COOPER NUCLEAR STATION
TECHNICAL SPECIFICATIONS PROPOSED CHANGE NO. 140
Primary Containment Isolation Valve Tables

Revised Pages

47	52b (delete)
50	83
51	84
52	169
52a (delete)	

1.0. Introduction.

The Nebraska Public Power District (District) requests that the Cooper Nuclear Station (CNS) Technical Specifications be revised to add requirements for primary containment isolation of the drywell air sampling system and clarify the requirements for instruments that initiate primary containment isolation signals. This submittal fulfills the commitment[1/] to submit a proposed Technical Specifications change to add the air sampling system isolation by August 1993.

To provide sufficient time for licensed operator training and the revision of station procedures, the District requests that the amendment implementing these proposed changes become effective thirty days after its issuance.

2.0. Basis for Change.

2.1. During the 1993 CNS refueling outage, a replacement radiation monitor was installed for the drywell air sampling system to improve its reliability. The replacement monitor, which is currently operating in parallel with the original monitor, is undergoing final acceptance testing prior to being placed into service. The monitor for this system is required to be operable during reactor power operation by Technical Specification 3.6.C and Table 3.2.E. The original monitor continues to satisfy these requirements. The monitor provides local and remote indication of drywell particulate, iodine, and gaseous radioactivity, alarms in the control room on high radioactivity, but does not initiate any engineered safeguards or provide any control signals for other equipment. The replacement radiation monitor, although the most suitable model for this application, has a pressure rating which is lower than the containment design pressure. Because the monitor is located outside the drywell but communicates with the primary containment atmosphere through its sample and return lines, and the replacement monitor is rated at a pressure lower than the design basis pressure for the containment, two automatic containment isolation valves were installed on each line to the monitor. These valves are air operated and fail closed on loss of air pressure or loss of power to the solenoid pilot valves. A maximum valve closing time of 15 seconds was established consistent with reliable valve operation and the need to isolate the line in the event of an accident.

1/ G. R. Horn to J. L. Milhoan, NSD930690, June 7, 1993, Status of Issues Related to Unit Startup.

Group 2 was selected as the appropriate primary containment isolation signal to isolate the air sampling system. Group 2 isolates on a reactor low water level of ≥4.5 inches (Level 3) or a high drywell pressure of ≤2 psig. This containment isolation signal also isolates the shutdown cooling mode of the Residual Heat Removal (RHR) system, the drywell floor and equipment drain sump discharge lines, and the Traversing In-core Probe (TIP) system, and also initiates a Group 6 containment isolation signal.

As a result of this station modification, CNS Technical Specifications needs to be revised to add the four new containment isolation valves to the list of primary containment isolation valves on Table 3.7.1 and to add the drywell air sampling system to the list of systems isolated by the Group 2 signal in the notes to Table 3.2.A.

2.2. A review of Table 3.2.A, Primary Containment and Reactor Vessel Isolation Instrumentation, found that the action required when component operability is not assured did not always either isolate the systems associated with that containment isolation signal or place the plant in a condition where operability of that instrumentation was not required. In some cases, following one of the current assigned actions would result in isolation of systems that are not associated with the inoperable instrumentation.

For example, the current actions associated with inoperable reactor low water level instrumentation, which initiates Group 2 and 3 isolations and also results in a Group 6 isolation, are actions A and B. While action A will result in placing the plant in a cold shutdown condition, where primary containment integrity and hence operability of this instrumentation is not required, action B results in isolation of the Main Steam Isolation Valves (MSIVs) and placing the plant in a hot shutdown condition. Closing the MSIVs will not isolate the systems associated with the Group 2, 3, or 6 isolation signals.

To correct this, new actions are assigned to several of the instruments of Table 3.2.A. Following the proposed actions would result in either the isolation of affected systems or, if isolation of the affected systems would be inconsistent with continued safe power operation, placing the plant in a cold shutdown condition.

2.3. The Table 3.2.A action statements A, C, D, and E in note 2 are also being revised to be more compatible with the action statements of Table 3.3.2-1 of the Fermi-2 Standard Technical Specifications.[2/] Action statement A is being revised to correspond with Fermi-2 action statement 20, action statement D is being revised to add a time limit from Fermi-2 action statement 25, and action statements C and E are being combined into a new action statement C that corresponds with Fermi-2 action statement 23. This will result in action statements with completion times for this table that are consistent with current NRC requirements.

2/ NUREG-1089, Fermi-2 Technical Specifications, March 1985.

In the revised action statements C and D, the District proposes to use the term "isolate" instead of directing the closing of valves that is used in the Fermi-2 statements. Use of the term "isolate" is consistent with the requirements for inoperable primary containment isolation valves in specification 3.7.D and the CNS Technical Specifications definition of primary containment integrity.

2.4. Certain administrative changes are also being made to improve the readability of these specifications. These include the clarification of specification 3.2.A and its Bases and of some Table 3.2.A notes. These changes do not change the intent of these sections. Defined terms are also being capitalized, a practice consistent with Standard Technical Specifications.

3.0. Detailed Description of Proposed Changes.

3.1. The District proposes several changes to page 47. Specification 3.2.A is revised to clearly state that the instrumentation that initiates primary containment isolation must be operable whenever primary containment integrity is required. Minor grammatical changes are made to specification 3.2.B. All defined terms on this page are capitalized.

3.2. The District proposes several changes to Table 3.2.A, Primary Containment and Reactor Vessel Isolation Instrumentation, page 50.

3.2.1. Several changes are being made to the column of Action Required When Component Operability is Not Assured. The referenced action statement for the Main Steam Line High Radiation instrument line item is changed from E to C to correspond with changes to note 2 of the table. Action statement B is replaced by C as an option for the Reactor Low Water Level and High Drywell Pressure instrument line items since action B will not result in either a condition where operability of these instruments is not required or the isolation of the affected systems. Action statement A is being added as an option for the Main Steam Line Leak Detection, Main Steam Line High Flow, and Main Steam Line Low Pressure instrument line item as it will result in a condition where operability of these instruments is not required.

3.2.2. The line item for Reactor Water Cleanup System High Space Temperature is moved from page 51 to page 50. This reduces the length of this table to one page.

3.2.3. As an administrative change, the format of the instrument identification numbers is made consistent and defined terms are capitalized.

3.3. The District proposes several changes for the Notes for Table 3.2.A, which are moved to pages 51 and 52 from pages 52, 52a, and 52b.

3.3.1. In Note 2, action statement A is revised as follows to conform to Fermi-2 Standard Technical Specifications action statement 20 of Table 3.3.2-1:

"Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours."

3.3.2. In Note 2, action statements C and E to isolate the Reactor Water Cleanup system and Reactor Water Sample Valves are combined into the following action statement C, which is based upon Fermi-2 Standard Technical Specifications action statement 23 of Table 3.3.2-1:

"Isolate the affected system within 1 hour and declare the affected system inoperable."

3.3.3. In Note 2, action statement D to isolate the Shutdown Cooling mode of the Residual Heat Removal (RHR) system is modified to add a time limit similar to action statement 25 of the Fermi-2 Standard Technical Specifications:

"Isolate the Shutdown Cooling mode of RHR within 1 hour."

3.3.4. In Notes 5 and 7, "mode switch" is replaced with "Reactor Mode Selector Switch." Also in Note 7, the word "valve" is added after "turbine stop" as a clarification.

3.3.5. In Note 8, the Drywell Air Sampling System is added to the list of systems isolated by the Group 2 isolation signals. Automatic containment isolation valves for the air sampling system were added during the 1993 refueling outage.

3.3.6. All defined terms in the notes were capitalized.

3.4. The District proposes changes be made to Bases 3.2.A for the Primary Containment Isolation Functions on pages 83 and 84.

3.4.1. Statements made in two paragraphs that the grouping of valves for containment isolation can be found in specification 3.7 are deleted. The listing of valve groups for the various containment isolation signals is found in Note 8 of Table 3.2.A. This appears to have been an administrative error in the Bases from the original issuance of the CNS Technical Specifications.

3.4.2. A paragraph is added at the end of the Bases referencing specification 3.7.D for the requirements for inoperable primary containment isolation valves.

3.4.3. Several editorial changes such as correcting the format for USAR references, making the capitalization of component names consistent, changing "primary system isolation" to "primary containment isolation," spelling out an abbreviation for "temperature," and clarifying some paragraph wording are made on pages 83 and 84. All defined terms on these pages are also capitalized.

3.5. On page 169, the District proposes to add to Table 3.7.1, Primary Containment Isolation Valves, the four isolation valves added during the 1993 refueling outage for the Drywell Air Sampling System sample and return lines. These normally open air operated valves close on a Group 2 signal with a specified maximum closing time of 15 seconds.

4.0. Significant Hazards Determination.

10 CFR 50.91(a)(1) requires that licensee requests for operating license amendments be accompanied by an evaluation of significant hazards posed by the issuance of the amendment. This evaluation is performed with respect to the criteria given in 10 CFR 50.92(c).

This proposed change to the Cooper Nuclear Station (CNS) Technical Specifications adds requirements for the primary containment isolation of the drywell air sampling system and clarifies the requirements for instrumentation that initiate primary containment isolation signals.

4.1. The proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated. The addition of the drywell air sampling system isolation to the tables listing primary containment isolation valves and clarification of the requirements for instrumentation that initiates primary containment isolation will ensure primary containment integrity requirements are maintained for this system. Revisions to the action statements for the instrumentation that initiate primary containment isolation signals will ensure, when these instruments become inoperable, that the affected systems are isolated or the plant is placed in a condition where operability of the instrumentation is not required. By ensuring primary containment isolation during accidents as previously evaluated, these changes will not result in an increase in the probability or consequences of a previously evaluated accident.

4.2. The proposed changes will not create the possibility of a new or different kind of accident from any accident previously evaluated. The addition of the drywell air sampling system isolation to the tables listing primary containment isolation valves and clarification of the requirements for instrumentation that initiates primary containment isolation will ensure primary containment integrity requirements are maintained for this system. Revisions to the action statements for the instrumentation that initiate primary containment isolation signals will ensure, if the instrumentation becomes inoperable, that the affected systems are isolated or the plant is placed in a condition where operability of the instrumentation is not required. These changes will ensure the primary containment functions during accidents as previously evaluated and will not result in an accident of a new or different type.

4.3. The proposed changes will not create a significant reduction in the margin of safety. The addition of the drywell air sampling system isolation to the tables listing primary containment isolation valves and clarification of the requirements for instrumentation that initiates primary containment isolation will ensure primary containment integrity requirements are maintained for this system. Revisions to the action statements for the instrumentation that initiate primary containment isolation signals will ensure, if the instrumentation becomes inoperable, that the affected systems are isolated or the plant is placed in a condition where operability of the instrumentation is not required. These changes will ensure the primary containment functions during accidents as previously evaluated and will not reduce the margin of safety.

5.0. Conclusion.

The District has evaluated the proposed changes described above against the criteria of 10 CFR 50.92(c) in accordance with the requirements of 10 CFR 50.91(a)(1). This evaluation has determined that Proposed Change Number 120 to Technical Specifications will not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility for a new or different kind of accident from any accident previously evaluated, or (3) create a significant reduction in the margin of safety. Therefore, the District requests NRC approval of Proposed Change Number 120.

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APPENDIX A

MARKED-UP TECHNICAL SPECIFICATIONS PAGES

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
3.2 Protective Instrumentation	4.2 Protective Instrumentation
Applicability:	Applicability:
Applies to the plant instrumentation which initiates and controls a protective function.	Applies to the surveillance requirement of the instrumentation that initiates and controls protective function.
Objective:	Objective:
To assure the operability of protective instrumentation.	To specify the type and frequency of surveillance to be applied to protective instrumentation.
Specifications:	Specifications:
A. Primary Containment Isolation Functions	A. Primary Containment Isolation Functions
~~When primary containment integrity is required,~~ The limiting conditions for operation for the instrumentation that initiates primary containment isolation are given in Table 3.2.A. This instrumentation shall be OPERABLE whenever PRIMARY CONTAINMENT INTEGRITY is required.	Instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.A. System logic shall be functionally tested as indicated in Table 4.2.A.
B. Core and Containment Cooling Systems Initiation and Control	B. Core and Containment Cooling Systems Initiation & Control
The limiting conditions for operation for the instrumentation that initiates or controls the core and containment cooling systems are given in Table 3.2.B. This instrumentation ~~must~~ be operable ~~when~~ the system ~~(s)~~ it initiates or controls ~~are~~ required is to be operable as specified in Section 3.5.	Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.B. System logic shall be functionally tested as indicated in Table 4.2.B.
C. Control Rod Block Actuation	C. Control Rod Block Actuation
The limiting conditions for operation for the instrumentation that initiates control rod blocks are given in Table 3.2.C.	Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.C. System logic shall be functionally tested as indicated in Table 4.2.C.

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TABLE 3.2.A ~~(Page 1)~~

PRIMARY CONTAINMENT AND REACTOR VESSEL ISOLATION INSTRUMENTATION

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Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of Operable Components Per Trip System (1)	Action Required When Component Operability is Not Assured (2)
Main Steam Line High Radiation	RMP-RM-251 A,B,C,&D	≤ 3 Times Full Power	2	C
Reactor Low Water Level	NBI-LIS-101 A,B,C,&D #1	≥+4.5 in. Indicated Level	2(4)	A or C
Reactor Low Low Low Water Level	NBI-LIS-57 A & B #1 NBI-LIS-58 A & B #1	≥-145.5 in. Indicated Level	2	A or B
Main Steam Line Leak Detection	MS-TS-121 A,B,C,&D 122, 123, 124, 143, 144, 145, 146, 147, 148, 149, 150	≤ 200°F	2(6)	B A or B B
Main Steam Line High Flow	MS-dPIS-116 A,B,C,&D 117, 118, 119	≤ 150% of Rated Steam Flow	2(3)	
Main Steam Line Low Pressure	MS-PS-134 A,B,C,&D	≥ 825 psig	2(5)	
High Drywell Pressure	PC-PS-12 A,B,C,&D	≤ 2 psig	2(4)	A or C
High Reactor Pressure	RR-PS-128 A & B	≤ 75 psig	1	D
Main Condenser Low Vacuum	MS-PS-103 A,B,C,&D	≥ 7" Hg (7)	2	A or B
Reactor Water Cleanup System High Flow	RWCU-dPIS-170 A & B	≤ 200% of System Flow	1	C

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TABLE 3.2.A (Page 2)
PRIMARY CONTAINMENT AND REACTOR VESSEL ISOLATION INSTRUMENTATION

Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of Operable Components Per Trip System (1)	Action Required When Component Operability is Not Assured (2)
RWCU System Hi Space Temp.	RWCU-TS-150, A-D, 151 152, 153, 154, 155, 156 157, 158, 159 RWCU-TS-81 A,B,E,F, RWCU-TS-81 C,D,G,H	$\leq$200°F	2(6)	C

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NOTES FOR TABLE 3.2.A

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1. Whenever Primary Containment integrity is required there shall be two operable or tripped trip systems for each function.

2. If the minimum number of operable instrument channels per trip system requirement cannot be met by a trip system, that trip system shall be tripped. If the requirements cannot be met by both trip systems, the appropriate action listed below shall be taken.

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

   B. Initiate an orderly load reduction and have the Main Steam Isolation Valves shut within 8 hours.

   C. Isolate the Reactor Water Cleanup System.

   D. Isolate the Shutdown Cooling mode of the RHR System.

   ~~E. Isolate the Reactor Water Sample Valves.~~

see insert on next page

1

3. Two required for each steam line.

4. These signals also start the Standby Gas Treatment System and initiate Secondary Containment isolation.

all caps

5. Not required in the refuel, shutdown, and startup/hot standby modes (interlocked with the ~~mode switch~~).

Reactor Mode Selector Switch

6. Requires one channel from each physical location for each trip system.

valve

all caps

Low vacuum isolation is bypassed when the turbine stop is not full open, manual bypass switches are in bypass and ~~mode switch~~ is not in RUN.

8. The instruments on this table produce primary containment and system isolations. The following listing groups the system signals and the system isolated.

Group 1

Isolation Signals:

1. Reactor Low Low Low Water Level (≥-145.5 in.)
2. Main Steam Line Low Pressure (≥825 psig in the RUN mode)
3. Main Steam Line Leak Detection (≤200°F)
4. Condenser Low Vacuum (≥7" Hg vacuum)
5. Main Steam Line High Flow (≤150% of rated flow)

Isolations:

1. MSIVs
2. Main Steam Line Drains

move Group 2 to this page

INSERT FOR PAGE 51 ACTION STATEMENTS:

A. Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

C. Isolate the affected system within 1 hour and declare the affected system inoperable.

D. Isolate the Shutdown Cooling mode of RHR within 1 hour.

NOTES FOR TABLE 3.2.A (cont'd.)

move to Page 51

Group 2

Isolation Signals:

1. Reactor Low Water Level (≥4.5 inches)
2. High Dry Well Pressure (≤ 2 psig)

Isolations:

1. RHR Shutdown Cooling mode of the RHR System.
2. Drywell floor and equipment drain sump discharge lines.
3. TIP ball valves
4. Group 6 isolation relays
5. Drywell Air Sampling System

Group 3

Isolation Signals:

1. Reactor Low Water Level (≥4.5 inches)
2. Reactor Water Cleanup System High Flow (≤200% of system flow)
3. Reactor Water Cleanup System High Area Temperature (≤ 200°F)

Isolations:

1. Reactor Water Cleanup System

Group 4

Isolation Signals:

Provided by instruments on Table 3.2.B (HPCI)

Isolations:

Isolates the HPCI steam line

Group 5

Isolation Signals:

Provided by instruments on Table 3.2.B (RCIC)

Isolations:

Isolates the RCIC steam line.

Group 6

Isolation Signals:

1. Group 2 Isolation Signal
2. Reactor Building H&V Exhaust Plenum High Radiation ((100 mr/hr)

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NOTES FOR TABLE 3.2.A (cont'd.)

Isolations

1. Secondary Containment Isolation
2. Start Standby Gas Treatment System

Group

Isolation Signals:

1. Reactor Low Low Low Water Level ($\geq$-145.5 in)
2. Main Steam Line High Radiation ($\leq$3 times full power background)

Isolations:

1. Reactor Water Sample Valves

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3.2 BASES

In addition to Reactor Protection instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operator's ability to control, or terminates operator errors before they result in serious consequences. This set of specifications provides the limiting conditions ~~of~~ for operation for the primary ~~system~~ isolation function, initiation of the core cooling systems, control rod block and Standby Gas Treatment System. The objectives of the specifications are (1) to assure the effectiveness of the protective instrumentation when required ~~even during periods~~ when portions of ~~such~~ these systems are ~~out of service for maintenance~~, and (2) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be made inoperable for brief intervals to conduct required functional tests and calibrations.

Some of the settings on the instrumentation that initiate or control core and containment cooling have tolerances explicitly stated where the high and low values are both critical and may have a substantial effect on safety. The set points of other instrumentation, where only the high or low end of the setting has a direct bearing on safety, are chosen ~~at a level away~~ from the normal operating range to prevent inadvertent actuation of the safety system involved and exposure to abnormal situations.

A. Primary Containment Isolation Functions

Actuation of primary containment valves is initiated by protective instrumentation shown in Table 3.2.A which senses the conditions for which isolation is required. Such instrumentation must be ~~available~~ whenever primary containment integrity is required.

The instrumentation which initiates primary ~~system~~ isolation is connected in a dual bus arrangement.

The low water level instrumentation, set to trip at 168.5 inches (+4.5 inches) above the top of the active fuel, closes all isolation valves except those in Groups 1, 4, 5, and 7. ~~Details of grouping and~~ Required closing times are given in Specification 3.7. For valves which isolate at this level this trip setting is adequate to prevent core uncovery in the case of a break in the largest line assuming a 60 second valve closing time. Required closing times are less than this.

The low low low reactor water level instrumentation is set to trip when the water level is 19 inches (-145.5 inches) above the top of the active fuel. This trip closes Groups 1 and 7 Isolation Valves (Reference 1), activates the remainder of the CSCS subsystems, and starts the emergency diesel generators. These trip level settings were chosen to be high enough to prevent spurious actuation but low enough to initiate CSCS operation and primary ~~system~~ isolation so that post accident cooling can be accomplished.

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3.2 BASES: (Cont'd)

and the guidelines of 10CFR100 will not be exceeded. For large breaks up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation and primary system isolation are initiated in time to meet the above criteria. Reference ~~Paragraph~~ Section VI-5.3.4 USAR.

The high drywell pressure instrumentation is a diverse signal for malfunctions to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 and 6 isolation valves. For the breaks discussed above, this instrumentation will generally initiate CSCS operation before the low-low-low water level instrumentation; thus the results given above are applicable here also. The water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of all isolation valves except Groups 4 and 5.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case of accident, main steam line break outside the drywell, a trip setting of ≤ 150% of rated steam flow in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel clad temperatures peak at approximately 1000°F and release of radioactivity to the environs is below 10CFR100 guidelines. Reference Section XIV-6.5 USAR.

Temperature monitoring instrumentation is provided in the main steam tunnel and along the steam line in the turbine building to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. ~~See Spec. 3.7 for Valve Group.~~ The setting is ≤ 200°F for the main steam leak detection system. For large breaks, the high steam flow instrumentation is a backup to the ~~temp.~~ temperature instrumentation.

High radiation monitors in the main steam tunnel have been provided to detect gross fuel failure as in the control rod drop accident. These monitors alert control room operators to potential fuel degradation by means of an alarm set at ≤ 1.5 times the normal background, and initiate a Group 7 isolation at ≤ 3 times the normal background.

Pressure instrumentation is provided to close the Main Steam Isolation Valves in RUN Mode when the main steam line pressure drops below Specification 2.1.A.6. The Reactor Pressure Vessel thermal transient due to an inadvertent opening of the turbine bypass valves when not in the RUN Mode is less severe than the loss of feedwater analyzed in Section XIV-5 of the USAR, therefore, closure of the Main Steam Isolation Valves for thermal transient protection when not in RUN mode is not required.

The Reactor Water Cleanup System high flow and temperature instrumentation are arranged similar to that for the HPCI. The trip settings are such that core uncovery is prevented and fission product release is within limits.

Requirements for inoperable primary containment isolation valves are in Specification 3.7.D.

COOPER NUCLEAR STATION
TABLE 3.7.1 (Page 2)
PRIMARY CONTAINMENT ISOLATION VALVES

Valve & Steam	Number of Power Operated Valves Inboard	Outboard	Maximum Operating Time (Sec) (1)	Normal Position (2)	Action On Initiating Signal (3)
Primary Containment Purge & Vent PC-246AV, PC-231MV		2	15	C	SC
Primary Containment & N_2 Supply PC-238AV, PC-232MV		2	15	C	SC
Suppression Chamber Purge & Vent PC-230MV Bypass (PC-305MV)		1	40	C	SC(4)
Primary Containment Purge & Vent PC-231MV Bypass (PC-306MV)		1	40	C	SC(4)
Dilution Supply					
PC-1303MV, PC-1304MV		2	15	C	SC
PC-1305MV, PC-1306MV		2	15	C	SC
Dilution Supply					
PC-1301MV, PC-1302MV		2	15	O	GC
PC-1311MV, PC-1312MV		2	15	O	GC
Suppression Chamber Purge and Vent Exhaust PC-1308MV		1	15	C	SC
Primary Containment Purge and Vent Exhaust PC-1310MV		1	15	C	SC
Drywell Air Sampling System					
RMV-10AV, RMV-11AV		2	15	O	GC
RMV-12AV, RMV-13AV		2	15	O	GC

APPENDIX B

REVISED TECHNICAL SPECIFICATIONS PAGES

LIMITING CONDITIONS FOR OPERATION

3.2 Protective Instrumentation

Applicability:

Applies to the plant instrumentation which initiates and controls a PROTECTIVE FUNCTION.

Objective:

To assure the OPERABILITY of protective instrumentation.

Specifications:

A. Primary Containment Isolation Functions

The LIMITING CONDITIONS FOR OPERATION for the instrumentation that initiates primary containment isolation are given in Table 3.2.A. This instrumentation shall be OPERABLE whenever PRIMARY CONTAINMENT INTEGRITY is required.

B. Core and Containment Cooling Systems Initiation and Control

The LIMITING CONDITIONS FOR OPERATION for the instrumentation that initiates or controls the core and containment cooling systems are given in Table 3.2.B. This instrumentation shall be OPERABLE whenever the system it initiates or controls is required to be OPERABLE as specified in Section 3.5.

C. Control Rod Block Actuation

The LIMITING CONDITIONS FOR OPERATION for the instrumentation that initiates control rod blocks are given in Table 3.2.C.

SURVEILLANCE REQUIREMENT

4.2 Protective Instrumentation

Applicability:

Applies to the surveillance requirement of the instrumentation that initiates and controls a PROTECTIVE FUNCTION.

Objective:

To specify the type and frequency of surveillance to be applied to protective instrumentation.

Specifications:

A. Primary Containment Isolation Functions

Instrumentation shall be functionally tested and calibrated as indicated in Table 4.2.A.

System logic shall be functionally tested as indicated in Table 4.2.A.

B. Core and Containment Cooling Systems Initiation & Control

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.B.

System logic shall be functionally tested as indicated in Table 4.2.B.

C. Control Rod Block Actuation

Instrumentation shall be functionally tested, calibrated and checked as indicated in Table 4.2.C.

System logic shall be functionally tested as indicated in Table 4.2.C.

COOPER NUCLEAR STATION
TABLE 3.2.A
PRIMARY CONTAINMENT AND REACTOR VESSEL ISOLATION INSTRUMENTATION

Instrument	Instrument I.D. No.	Setting Limit	Minimum Number of OPERABLE Components Per Trip System (1)	Action Required When Component OPERABILITY is Not Assured (2)
Main Steam Line High Radiation	RMP-RM-251 A,B,C,&D	≤ 3 Times Full Power	2	C
Reactor Low Water Level	NBI-LIS-101 A,B,C,&D #1	≥+4.5 in. Indicated Level	2(4)	A or C
Reactor Low Low Low Water Level	NBI-LIS-57 A & B #1 NBI-LIS-58 A & B #1	≥-145.5 in. Indicated Level	2	A or B
Main Steam Line Leak Detection	MS-TS-121 A,B,C,&D 122, 123, 124, 143, 144, 145, 146, 147, 148, 149, 150	≤ 200°F	2(6)	A or B
Main Steam Line High Flow	MS-dPIS-116 A,B,C,&D 117, 118, 119	≤ 150% of Rated Steam Flow	2(3)	A or B
Main Steam Line Low Pressure	MS-PS-134 A,B,C,&D	≥ 825 psig	2(5)	A or B
High Drywell Pressure	PC-PS-12 A,B,C,&D	≤ 2 psig	2(4)	A or C
High Reactor Pressure	RR-PS-128 A & B	≤ 75 psig	1	D
Main Condenser Low Vacuum	MS-PS-103 A,B,C,&D	≥ 7" Hg (7)	2	A or B
Reactor Water Cleanup System High Flow	RWCU-dPIS-170 A & B	≤ 200% of System Flow	1	C
Reactor Water Cleanup System High Space Temperature	RWCU-TS-150 A,B,C,&D 152, 153, 154, 155, 156, 157, 158, 159 RWCU-TS-81 A, B, C, D, E, F, G, & H	≤ 200°F	2(6)	C

NOTES FOR TABLE 3.2.A

1. Whenever PRIMARY CONTAINMENT INTEGRITY is required there shall be two OPERABLE or tripped TRIP SYSTEMS for each function.

2. If the minimum number of OPERABLE INSTRUMENT CHANNELS per TRIP SYSTEM requirement cannot be met by a TRIP SYSTEM, that TRIP SYSTEM shall be tripped. If the requirements cannot be met by both TRIP SYSTEMS, the appropriate action listed below shall be taken.

   A. Be in at least HOT SHUTDOWN within 12 hours and in COLD SHUTDOWN within the next 24 hours.

   B. Initiate an orderly load reduction and have the Main Steam Isolation Valves shut within 8 hours.

   C. Isolate the affected system within 1 hour and declare the affected system inoperable.

   D. Isolate the Shutdown Cooling mode of RHR within 1 hour.

3. Two required for each steam line.

4. These signals also start the Standby Gas Treatment System and initiate Secondary Containment isolation.

5. Not required in the REFUEL, SHUTDOWN, and STARTUP/HOT STANDBY modes (interlocked with the Reactor Mode Selector Switch).

6. Requires one channel from each physical location for each TRIP SYSTEM.

7. Low vacuum isolation is bypassed when the turbine stop valve is not full open, manual bypass switches are in bypass and Reactor Mode Selector Switch is not in RUN.

8. The instruments on this table produce primary containment and system isolations. The following listing groups the system signals and the system isolated.

   Group 1

   Isolation Signals:

   1. Reactor Low Low Low Water Level (≥-145.5 in.)
   2. Main Steam Line Low Pressure (≥825 psig in the RUN mode)
   3. Main Steam Line Leak Detection (≤200°F)
   4. Condenser Low Vacuum (≥7" Hg vacuum)
   5. Main Steam Line High Flow (≤150% of rated flow)

   Isolations:

   1. MSIVs
   2. Main Steam Line Drains

   Group 2

   Isolation Signals:

   1. Reactor Low Water Level (≥4.5 inches)
   2. High Dry Well Pressure (≤ 2 psig)

   Isolations:

   1. RHR Shutdown Cooling mode of the RHR System.
   2. Drywell floor and equipment drain sump discharge lines.
   3. TIP ball valves
   4. Group 6 isolation relays
   5. Drywell Air Sampling System

NOTES FOR TABLE 3.2.A (cont'd.)

Group 3

Isolation Signals:

1. Reactor Low Water Level (≥4.5 inches)
2. Reactor Water Cleanup System High Flow (≤200% of system flow)
3. Reactor Water Cleanup System High Area Temperature (≤ 200°F)

Isolations:

1. Reactor Water Cleanup System

Group 4

Isolation Signals:

Provided by instruments on Table 3.2.B (HPCI)

Isolations:

Isolates the HPCI steem line

Group 5

Isolation Signals:

Provided by instruments on Table 3.2.B (RCIC)

Isolations:

Isolates the RCIC steam line.

Group 6

Isolation Signals:

1. Group 2 Isolation Signal
2. Reactor Building H&V Exhaust Plenum High Radiation (⟨100 mr/hr)

Isolations:

1. Secondary Containment Isolation
2. Start Standby Gas Treatment System

Group 7

Isolation Signals:

1. Reactor Low Low Low Water Level (≥-145.5 in)
2. Main Steam Line High Radiation (≤3 times full power background)

Isolations:

1. Reactor Water Sample Valves

3.2 BASES

In addition to Reactor Protection System instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operator's ability to control, or terminates operator errors before they result in serious consequences. This set of specifications provides the LIMITING CONDITIONS FOR OPERATION for the primary containment isolation function, initiation of the core cooling systems, control rod block and Standby Gas Treatment System. The objectives of the specifications are (1) to assure the effectiveness of the protective instrumentation when required and provide the actions required when portions of these systems are inoperable, and (2) to prescribe the trip settings required to assure adequate performance. When necessary, one INSTRUMENT CHANNEL may be made inoperable for brief intervals to conduct required INSTRUMENT FUNCTIONAL TESTS and INSTRUMENT CALIBRATIONS.

Some of the settings on the instrumentation that initiate or control core and containment cooling have tolerances explicitly stated where the high and low values are both critical and may have a substantial effect on safety. The setpoints of other instrumentation, where only the high or low end of the setting has a direct bearing on safety, are chosen with sufficient margin from the normal operating range to prevent inadvertent actuation of the safety system involved and exposure to abnormal situations.

A. Primary Containment Isolation Functions

Actuation of primary containment isolation valves is initiated by protective instrumentation shown in Table 3.2.A which senses the conditions for which isolation is required. Such instrumentation must be OPERABLE whenever PRIMARY CONTAINMENT INTEGRITY is required.

The instrumentation which initiates primary containment isolation is connected in a dual bus arrangement.

The low water level instrumentation, set to trip at $\geq$ 168.5 inches (+4.5 inches) above the top of the active fuel, closes all isolation valves except those in Groups 1, 4, 5, and 7. Required valve closing times are given in Specification 3.7. For valves which isolate at this level this trip setting is adequate to prevent core uncovery in the case of a break in the largest line assuming a 60 second valve closing time. Required closing times are less than this.

The low low low reactor water level instrumentation is set to trip when the water level is $\geq$ 19 inches (-145.5 inches) above the top of the active fuel. This trip closes Groups 1 and 7 Isolation Valves (Reference 1), activates the remainder of the CSCS subsystems, and starts the emergency diesel generators. These trip level settings were chosen to be high enough to prevent spurious actuation but low enough to initiate CSCS operation and primary containment isolation so that post accident cooling can be accomplished, and the guidelines of 10CFR100 will not be exceeded. For large breaks up to the complete circumferential break of a 28-inch recirculation line and with the trip setting given above, CSCS initiation and primary system isolation are initiated in time to meet the above criteria. Reference USAR Section VI-5.3.

3.2.A BASES: (Cont'd)

The high drywell pressure instrumentation is a diverse signal for malfunctions to the water level instrumentation and in addition to initiating CSCS, it causes isolation of Group 2 and 6 isolation valves. For the breaks discussed above this instrumentation will generally initiate CSCS operation before the low-low-low water level instrumentation; thus the results given above are applicable here also. The water level instrumentation initiates protection for the full spectrum of loss-of-coolant accidents and causes isolation of all isolation valves except Groups 4 and 5.

Venturis are provided in the main steam lines as a means of measuring steam flow and also limiting the loss of mass inventory from the vessel during a steam line break accident. The primary function of the instrumentation is to detect a break in the main steam line. For the worst case of accident, main steam line break outside the drywell, a trip setting limit of $\leq$ 150% of rated steam flow in conjunction with the flow limiters and main steam line valve closure, limits the mass inventory loss such that fuel is not uncovered, fuel clad temperatures peak at approximately 1000°F and release of radioactivity to the environs is below 10CFR100 guidelines. Reference USAR Section XIV-6.5.

Temperature monitoring instrumentation is provided in the main steam tunnel and along the steam line in the turbine building to detect leaks in these areas. Trips are provided on this instrumentation and when exceeded, cause closure of isolation valves. The setting limit is $\leq$ 200°F for the main steam leak detection system. For large breaks, the high steam flow instrumentation is a backup to the temperature instrumentation.

High radiation monitors in the main steam tunnel have been provided to detect gross fuel failure as in the control rod drop accident. These monitors alert control room operators to potential fuel degradation by means of an alarm set at $\leq$ 1.5 times the normal background, and initiate a Group 7 isolation at $\leq$ 3 times the normal background.

Pressure instrumentation is provided to close the Main Steam Isolation Valves in RUN Mode when the main steam line pressure drops below Specification 2.1.A.6. The Reactor Pressure Vessel thermal transient due to an inadvertent opening of the turbine bypass valves when not in the RUN Mode is less severe than the loss of feedwater analyzed in Section XIV-5 of the USAR, therefore, closure of the Main Steam Isolation Valves for thermal transient protection when not in RUN mode is not required.

The Reactor Water Cleanup System high flow and temperature instrumentation are arranged similar to that for the HPCI. The trip settings are such that core uncovery is prevented and fission product release is within limits.

Requirements for inoperable primary containment isolation valves are in Specification 3.7.D.

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TABLE 3.7.1 (Page 2)
PRIMARY CONTAINMENT ISOLATION VALVES

Valve & Steam	Number of Power Operated Valves Inboard	Outboard	Maximum Operating Time (Sec) (1)	Normal Position (2)	Action On Initiating Signal (3)
Primary Containment Purge & Vent PC-246AV, PC-231MV		2	15	C	SC
Primary Containment & N_2 Supply PC-238AV, PC-232MV		2	15	C	SC
Suppression Chamber Purge & Vent PC-230MV Bypass (PC-305MV)		1	40	C	SC(4)
Primary Containment Purge & Vent PC-231MV Bypass (PC-306MV)		1	40	C	SC(4)
Dilution Supply					
PC-1303MV, PC-1304MV		2	15	C	SC
PC-1305MV, PC-1306MV		2	15	C	SC
Dilution Supply					
PC-1301MV, PC-1302MV		2	15	O	GC
PC-1311MV, PC-1312MV		2	15	O	GC
Suppression Chamber Purge and Vent Exhaust PC-1308MV		1	15	C	SC
Primary Containment Purge and Vent Exhaust PC-1310MV		1	15	C	SC
Drywell Air Sampling System					
RMV-10AV, RMV-11AV		2	15	O	GC
RMV-12AV, RMV-13AV		2	15	O	GC