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Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station 0-P1-17
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49

References: 1. NG-99-0008, dated February 18, 1999, J. Franz (IES) to NRC, Technical Specification Change Request (TSCR-003): "Removal Of Requirements For High Pressure Coolant Injection System and Reactor Core Isolation Cooling System Isolation Manual Initiation Instrumentation"
2. NG-99-1278, dated September 15, 1999, K. Peveler to B. Mozafari (NRC), "Editorial Correction To Mark-up For Technical Specification Change Request (TSCR-003)"

File: A-117

Reference 1 submitted a proposed amendment to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS). This proposed amendment deletes the Manual Initiation Function of the High Pressure Coolant Injection/Reactor Core Isolation Cooling (HPCI)/RCIC) Isolation from Table 3.3.6.1-1. A related Condition as well as related Surveillance Requirements (SRs) and Bases are also deleted.

The referenced submittals provided "marked-up" copies of the TS and Bases showing the proposed changes. The attachment to this letter contains "clean typed" pages of the revised TS and Bases pages.

A copy of this submittal is being forwarded to our appointed state official pursuant to 10 CFR Section 50.91. Should you have any questions regarding this matter, please contact this office.

A001

This letter is true and accurate to the best of my knowledge and belief.

IES UTILITIES INC.

By Gary D. Van Middlesworth for DLW
David L. Wilson
Vice President, Nuclear

State of Iowa
(County) of Linn

Signed and sworn to before me on this 12th day of May, 2000,

by Gary D. Van Middlesworth

Nancy S. Franck
Notary Public in and for the State of Iowa

NOTARIAL SEAL IOWA NANCY S. FRANCK

9-28-01 Commission Expires

cc: D. Barta
E. Protsch (w/o)
B. Mozafari (NRC-NRR)
J. Dyer (Region III)
D. McGhee (State of Iowa)
NRC Resident Office
K. Putnam
DOCU
TSCR File
CTS Project

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	F.1 Isolate the affected penetration flow path(s).	1 hour
G. [Deleted]		
H. As required by Required Action C.1 and referenced in Table 3.3.6.1-1. <u>OR</u> Required Action and associated Completion Time for Condition F not met.	H.1 Be in MODE 3. <u>AND</u> H.2 Be in MODE 4.	12 hours 36 hours
I. As required by Required Action C.1 and referenced in Table 3.3.6.1-1.	I.1 Declare Standby Liquid Control (SLC) System inoperable. <u>OR</u> I.2 Isolate the Reactor Water Cleanup System.	1 hour 1 hour

(continued)

SURVEILLANCE REQUIREMENTS

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

1. Refer to Table 3.3.6.1-1 to determine which SRs apply for each Primary Containment Isolation Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed as follows: (a) for up to 6 hours for Function 5.a; and (b) for up to 6 hours for Functions other than 5.a provided the associated Function maintains isolation capability.

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.6.1.2	Perform CHANNEL CHECK.	24 hours
SR 3.3.6.1.3	Perform CHANNEL FUNCTIONAL TEST.	31 days
SR 3.3.6.1.4	Perform CHANNEL FUNCTIONAL TEST.	92 days
SR 3.3.6.1.5	Perform CHANNEL CALIBRATION.	92 days
SR 3.3.6.1.6	Perform CHANNEL CALIBRATION.	184 days
SR 3.3.6.1.7	Perform CHANNEL CALIBRATION.	12 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.6.1.8	Perform CHANNEL CALIBRATION.	24 months
SR 3.3.6.1.9	Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months

Table 3.3.6.1-1 (page 3 of 5)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
3. HPCI System Isolation (continued)					
b. HPCI Steam Supply Line Pressure – Low	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 50 psig and ≤ 147.1 psig
c. HPCI Turbine Exhaust Diaphragm Pressure - High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 2.5 psig
d. Drywell Pressure -High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
e. Suppression Pool Area Ambient Temperature – High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 153.3°F
f. HPCI Leak Detection Time Delay	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	N/A
g. Suppression Pool Area Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F
h. HPCI Equipment Room Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 178.3°F
i. HPCI Room Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F

(continued)

Table 3.3.6.1-1 (page 4 of 5)
Primary Containment Isolation Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION C.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
4. Reactor Core Isolation Cooling (RCIC) System Isolation					
a. RCIC Steam Line Flow – High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 164 inches (inboard) ≤ 159 inches (outboard)
b. RCIC Steam Supply Line Pressure - Low	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≥ 50.3 psig
c. RCIC Turbine Exhaust Diaphragm Pressure - High	1,2,3	2	F	SR 3.3.6.1.4 SR 3.3.6.1.6 SR 3.3.6.1.9	≥ 3.3 psig
d. Drywell Pressure – High	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 2.2 psig
e. RCIC Suppression Pool Area Ambient Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 153.3°F
f. RCIC Leak Detection Time Delay	1,2,3	1	F	SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	N/A
g. RCIC Suppression Pool Area Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F
h. RCIC Equipment Room Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 178.3°F
i. RCIC Room Ventilation Differential Temperature - High	1,2,3	1	F	SR 3.3.6.1.2 SR 3.3.6.1.4 SR 3.3.6.1.8 SR 3.3.6.1.9	≤ 51.5°F

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY (continued)

Reactor Water Cleanup System Isolation

5.a Differential Flow-High

The high differential flow signal is provided to detect a break in the RWCU System. This will detect leaks in the RWCU System when area or differential temperature would not provide detection (i.e., a cold leg break). Should the reactor coolant continue to flow out of the break, offsite dose limits may be exceeded. Therefore, isolation of the RWCU System is initiated when high differential flow is sensed to prevent exceeding offsite doses. A time delay is provided to prevent spurious trips during most RWCU operational transients. This Function is not assumed in any UFSAR transient or accident analysis, since bounding analyses are performed for large breaks such as MSLBs.

The high differential flow signals are initiated from flow transmitters that are connected to the inlet (from the reactor vessel) and outlets (to the condenser (or radwaste) and to feedwater) of the RWCU System. The outputs of the transmitters are compared (in a common summer) and the resulting output is sent to two flow switches that trip when the sensed differential flow exceeds a predetermined value. If the difference between the inlet and outlets flow is too large, each flow switch generates an isolation signal. Two channels of Differential Flow — High Function are available and are required to be OPERABLE to ensure that no single instrument failure downstream of the common summer can preclude the isolation function.

The Differential Flow — High Allowable Value ensures that a "critical crack" in the RWCU piping is detected.

This Function isolates the Group 5 valves.

5.b., 5.c., and 5.f Area, Area Near Tip Room Ambient, and Area Ventilation Differential Temperature — High

RWCU area, area near TIP Room ambient, and area ventilation differential temperatures are provided to detect a leak from the RWCU System. The isolation occurs even when very small leaks have occurred and is diverse to the high differential flow instrumentation for the hot portions of the RWCU System. If the small leak continues without isolation, offsite dose limits may be reached. In addition, the Area

(continued)

BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5.b., 5.c., and 5.f Area, Area Near Tip Room Ambient, and Area Ventilation Differential Temperature – High (continued)

Near TIP Room Ambient Temperature - High Function isolates the RWCU System to ensure that the assumed environmental conditions are maintained in the first floor of the Reactor Building for equipment qualification purposes. Credit for these instruments is not taken in any transient or accident analysis in the UFSAR, since bounding analyses are performed for large breaks such as recirculation or MSL breaks.

Area, area near TIP Room ambient, and area ventilation differential temperature signals are initiated from temperature elements that are located in the area that is being monitored. Six temperature elements provide input to the Area Temperature—High Function (four in the RWCU heat exchanger area and two in the RWCU pump area). However, only two channels are required to be OPERABLE (one in each trip system) to ensure that no single instrument failure can preclude the isolation function since the Area Differential Temperature High Function is able to detect breaks in the same areas as the Area Temperature - High Functions. As noted in footnote (d) to Table 3.3.6.1-1, in order to maintain coverage in both areas, each area (i.e., the heat exchanger area and the pump area) must have either an OPERABLE Area Temperature - High channel or an OPERABLE Area Ventilation Differential Temperature - High channel in each trip system.

Twelve temperature elements provide input to the Area Ventilation Differential Temperature — High Function. The output of these temperature elements is used to determine the differential temperature. Each channel consists of a differential temperature instrument that receives inputs from temperature elements that are located in the inlet and outlet of the area cooling system and for a total of six available channels (three in the RWCU heat exchanger area and three in the RWCU pump area). However, only two channels are required to be OPERABLE (one in each trip system) to ensure that no single instrument failure can preclude the isolation function since the Area Temperature - High Function is able to detect breaks in the same area as the Area Ventilation Differential Temperature - High Function. As noted in footnote (d) to Table 3.3.6.1-1, in order to maintain coverage in both areas, each area (i.e., the heat exchanger area and the pump area) must have either

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5.b., 5.c., and 5.f Area, Area Near Tip Room Ambient, and Area Ventilation Differential Temperature — High (continued)

an OPERABLE Area Temperature - High channel or an OPERABLE Area Ventilation Differential Temperature - High channel in each trip system.

Four temperature elements provide input to the Area Near TIP Room Ambient Temperature - High Function. However, only two channels are required to be OPERABLE (one in each trip system) to ensure that no single instrument failure can preclude the isolation function.

The Area, Area Near TIP Room Ambient, and Area Ventilation Differential Temperature — High Allowable Values are set low enough to detect a leak equivalent to 5 gpm.

These Functions isolate the Group 5 valves.

5.d. SLC System Initiation

The isolation of the RWCU System is required when the SLC System has been initiated to prevent dilution and removal of the boron solution by the RWCU System (Ref. 4). The SLC System initiation signal is initiated from the SLC System initiation switch. There is no Allowable Value associated with this Function since the channels are mechanically actuated based solely on the position of the SLC System initiation switch. One channel of the SLC System Initiation Function is available and is required to be OPERABLE only in MODES 1 and 2, since these are the only MODES where the reactor can be critical, and these MODES are consistent with the Applicability for the SLC System (LCO 3.1.7). As noted (footnote (e) to Table 3.3.6.1-1), this Function is only required to close the valves associated with one trip system, since the signal only provides input into one of the two trip systems. This results in isolating two of the three RWCU PCIVs.

5.e. Reactor Vessel Water Level — Low Low

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some interfaces with the reactor vessel occurs to isolate the potential sources of a break. The isolation of the

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

5.e. Reactor Vessel Water Level — Low Low (continued)

RWCU System on Reactor Vessel Water Level-Low Low supports actions to ensure that the fuel peak cladding temperature remains below the limits of 10 CFR 50.46. The Reactor Vessel Water Level — Low Low Function associated with RWCU isolation is not directly assumed in the UFSAR safety analyses because the RWCU System line break is bounded by breaks of larger systems (recirculation and MSL breaks are more limiting).

Reactor Vessel Water Level — Low Low signals are initiated from four level switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water level (variable leg) in the vessel. Four channels of Reactor Vessel Water Level — Low Low Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Reactor Vessel Water Level — Low Low Allowable Value was chosen to be the same as the ECCS Reactor Vessel Water Level — Low Low Allowable Value (LCO 3.3.5.1), since the capability to cool the fuel may be threatened.

This Function isolates the Group 5 valves.

Shutdown Cooling System Isolation

6.a. Reactor Steam Dome Pressure - High

The Reactor Steam Dome Pressure — High Function is provided to isolate the shutdown cooling portion of the Residual Heat Removal (RHR) System (i.e., the shutdown cooling suction valves). This interlock is provided only for equipment protection to prevent an intersystem LOCA scenario (i.e., a break of the low pressure RHR suction piping caused by exposure to relatively high pressure RPV fluid), and credit for the interlock is not assumed in the accident or transient analysis in the UFSAR.

The Reactor Steam Dome Pressure — High signals are initiated from two pressure switches that are connected to different taps on the suction piping of the "B" Recirculation System. Two channels of Reactor Steam Dome Pressure — High Function are available and are required to be OPERABLE to ensure that

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6.a. Reactor Steam Dome Pressure - High (continued)

no single instrument failure can preclude the isolation function. The Function is only required to be OPERABLE in MODES 1, 2, and 3, since these are the only MODES in which the reactor can be pressurized; thus, over pressure protection is needed. The Allowable Value was chosen to be low enough to protect the RHR System piping from overpressurization (even with a time delay present), yet high enough to preclude spurious isolations of shutdown cooling during system startup and operation and to provide sufficient overlap with the low pressure isolations of the HPCI and RCIC turbines to allow the transition to shutdown cooling during plant shutdowns.

This Function isolates the Group 4 valves.

6.b. Reactor Vessel Water Level — Low

Low RPV water level indicates that the capability to cool the fuel may be threatened. Should RPV water level decrease too far, fuel damage could result. Therefore, isolation of some reactor vessel interfaces occurs to begin isolating the potential sources of a break. The Reactor Vessel Water Level — Low Function associated with RHR Shutdown Cooling System isolation is not directly assumed in safety analyses because a break of the RHR Shutdown Cooling System is bounded by breaks of the Recirculation Suction and MSL. The RHR Shutdown Cooling System isolation on Reactor Vessel Water Level-Low supports actions to ensure that the RPV water level does not drop below the top of the active fuel during a vessel draindown event caused by a leak (e.g., pipe break or inadvertent valve opening) in the RHR Shutdown Cooling System when the system is in operation (i.e., the shutdown cooling suction valves are automatically isolated, and if both of the RHR shutdown cooling suction valves are not fully closed and reactor steam dome pressure is less than 135 psig (nominal), then the two inboard LPCI injection valves are also automatically isolated if a low reactor vessel water level signal is received).

Reactor Vessel Water Level — Low signals are initiated from four level indicating switches that sense the difference between the pressure due to a constant column of water (reference leg) and the pressure due to the actual water

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6.b. Reactor Vessel Water Level — Low (continued)

level (variable leg) in the vessel. Four channels (two channels per trip system) of the Reactor Vessel Water Level — Low Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function. As noted (footnote (f) to Table 3.3.6.1-1), only two channels of the Reactor Vessel Water Level — Low Function are required to be OPERABLE in MODES 4 and 5 (and must be capable of providing input to initiate the isolation of the same division of isolation valves, i.e., both the A1 and B1 channels or both the A2 and B2 channels are required to be OPERABLE), provided the RHR Shutdown Cooling System integrity is maintained. System integrity is maintained provided the piping is intact and no operations with the potential for draining the reactor vessel through the system are being performed.

The Reactor Vessel Water Level — Low Allowable Value was chosen to be the same as the RPS Reactor Vessel Water Level — Low Allowable Value (LCO 3.3.1.1), since the capability to cool the fuel may be threatened.

The Reactor Vessel Water Level — Low Function is only required to be OPERABLE in MODES 3, 4, and 5 to prevent this potential flow path from lowering the reactor vessel level to the top of the fuel. In MODES 1 and 2, another isolation (i.e., Reactor Steam Dome Pressure — High) and administrative controls ensure that this flow path remains isolated to prevent unexpected loss of inventory via this flow path.

This Function isolates the Group 4 valves.

6.c. Drywell Pressure - High

High drywell pressure indicates that the RHR Shutdown Cooling System piping downstream of the inboard isolation valve located in the drywell may have experienced a break. In order to prevent the level in the RPV from dropping below the top of active fuel if this were to occur, this Function will cause the RHR Shutdown Cooling System to isolate if the system is in use (i.e., the shutdown cooling suction valves are automatically isolated, and if both of the RHR shutdown cooling suction valves are not fully closed and reactor steam dome pressure is less than 135 psig (nominal), then the two inboard LPCI injection valves are also automatically

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APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

6.c. Drywell Pressure - High (continued)

isolated if a high drywell pressure signal is received). The Drywell Pressure - High Function associated with the RHR Shutdown Cooling System isolation is not directly assumed in safety analyses because a break of the RHR Shutdown Cooling system is bounded by breaks of the Recirculation System and MSL.

Drywell Pressure - High signals are initiated from four pressure switches that are connected to the primary containment via four different penetrations. Four channels (two channels per trip system) of the Drywell Pressure - High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the isolation function.

The Drywell Pressure - High Function is only required to be OPERABLE in Modes 1, 2, and 3 since these are the only MODES in which a LOCA could occur to cause the drywell to pressurize.

The Allowable Value was selected to be approximately the same as the ECCS Drywell Pressure-High Allowable Value (LCO 3.3.5.1), since this may be indicative of a LOCA inside primary containment.

This Function isolates the Group 4 valves.

Containment Cooling System Isolation

7.a Containment Pressure - High

High containment pressure indicates that a primary system break inside the containment has occurred. In order to maintain long term primary containment integrity under these conditions, the primary containment must be cooled. However, before Residual Heat Removal (RHR) System flow can be diverted from the LPCI flow path to the containment cooling flow path (e.g., suppression pool cooling), adequate core cooling must be assured. This assurance is provided by the Containment Cooling System Permissive Function, which receives inputs from LPCI initiation signals, reactor vessel shroud level signals and primary containment pressure signals. The LPCI initiation inputs and reactor vessel shroud level inputs to the Containment Cooling System

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

7.a Containment Pressure - High (continued)

Permissive logic can be overridden, if desired. Therefore, suppression pool cooling is still capable of performing the post accident containment cooling function if either of these two functions are inoperable. However, in order to prevent challenging the containment negative design pressure limit when spraying the containment, the Containment Pressure - High Function cannot be overridden (suppression pool spray valves are located on the same primary containment penetrations as the suppression pool cooling valves). Therefore, if certain combinations of Function 7.a channels are inoperable and untripped (such that the one-out-of-two taken twice logic is inhibited), then the logic will not allow the suppression pool cooling valves to be opened under post accident conditions, and the Suppression Pool Cooling System would be unavailable to perform the post accident containment cooling function. Consequently, this Function must be OPERABLE to support long term primary containment integrity by allowing containment cooling under post-LOCA conditions.

Additionally, if certain combinations of Function 7.a channels are in the tripped condition (such that the one-out-of-two taken twice logic is fulfilled), then the logic is not capable of automatically isolating the containment sprays to prevent containment pressure from dropping below the negative design pressure limit when the containment is being sprayed. Therefore, in order to protect primary containment integrity if the correct combination of Function 7.a channels are in the tripped condition such that automatic isolation capability is lost, the containment sprays should be inhibited.

Containment Pressure - High signals are initiated from four pressure switches that are connected to the primary containment via four different penetrations. Four channels of the Containment Pressure - High Function are available and are required to be OPERABLE to ensure that no single instrument failure can preclude the containment cooling function under post accident conditions.

The Containment Pressure - High Function is only required to be OPERABLE in MODES 1, 2 and 3, since these are the only MODES in which a LOCA could cause pressurization of the primary containment. In MODES 4 and 5, the probability

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BASES

APPLICABLE SAFETY ANALYSES, LCO, and APPLICABILITY

7.a Containment Pressure - High (continued)

and consequences of such events are reduced due to the pressure and temperature limitations in these MODES.

The Allowable Value was selected to be high enough to prevent the primary containment from exceeding the negative design pressure limit when spraying the containment.

This Function contributes to maintaining primary containment integrity under post accident conditions by: 1) allowing the use of the Suppression Pool Cooling System to fulfill the containment cooling function, and 2) preventing the containment negative design pressure limit from being exceeded by automatically isolating the sprays as pressure drops to the Allowable Value when spraying the containment.

ACTIONS

A Note has been provided to modify the ACTIONS related to primary containment isolation instrumentation channels. Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition, discovered to be inoperable or not within limits, will not result in separate entry into the Condition. Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for inoperable primary containment isolation instrumentation channels provide appropriate compensatory measures for separate inoperable channels. As such, the Note has been provided to allow separate Condition entry for each inoperable primary containment isolation instrumentation channel.

A.1, and A.2

Because of the diversity of sensors available to provide isolation signals and the redundancy of the isolation design, an allowable out of service time of 12 hours for Functions 2.a, 2.b, 6.b, and 6.c and 24 hours for Functions other than Functions 2.a, 2.b, 6.b, and 6.c has been shown to be acceptable (Refs. 5 and 6) to permit restoration of

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BASES

ACTIONS

A.1, and A.2 (continued)

any inoperable channel to OPERABLE status. This out of service time is only acceptable provided the associated Function is still maintaining isolation capability (refer to Required Action B.1 Bases). If the inoperable channel cannot be restored to OPERABLE status within the allowable out of service time, the channel must be placed in the tripped condition per Required Action A.1. Placing the inoperable channel in trip would conservatively compensate for the inoperability, restore capability to accommodate a single failure, and allow operation to continue with no further restrictions. Alternately, if it is not desired to place the channel in trip (e.g., as in the case where placing the inoperable channel in trip would result in an isolation), Condition C must be entered and its Required Action taken.

An additional Required Action is provided for Function 7.a. Required Action A.2 requires that within 24 hours the containment sprays be inhibited. If a Function 7.a channel is placed in trip per Required Action A.1, containment integrity could be threatened due to exceeding the containment negative design pressure limit. Inhibiting the containment sprays from spraying both the drywell and the suppression chamber removes this threat. One acceptable method of inhibiting containment spray operation is to verify that either the inboard or outboard containment spray Motor Operated Valve (MOV) on each applicable penetration is closed, and then to open the circuit breakers that supply electrical power to those MOVs (Note: if the inboard suppression chamber MOVs are closed, suppression pool cooling is not affected). Refer to LCO 3.6.2.4 for the Required Actions and associated Completion Times for inoperable RHR Suppression Pool Spray Subsystem(s). The 24 hour completion time is consistent with the time allowed to place the channel in trip.

B.1

Required Action B.1 is intended to ensure that appropriate actions are taken if multiple, inoperable, untripped channels within the same Function result in redundant automatic isolation capability being lost for the associated penetration flow path(s). The MSL Isolation Functions are considered to be maintaining isolation capability when

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BASES

ACTIONS

B.1 (continued)

sufficient channels are OPERABLE or in trip, such that both trip systems will generate a trip signal from the given Function on a valid signal. The other isolation functions are considered to be maintaining isolation capability when sufficient channels are OPERABLE or in trip, such that one trip system will generate a trip signal from the given Function on a valid signal. This ensures that one of the two PCIVs in the associated penetration flow path can receive an isolation signal from the given Function. Note that Condition B can not exist for penetrations that are isolated by a single automatic isolation valve in series with a check valve (e.g., recirculation pump mini-purge penetrations and drywell pneumatics nitrogen supply penetration) since isolation capability is considered to be maintained by the check valve regardless of the ability of the automatic isolation functions to affect isolation of the penetration. For one-out-of-two taken twice logics, this would require both trip systems to have one channel OPERABLE or in trip. For the MSL High Flow Function, this would require both trip systems to have one channel, associated with each MSL, OPERABLE or in trip. For Functions that consist of channels that monitor several locations within a given area (e.g., different locations for monitoring MSL temperatures in the turbine building), this would require both trip systems to have one channel per location OPERABLE or in trip. For the Main Steam Line Tunnel Temperature - High Function, two channels per steam line, either OPERABLE or in trip, are required in either trip system. With this degree of coverage available in the steam tunnel, the logic is adequate to detect and isolate the MSIVs for a break of the size for which protection is necessary. For two-out-of-two once logics, this would require the trip system logic associated with either the inboard components or the outboard components to have two channels, each OPERABLE or in trip. For one-out-of-one once logics this would require the trip system logic associated with either the inboard components or the outboard components to have one channel OPERABLE or in trip. For the RWCU Area High Temperature and Area Ventilation High Differential Temperature Functions, each Function consists of channels that monitor several different locations. Therefore, this would require one channel per location (i.e., either one OPERABLE RWCU Area High Temperature channel or one OPERABLE Area Ventilation High Differential Temperature channel per

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BASES

ACTIONS

B.1 (continued)

location) to be OPERABLE or in trip (the channels are not required to be in the same trip system). Specific guidance for when Condition B exists is contained in plant procedures.

The Completion Time is intended to allow the operator time to evaluate and repair any discovered inoperabilities. The 1 hour Completion Time is acceptable because it minimizes risk while allowing time for restoration or tripping of channels.

C.1

Required Action C.1 directs entry into the appropriate Condition referenced in Table 3.3.6.1-1. The applicable Condition specified in Table 3.3.6.1-1 is Function and MODE or other specified condition dependent and may change as the Required Action of a previous Condition is completed. Each time an inoperable channel has not met any Required Action of Condition A or B and the associated Completion Time has expired, Condition C will be entered for that channel and provides for transfer to the appropriate subsequent Condition.

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

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours (Required Actions D.2.1 and D.2.2). Alternately, the associated MSLs may be isolated (Required Action D.1), and, if allowed (i.e., plant safety analysis allows operation with an MSL isolated), operation with that MSL isolated may continue. Isolating the affected MSL accomplishes the safety function of the inoperable channel. The Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

(continued)

BASES

ACTIONS (continued)

E.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 2 within 8 hours.

The allowed Completion Time of 8 hours is reasonable, based on operating experience to reach MODE 2 from full power conditions in an orderly manner and without challenging plant systems.

F.1

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, plant operations may continue if the affected penetration flow path(s) is isolated. Isolating the affected penetration flow path(s) accomplishes the safety function of the inoperable channels.

For the RWCU Differential Flow — High Function, if the flow element/transmitter monitoring RWCU flow to radwaste and condensate is the only portion of the channel inoperable, then the affected penetration flow path(s) may be considered isolated by isolating the RWCU return to radwaste and condensate.

Alternately, if it is not desired to isolate the affected penetration flow path(s), Condition H must be entered and its Required Actions taken.

The 1 hour Completion Time is acceptable because it minimizes risk while allowing sufficient time for plant operations personnel to isolate the affected penetration flow path(s).

G.1

[Deleted]

(continued)

BASES

ACTIONS (continued)

H.1 and H.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, or any Required Action of Condition F is not met and the associated Completion Time has expired, the plant must be placed in a MODE or other specified condition in which the LCO does not apply. This is done by placing the plant in at least MODE 3 within 12 hours and in MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems.

I.1 and I.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the SLC System is declared inoperable or the RWCU System is isolated. Since this Function is required to ensure that the SLC System performs its intended function, sufficient remedial measures are provided by declaring the SLC System inoperable or isolating the RWCU System.

The 1 hour Completion Time is acceptable because it minimizes risk while allowing sufficient time for personnel to isolate the RWCU System.

J.1 and J.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the associated penetration flow path should be closed. However, if the shutdown cooling function is needed to provide core cooling, these Required Actions allow the penetration flow path to remain unisolated provided action is immediately initiated to restore the channel to OPERABLE status or to isolate the RHR Shutdown Cooling System (i.e., provide alternate decay heat removal capabilities so the penetration flow path can be isolated). Actions must continue until the channel is restored to OPERABLE status or the RHR Shutdown Cooling System is isolated.

(continued)

BASES

ACTIONS (continued)

K.1 and K.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, the containment cooling system permissive logic may not allow the Suppression Pool Cooling System to be placed in service under post accident conditions (i.e., with containment pressure greater than 2 psig). Therefore, the affected Suppression Pool Cooling subsystem(s) must be declared inoperable immediately per Required Action K.1. Refer to LCO 3.6.2.3 for the Required Actions and associated Completion Times for inoperable RHR Suppression Pool Cooling subsystem(s). As noted earlier, due to the common values between the two functions, this Action also makes the associated loop of Suppression Pool Spray inoperable and LCO 3.6.2.4 must also be entered. Alternatively, if the channel is placed in trip but the containment sprays are not inhibited, containment integrity could be threatened due to exceeding the negative design pressure limit. Therefore, the primary containment must be declared inoperable immediately per Required Action K.2.

L.1 and L.2

If the channel is not restored to OPERABLE status or placed in trip within the allowed Completion Time, either the primary containment vent and purge penetration flow paths must be isolated or administrative control of the primary containment vent and purge valves using continuous monitoring of alternate instrumentation must be established. These actions are required because the ability of the Function 2.c isolation signals to limit releases to less than 10 CFR 20 limits (if a LOCA were to occur during primary containment venting operations) is threatened. When Function 2.c is inoperable, the activity for which the isolation was intended must be terminated or administrative controls must be implemented. Acceptable administrative controls are implemented and venting or purging of primary containment may proceed, provided the following conditions are met: 1) an operator is stationed at the valve controls, and 2) that operator is instructed to terminate venting or purging when procedures direct valve closure.

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs for each Primary Containment Isolation instrumentation Function are found in the SRs column of Table 3.3.6.1-1.

The Surveillances are modified by a Note to indicate that when a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions for Functions other than 5.a may be delayed for up to 6 hours provided the associated Function maintains isolation capability and for up to 6 hours for Function 5.a. For Functions 1.c, 1.e, and 1.g, the Allowed Outage Time (AOT) is applied at the instrument channel level, since the associated trip function and isolation capability are maintained via the companion logic channel. This is consistent with the "normal" trip arrangements with one instrument channel feeding each trip logic. Thus, a six hour AOT is applied to each instrument channel undergoing required testing. Upon completion of the Surveillance, or expiration of the applicable 6 hour allowance, the channel must be returned to OPERABLE status or the applicable Condition entered and Required Actions taken.

This Note is based on the reliability analysis (Refs. 5 and 6) assumption of the average time required to perform channel surveillance. That analysis demonstrated that the 6 hour testing allowance does not significantly reduce the probability that the PCIVs will isolate the penetration flow path(s) when necessary. Because the Ref. 5 and 6 analyses made no assumptions regarding the elapsed time between testing of consecutive channels in the same logic, it is not necessary to remove jumpers/relay blocks or reconnect lifted leads used to prevent actuation of the trip logic during testing of logic channels with instruments in series solely for the purpose of administering the AOT clocks, provided that the AOT allowance is not exceeded on a per instrument channel basis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.1 and SR 3.3.6.1.2

Performance of the CHANNEL CHECK once every 12 hours or once every 24 hours ensures 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 instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined by the plant 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 instrument has drifted outside its limit.

The Frequencies are based on 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 the channels required by the LCO.

SR 3.3.6.1.3, and SR 3.3.6.1.4

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function. The CHANNEL FUNCTIONAL TEST verifies acceptable response by verifying the change of state of at least one contact on the relay which inputs into the trip logic. The required contacts not tested during the CHANNEL FUNCTIONAL TEST are tested under the LOGIC SYSTEM FUNCTIONAL TEST. This is acceptable because operating experience shows that the contacts not tested during the CHANNEL FUNCTIONAL TEST normally pass the LOGIC SYSTEM FUNCTIONAL TEST.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1.3, and SR 3.3.6.1.4 (continued)

The 92 day Frequency of SR 3.3.6.1.4 is based on the reliability analyses described in References 6 and 7. The 31 day Frequency of SR 3.3.6.1.3 is based on engineering judgment and the reliability of the components.

SR 3.3.6.1.5, SR 3.3.6.1.6, SR 3.3.6.1.7 and SR 3.3.6.1.8

A CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. This test verifies the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drifts between successive calibrations consistent with the plant specific setpoint methodology.

The Frequency of SR 3.3.6.1.5 is based on the assumption of a 92 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.1.6 is based on the assumption of a 184 day calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.1.7 is based on the assumption of a 12 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

The Frequency of SR 3.3.6.1.8 is based on the assumption of a 24 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.6.1.9

The LOGIC SYSTEM FUNCTIONAL TEST demonstrates the OPERABILITY of the required isolation logic for a specific channel. The system functional testing performed on PCIVs in LCO 3.6.1.3 overlaps this Surveillance to provide complete testing of the assumed safety function. The 24 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a plant outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 24 month Frequency.

REFERENCES

1. UFSAR, Section 6.3.
2. UFSAR, Chapter 15.
3. NEDO-31466, "Technical Specification Screening Criteria Application and Risk Assessment," November 1987.
4. UFSAR, Section 9.3.4.2.
5. NEDC-31677P-A, "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation," July 1990.
6. NEDC-30851P-A Supplement 2, "Technical Specifications Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation," March 1989.
7. UFSAR, Section 7.3.
8. UFSAR, Section 15.6.5.

(continued)

BASES

REFERENCES (continued)

9. Amendment 182 to Facility Operating License No. DPR-49 and NEDO-31400A, "Safety Evaluation for Eliminating the Boiling Water Reactor Main Steam Line Isolation Valve Closure Function and Scram Function of the Main Steam Line Radiation Monitor," October 1992.

10. NUREG 0737, Section II.E.4.2.(7).