK during the post accident phase to confirm the validity of displayed information. [More than two channels may be required at some units if the Regulatory Guide 1.97 analysis determines that failure of one accident monitoring channel results in information ambiguity (i.e., the redundant displays disagree) that could lead operators to defeat or to fail to accomplish a required safety function.] (26)

<INSERT B 3.3-142A>

The exception to the two channel requirement is ~~Containment~~ isolation valve position. In this case, the important information is the status of the ~~Containment~~ penetrations. The LCO requires one position indicator for each ~~active~~ automatic ~~Containment~~ isolation valve. This is sufficient to redundantly verify the isolation status of each isolable penetration either via indicated status of the active valve (18)

reactor building

(continued)

<INSERT B3.3-142A>

When a channel includes more than one qualified control room indication, such as both an indicator and a recorder, or an indicator and Safety Parameter Display System (SPDS) readout, etc., only one indication is required for channel OPERABILITY.

BASES

LCO (continued)

and prior knowledge of the passive valve or via system boundary status. If a normally active containment isolation valve is known to be closed and deactivated, position indication is not needed to determine status. Therefore, the position indication for valves in this state is not required to be OPERABLE. (See Table 3.3.15-1, Note (a))

Each → The following LBC is a discussion of the specified instrument Functions listed in Table 3.3.[17]-1. These discussions are intended as examples of what should be provided for each Function when the unit specific list is prepared. are discussed below:

1. Wide Range Neutron Flux

Wide Range Neutron Flux indication is provided to verify reactor shutdown. For this unit, the Wide Range Neutron Flux channels consist of the following:

INSERT B 3.3-143A

2. Reactor Coolant System (RCS) Hot and Cold Leg Temperature

RCS Hot and Cold Leg Temperature instrumentation is a Type A, Category I variable provided for verification of core cooling and long term surveillance. Reactor outlet temperature inputs to the RPS are provided by two fast response resistance elements and associated transmitters in each loop. The channels provide indication over a range of 32°F to 700°F.

INSERT B 3.3-143B

INSERT B 3.3-143C

4. RCS Pressure (Wide Range)

RCS Pressure (Wide Range) instrumentation is provided for verification of core cooling and RCS integrity long term surveillance.

Wide range RCS loop pressure is measured by pressure transmitters with a span of 0 psig to 3000 psig. The pressure transmitters are located outside the RB. Redundant monitoring capability is provided by two trains of instrumentation. Control room indications are provided through the inadequate core cooling plasma display. The inadequate core cooling plasma

channels

(continued)

<INSERT B3.3-143A>

two channels of qualified fission chamber based instrumentation (Gamma-Metrics) with readout on one recorder and on the SPDS. The channels provide indication over a range of 10^{-8} to 100% full power (Ref. 1).

<INSERT B3.3-143B>

The two channels provide readout on one indicator and one recorder and on the SPDS.

<INSERT B3.3-143C>

3. RCS Hot Leg Level

RCS Hot Leg Level instrumentation is a Type B, Category I variable provided to support operator diagnosis of inadequate core cooling and tracking reactor coolant inventory. Each channel monitors level from one (1) wide range and any two (2) of four (4) narrow range transmitters per hot leg. Channel OPERABILITY requires a minimum of one wide range and any two of the narrow range transmitters in the same channel OPERABLE. In addition, reference leg temperature inputs and core exit thermocouple average temperature are used for density compensation of the level. The system is designed to infer the water level in the hot legs during no-flow conditions. The channels provide readout on two indicators and on the SPDS. The channels provide indication over a unit elevation range of 368 feet 6 inches to 417 feet 6 inches.

BASES

LCO 4. RCS Pressure (Wide Range) (continued)

(Consisting of one indicator and one recorder, and the SPDS)

This control room display is the primary indication used by the operator during an accident. Therefore, the accident monitoring specification deals specifically with this portion of the instrument string.

(Category I)

In some units, RCS Pressure is a Type A variable because the operator uses this indication to monitor the cooldown of the RCS following a steam generator (SG) tube rupture or small break LOCA. Operator actions to maintain a controlled cooldown, such as adjusting SG pressure or level, would use this indication. In addition, high pressure injection (HPI) flow is throttled based on RCS Pressure and subcooled margin. For some small break LOCAs, low pressure injection (LPI) may actuate with system pressure stabilizing above the shutoff head of the LPI pumps. If this condition exists, the operator is instructed to verify HPI flow and then terminate LPI flow prior to exceeding 30 minutes of LPI pump operation against a deadhead pressure. RCS Pressure, in conjunction with LPI flow, is also used to determine if a core flood line break has occurred.

5. Reactor Vessel Water Level

(a Type B, Category I variable and is)

Reactor Vessel Water Level instrumentation is provided for verification and long term surveillance of core cooling. The reactor vessel level monitoring system provides an indication of the collapsed liquid level above the fuel alignment plate. The collapsed level represents the amount of liquid mass that is in the reactor vessel above the core. Measurement of the collapsed water level is selected because it is a direct indication of the water inventory.

The collapsed level is obtained over the same temperature and pressure range as the saturation measurements, thereby encompassing all operating and accident conditions where it must function. Also, it functions during the recovery interval. Therefore, it is designed to survive the high steam temperature that may occur during the preceding core recovery interval.

(continued)

BASES

LCO

5. Reactor Vessel Water Level (continued)

The level range extends from the top of the vessel (dome) down to the top of the fuel alignment plate. The response time is short enough to track the level during small break LOCA events. The resolution is sufficient to show the initial level drop, the key locations near the hot leg elevation, and the lowest levels just above the ~~alignment plate~~ (fuel). This provides the operator with adequate indication to track the progression of the accident and to detect the consequences of its mitigating actions or the functionality of automatic equipment. edit

INSERT B3.3-145A

~~For this unit,~~ the Reactor Vessel Water Level channels consist of ~~the following:~~ (26)

6. ~~Containment Sump~~ Water Level (Wide Range)

Reactor Building

~~Containment Sump~~ Water Level (Wide Range) instrumentation is ~~provided for verification and long term surveillance of RCS integrity. [For this unit, the Containment Sump Water Level instrumentation consists of the following:]~~ (17) edit (26)

INSERT B3.3-145B

7. ~~Containment~~ Pressure (Wide Range)

Reactor Building

reactor building

~~Containment~~ Pressure (Wide Range) instrumentation is provided for verification of RCS and ~~containment~~ OPERABILITY. ~~[For this unit, Containment~~ Pressure instrumentation consists of ~~the following:]~~ (17) edit (26)

INSERT B3.3-145C

a Type B, Category I variable and is

8. ~~Containment~~ Isolation Valve Position (17) edit (18)

Automatic Reactor Building

Automatic Reactor Building Isolation Valve Position

~~PCIV position~~ is provided for verification of ~~containment~~ integrity. ~~In the case of PCIV position,~~ the ~~important~~ information is the isolation status of the ~~containment~~ penetration. The LCO requires one channel of valve position indication in the control room to be OPERABLE for each ~~active PCIV~~ in a ~~containment~~ penetration flow path, i.e., two total channels of ~~PCIV~~ position indication for a penetration flow path with two ~~active~~ valves. For ~~containment~~ (26)

automatic isolation valve

automatic

reactor building

reactor building

(continued)

<INSERT B3.3-145A>

two redundant Radcal Level Instruments (RLIs) (each containing nine (9) axially distributed level sensors and one reactor vessel head temperature thermocouple to detect reactor coolant inventory above the core), and a data acquisition system with readout on two indicators. When Reactor Coolant Pumps are running, all except the dome sensors are interlocked to read "invalid" due to flow induced variables that may offset the sensor outputs. Channel OPERABILITY requires a minimum of three sensors in the upper plenum region and two sensors in the dome region OPERABLE. Readout for this parameter is also provided on the SPDS.

<INSERT B3.3-145B>

a Type B, Category I variable and is provided for verification of net positive suction head (NPSH) for the recirculation phase. The Reactor Building Water Level instrumentation consists of two channels with readout on two indicators and one recorder and on the SPDS. The channels provide water level indication over a range of 0 to 144 inches.

<INSERT B3.3-145C>

two channels with readout on two indicators and one recorder and on the SPDS. The channels provide pressure indication over a range of 0 to 210 psia (-15 to 195 psig).

BASES

LCO

8. Containment Isolation Valve Position (continued)

penetrations with only one active PCIV having control room indication, Note (b) requires a single channel of valve position indication to be OPERABLE. This is sufficient to redundant verify the isolation status of each isolable penetration via indicated status of the active valve, as applicable, and prior knowledge of passive valve or system boundary status. If a penetration flow path is isolated, position indication for the PCIV(s) in the associated penetration flow path is not needed to determine status. Therefore, the position indication for valves in an isolated penetration flow path is not required to be OPERABLE. For this plant, the PCIV position PAM instrumentation consists of the following:

9. Containment Area Radiation (High Range)

Containment Area Radiation (High Range) instrumentation is provided to monitor the potential for significant radiation releases and to provide release assessment for use by operators in determining the need to invoke site emergency plans. For this unit, the Containment Area Radiation instrumentation consists of the following:

10. Containment Hydrogen Concentration

Containment Hydrogen Concentration instrumentation is provided to detect high hydrogen concentration conditions that represent a potential for Containment breach. This variable is also important in verifying the adequacy of mitigating actions. For this unit, the Containment Hydrogen Concentration instrumentation consists of the following:

11. Pressurizer Level

Pressurizer Level instrumentation is used to determine whether to terminate safety injection (SI), if still in progress, or to reinitiate SI if it has been stopped. Knowledge of pressurizer water level is also

(continued)

Automatic Reactor Building
automatic valve
automatic
isolation valve(s)
<INSERT B3.3-146A>
<INSERT B3.3-146B>
Reactor Building
a Type E, Category I variable and is
<INSERT B3.3-146C>
a Type A, Category I variable and is
Reactor Building
and the need to initiate hydrogen control measures such as hydrogen purge.
a reactor building
<INSERT B3.3-146D>
a Type D, Category I variable and is
in combination with other system parameters
edit
12
15
17
18
26
edit
26
18
26
17
26
edit
17
26
edit

<INSERT B3.3-146A>

Each penetration is treated separately and each penetration flow path is considered a separate function. Therefore, separate Condition entry is allowed for each inoperable penetration flow path.

<INSERT B3.3-146B>

Class 1E position switches for each automatic reactor building isolation valve. These switches provide "closed -not closed" indication via indicating lights in the control room.

<INSERT B3.3-146C>

two channels with readout on two indicators and one recorder and on the SPDS. The channels provide high radiation indication over a range of 1 to 10^8 R/hour gamma; however, the required range is only 1 to 10^7 R/hour gamma.

<INSERT B3.3-146D>

two channels with readout on two indicators and one recorder and on the SPDS. The channels provide hydrogen concentration indication over a range of 0 to 10% volume.

BASES

LCO 11. Pressurizer Level (continued)

used to verify the unit conditions necessary to establish natural circulation in the RCS and to verify that the unit is maintained in a safe shutdown condition. ~~[For this unit,~~ the Pressurizer Level instrumentation consists of ~~the following:]~~

INSERT B3.3-147A

26

and to determine the affected SG for isolation following a SGTR event.

12. Steam Generator Water Level

a Type A, Category I variable

Steam Generator Water Level instrumentation is provided to monitor operation of ~~decay~~ heat removal via the SG. The indication of SG level is provided by the ~~extended startup~~ low range and high range level instrumentation, covering a span of 6 inches to 394 500 inches above the lower tubesheet. The measured differential pressure is displayed in inches of water at 68°F. Temperature compensation for this indication is performed manually by the operator. Redundant monitoring capability is provided by two trains of instrumentation. The uncompensated level signal is input to the unit computer, a control room indicator, and the Emergency Feedwater (EFW) Control System.

edit

19

INSERT B3.3-147B

high range SG level indication is used by the operator to manually raise and control SG level to establish reflux boiling (boiler condenser) heat transfer. Operator action is initiated on a loss of subcooled margin. Feedwater flow is increased until the indicated ~~extended startup~~ range level reaches the (boiler condenser) setpoint.

19 20

INSERT B3.3-147C

Q

13 14. Condensate Storage Tank (CST) Level

a Type A, Category I variable and is

edit

readily available, Condensate quality

QCST Level instrumentation is provided to ensure a water supply for EFW. The CST provides the assured, safety grade water supply for the EFW System. The CST consists of two identical tanks connected by a common outlet header. Inventory is monitored by a Q ~~[4]~~ to ~~[44 inch]~~ level indication ~~[per each tank.]~~ QCST Level is displayed on ~~one~~ control room indicator ~~[strip chart and one recorder, and unit computer.]~~ In addition, a control room annunciator alarms on low level.

30 feet

and on the SPDS.

26

(continued)

<INSERT B3.3-147A>

two channels with readout on one indicator and one recorder and on the SPDS. The channels provide level indication over a range of 87 to 407 inches (bottom to top).

<INSERT B3.3-147B>

The Steam Generator Water Level instrumentation consists of two channels (A and B) for each steam generator for the low range and two channels for each steam generator for the high range with readout on four dual indicators (one SG channel with both ranges per indicator) and on the SPDS. The Low Range channels provide level indication over a range of 6 to 156 inches of water and the High Range channels provide level indication over a range of 102 to 500 inches of water. Each range of water level instrumentation for each steam generator is considered a separate Function of PAM Instrumentation. Two additional channels (C and D) also monitor SG water level for EFIC but these channels are not required as PAM instrumentation.

<INSERT B3.3-147C>

13. Steam Generator Pressure

Steam Generator Pressure instrumentation is a Type A, Category I variable provided to support operator diagnosis of a design basis steam generator tube rupture to identify and isolate the affected SG. In addition, SG pressure is a key parameter used by the operator to evaluate primary-to-secondary heat transfer. For example, the operator may use this indication to control the primary system cooldown following a steam line break accident or a small break loss of coolant accident (LOCA).

Steam generator pressure measurement is provided by two pressure transmitters per SG. The channels provide readout on two indicators (one per SG) and two dual pen recorders (one per SG) and on the SPDS. The channels provide pressure indication over a range from 0 to 1200 psig. The pressure instrumentation for each steam generator is considered a separate Function of PAM Instrumentation.

BASES

LCO

14 13. Condensate Storage Tank (CST) Level (continued)

INSERT B3.3-148A

QCST Level is the primary indication used by the operator to identify loss of QCST volume and replenish the QCST or align suction to the EFW pumps from the ~~normal~~ to the safety related source, i.e., service water. (26) (21)

16 15. Core Exit Temperature

a Type C, Category I variable and is

Core Exit Temperature is provided for verification and long term surveillance of core cooling. An evaluation was made of the minimum number of valid core exit thermocouples (CETs) necessary for inadequate core cooling detection. The evaluation determined the reduced complement of CETs necessary to detect initial core recovery and to trend the ensuing core heatup. The evaluations account for core nonuniformities and cold leg injection. Based on these evaluations, adequate or inadequate core cooling detection is ensured with two sets of five valid CETs.

INSERT B3.3-148B

The subcooling margin monitor takes the average of the five highest CETs for each of the ICCM trains. Two channels ensure that a single failure will not disable the ability to determine the representative core exit temperature. (27)

edit

is a Type D, Category I variable and is

channels provide indication of

17 16. Emergency Feedwater Flow

INSERT B3.3-148C

EFW Flow instrumentation is provided to monitor operation of decay heat removal via the SGs. The EFW Flow to each SG is determined from a differential pressure measurement calibrated to a span of 0 gpm to 1200 gpm. Redundant monitoring capability is provided by two independent trains of instrumentation for each SG. Each differential pressure transmitter provides an input to a control room indicator and the unit computer. (22)

RCS

over a range

900

INSERT B3.3-148D

EFW Flow is the primary indication used by the operator to determine the need to throttle flow during an SLB accident to prevent the EFW pumps from operating in runout conditions. EFW Flow is also used by the operator to verify that the EFW System is (26)

edit

(continued)

<INSERT B3.3-148A>

15. Borated Water Storage Tank Level

Borated Water Storage Tank (BWST) Level instrumentation is a Type A, Category I variable provided to support action for long term cooling requirements, i.e., to determine when to initiate the switch-over of the core cooling pump suction from the BWST to sump recirculation. BWST Level measurement is provided by two channels with readout on two indicators and one recorder and on the SPDS. The level transmitters are calibrated over a range of 0 to 45 feet. The "0" reference is the level instrument tap, which is approximately 5 inches above the bottom of the tank.

<INSERT B3.3-148B>

Twenty-four (24) qualified core exit thermocouples (CETs) are provided with six (6) located in each core quadrant. Two CETs are required in each core quadrant and readout is provided on two indicators and on the SPDS. The channels provide core exit temperature indication over a range of 50 to 2300°F. This Function is specified on a "CETs per quadrant" basis. Therefore, each quadrant of required CETs is considered a separate Function for Condition entry.

<INSERT B3.3-148C>

One channel is provided for each flow path of an EFW pump to each SG, i.e., each pump feeds both SGs so there are four flow paths.

<INSERT B3.3-148D>

(four indicators total) and to the SPDS. Flow measurement to each steam generator is considered a separate Function of PAM Instrumentation.

BASES

LCO

17 18. Emergency Feedwater Flow (continued)

delivering the correct flow to each SG. However, the primary indication used by the operator to ensure an adequate inventory is SG level.

INSERT B 3.3-149A

RCS pressure is used by the operator to monitor the cooldown of the RCS following an SG tube rupture or small break LOCA. In addition, HPI flow is throttled based on RCS pressure and subcooled margin. The indication is also used to identify an LPI pump operating at system pressures above its shutoff head. If this condition exists, the operator is instructed to verify this condition exists, to verify HPI flow, and to terminate LPI flow prior to exceeding 30 minutes of LPI pump operation against a deadhead pressure. RCS pressure, in conjunction with LPI flow, is also used to determine if a core flood line break has occurred.

INSERT B3.3-149B

26 22 edit may be 26 23

APPLICABILITY

for safe shutdown and to determine that safety systems are performing their intended function when required.

The PAM instrumentation LCO is applicable in MODES 1, 2, and 3. These variables are related to the diagnosis and preplanned actions required to mitigate DBAs. The applicable DBAs are assumed to occur in MODES 1, 2, and 3. In MODES 4, 5, and 6, unit conditions are such that the likelihood of an event occurring that would require PAM instrumentation is low; therefore, the PAM instrumentation is not required to be OPERABLE in these MODES.

ACTIONS

The ACTIONS are modified by two Notes. Note 1 is added to the ACTIONS to exclude the MODE change restriction of LCO 3.0.4. This exception allows entry into an applicable MODE while relying on the ACTIONS even though the ACTIONS may eventually require a unit shutdown. This exception is acceptable due to the passive function of the instruments, the operator's ability to respond to an accident utilizing alternate instruments and methods, and the low probability of an event requiring these instruments.

Note 2 is added to the ACTIONS to clarify the application of Completion Time rules. The Conditions of this Specification may be entered independently for each edit

(continued)

<INSERT B3.3-149A>

18, 19. High and Low Pressure Injection Flow

High and Low Pressure Injection Flow instrumentation is a Type A, Category I variable provided to support action for long term cooling requirements.

<INSERT B3.3-149B>

and pressurizer level, and to balance flow rates between the injection lines. LPI flow information is used to determine when it is acceptable to terminate HPI. High and Low Pressure Injection Flow measurement is provided by two channels each with readout on two indicating recorders for high pressure injection (HPI), and with readout on two indicators and one recorder for low pressure injection (LPI) and on the SPDS. Each HPI channel includes four instruments (one per flow path) which provide flow indication over a range from 0 to 200 gpm, and the LPI channels provide flow indication over a range from 0 to 4500 gpm.

20. Reactor Building Spray Flow

Reactor Building Spray Flow instrumentation is a Type A, Category I variable provided to support action for long term reactor building cooling requirements (e.g., maintain NPSH) and iodine removal. Reactor Building Spray Flow measurement is provided by two channels with readout on two indicators and one recorder and on the SPDS. The channels provide flow indication over a range from 0 to 2000 gpm.

(12)

BASES

ACTIONS (continued)

Function listed in Table 3.3.17-1 (15). The Completion Time(s) of the inoperable channels of a Function will be tracked separately for each Function starting from the time the Condition was entered for that Function. This Note is also applicable for Table 3.3.15-1 items 12a, 12b, 12c, 12d, 13a, 13b, 17a and 17b, each of which is considered a separate Function. (19) (20) (22)

A.1

When one or more Functions have one required channel inoperable, the inoperable channel must be restored to OPERABLE status within 30 days. The 30 day Completion Time is based on operating experience. This takes into account the remaining OPERABLE channel (or, in the case of a Function that has only one required channel, other non-Regulatory Guide 1.97 instrument channels to monitor the Function), the passive nature of the instrument (no critical automatic action is assumed to occur from these instruments), and the low probability of an event requiring PAM instrumentation during this interval.

edit

B.1

INSERT B3.3-150A

Required Action B.1 specifies initiation of actions described in Specification 5.6.8, that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative actions. (13)

INSERT B3.3-150B

This action is appropriate in lieu of a shutdown requirement since alternative actions are identified before loss of functional capability and given the likelihood of unit conditions that would require information provided by this instrumentation. The Completion Time of "Immediately" for Required Action B.1 ensures the requirements of Specification 5.6.8 are initiated. (13) (28)

INSERT B3.3-150C

C.1

When one or more Functions have two required channels inoperable (i.e., two channels inoperable in the same Function), one channel in the Function should be restored to OPERABLE status within 7 days. This Condition does not apply to the hydrogen monitor channels. The Completion Time of 7 days is based on the relatively low probability

(continued)

<INSERT B3.3-150A>

actions to prepare and submit a Special Report

<INSERT B3.3-150B>

The Special Report is to be submitted in accordance with 10 CFR 50.4 within 30 days of entering Condition B.

<INSERT B3.3-150C>

identifies the start of the "clock" for submittal of the Special Report. Condition B is modified by a Note requiring Required Action B.1 to be completed whenever the Condition is entered. The Note ensures the requirement to prepare and submit the report is completed. Restoration alone per Required Action A.1 after the initial Completion Time of 30 days does not alleviate the need to report the extended inoperability to the NRC.

BASES

ACTIONS

C.1 (continued)

of an event requiring PAM instrumentation action operation and the availability of alternative means to obtain the required information. Continuous operation with two required channels inoperable in a Function is not acceptable because the alternate indications may not fully meet all performance of qualification requirements applied to the PAM instrumentation. Therefore, requiring restoration of one inoperable channel of the Function limits the ~~risk~~ probability that the PAM Function will be ~~in a degraded condition~~ unavailable should an accident occur. edit

D.1

When two required hydrogen monitor channels are inoperable, Required Action D.1 requires one channel to be restored to OPERABLE status. This action restores the monitoring capability of the hydrogen monitor. The 72 hour Completion Time is based on the relatively low probability of an event requiring hydrogen monitoring ~~and the availability of alternative means to obtain the required information.~~ (26) Continuous operation with two required channels inoperable is not acceptable because alternate indications are not available.

E.1

Required Action E.1 directs entry (15) into the appropriate Condition referenced in Table 3.3.[17]-1. The applicable Condition referenced in the Table is Function dependent. Each time an inoperable channel has not met ~~any~~ the Required Action of Condition C or D, as applicable, ~~and the associated Completion Time has expired,~~ and associated Completion Time Condition E is entered for that channel and provides for transfer to the appropriate subsequent Condition. (12) edit

F.1

If the Required Action and associated Completion Time of Conditions C or D are not met and Table 3.3.[17]-1 directs (15) entry into Condition F, the unit must be brought to a MODE in which the requirements of this LCO do not apply. To (12)

(continued)

BASES

ACTIONS

F.1 (continued)

achieve this status, the unit must be brought to at least MODE 3 within 6 hours and MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

<INSERT B 3.3-152A>

G.1

At this unit, alternative means of monitoring Containment Area Radiation have been developed and tested. These alternative means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allowed time.

If these alternative means are used, the Required Action is not to shut the unit down, but rather to follow the directions of Specification 5.6.8, in the Administrative Controls section of the Technical Specifications. The report provided to the NRC should discuss the alternative means used, describe the degree to which the alternative means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels.

In the case of reactor vessel level, Reference 4 determined that the appropriate Required Action was not to shut the unit down, but rather to follow the directions of Specification 5.6.8.

At this unit, the alternative monitoring provisions consist of the following:

(28)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs apply to each PAM instrumentation Function in Table 3.3.17-1. (15) (12)

(continued)

<INSERT B3.3-152A>

If the Required Action and associated Completion Time of Conditions C or D are not met and Table 3.3.15-1 directs entry into Condition E, alternate means of monitoring the parameter should be applied and the Required Action is not to shut down the unit but rather to initiate actions to prepare and submit a Special Report to the NRC. These alternate means may be temporarily installed if the normal PAM channel cannot be restored to OPERABLE status within the allotted time. The report provided to the NRC should discuss the alternate means used, describe the degree to which the alternate means are equivalent to the installed PAM channels, justify the areas in which they are not equivalent, and provide a schedule for restoring the normal PAM channels. The Special Report is to be submitted in accordance with 10 CFR 50.4 within 30 days of entering Condition F.

Both the RCS Hot Leg Level and the Reactor Vessel Level are methods of monitoring for inadequate core cooling.

The alternate means of monitoring the Reactor Building Area Radiation (High Range) consist of a combination of installed area radiation monitors and portable instrumentation.

The Completion Time of "Immediately" for Required Action G.1 identifies the start of the "clock" for submittal of the Special Report. Condition G is modified by a Note requiring Required Action G.1 to be completed whenever the Condition is entered. The Note ensures the requirement to prepare and submit the report is completed. Restoration alone per Required Action C.1 or Required Action D.1 after the initial Completion Time of 7 days, or 72 hours, respectively, does not alleviate the need to report the extended inoperability to the NRC.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.[illegible] 1 (15) (12)

Performance of the CHANNEL CHECK once every 31 days for each required instrumentation channel that is normally energized ~~ensures that~~ a gross failure of instrumentation ~~has not occurred~~. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared with similar unit instruments located throughout the unit. ~~If~~ For the radiation monitor ~~uses keep alive sources or check sources OPERABLE from the control room~~, the CHANNEL CHECK should also note the detector's response to these ~~sources~~ keep alive. (26)

Agreement criteria are determined by the unit staff, based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are verified to be reading at the bottom of the range and not failed downscale, where practical,

The Frequency is based on unit operating experience that demonstrates channel failure is rare. The CHANNEL CHECK supplements less formal but more frequent checks of channels during normal operational use of the displays associated with this LCO's required channels.

provides reasonable assurance for prompt identification of

reactor building hi-range

edit

edit

(continued)

12

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.[7].2 (15)

A CHANNEL CALIBRATION is performed every [18] months, ~~or approximately at every refueling~~. CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy.

12

edit

INSERT B3.3-154A →

A Note clarifies that the neutron detectors are not required to be tested as part of the CHANNEL CALIBRATION. There is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration and the monthly axial channel calibration.

26

Reactor Building

For the ~~Containment~~ Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

INSERTS B3.3-154B & B3.3-154C →

The Frequency is based on operating experience and consistency with the typical industry refueling cycle and is justified by the assumption of an [18] month calibration interval in the determination of the magnitude of equipment drift.

at least

26

30

REFERENCES

1. ~~[Unit Specific Documents (e.g., FSAR, NRC Regulatory Guide 1.97 SER letter).]~~ SAR, Table 7-11A.
2. Regulatory Guide 1.97.
3. NUREG-0737, 1979.
4. ~~32-1177256-00, "Technical Basis for Reactor Vessel Level Indication System (RVLIS) Action Statement," April 10, 1990.~~ SAR, Section 7.3.4.

edit

edit

5. 10 CFR 50.36.

33

<INSERT B3.3-154A>

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult, and there is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift. Finally, the detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output.

<INSERT B3.3-154B>

For the Reactor Building Hydrogen Concentration instrumentation, the calibration includes proper consideration of moisture effect.

<INSERT B3.3-154C>

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detector (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.