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October 9, 2006

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Subject: Duke Power Company LLC
d/b/a Duke Energy Carolinas, LLC
Oconee Nuclear Station
Docket 50-269, -270, -287
Selected Licensee Commitments Manual (SLC)

Gentlemen:

Pursuant to 10CFR 50.4 and 50.71, please find attached 7 copies of the latest revisions to the Oconee Selected Licensee Commitments Manual (SLC). The SLC Manual is Chapter 16.0 of the Oconee Updated Final Safety Analysis Report (UFSAR). This manual is intended to contain commitments and other station issues that warrant higher control, but are not appropriate for inclusion into the Technical Specifications (TS). Instead of being updated with the annual UFSAR Update, the SLC Manual will be updated as necessary throughout the year.

Very truly yours,

Bruce Hamilton

B. H. Hamilton
Vice President
Oconee Nuclear Station

RGJ/rgj
Attachment

xc: W. D. Travers
Regional Administrator, Region II

L. N. Olshan, ONRR

Dan Rich,
Oconee Resident Inspector

A053

Bxc: ELL
ONS Document Management
MR Coordinator (Ron Harris)

October 9, 2006

Subject: Oconee Selected Licensee Commitments Manual (SLC) Revision

On 12/09/04, Station Management approved Selected Licensee Commitments (SLC) Change 2004-12 to revise SLC 16.6.1 to reflect that penetrations 63 and 64 have been installed on all three Units. Modification NSM ON-33107 installed them on Unit 3 during this past outage.

Please revise your manual as instructed below.

Remove these pages	Insert these pages
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SLC Page 16.6.1-3	SLC Page 16.6.1-3
SLC Page 16.6.1-4	SLC Page 16.6.1-4

Any questions concerning these revisions may be directed to Reene Gambrell at 864-885-3364.

Regulatory Compliance
By: Gail Joyner
Regulatory Compliance

Oconee Nuclear Station
Selected Licensee Commitments Revised 09/11/06

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Proposed SLC revision

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16.6 ENGINEERED SAFETY FEATURES

16.6.1 Containment Leakage Tests

COMMITMENT The local leak rate shall be measured for the containment penetrations listed in Table 16.6-1 in accordance with ITS SR 3.6.1.2.

APPLICABILITY MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. NA	A.1 NA	NA

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 16.6.1.1 NA	NA

BASES

This commitment establishes the list of penetrations that require local leak rate testing in accordance with ITS SR 3.6.1.2. This list was removed from the Technical Specifications in accordance with the guidance in NRC Generic Letter 91-08.

The requirement to leak test the blind isolation flanges on the containment Hydrogen Recombiner System permanent piping after each installation was relocated from CTS 4.4.3.1.b during conversion to the ITS.

The Containment Leak Rate Testing Program (Type A and Type B Tests only) is credited in Oconee License Renewal with managing aging of steel components of the Reactor Building Containment for the period of extended operation.

REFERENCES

1. 10 CFR 50, Appendix J.
2. NRC Generic Letter 91-08.
3. UFSAR section 3.8.1.7.4, 6.2.3, 6.2.4, and Table 18-1.
4. OSS-0274.00-00-0016, Oconee License Renewal Commitments.

Table 16.6-1
List of Penetrations With 10 CFR 50 Appendix J Requirements

Penetration Number	System	Type A Test System Condition	Local Leak Test	Remarks
1	Pressurizer sample line (Unit 1 only)	Vented - Note 1, 2	Type C	
2	OTSG A Sample line	Not Vented	None Required	
3	Component Cooling inlet line	Vented - Note 1, 2	Type C	
4	OTSG B drain line	Not Vented	None required	
5a	RB normal sump drain line portion	Not Vented	None required	
5a	Hydrogen Recombiner drains portion	Not Vented	None required	
5b	Post Accident Liquid Sample Line	Vented - Note 1, 2	Type C	
6	Letdown line	Vented - Note 1, 2	Type C	
7	RC Pump seal return line	Not Vented	Type C	Note 3
8a	Pressurizer Aux. Spray Line	Not Vented	None Required	
8b	Loop A nozzle warming line	Not Vented	None Required	
9	RCS normal makeup line and HP injection "A" loop	Not Vented	None Required	
10a	RC Pump B1 seal injection	Not Vented	Type C	
10b	RC Pump B2 seal injection	Not Vented	Type C	
11a	Fuel transfer tube cover portion	Not Vented	Type B	
11b	RC Makeup Pump suction portion	Vented - Note 1, 2	Type C	
11c	Fuel transfer tube drain portion	Vented - Note 1, 2	Type C	
12a	Fuel transfer tube cover portion	Not Vented	Type B	
12b	RC Makeup Pump discharge portion	Vented - Note 1, 2	Type C	
13	RB Spray inlet line	Not Vented	None Required	
14	RB Spray inlet line	Not Vented	None Required	
15	LPI and DHR inlet line	Not Vented	None Required	
16	LPI and DHR inlet line	Not Vented	None Required	
17	OTSG B Emergency FDW line	Not Vented	None Required	
18	Quench tank vent line	Vented - Note 1, 2	Type C	Note 3
19	RB purge inlet line	Vented – Note 1	Type C	Note 3
20	RB purge outlet line	Vented – Note 1	Type C	Note 3

Table 16.6-1
List of Penetrations With 10 CFR 50 Appendix J Requirements

Penetration Number	System	Type A Test System Condition	Local Leak Test	Remarks
21	LPSW to RC Pump motors and lube oil coolers inlet	Not Vented	None Required	
22	LPSW from RC Pump motors and lube oil coolers outlet	Not Vented	None Required	
23a	RC Pump A1 seal injection	Not Vented	Type C	
23b	RC Pump A2 seal injection	Not Vented	Type C	
24a	RB H_2 Analyzer Train A	Vented – Note 1	Type C	
24b	RB H_2 Analyzer Train A	Vented – Note 1	Type C	
25	OTSG B Feedwater line	Not Vented	None Required	
26	OTSG A Main steam line	Not Vented	None Required	
27	OTSG A Feedwater line	Not Vented	None required	
28	OTSG B Main steam line	Not Vented	None required	
29	Quench tank drain line	Vented - Note 1, 2	Type C	Note 3
30, 31, 32	LPSW for RB Cooling units inlet line	Not Vented	None required	
33, 34, 35	LPSW for RB cooling units outlet line	Not Vented	None required	
36, 37	RB emergency sump recirculation line	Not Vented	None required	
38	Quench tank cooler inlet line	Vented - Note 1, 2	Type C	
39a (Unit 2, 3 only)	CFT Vent Line	Vented - Note 1, 2	Type C	
39b	HP Nitrogen supply	Vented - Note 1	Type C	
40	RB emergency sump drain line	Not Vented	None required	
40 (Unit 1, 3 only)	LDST drain line portion	Not Vented	None required	
41	Instrument air supply & ILRT verification line	Vented – Note 1	Type C	
42a	RB H_2 Analyzer Train B	Vented – Note 1	Type C	
42b	RB H_2 Analyzer Train B	Vented – Note 1	Type C	
43	OTSG A drain line	Not Vented	None required	
44	Component cooling to control rod drive inlet line	Vented - Note 1, 2	Type C	
45a	ILRT instrument line	Vented - Note 1, 2	Type C	
45b	ILRT instrument line	Vented - Note 1, 2	Type C	
45c (Units 2 & 3)	ILRT instrument line	Vented - Note 1, 2	Type C	
48	Breathing air inlet	Vented – Note 1	Type C	

Table 16.6-1
List of Penetrations With 10 CFR 50 Appendix J Requirements

Penetration Number	System	Type A Test System Condition	Local Leak Test	Remarks
49 (Unit 1 only)	LP Nitrogen supply	Vented – Note 1	Type C	
50	OTSG A Emergency FDW line	Not Vented	None required	
51	ILRT Pressurization line	Vented – Note 1	Type C	
52	HP injection to 'B' loop	Not Vented	None required	
53a (All)	HP Nitrogen supply to 'A' core flood tank	Vented - Note 1	Type C	
53b (Units 2,3)	LP Nitrogen supply	Vented – Note 1	Type C	
54	Component cooling outlet line	Vented - Note 1, 2	Type C	Note 3
55	Demineralized water supply	Vented - Note 1, 2	Type C	
56	Spent fuel canal fill and drain	Vented - Note 1, 2	Type C	
57 (Unit 1 only)	DHR return line	Not Vented	None required	
58a (Unit 2, 3)	Pressurizer sample line	Vented - Note 1, 2	Type C	
58b (All)	OTSG B sample line	Not Vented	None required	
59	CF tank sample line	Not Vented	None required	
60	RB sample line (outlet)	Vented - Note 1	Type C	Note 3
61	RB sample line (inlet)	Vented - Note 1	Type C	Note 3
62 (Units 2, 3 Only)	DHR return line	Not Vented	None required	
63	LPSW RBAC Supply	Vented – Note 1,2	Type C	
64	LPSW RBAC Return	Vented - Note 1,2	Type C	
90	Personnel hatch		Type B	
91	Equipment hatch	Vented	Type B	
92	Emergency hatch	Vented	Type B	
101 through 105	Electrical Penetrations	Vented	Type B	

NOTE 1 Pathways shall be vented to the containment atmosphere during the test. Vented pathways shall be drained of fluid to the extent necessary to expose the pathway to post accident differential pressure.

NOTE 2 Pathways which are Type B or Type C tested within the previous 24 months need not be vented or drained during the Type A test.

NOTE 3 Reverse direction test of inside containment isolation valve authorized. Leakage results are conservative.

GENERAL NOTE: Refer to OSS-0254.00-00-4001 for specific penetration testing and alignment bases.

Attachment #2

Markup of current SLC

Table 16.6-1
List of Penetrations With 10 CFR 50 Appendix J Requirements

Penetration Number	System	Type A Test System Condition	Local Leak Test	Remarks
49 (Unit 1 only)	LP Nitrogen supply	Vented – Note 1	Type C	
50	OTSG A Emergency FDW line	Not Vented	None required	
51	ILRT Pressurization line	Vented – Note 1	Type C	
52	HP injection to 'B' loop	Not Vented	None required	
53a (All)	HP Nitrogen supply to 'A' core flood tank	Vented - Note 1	Type C	
53b (Units 2,3)	LP Nitrogen supply	Vented – Note 1	Type C	
54	Component cooling outlet line	Vented - Note 1, 2	Type C	Note 3
55	Demineralized water supply	Vented - Note 1, 2	Type C	
56	Spent fuel canal fill and drain	Vented - Note 1, 2	None required	
57 (Unit 1 only)	DHR return line	Not Vented	None required	
58a (Unit 2, 3)	Pressurizer sample line	Vented - Note 1, 2	Type C	
58b (All)	OTSG B sample line	Not Vented	None required	
59	CF tank sample line	Not Vented	None required	
60	RB sample line (outlet)	Vented - Note 1	Type C	Note 3
61	RB sample line (inlet)	Vented - Note 1	Type C	Note 3
62 (Units 2,3 Only)	DHR return line	Not Vented	None required	
63 (Unit 2 Only)	LPSW RBAC Supply	Vented – Note 1, 2	Type C	
64 (Unit 2 Only)	LPSW RBAC Return	Vented – Note 1,2	Type C	
90	Personnel hatch	Vented	Type B	
91	Equipment hatch	Vented	Type B	
92	Emergency hatch	Vented	Type B	
101 through 105	Electrical Penetrations	Vented	Type B	

NOTE 1 Pathways shall be vented to the containment atmosphere during the test. Vented pathways shall be drained of fluid to the extent necessary to expose the pathway to post accident differential pressure.

NOTE 2 Pathways which are Type B or Type C tested within the previous 24 months need not be vented or drained during the Type A test.

NOTE 3 Reverse direction test of inside containment isolation valve authorized. Leakage results are conservative.

GENERAL NOTE: Refer to OSS-0254.00-00-4001 for specific penetration testing and alignment bases.

Attachment #3

10CFR50.59 Evaluation for SLC Revision

September 30, 2004

E. S. Durham ON02PM

Subject: Oconee Nuclear Station, Unit 3
NSM ON-33107/0 Parts A and B
Convert Two Electrical Penetrations into Two Mechanical Fluid Penetrations (Part A) and LPSW Supply Upgrade to Reactor Building Auxiliary Coolers (Part B)
10 CFR 50.59 Evaluation

This NSM consist of Part A and Part B. Note that the NSM parts may be installed separately or together, thus the parts were evaluated both individually and together. Since both parts may also be installed together, any differences in the information for each part being installed separately were also addressed. Thus, this 10 CFR 50.59 is also valid for Parts A and B if they are installed individually or together. This evaluation is also valid for implementing the new cabinets and/or wet taps identified with Part B if they are implemented independent of the rest of Part B.

This 10 CFR 50.59 evaluation determined that none of the 10 CFR 50.59 criteria were met for Part A of this NSM. UFSAR Section 3.8.1.5.4 and Figure 3-20 are to be revised to reflect Part A of this NSM. No technical specification or SLC changes are required for Part A.

This 10 CFR 50.59 evaluation determined that none of the 10 CFR 50.59 criteria were met for Part B of this NSM. No technical specification changes are required for Part B.

There are numerous changes to the UFSAR and a change to a SLC table due to Part B of the NSM. UFSAR Sections 3.7.3.9, 6.2.2.2.7, 6.2.3.2, 9.2.2.2.3, and 9.4.6.2 are to be revised to reflect changes due to Part B of this NSM. UFSAR Figures 6-3, 6-4, 6-9, 8-4, and 9-12 are also to be revised. For UFSAR Figures 6-3, 6-4, and 9-12, the original figure is to be revised to indicate it is for Units 1 and 2 and a second page for this figure is to be added to reflect the Unit 3 design. UFSAR Table 6-7 and 7-3 are to be revised. SLC Table 16.6-1 is to be revised.

If the cabinets and/or wet taps are installed independent of Part B, there are no UFSAR, Technical Specification, or SLC changes required.

The waterhammer prevention circuitry is to enhance prevention of waterhammer, but is currently not to be used to resolve the waterhammer issue identified in Generic Letter 96-06. This differentiation is important since taking credit for this circuitry to prevent Generic Letter 96-06 waterhammer issues during certain accidents and events may require a technical specification to address the circuitry.

The NSM includes pipe connections for the temporary chiller. This NSM does not address the use of the temporary chiller. Thus, this 10 CFR 50.59 does not address the use or function of the temporary chiller.

This evaluation is not addressing procedures, procedure changes, implementation, or testing activities.

If you have any questions, please contact me at 885-4382.

Ken Sandel

K. W. Sandel, Engineer
Oconee Engineering Division

Attachment

KWS/

xc:	W. B. Edge	ON02PM
	H. E. Harling	ON02MO
	J. V. Weast	ON03RC
	NSRB Staff	EC05P
	B. L. Nichols	ON02MO
	R. V. Gambrell	ON03RC

Oconee Nuclear Site
Regulatory Compliance Group
10 CFR 50.59 REVIEW SHEET:

The following criteria are used to determine the regulatory adequacy of the 10 CFR 50.59 (50.59) report and whether additional reviews of the report are deemed necessary. The RCG reviewer should understand the technical aspects of the change but is not responsible for verifying that portion of the change. NOTE: The 50.59 preparers are encouraged to obtain all of the necessary technical reviews and obtain concurrence prior to requesting the RCG review.

Because this review is a licensing basis review and not a verification of the 50.59 test, The RCG reviewer should be familiar with the 50.59 process but does not necessarily have to be 50.59 qualified at Oconee. Deviations or questionable findings will be promptly discussed with the 50.59 originator. This sheet along with a copy of the 50.59 will be maintained by RCG. A copy of this sign-off sheet will be given to the 50.59 owners following the completion of the review.

I 10 CFR 50.59 DESCRIPTION/APPROVAL DATE

RBAC LPSW Piping Penetration Modification / 9-29-04

II LB REVIEW CRITERIA (CIRCLE CHOICES)

1. Is the proposed change understandable and clearly written? (YES) NO
2. Is the current licensing basis (CLB) clearly described? (YES) NO
3. Is the CHANGE to the CLB clearly described? (YES) NO
4. This is not a change to a previous non-UFSAR chapter 15 analyzed event or accident. (YES) NO
5. Are 50.59 questions answered appropriately in regards to the change in the CLB? (YES) NO
6. Are references listed to appropriately describe the CLB? (YES) NO

If all "YES", the 50.59 has been determined to be adequate. Any "NO" response should be promptly rectified by the preparer and the report re-evaluated by RCG.

Reviewed by: Reene Gambrell Date: 9/30/04
Regulatory Compliance Engineer

Approved by: [signature] Date: 9/30/04
RCG Compliance Manager or
RCG Duty Person

10CFR50.59 EVALUATION					Page 1 of 2
DUKE POWER SITE			UNIT(S)		
☒ Oconee	☐ McGuire	☐ Catawba	☐ Unit 1	☐ Unit 2	☒ Unit 3

ACTIVITY TITLE/DOCUMENT/REVISION

NSM ON-33107 Parts A and B - Modify LPSW Piping to & from RBACs (Includes Electrical to Mech Penetration Conversion)

CONCLUSIONS

Check all that apply:

- ☐ **The activity requires a change to the Technical Specifications.**
- ☐ **One or more of the 8 Evaluation criteria are met; LAR Required.**
- ☒ **The activity requires a UFSAR change.**
- ☒ **The activity does NOT require prior NRC approval.**

SIGNOFFS

(Print Name)	Kenneth Sandel EVALUATION PREPARER	(Sign)	KW Sandel	DATE	9/21/04
	Warren Bright		Warren A Bright		9/29/04
(Print Name)	R. Scott Manning EVALUATION REVIEWER	(Sign)	R. Scott Manning	DATE	9-28-04

Note: The Evaluation Reviewer is responsible for assuring a copy of the 10CFR50.59 Evaluation is sent to the site Regulatory Compliance Group and the NSRB (Mail Code EC05P).

SUMMARY

ACTIVITY DESCRIPTION:
See Attachment 1

SUMMARY OF EVALUATION:

See Attachment 1

TECHNICAL SPECIFICATIONS REVIEW

Does the proposed activity require a modification, deletion, or addition to the Technical Specifications? ☐ YES ☒ NO

If "YES," then identify Technical Specification sections that require change.
This NSM is divided into Part A and Part B. Part A does not require a Technical Specification change. Part B also does not require a Technical Specification change, since no licensing basis credit is currently being taken for the new Waterhammer Prevention circuitry.

10CFR50.59 EVALUATION QUESTIONS

For each question, check the correct response and provide justification. If the answer to any question is "YES," then the proposed activity may not be implemented until a License Amendment has been requested and obtained from the NRC.

EFFECT ON ACCIDENTS AND MALFUNCTIONS EVALUATED IN THE LICENSING BASIS DOCUMENTS

1. **Does the proposed activity result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the UFSAR?** ☐ YES ☒ NO

   JUSTIFICATION:
   See Attachment 1

2. **Does the proposed activity result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR?** ☐ YES ☒ NO

   JUSTIFICATION:
   See Attachment 1

3. **Does the proposed activity result in more than a minimal increase in the consequences of an accident previously evaluated in the UFSAR?** ☐ YES ☒ NO

JUSTIFICATION:
See Attachment 1

4. **Does the proposed activity result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR?** ☐YES ☒NO

JUSTIFICATION:
See Attachment 1

POTENTIAL FOR CREATION OF A NEW TYPE OF UNANALYZED EVENT

5. **Does the proposed activity create a possibility for an accident of a different type than previously evaluated in the UFSAR?** ☐YES ☒NO

JUSTIFICATION:
See Attachment 1

6. **Does the proposed activity create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR?** ☐YES ☒NO

JUSTIFICATION:
See Attachment 1

IMPACT ON FISSION PRODUCT BARRIERS

7. **Does the proposed activity result in a design basis limit for a fission product barrier as described in the UFSAR being exceeded or altered?** ☐YES ☒NO

JUSTIFICATION:
See Attachment 1

IMPACT ON EVALUATION CONSERVATISM

8. **Does the proposed activity result in a departure from a method of evaluation described in the UFSAR used in establishing the design bases or in the safety analyses?** ☐YES ☒NO

JUSTIFICATION:
See Attachment 1

REFERENCES

List applicable references. Include sufficient identifying detail to facilitate independent review and retrieval.

See Attachment 1

NSD 209, Rev 9

ACTIVITY DESCRIPTION

The purpose of this NSM is to modify the Low Pressure Service Water (LPSW) System to provide containment isolation of the Reactor Building Auxiliary Coolers (RBAC) during an accident such that the piping to and from the RBACs is not credited as a containment boundary. This modification will also convert two spare electrical containment penetrations to two mechanical fluid penetrations (Reference 4).

The modification consists of Part A and Part B. All installation activities associated with the conversion of the spare electrical penetrations to mechanical penetration assemblies will constitute Part A. The remaining portions of the modification will be implemented in Part B (Reference 4).

Part A of NSM ON-33107 is to convert two spare electrical penetrations into two mechanical fluid penetrations. The existing spare electrical penetrations consist of 12 inch pipes that pass through containment with a plate welded on the Reactor Building side of the pipe. These spare electrical penetrations will be modified to allow piping to be installed. Piping that will be used as LPSW System piping in Part B is to pass through the existing 12 inch pipe and is to be connected to the liner plate with a dished head. The dished head will be welded to the containment liner plate. The end of the pipe will extend past the dished head into containment. A pipe cap will be welded to the end of the containment side of the pipe if Part A is to be installed without Part B also being installed. The dished head/piping/cap will become a portion of the containment pressure boundary. Guide lugs (i.e., lateral restraints) will be provided on the end of the penetration pipe opposite the dished head/cap. The new fluid penetrations will be designated as Penetrations 63 and 64 (References 4 and 6).

Part B of the NSM will isolate the LPSW piping associated with the RBACs from the LPSW supply to the "B" Reactor Building Cooling Unit (RBCU). The NSM will tie the RBAC piping to the LPSW supply and return main headers in the Auxiliary Building by utilizing the two converted penetrations from Part A of this NSM. Two air operated valves per penetration (supply header and return header) will be provided as containment isolation valves for the RBAC supply and return piping that penetrates the Reactor Building to ensure that the integrity of the containment is maintained following a design basis accident. Valves, flow measurement orifices, instrumentation, test connections and flanges will also be provided. This modification is to provide seismically qualified QA-1 piping and components to meet the requirements of the Updated Final Safety Analysis Report (UFSAR). The portion of the RBACs piping inside the containment will no longer be credited as a containment barrier (Reference 4).

The modification will remove the existing valve 3LPSW565, which is a Motor Operated Valve (MOV) in the Reactor Building, and the connection to the RBCU piping will be capped. The existing valve 3LPSW566, which is also an MOV located in the reactor building, will be removed. As a result, the Engineered Safeguards (ES) signal that 3LPSW565 and 566 receives from Channels 5 and 6 will be removed from these valves. The ES channel 5 signals that currently go to 3LPSW565 and 3LPSW566 are to be utilized with the first outside containment isolation valves (3LPSW1055 and 3LPSW1061) for the new penetration assemblies 63 and 64. The ES channel 6 signals that currently go to 3LPSW565 and 3LPSW566 will be utilized with the second outside containment isolation valves (3LPSW1054 and 3LPSW1062) (Reference 4).

Waterhammer prevention circuitry, also known as RBAC Isolation Circuitry, is to be provided that will close the containment isolation valves on low LPSW supply pressure to prevent a column closure waterhammer prior to LPSW system repressurization. This circuitry is to enhance prevention of waterhammer, but is currently not to be used to resolve the waterhammer issue identified in Generic Letter 96-06. This differentiation is important since taking credit for this circuitry to prevent Generic Letter 96-06 waterhammer issues during certain accidents and events requires a technical specification to address the circuitry (Reference 4). By using the philosophy of not taking credit for the circuitry in the licensing basis, the circuitry does not meet 10 CFR 50.36 criteria for requiring a new technical specification.

Operator Aid Computer indication is to be provided for the 4 new Air Operated Valves (AOV) containment isolation valves' position, the RBACs supply and return flow rates, and a new RBAC tube rupture alarm (based on flow mismatch). To assist in meeting the requirement of Generic Letter 96-06 for thermal overpressure protection, each penetration is provided with a relief valve (3LPSW-1057 and 3LPSW-1089) between the penetration and the adjoining valve inside containment. Piping and valves will be added in the Auxiliary Building between the LPSW supply & return main headers and the RBAC to allow the hook up and usage of the temporary chiller during outages (Reference 4).

Add new QA-1 auxiliary terminal cabinets in the Unit 3 Cable Room. These cabinets are necessary on Unit 3 to supply space for this NSM (Reference 4).

Several options are being considered with respect to implementation of this NSM. The first option is to perform the implementation of Part A and Part B together during the same outage. The second option is to install Part A in one outage and Part B during a different outage. A variation within these options is to install the new electrical cabinets that are identified with Part B at any time. If the cabinets are installed independent of Part B, they will not be made functional (i.e., no components installed or cables pulled to them). An additional variation is to install the wet taps identified with Part B (including tapping valves) such that they tie into the new LPSW lines into the existing LPSW supply and return headers at any time. If the wet taps are installed independent of Part B, blind flanges will also be installed. Since the NSM parts may be installed separately, the NSM parts will be evaluated individually. Thus, this evaluation will address both parts implemented together. The implementation of the electrical cabinets and the wet taps (with valves and blind flanges) identified with Part B will be evaluated from the standpoint of them being installed separately also. Thus, this 10 CFR 50.59 will be valid for any of these options or variations.

See Reference 4 for additional modification details.

This evaluation is not addressing procedures, procedure changes, implementation, or testing activities.

SUMMARY OF EVALUATION

Part A

NSM ON-33107 Part A does not meet any of the 10 CFR 50.59 criteria. Part A does not require a Technical Specification or Selected Licensee Commitment (SLC) changes.

The containment is used to contain releases during accidents. The containment does not cause any accidents previously evaluated in the UFSAR. The new mechanical fluid penetrations do not cause adverse effects with respect to the containment design conditions. Appropriate design conditions are used in the mechanical penetration design. Thus, the containment and associated penetrations are not more likely to malfunction as evaluated in the UFSAR. In addition, there is not more than a minimal increase in the consequences of an accident that requires containment integrity or in the consequences of failure of a component or system that could create radiological releases. This activity does not introduce the possibility of a new accident because the new mechanical fluid penetrations are not an initiator of any accident and no new failure modes are introduced. This activity does not introduce the possibility for a malfunction of an SSC with a different result because the activity does not introduce a failure mode that is not bounded by those described in the UFSAR containment system description or the penetration descriptions. The fission product barriers are the fuel pellet, cladding, reactor coolant pressure boundary, and containment. This activity modifies the containment barrier, but does not alter plant safety limits, setpoints, or design basis limits for a fission product barrier, thus the activity does not result in exceeding or altering a design basis limit for a fission product barrier as described in the UFSAR. This activity does not involve a change in an evaluation methodology.

UFSAR Section 3.8.1.5.4 is to be revised to include specific codes and code sections for which the converted mechanical penetrations conform. UFSAR Figure 3-20 is to be revised to include information on the new spare penetrations.

Part B

NSM ON-33107 Part B does not meet any of the 10 CFR 50.59 criteria. Part B does not require a Technical Specification change since no licensing basis credit is being taken for the new waterhammer prevention circuitry.

The RBCUs and the RBACs are used to provide normal containment ventilation. The RBCUs also provide cooling during accidents. This NSM does not change the operation or function of the RBCUs during normal or emergency operation.

All new piping is to be stainless steel. The piping outside Containment that extends from the supply and return headers connection to the penetrations is to be QA-1 and Duke Class F, including the piping from the penetration to first manual valve inside containment. The tapping valve and blind flange (if installed) are QA-1 and Duke Class F. The LPSW piping to the RBACs inside Containment past the first manual valve from the penetration is to remain Seismic Category II to prevent adverse interaction of the non-safety piping with safety related components during an earthquake. The pipe class is to remain Class D. The electrical, instrumentation, and control components that are necessary to process and actuate ES signals and devices or to process and actuate signals and devices associated with the RBAC Isolation Circuitry are QA Condition 1. The RBAC Isolation Circuitry that closes the containment isolation valves on low LPSW pressure is QA-1, but can not be credited for preventing waterhammers to assure LPSW system functions at this time. The solenoid valves and the air supply line from the QA-1 containment isolation valves to the solenoid valves are QA-1 so that the air has a QA-1 flow path for air release when being closed. The non-QA instrumentation is in the Class F portion of the piping and is qualified for pressure boundary, but is not QA-1 for function. The electrical cabinets are mounted QA-1.

The new penetrations are to have double isolation barriers which are to consist of two valves for each penetration. The supply of LPSW flow to the RBACs will go directly to the RBACs. This LPSW flow will be isolated on an ES signal like the current design. Thus, a single failure will not prevent the RBACs from being isolated on an ES signal.

To assist in meeting the requirements of Generic Letter 96-06 for thermal overpressure protection, each penetration is provided with a relief valve (3LPSW-1057 and 3LPSW-1089) between the penetration and the adjoining valve inside containment.

The LPSW piping is in an operable but degraded/non-conforming condition due to the waterhammer concerns. The operable but degraded/non-conforming condition was established in response to Generic Letter 96-06. To address the waterhammer issue, the NSM will install an instrumentation system that will monitor for low LPSW supply header pressure, indicative of a loss of LPSW, and close RBAC supply and return valves. This system will eliminate both column closure waterhammer as well as condensation induced waterhammers. A new technical specification is planned for this system that will govern its operation. Since the new technical specification will not be approved prior to the implementation of the NSM, the new system can not be credited in the licensing basis with mitigating the event. The operable but degraded/non-conforming condition is based on the existing piping configuration. This NSM will modify a portion of that piping. The effect of the modified piping on the response of the piping system to the waterhammer events was evaluated. The circuitry was assumed out of service such that it would not function. The evaluation concluded that the piping changes will not adversely impact the existing predicted waterhammer response of the LPSW piping going to the RBACs. SLC 16.9.12 includes conditions to minimize waterhammers for certain valve positions, which includes using a method of isolating the RBACs using valve LPSW-565 for the units that do not have this RBAC modification installed. However, since the new waterhammer prevention circuitry can not be credited until the new technical specification is approved and implemented, SLC 16.9.12 was revised as a result of the comparable Unit 2 RBAC modification to account for a different method of isolating the RBACs if these same conditions exist for the units that have the RBAC modification installed. Thus the modified RBAC System will have comparable waterhammer protection features without taking credit for the new circuitry No additional changes are required for SLC 16.9.12 as a result of this Unit 3 NSM.

To assist in mitigating the effects of waterhammer that could be caused by filling of the voided line following the restart of the pump, both system design and specified procedural actions will also be included as part of the NSM. These actions are not currently intended to satisfy the Generic Letter 96-06 issues and are not considered as being part of the licensing basis event mitigation strategy. These actions are only intended to enhance the mitigation of waterhammer forces. The closure speed of the containment isolation valves is selected so that water hammers will not occur.

The LPSW required flow to components (e.g., RBCUs, LPI) is not adversely affected due to this NSM. In addition, flow to non-required loads (e.g., RBACs during normal operation) is not adversely affected. There are control board changes and QA-1 cabinet changes and cabinet additions associated with this NSM. The control boards and QA-1 cabinets are seismically qualified after these changes and additions. The cabling and other electrical components are adequately sized. The modification meets the applicable electrical separation criteria and specifications for electrical components as listed and described in the UFSAR. The modification does not create any new seismic/non-seismic interactions for Part B. New safety to non-safety (QA-1 to non-QA-1) electrical interfaces will have QA-1 isolation devices. For Part B, an electrical 10 CFR 50 Appendix R fire review was performed for the design phase with no adverse effects to the Appendix R fire separation requirements. The electrical equipment is qualified for its environment. The piping and supports of Part B are designed such that they meet applicable design codes when connected to the converted penetrations of Part A. The piping was reanalyzed to address the installation of the wet taps and associated hardware (e.g., tapping valves) for the condition of their being installed separately from Part B.

There are no adverse effects to structures, systems, or components associated with this NSM from missiles generated inside containment or missiles generated from natural phenomena events. There are also no adverse effects due to high or low trajectory missiles.

The new AOVs are to fail closed on a loss of power or loss of air. The outside containment isolation valves each use a Moore controller to throttle the valves. Supply header containment isolation valve 3LPSW-1054 and return header containment isolation valve 3LPSW-1062 have non-QA positioners on them and they can be throttled open using non-QA Moore controllers that are setup as manual loaders. The Moore controllers are located on the control board. The Moore controllers are setup with an interlock from the solenoid valve control circuits for the two supply or two return header valves that will cause the valve demand signal from the Moore to runback to the closed position. This prevents flow from being admitted to the RBACs when LPSW supply pressure is reestablished to prevent a waterhammer. The valves must be slowly reopened. An automatic ramp open function is to perform this action. If the power is lost to the Moore controller, then the respective valve will fail open. Even if the Moore controller loses power, the valve will still close automatically on receiving an ES signal and the operators can manually close any of the new containment isolation valves with the control room OPEN/CLOSE button. The QA-1 solenoid valves for the outermost containment isolation valves are on one power supply and the QA-1 solenoid valves for the innermost valves are on a different power supply.

A single failure will not prevent the new low pressure logic from actuating on low pressure. But a single failure could cause the new low pressure logic to inadvertently actuate the new AOVs, causing isolation of the RBACs. The RBACs are not safety related or QA-1 and are not used for accident mitigation. The Reactor Building Ventilation System, which includes the RBACs, does not have to meet the single failure criterion. Thus, assuring the RBACs perform their cooling function, assuming a single failure, is not required as part of the Oconee licensing basis.

The existing monitoring to the RBCUs will remain. The new LPSW lines to and from the RBACs will have flow monitoring instrumentation (flow orifices) and control room alarm included as part of the NSM. The instrumentation will be used to determine a differential flow to assist in detecting a loss of LPSW flow to and from the RBACs. Both the existing differential flow instrumentation for the RBCUs and the new instrumentation for the RBACs are non-QA for function. The existing RBCU differential flow instrumentation is not being changed. The new RBAC differential instrumentation is qualified for the pressure boundary.

There is no known specified closure time for containment isolation valves, but the time chosen is within the ranges of existing containment isolation valves.

The use of double AOVs outside of containment is to ensure that the RBACs are isolated prior to power being returned following an event assuming a single failure. The double isolation of the RBACs eliminates any post accident concerns associated with leakage of the RBACs with respect to containment integrity and sump dilution. The total volume of water that will be discharged from the thermal overpressure relief valve will be very small and will not adversely affect the volume of the sump's contents. This will have a negligible effect on boron concentration in the sump.

This activity does not alter plant safety limits, setpoints, or design basis limits for a fission product barrier. Thus, the activity does not result in exceeding or altering a design basis limit for a fission product barrier as described in the UFSAR. This activity does not involve a change in an evaluation methodology. Thus, this activity does not result in a departure from a method of evaluation in the UFSAR.

UFSAR Sections 3.7.3.9, 6.2.2.2.7, 6.2.3.2, 9.2.2.2.3, and 9.4.6.2 are to be revised to reflect changes due to Part B of this NSM. UFSAR Figures 6-3, 6-4, 6-9, 8-4, and 9-12 are also to be revised. For UFSAR Figures 6-3, 6-4, and 9-12, the original figure is to be revised to indicate it is for Units 1 and 2 and a second page for this figure is to be added to reflect the Unit 3 design. UFSAR Table 6-7 and 7-3 are to be revised. SLC Table 16.6-1 is to be revised.

If the cabinets and/or wet taps are installed independent of Part B, there are no UFSAR, Technical Specification, or SLC changes required.

BACKGROUND

The piping to the Reactor Building Auxiliary Coolers (RBACs) is currently credited as a closed loop piping system inside containment, but is not classified QA-1. Per UFSAR Section 3.1.1.1, this piping system that serves as containment barrier (including the piping penetration paths) is required to be QA-1 (Reference 4).

The RBACs were initially installed by station modification NSM ON-1261 between 1980 and 1982. During original installation, pressure within the RBACs was assumed to be greater than the maximum post-accident containment pressure (59 psig). With this assumption, containment integrity was not assumed to be affected by the installation of the RBACs. Therefore, the RBACs were installed as non-seismic and non-safety related (Duke Class G). In 1989, further evaluations determined that pressures within the RBACs could be less than maximum post-accident containment pressure. Therefore, it was concluded that the RBACs should be seismically qualified (per UFSAR Section 3.2.2) to ensure that containment integrity would be maintained during design basis accidents with a concurrent seismic event. It was determined that the LPSW pressure boundary associated with the RBACs was inappropriately classified as non-seismic Duke Class G piping. NSM ON-x2844 was completed to attempt to address this issue. As a part of NSM ON-x2844, the lack of seismic qualification (required in UFSAR Section 3.2.2) of the RBACs was addressed and the RBACs were upgraded to Duke Class D, QA-4. However, the requirement for the pressure boundary of the RBACs to be QA Condition 1, as specified by UFSAR Section 3.1.1.1, was not addressed since this UFSAR section was not written in its current format until 1995. Thus, the pressure boundary associated with the containment boundary of the RBACs on Penetrations 32 and 35 is currently seismically qualified (meets UFSAR 3.2.2) but non-safety related (does not meet UFSAR 3.1.1.1). Therefore, the subject penetrations are currently not in conformance with UFSAR Section 3.1.1.1 since the piping and components to the RBACs are not QA Condition 1 (Reference 4).

There were other issues identified during the review of the QA Condition that are not related to the QA Condition of the RBAC piping. The first issue relates to large portions of small bore raw water piping that need to be replaced due to various failures from degradation. Another issue involved waterhammer concerns. These concerns are associated with water hammers within the RBACs following an event that stops and restarts LPSW flow (e.g., LOOP). An additional issue involved providing isolation between the RBCUs and the RBACs to allow work on the RBCU discharge valves without requiring the RBACs to be removed from service (Reference 4).

LICENSING BASIS/ACTIVITY REVIEW

Note: Since Part A of this NSM may be installed independent of Part B, this 10 CFR 50.59 will evaluate both parts separately. The 10 CFR 50.59 will also address any aspects that need to be addressed if both parts are installed together. The variation of installing the new electrical cabinets identified with Part B if they are implemented independent of the rest of Part B will be addressed, if needed, with respect to any differences of installing Part B being installed as a complete part. Likewise, the installation of the wet taps (including tapping valves) and blind flanges (if installed) will be addressed as needed.

Note: The references in the quotes from the licensing documents are for those licensing documents and not for the references of this 10 CFR 50.59.

Part A

The containment consists of the Reactor Building structure, its steel liner, and the penetrations of this liner and structure. The containment is designed to contain radioactive material that may be released from the reactor core following an accident. Containment operability ensures that leakage rate limits (during design basis accidents) assumed within safety analysis are met (Reference 2, Section 3.6.1 Bases, and Reference 4).

The Reactor Building and its associated penetrations are a Class 1 structure. Class 1 structures are those which prevent uncontrolled release of radioactivity and they are designed to withstand all loadings without loss of function (Reference 1, Section 3.2.1.1.1).

The UFSAR (Reference 1) contains the following information in Section 3.1.49:

> "The Reactor Building, access openings and penetrations, have been designed to accommodate a pressure of 59 psig at 286°F (Section 6.2.1). As described in Section 15.14 these conditions exceed the greatest transient peak pressure associated with a hypothetical rupture of a pipe in the Reactor Coolant System, including the margin for the effects of metal-water reactions. The capacity of each Reactor Building Cooling System (Sections 6.2 and 6.2.2) is designed to remove heat from the Reactor Building to reduce pressure following a loss-of-coolant accident."

The converted penetrations are designed for the 59 psig and 286°F design conditions (Reference 4).

The UFSAR (Reference 1) contains the following information in Section 3.1.53:

> "Piping penetrations that require closure under accident conditions are provided with double barriers so that no single credible failure or malfunction could result in a loss of isolation. Valves are manually, electrically or pneumatically operated. Check valves are used in certain applications. All isolation valves inside the Reactor Building requiring remote operation are electrically operated. As an alternative to valves, other types of apparatus which provide a suitable barrier for containment isolation may be utilized. Examples of such mechanisms include, but are not limited to flanges and closed loop piping systems that are designed to remain intact when containment isolation is required."

If Part A is not installed coincident with the Part B portion, then, these penetrations do not require closure since they are spare penetrations that are already isolated by dished heads welded to the containment wall and pipe caps welded to the inside containment pipe end (References 4 and 6). If both parts are installed together, then the active components and double barrier aspect will be addressed by the Part B section of this 10 CFR 50.59.

The UFSAR (Reference 1) contains the following information in Section 3.1.54:

> "The Reactor Buildings are designed so that leakage rate can be determined at design pressure after completion and installation of all penetrations. The leak-rate test will verify that the maximum integrated leak rate does not exceed the design leakage rate."

The UFSAR (Reference 1) contains the following information in Section 6.2.1.1.1:

> "The Reactor Building completely encloses the Reactor Coolant System to minimize release of radioactive material to the environment should a serious failure of the Reactor Coolant System occur. The structure provides adequate biological shielding for both normal operation and accident situations. The Reactor Building is designed for an internal pressure of 59 psig. The leakage rate will not exceed 0.25 percent by volume in 24 hours under the conditions of the maximum hypothetical accident as described below.
>
> The Reactor Building is designed for an external pressure 3.0 psi greater than the internal pressure. The design external pressure of 3.0 psi corresponds to a margin of 0.5 psi above the differential pressure that could be developed if the building is sealed with an internal temperature of 120°F with a barometric pressure of 29.0 inches of Hg and the building is subsequently cooled to an internal temperature of 80°F with a concurrent rise in barometric pressure to 31.0 inches of Hg. The weather conditions assumed here are

conservative since an evaluation of National Weather Service records for this area indicates that from 1918 to 1970 the lowest barometric pressure recorded is 29.05 inches of Hg and the highest of 30.85 inches of Hg.

The principal design basis for the structure is that it be capable of withstanding the internal pressure resulting from a loss-of-coolant accident or a secondary line rupture with no loss of integrity. In a LOCA, the total energy contained in the water of the Reactor Coolant System is assumed to be released into the Reactor Building through a break in the reactor coolant piping. In a secondary line break event the energy contained in the water in the secondary coolant system, as well as energy transferred across the steam generator tubes from the Reactor Coolant System is assumed to be released into the Reactor Building through a break in the steam line piping. However, in the case of a secondary line break, the release of energy essentially stops when the faulted steam generator empties and is no longer being supplied with feedwater. In either case, subsequent pressure behavior is determined by the building volume, engineered safeguards, and the combined influence of energy source and heat sinks."

The spare converted mechanical penetrations are designed to the 3.0 psi differential pressure of the Reactor Building as described in UFSAR Section 6.2.1.1.1 (Reference 4).

The UFSAR (Reference 1) contains the following information in Section 6.2.3.1 relating to containment isolation design bases:

"The general design basis governing isolation requirements is:

Leakage through all fluid penetrations not serving accident-consequence limiting systems is to be minimized by a double barrier so that no single, credible failure or malfunction of an active component can result in loss-of-isolation or intolerable leakage. The installed double barriers take the form of closed piping systems, both inside and outside the Reactor Building, and various types of isolation valves."

If Part A is not installed coincident with the Part B portion, then the spare penetrations do not have any active components (References 4, 5, and 6). If both parts are installed together, then the active components and double barrier aspect will be addressed by the Part B section of this 10 CFR 50.59.

The UFSAR (Reference 1) contains the following information in Section 6.2.3.2 when describing a Type C fluid penetration that requires isolation after an accident:

"Each line not directly connected to the Reactor Coolant System or not open to the Reactor Building atmosphere has at least one valve, either a check valve or an automatic remotely operated valve. This valve is located outside the Reactor Building. A seismic closed loop forms the inside barrier for most Type C penetrations. Since the Component Cooling System has a non-seismic closed loop, penetrations for this system have an additional automatic remotely operated valve or check valve located inside the Reactor Building (referred to as Type III penetrations in the DBD)."

Further discussion of "closed loop piping systems" will be discussed later in the Part A section of this 10 CFR 50.59. If both parts are installed together, the isolation of the penetrations via isolation valves will be addressed in Part B of this 10 CFR 50.59.

UFSAR Section 3.2.2.2 (Reference 1), when addressing system piping classifications, contains the following information:

"Code Applicability: Due to the numerous code references located throughout this UFSAR, no attempt is made to revise these references as Codes are amended, superseded or substituted. Consequently, the station piping specifications should be relied upon to determine applicable codes. The existing Code references are the basis for design and materials; however, it is Duke Power Company's intent to comply with portions of, or all of, the latest versions of existing Codes unless material and/or design commitments have progressed to a stage of completion such that it is not practical to make a change. When only portions of Code Addenda are utilized, the appropriate engineering review of the entire addenda will be made to assure that the overall intent of the Code is still maintained. Detailed information for each station unit and code applicability with respect to design, material procurement, fabrication techniques, Nondestructive Testing (NDT) requirements and material traceability for each piping system class is described in the station piping specifications."

There is similar information in UFSAR Sections 3.2.2.3 and 3.2.2.4, which refers to system valve and system component classifications concerning the use of amended, superseded, or substituted codes (Reference 1).

UFSAR Section 3.8.1 (Reference 1) contains the following information:

"3.8.1 Concrete Containment

The concrete/steel containment is analyzed as a free standing structure and is referred to as the Reactor Building. It is constructed of reinforced concrete and structural liner plate steel with no separation between the two.

3.8.1.1 Description of the Containment

The structure consists of a post-tensioned reinforced concrete cylinder and dome connected to and supported by a massive reinforced concrete foundation slab as shown in

Figure 3-19. The entire interior surface of the structure is lined with a ¼ inch thick welded ASTM A36 steel plate to assure a high degree of leak tightness. Numerous mechanical and electrical systems penetrate the Reactor Building wall through welded steel penetrations as shown in Figure 3-20 and Figure 3-21. The mechanical penetrations and access openings are design, fabricated, inspected, and installed in accordance with Subsection B, Section III, of the ASME Pressure Vessel Code.

. . .

The ¼ inch thick liner plate is attached to the concrete by means of an angle grid system stitch welded to the liner plate and embedded in the concrete. The details of the anchoring system are provided in Figure 3-19. The frequent anchoring is designed to prevent significant distortion of the liner plate during accident conditions and to insure that the liner maintains its leak tight integrity. The design of the liner anchoring system also considers the various erection tolerances and their effect on its performance. The liner plate was coated during construction for corrosion protection. See Table 3-12 for Reactor Building coatings. There is no paint on the side in contact with concrete.

Containment repair/replacement activities are presently governed by the 1992 Edition including the 1992 Addenda of ASME Section XI. Section XI allows the use of the original design code, or a later edition of that code. The converted mechanical penetrations have been designed to the 1992 edition, including the 1992 addenda of Section III of the ASME Boiler and Pressure Vessel Code. This code was chosen since it is the current code of record for Containment In-Service Inspection (Reference 22).

UFSAR Section 3.8.1.5.4 (Reference 1) contains the following information:

"Penetrations conform to the applicable sections of ASA N6.2-1965, "Safety Standard for the Design, Fabrication and Maintenance of Steel Containment Structures for Stationary Nuclear Power Reactors." All personnel locks and any portion of the equipment access door extending beyond the concrete shell conform in all respects to the requirements of ASME Section III, Nuclear Vessels Code.

. . .

1. <u>Piping and Ventilation Penetrations</u>
All piping and ventilation penetrations are of the rigid welded type and are solidly anchored to the Reactor Building wall or foundation slab, thus precluding any requirements for expansion bellows. All penetrations and anchorages are designed for the forces and moments resulting from operating conditions. External guides and stops are provided as required to limit motions, bending and torsional moments to prevent rupture of the penetrations and the adjacent liner plate for postulated pipe

rupture. Piping and ventilation penetrations have no provision for individual testing since they are of all-welded construction."

The above UFSAR section provides information that penetrations conform to the applicable sections of ASA N6.2-1965. ASA N6.2-1965 requires penetrations to be designed to ANSI B31.1-1955 with 1963 addendum. The code that was used for this NSM part was the 1992 edition of ASME Section III, with 1992 addenda. The design rules as far as loading combinations and such are unchanged from the original plant design (Reference 22). This NSM revises the above UFSAR section to include the specific codes and code sections for which the converted mechanical penetrations conform (Reference UFSAR markups in Reference 4).

UFSAR Section 3.8.1.6.4 (Reference 1) contains the following information:

"Construction of the liner plate conformed to the applicable portions of Part UW of Section VIII of the ASME Code. In addition, the qualification of all welding procedures and welders was performed in accordance with Part A of Section IX of the ASME Code. All liner angle welding was visually inspected prior to, during, and after welding to insure that quality and general workmanship met the requirements of the applicable welding procedure specification."

UFSAR Section 1.2.2.3 (Reference 1) contains details on the design of the penetrations and is as follows:

"The prestressed, post-tensioned, steel lined, concrete Reactor Building is designed to withstand the maximum internal pressure resulting from an analysis of a spectrum of Reactor Coolant System and Main Steam line leaks.

Isolation valves are provided on fluid piping penetrating the Reactor Building to provide containment integrity when required. Isolation valves which are required to be closed for containment isolation function are either check valves, normally closed valves, or automatic remotely operated valves actuated by signals received from the Engineered Safeguards Protective System.

All electrical and fluid penetrations with the exception of those penetrations listed in Section 6.5.1.2 are grouped in a penetration room. Any leakage that might occur from any of these penetrations (except the noted lines) will be filtered and exhausted through a unit vent. Access hatches are provided with double seals, and the volume between the seals is piped to the penetration room. Provision is made to leak test all the access hatch closures."

The outside portions of these converted penetrations enter into the East Penetration Room (Reference 1, Sections 1.2.2.3 and 6.5.1.2, and Reference 22). The isolation valves are discussed in Part B of this 10 CFR 50.59. There are no isolation valves in Part A.

UFSAR Section 3.6.1.1 (Reference 1) contains the following information:

> "The basic design criteria for pipe whip protection is as follows:
>
> 1. All penetrations are designed to maintain containment integrity for any loss of coolant accident combination of containment pressures and temperatures.
>
> 2. All penetrations are designed to withstand line rupture forces and moments generated by their own rupture as based on their respective design pressures and temperatures.
>
> 3. All primary penetrations, and all secondary penetrations that would be damaged by a primary break, are designed to maintain containment integrity.
>
> 4. All secondary lines whose break could damage a primary line and also breach containment are designed to maintain containment integrity."

The applicable portions of UFSAR Section 3.6.1.1 are met (Reference 4).

If Part A is not installed coincident with the Part B portion, then, the converted spare mechanical penetration could be construed as being a closed loop inside containment. But the concept of a closed loop would be for the penetration to contain a fluid that enters containment through one penetration, performs a function, and then exits containment through a different penetration. Thus, the spare penetration is not being considered as a closed loop system, and is considered to be more of an extension of containment. Therefore only one end of the pipe would be required to be capped. Other reasons why the converted spare mechanical penetrations were determined to only require one end of the pipe capped are as follows (References 20 and 21):

- The penetration assembly is a totally passive component which is not subject to the active single failure requirements that is the focus of the UFSAR.
- The UFSAR cited design standard, ASA N6.2, allows for single barriers.
- Passive failures are not required to be "single-failure proof".
- The current design of the spare electrical penetrations only uses a single plate.
- The dished head between the liner and the process pipe in current fluid penetrations does not have a second barrier between containment and the environment.
- More modern standards specifically allow only a single pipe cap for spare pipe penetrations.

In addition, the single boundary design for this NSM's spare mechanical penetrations is consistent with other spare penetrations. Additional details are included in references 20 and 21.

If the parts are both installed during the same outage, then the piping portion of Part B will not be considered a closed loop inside containment, but will have double isolation valves on both of the RBAC penetrations as discussed in the Part B section of this 10 CFR 50.59 (Reference 4).

If Part A is not installed coincident with the Part B portion, then the converted mechanical penetration does not "trap" an incompressible fluid since it is open on the outside of the penetration pipe stub, thus no thermal overpressure protection is required (References 5 and 6). If the parts are both installed during the same outage, the thermal overpressure protection is addressed in Part B of this 10 CFR 50.59.

Part A of the NSM is to be implemented during the outage for the steam generator replacement project when containment closure is not required. The intent of this Part A implementation is to utilize the containment integrated leak rate test (ILRT) for the leak testing of the penetration assemblies. Containment ILRT is required by 10 CFR 50 Appendix J for the steam generator project (Reference 4).

In order to ensure that the pressure boundary of containment remains intact during accidents, UFSAR Section 3.2.2 and UFSAR Section 3.1.1.1 require that such pressure boundaries are seismically qualified and QA-1 respectively. The converted mechanical fluid penetrations are QA-1. The piping is QA-1 and Class F (References 4 and 5). Penetrations (including piping through their associated containment isolation valves and/or containment isolation barriers) are to be capable of withstanding a seismic event without loss of function. They are considered Class 1 structures which are to be designed to withstand a maximum hypothetical earthquake ground acceleration of 0.10 g. The design loads for the penetrations themselves envelope the seismic loading (Reference 4). The penetrations are designed for pipe rupture loads as required by UFSAR Section 3.6.1.1. These loads are faulted condition loads which envelope the maximum hypothetical earthquake as well as all normal operating loads (Reference 24). No seismic interactions exist between non-seismically restrained structures, systems, or components and the new modified penetrations as designed in Part A (Reference 22).

Components required to maintain the containment integrity are protected from loss of functions due to damage from missiles that might be generated by the primary system. These components are also protected from loss of functions due to damage from whipping pipe that might be generated due to high energy line breaks in the area (Reference 4). The designs of the modified penetrations are such that containment integrity is not adversely affected, as compared to the UFSAR description of penetrations (Reference 22). The piping and supports are designed to applicable codes for Part A (Reference 25).

UFSAR Table 6-7 contains a list of Reactor Building Penetration Valve information. The converted mechanical spare penetration does not contain isolation valves for Part A of this NSM. Thus, this figure does not need to be revised if Part A of this NSM is not installed coincident with Part B (Reference 1). The revision of this table will be addressed in the discussion of Part B in this 10 CFR 50.59.

Selected Licensee Commitment Table 16.6-1 contains penetration 10 CFR 50 Appendix J testing requirements. This table is not to be revised if Part A of this NSM is not installed coincident with Part B since the spare penetrations do not contain an active or flanged component. Until parts of the NSM that add valves and uncap the penetration are completed, the spare piping penetrations will be covered by the integrated leak rate test (Appendix J Type A test). The spare mechanical penetrations are considered to be part of containment. Revisions to this SLC will be addressed in the discussion of Part B in this 10 CFR 50.59 (References 3, 4, and 22).

UFSAR Section 3.8.1.5.4 is to be revised to include specific codes and code sections for which the converted mechanical penetrations conform. UFSAR Figure 3-20 shows typical electrical and piping penetrations and is to be revised to include information on the new spare penetrations. No technical specification or Selected Licensee Commitments (SLC) changes are required for Part A (References 1, 2, 3, and 4).

Part B

Penetrations 32 and 35 are utilized post accident to provide cooling to the "B" RBCU. Per UFSAR Section 6.2.3.2, Penetrations 32 and 35 are only required to have one containment barrier since the penetrations are required to be in service following an accident. Per UFSAR Table 6-7 and Figure 6-9, the containment barrier for Penetration 32 and 35 is a closed loop piping system (including the LPSW pressure boundary associated with the RBACs). Thus, during a postulated Loss of Coolant Accident (LOCA), the pressure boundary of LPSW to the RBACs must be intact in order to maintain containment integrity. In order to ensure that the pressure boundary of containment remains intact during accidents, UFSAR Section 3.2.2 and UFSAR Section 3.1.1.1 require that such pressure boundaries are seismically qualified and QA Condition 1, respectively (Reference 4).

Since the RBACs are not being supplied by the LPSW flow to the "B" RBCU after Part B is implemented, valve 3LPSW565 is not required to close for flow diversion to the "B" RBCU on an ES signal and is not needed. Likewise, valve 3LPSW566 is no longer needed to close to allow flow to be diverted to the RBACs during normal operation. Part B of this NSM will remove valves 3LPSW565 and 3LPSW566. The RBACs will now have their own ES isolation valves to stop LPSW flow to the RBACs during a design basis accident in which an ES signal is generated (References 4 and 5).

The UFSAR (Reference 1) contains the following information in Section 6.2.1.1.3.4:

"Normal containment ventilation is provided by four Reactor Building auxiliary cooling units (RBACUs) and two of the three RBCUs. The function of these units during normal operation is described in Section 9.4.6. Upper and lower limits on containment pressure during normal operation are maintained by complying with the Technical Specifications."

UFSAR Section 6.2.2.1 contains information that the RBCUs are one of the two ES systems that is provided to remove heat from the containment atmosphere following an accident (Reference 1).

There is also some discussion of the functioning of the RBCUs in the event of a loss of coolant accident (LOCA) in UFSAR Section 6.2.2.2.7. In this discussion, the current operation of closing valve LPSW565, which stops water flow in the RBACs, is included. In addition, the current operation of valve LPSW566 opening, if not already full open, to establish flow to RBCU "B" is addressed. This section is to be revised to describe the operation of Unit 3 since these valves for Unit 3 are being deleted and the isolation of the RBACs will be changed as a result of this NSM. The current discussion of the operation is to be identified as being for Units 1 and 2 (Reference 1 and UFSAR markups in Reference 4).

The UFSAR (Reference 1) contains the following information in Section 9.2.2.2.3:

"The three (per unit) Reactor Building coolers ("A", "B", and "C") are supplied by individual lines from the separate LPSW supply headers. Each inlet line is provided with a motor operated shutoff valve located outside the Reactor Building. Similarly, each discharge line from the coolers is provided with a motor operated valve located outside the Reactor Building. This allows each cooler to be isolated individually. During normal operation, the "A" and "C" coolers can receive throttled flow while flow through the "B" cooler may be diverted to the four Reactor Building auxiliary cooling units to provide normal Reactor Building cooling. Flow to the RB auxiliary cooling units is automatically isolated by an engineered safeguards signal returning full flow to the "B" RB cooling unit. LPSW is simultaneously aligned to the "B" RBCU and the auxiliary coolers (reference 13). This alignment ensures sufficient flow is maintained through a RBCU to prevent condensation induced waterhammers which are not bounded by existing analysis. This alignment also allows LPSW to supply the auxiliary cooling units for reactor building temperature control. On an engineered safeguards signal the outlet valves on the three RB cooling units fully open automatically to assure emergency flow through coolers."

This section is to be revised for Unit 3's function since it discusses the diversion of the RBAC flow to the "B" RBCU (Reference UFSAR markups included in Reference 4).

The UFSAR (Reference 1) contains the following information in Section 9.4.6.1:

"The Reactor Building Cooling Systems are designed to remove the heat in the containment atmosphere during normal plant operation and post accident operation.

A portion of the Reactor Building Cooling System is described in Section 6.2.2 as an Engineered Safety Feature.

The Reactor Building Cooling System is composed of two subsystems: Reactor Building Coolers and Reactor Building Auxiliary Coolers.

All components of the Reactor Building Cooling System are inside the Reactor Building. The only penetrations into and out of the Reactor Building that are related to the cooling system are the low pressure service water supply and return lines and isolation valves are provided on these lines at the penetrations."

The UFSAR (Reference 1) contains the following information in Section 9.4.6.2 for the current design of the RBACs and the RBCUs:

"The Reactor Building Cooling System shown in Figure 6-3 consists of the following subsystems and components:

1. Three Reactor Building Cooling Units (RBCUs), each consisting of a 2-speed vane axial fan, four cooling coils and distribution ductwork. These three cooling units are Engineered Safety Systems.
2. Four Reactor Building Auxiliary Cooling Units, each consisting of a 2-speed vane axial fan, four cooling coils, and distribution ductwork.

During normal plant operation, the A and C Reactor Building Cooling Units may operate in the high speed mode. These units circulate Reactor Building air over low pressure service water supplied cooling coils and distribute the cool air throughout the lower portion of the Reactor Building. Low pressure service water supplied to the B RBCU may be diverted to four Auxiliary Cooling Units. Two EMO-ES valves (LPSW-565 and LPSW-566) provided in the Low Pressure Service Water System divert the water from the B RBCU to the Auxiliary Cooling Units. This low pressure service water supplies the four cooling coils that comprise each Auxiliary Cooling Unit. The four auxiliary cooling unit fans are operated in high or low speed modes. The Auxiliary Cooling Units distribute the cool air via a duct system to the upper portion of the Reactor Building. The temperature in the Reactor Building can be controlled by varying the number of Auxiliary Cooling Units running or their speed.

LPSW is simultaneously aligned to the "B" RBCU and the auxiliary coolers (reference 1). This alignment ensures sufficient flow is maintained through a RBCU to prevent condensation induced waterhammers which are not bounded by existing analysis. This alignment also allows LPSW to supply the auxiliary cooling units for reactor building temperature control.

During an emergency, the Reactor Building Cooling System mode of operation changes automatically. Upon receipt of the signal from the Engineered Safeguards Actuation System, the operating Reactor Building Cooling Units change to low speed operation and any idle unit(s) is energized at low speed. Upon an ES signal, the Reactor Building Cooling Units operating in high speed (Units 1, 2 and 3) or low speed (Units 1 and 2) automatically stop and then restart in low speed operation after 3 minute time delay; and any idle units is also energized at low speed after 3 minute time delay. Unit 3, if in low speed, will stay running in low speed and any idle unit(s) is also energized at low speed after 3 minute delay. The fans are run at the slower speed because of the changed horsepower requirements generated by the denser building atmosphere. Also on the ES signal, the EMO valves, in the Low Pressure Service Water System, which diverted water from the B RBCU to the Auxiliary Cooling Units are re-aligned. Valve LPSW-565 closes, stopping water flow to the Auxiliary Coolers. Valve LPSW-566 opens, if not already full open, allowing water flow to the B RBCU. Additionally, all Low Pressure Service Water valves at the discharge of the three RBCUs go to the full open position.

The accident may impose severe stresses on the lower portion of the duct work, causing possible collapse or deformation. Therefore, the fusible links holding the dropout plates provided in the duct work below the coils melt and drop off, assuring that a positive path for recirculation of the Reactor Building atmosphere is available."

This NSM does not change the operation or function of the RBCUs. The information in UFSAR Section 9.4.6.2 is to be revised for Unit 3 to reflect the new design of the LPSW flow to and from the RBCUs and RBACs and will delete references to valves 3LPSW565 and 3LPSW566 (Reference UFSAR markups in Reference 4).

UFSAR Figure 9-12 shows the LPSW piping to and from the RBACs and the RBCUs. This figure will not represent Unit 3's piping configuration after the NSM is implemented. Thus, this figure is to be revised to indicate the existing diagram is for Units 1 and 2 only. An additional diagram will be added to this figure to show the new Unit 3 piping configuration. UFSAR Figures 6-3 and 6-4 also shows the LPSW piping to and from the RBCUs and piping to the RBACs. These figures will not represent Unit 3's piping after the NSM is implemented. Thus, these figures are to be revised to indicate the diagram is for Units 1 and 2 only. An additional diagram will be added to each of these figures to show the new Unit 3 piping configuration (Reference 1 and UFSAR markups in Reference 4).

When Part B is connected to the new converted mechanical penetrations, the penetrations will have double isolation valves for both of the RBAC penetrations (Reference 4). The double isolation valves for each new penetration fulfills the double barrier as discussed in UFSAR Sections 3.1.53, 6.2.3.1, and 6.2.3.2 (for Type C/Type 3 penetrations) with variations as addressed by the UFSAR markups included in Reference 4 (References 1 and 4).

Selected Licensee Commitment (SLC) Section 16.9.12, Conditions L and M, have conditions involving valve LPSW565 for units that do not have the RBAC modification installed. Based on information from these SLC bases, the SLC conditions are to address large water hammers that could occur and challenge the integrity of the LPSW flowpath as well as containment. SLC Surveillance Requirements 16.9.12.4 and 16.9.12.5 have surveillances involving valve LPSW565 that relate to these conditions. There are also several references to valve LPSW565 in the bases to SLC 16.9.12. SLC 16.9.12 includes conditions to minimize waterhammers for certain valve positions, including a method of isolating the RBACs using valve LPSW-565 for the units that do not have the RBAC modification installed. The new waterhammer prevention circuitry will not be credited in the licensing basis at this time for resolving the waterhammer issues as identified in Generic Letter 96-06. The new circuitry is to assist in preventing a column closure water hammer or a condensation induced water hammer, but is only considered an enhancement. Since the waterhammer prevention circuitry can not be credited until the new technical specification is approved and implemented, SLC 16.9.12 was revised as a result of the comparable Unit 2 RBAC modification to define a different method of isolating the RBACs if these same conditions exist for the units that have the RBAC modification installed. The SLC requirements involving valve LPSW-565 will remain in effect for units that do not have the modification installed. Thus the modified RBAC System will have comparable waterhammer protection features without taking credit for the new circuitry. No additional changes are required for SLC 16.9.12 as a result of this Unit 3 NSM (Reference 3 and SLC markups in Reference 4, Reference 4, References 22, and 34).

UFSAR Table 6-7 contains Reactor Building penetration valve information. This table is to be revised to show information about the two penetrations that will be used for the new LPSW flow to and from the RBACs. These are the penetrations designated as 63 and 64. This table change is identified in the markup as for Unit 3 only (Reference 1 and UFSAR markups in Reference 4). In addition, UFSAR Figure 6-9 includes the isolation valve arrangements that are associated with UFSAR Table 6-7. This figure is to be revised to show the new penetration arrangement for penetrations 63 and 64 and the new penetration arrangement indicating it is for Unit 3 only (Reference 1 and UFSAR markups in Reference 4).

UFSAR Table 7-3 contains a list of ES actuated devices. This table is to be revised to indicate ES actuated devices for valves LPSW-565 and LPSW-566 are for Units 1 and 2 only. The table is also to be revised to add information about the ES Channel 5 and ES Channel 6 signals to the four new Unit 3 containment isolation valves for the LPSW supply to and from the RBACs (Reference 1 and UFSAR markups in Reference 4).

UFSAR Figure 8-4 shows some electrical one-line diagrams. Sheet 1 of 3 of this figure is for both Units 1 and 3. This figure needs to be revised to show that the loads of valves 3LPSW-565 and 566 are deleted from 600 Volt Motor Control Center 3XS3 (Reference 1 and UFSAR markups in Reference 4).

Numerous UFSAR tables and figure in Sections 6 and 15 contain results of LOCA accident analyses. The information in the UFSAR Sections 6 and 15 tables and figures are not affected by the change in flowrates to the RBCUs. In addition, UFSAR Section 6.2.1 contains information pertaining to LPSW flowrates and BTU/hour performance for the RBCUs. This information is not changed as a result of this NSM since the RBACs are currently isolated on an ES signal. None of these figures and tables needs to be revised because of this NSM (Reference 1 and 22).

UFSAR Section 3.4.1.1.2 (Reference 1) contains information about flood protection measures inside containment. This information contains a discussion about monitoring the inlet and outlet of the LPSW flow for each RBCU as follows:

> "The primary means for detecting leakage in the Reactor Building is the level indication for the normal sump.
>
> . . .
>
> In addition to the normal sump level, indication of the emergency sump level is also provided by redundant safety related systems with a range of 0 to 3 feet.
>
> . . .
>
> Leakage from the LPSW system in containment can also be detected by the monitoring of other parameters. For example, the inlet and outlet LPSW flows for each Reactor Building Cooling Unit (RBCU) are monitored for any differences which could be indicative of a cooler leak. If a flow difference is detected, an alarm is provided to the control room. The operator can then promptly isolate the affected cooler by closing remote operated valves."

From this UFSAR information, the LPSW inlet and outlet differential flow monitoring is not the primary means for detection of leakage in the Reactor Building. The existing monitoring to the RBCUs will remain. The new LPSW supply lines to and from the RBACs will have flow monitoring instrumentation (flow orifices) and control room alarm included as part of the NSM. The instrumentation will be used to determine a differential flow to detect a loss of LPSW flow to and from the RBACs. Both the existing differential flow instrumentation for the RBCUs and the new instrumentation for the RBACs are non-QA for function. The existing RBCU differential flow instrumentation is not being changed. The new RBAC differential instrumentation is qualified for the pressure boundary (Reference 23). The above UFSAR section is not specified in the final scope document as being revised. This section does not have to be revised since the monitoring of the LPSW flow to and from the RBCUs is given as an example, and not a list of all places where LPSW is monitored.

The flow differential between the inlet and the outlet of the RBAC is to be monitored on the Operator Aid Computer (OAC) for the above described tube ruptures. The tube rupture alarm is set at 90 gpm. Therefore, any flow differential reading on the OAC that is equal to or greater than 90 gpm will indicate multiple tube ruptures and will generate an alarm. Tube rupture events can be mitigated by closing 3LPSW-1054 or 3LPSW-1055. Note that the flow instrument uncertainty is higher than the postulated single RBAC tube rupture, thus the break cannot be reliably detected with alarms. However, data trending from the Plant Information (PI) server may be able to identify breaks should they occur in the future (Reference 4). Again, this alarm is not the primary means of detecting leakage in the Reactor Building. The existing LPSW flow differential is less accurate than this new flow instrumentation differential output (Reference 23).

UFSAR Section 9.2.2.2.3 (Reference 1) contains information about measuring LPSW flow to indicate cooler leakage. This information is as follows:

> "The LPSW flow to and from each Reactor Building cooler is measured. Provisions are available to indicate cooler leakage.
>
> LPSW is a non-radioactive cooling water system that is monitored for radioactivity. Monitoring is required per Section 11.5.1 since LPSW provides cooling to normally radioactive systems. Components from these normally radioactive systems could potentially leak radioactivity into LPSW. Upon any indication of radioactivity, the component suspected of leaking may be individually isolated."

The information reference above in UFSAR Section 11.5.1 (Reference 1) is as follows:

> "Monitors are also provided on various non-radioactive cooling water systems to detect leakage from normally radioactive systems due to any component failures and thus prevent their accidental release to the environment."

A local pressure gage for the LPSW return is to be provided to assist in LPSW System benchmark testing. The containment isolation valves will have control board controls (Reference 4).

The UFSAR (Reference 1) contains the following information in Section 7.3:

> "The Engineered Safeguards Protective System (ESPS) monitors parameters to detect the failure of the Reactor Coolant System and initiates operation of the High and Low Pressure Injection Systems, the Building Isolation, the Reactor Building Cooling and the

Reactor Building Spray Systems. In addition, the signal is used to start the standby power source and initiate a transfer to the standby power source when required as described in Section 8.3.1.1.3."

ES signals will be sent to all four new containment isolation valves (References 4 and 5).

Regulatory Guide 1.97 provides information that the containment isolation valve position variable is a Type B, Category 1 variable. The category provides the design criteria for the variables (Reference 1, Section 7.5.1, and References 17, 18, and 19). The containment isolation valves will have QA-1 control switches and position indication in the control room. These valve position indications meet Regulatory Guide 1.97 requirements for this variable (Reference 4). The new LPSW flow instrumentation is for non-accident monitoring, thus it is not considered Regulatory Guide 1.97 instrumentation (Reference 23).

SLC Table 16.6-1 contains a list of penetrations with 10 CFR 50 Appendix J requirements. The two new Unit 3 penetrations will have Type C local leak rate tests, and are to be added to this table (Reference 3 and SLC markups in Reference 4).

A single failure will not prevent the new low pressure logic from actuating on low pressure. But a single failure could cause the new low pressure logic to inadvertently actuate the new AOVs, causing isolation of the RBACs (Reference 4). The RBACs are not safety related or QA-1 and are not used for accident mitigation. The Reactor Building Ventilation System, which includes the RBACs, does not have to meet the single failure criterion (Reference 9, Sections 1.1, 1.2 and 2.3.1). Thus, assuring the RBACs perform their cooling function, assuming a single failure, is not required as part of the Oconee licensing basis.

The NSM uses AOVs. No new MOVs will be added to the LPSW System as part of this NSM. The new AOVs are to fail closed on a loss of power or loss of air (Reference 4).

Supply header containment isolation valve 3LPSW-1054 and return header containment isolation valve 3LPSW-1062 have non-QA positioners on them and they can be throttled open using non-QA Moore controllers that are setup as manual loaders. The Moore controllers are located on the control board. The Moore controllers are setup with an interlock from the solenoid valve control circuits for the two supply or two return header valves that will cause the valve demand signal from the Moore to runback to the closed position. This prevents flow from being admitted to the RBACs when LPSW supply pressure is reestablished to prevent a waterhammer. The valves must be slowly reopened. An automatic ramp open function is to perform this action (Reference 4). If the power is lost to the Moore controller, then the respective valve will fail open. Even if the Moore controller loses power, the valve will still close automatically on receiving an ES signal or low LPSW pressure signal from the new circuitry. The operators can also manually close any of the new containment isolation valves with the control room OPEN/CLOSE switch. The QA-1 solenoid valves for the outermost containment isolation valves are on one power supply and the QA-1 solenoid valves for the innermost valves are on a different power supply (References 4 and 23).

The seismic boundary valves are at normally open manual valves (Reference 5). UFSAR Section 3.7.3.9 (Reference 1) includes the following information:

> "Seismic/non-seismic boundaries are established by valves which are designed to meet the seismic design criteria. Failure in the non-seismic portion of the system cannot cause loss of function to the safety system in that automatic or remote manual-operated valves are used for valves normally open during Reactor Operation."

The piping in this NSM will have Seismic Category I/Seismic Category II boundaries located beyond an automatic or remote – manual valve. For containment isolation purposes in this particular case, the Seismic Category II piping is treated as non-seismic since it is not QA-1. These boundaries are extended past the containment isolation valves into containment. The containment isolation valves can be operated from the control room or will be automatic if the LPSW low pressure setpoint is reached. Closure of the containment isolation valves mitigates the effects of failure of the piping that is treated as non-seismic. A change to this UFSAR section is to be made to address the variation of this design criterion (Reference UFSAR markups in Reference 4 and Reference 5).

Generic Letter 96-06 requested licensees to determine (1) if containment air cooler cooling water systems are susceptible to waterhammer conditions during postulated accident conditions, (2) if containment air cooler cooling water systems are susceptible to two-phase flow conditions during postulated accident conditions or, (3) if piping systems that penetrate containment are susceptible to thermal expansion of fluid that could lead to over-pressurization of piping. One of Duke's supplemental responses summarized Duke's positions and actions. The response to the first concern was being addressed in a collaborative effort with EPRI and NEI. A Duke response dated September 30, 2002 addressed the current status. The response to the second concern was that the LPSW system provides sufficient flow to the LPI coolers and Reactor Building Cooling Units (RBCUs) to satisfy heat transfer requirements following a design basis accident with a single active failure. The response to the third concern was addressed in a number of previous letters and those previous letters described containment penetrations that required the installation of thermal relief valves and leak-off lines with check valves to prevent over-pressurization. Other containment penetrations were cut, capped, and abandoned to address this concern. Duke also provided information that water filled lines that are isolated within containment required administrative control to partially drain those lines prior to power operations (References 15 and 16).

To assist in meeting the requirements of Generic Letter 96-06 for thermal relief, each penetration is provided with a relief valve (3LPSW-1057 and 3LPSW-1089) between the penetration and the adjoining valve inside containment (References 4 and 5).

The LPSW piping is in an operable but degraded/non-conforming condition due to the waterhammer concerns. The operable but degraded/non-conforming condition was established in response to Generic Letter 96-06. To address the waterhammer issue, the NSM will install an instrumentation system that will monitor for low LPSW supply header pressure, indicative of a loss of LPSW, and close RBAC supply and return valves. This system will eliminate both column closure waterhammer as well as condensation induced waterhammers. A new technical specification is planned for this system that will govern its operation. Since the new technical specification will not be approved prior to the implementation of the NSM, the new system can not be credited in the licensing basis with mitigating the event. The operable but degraded/non-conforming condition is based on the existing piping configuration. This NSM will modify a portion of that piping. The effect of the modified piping on the response of the piping system to the waterhammer events was evaluated. The circuitry was assumed out of service such that it would not function. The evaluation concluded that the piping changes will not adversely impact the existing predicted waterhammer response of the LPSW piping going to the RBACs. SLC 16.9.12 includes conditions to minimize waterhammers for certain valve positions, which includes using a method of isolating the RBACs using valve LPSW-565 for the units that do not have the RBAC modification installed. However, since the new waterhammer prevention circuitry can not be credited until the new technical specification is approved and implemented, SLC 16.9.12 was revised as a result of the comparable Unit 2 RBAC modification to account for a different method of isolating the RBACs if these same conditions exist for the units that have the RBAC modification installed (References 4, 13 - Appendix I, 28, 29, 34, and 37).

To assist in mitigating the effects of waterhammer that could be caused by filling of the voided line following the restart of the pump, both system design and specified procedural actions will also be included as part of the NSM. These actions are not currently intended to satisfy the Generic Letter 96-06 issues and are not considered as being part of the licensing basis event mitigation strategy. These actions are only intended to enhance the mitigation of waterhammer forces. The design and procedural actions include closing both the inlet and outlet containment isolation valves upon low LPSW supply pressure in order to minimize voiding, ensure the containment isolation valves are closed prior to LPSW pump restart during a LOOP, and provide the containment isolation valves with the ability to throttle open to provide a controlled system restart. If at least one of the supply valves did not close and a water column separation water hammer occurred that ruptured the RBAC piping, the ruptured pipe could divert enough LPSW water to the break such that adequate flow would not be provided to other LPSW supplied safety related loads. Thus, the closing of one of the supply valves is to be considered as a safety related control action when the LOOP is accompanied by an event requiring the LPSW System to mitigate the event (e.g., main steam line break, LOCA) after licensing basis credit for the new circuitry is obtained (Reference 4).

Waterhammer prevention circuitry, also known as RBAC Isolation Circuitry, is included in the design to close the containment isolation valves on low LPSW supply pressure to prevent a column closure waterhammer prior to LPSW system repressurization. Such waterhammers were postulated during Generic Letter 96-06 reviews and it was determined that the RBAC piping does not meet piping design Code allowable stresses. This circuitry is not initially to be credited in the licensing basis for resolving the Generic Letter 96-06 issues. This circuitry is initially to be considered an enhancement to prevent waterhammer, but is not to be credited in the licensing basis. Four LPSW Pressure Transmitters are to be used to detect low pressure conditions in the LPSW Supply Header to the Penetration Room. Upon a low pressure condition, the RBAC's are to be isolated to prevent waterhammer when LPSW is restored. Isolation is required for any LOOP event to prevent waterhammer. The closing of one of the supply valves is considered to be a safety related control action when the LOOP is accompanied by an event requiring the LPSW system to mitigate the event (e.g., MSLB, LOCA). If neither of the supply valves closes, a waterhammer that could rupture the RBAC piping inside containment is postulated. The ruptured pipe could divert enough LPSW to the break such that inadequate flow would be provided to the HPI pump motor coolers and possibly have inadequate NPSH at the LPSW pump suction. If a main steam line break occurs in the Penetration Room, the temperatures in the room will increase dramatically for a short period of time. It is postulated that the fluid in the impulse line could begin to boil. Since the transmitter elevation is lower than the tap connection, the pressure sensed by the transmitter will be lower due to the lower density of the fluid. Since a lower pressure does not prevent actuation of the system, no additional uncertainty correction is provided in the setpoint for the RBAC isolation circuitry. Since the new waterhammer prevention circuitry is not credited to prevent damage during accidents, it does not meet criterion 3 of 10 CFR 50.36 for requiring a new technical specification limiting condition of operation (References 4 and 27).

The closure speed of the containment isolation valves is selected so that water hammers will not occur. There is no known specified closure time for containment isolation valves, but the time chosen is within the ranges of existing containment isolation valves (Reference 22).

The use of double AOVs outside of containment is to ensure that the RBACs are isolated prior to power being returned following an event assuming a single failure. The double isolation of the RBACs eliminates any post accident concerns associated with leakage of the RBACs with respect to containment integrity and sump dilution. The thermal overpressure relief valve discharge volume is expected to be minimal and will have a negligible effect on boron concentration in the sump (Reference 4).

UFSAR Section 6.2.3.2 includes some discussion in the description of Type C penetration that includes information about most Type C penetrations have a seismic closed loop as the inside barrier. This section also provides information that the Component Cooling System has a non-seismic closed loop inside containment so it uses an alternate inside barrier consisting of an additional automatic remotely operated valve or check valve (Reference 1). This description of the Type C penetration type in UFSAR Section 6.2.3.2 is also to be revised to include information about the LPSW supply to and from the RBACs being a variation to a non-seismic closed loop piping system inside containment. The piping inside containment is Seismic Category II, but it is not treated as such since it is not QA-1 (Reference UFSAR markups in Reference 4).

All new piping is to be stainless steel. The piping outside Containment that extends from the supply and return headers connection to the penetrations is QA-1 and Duke Class F, including the piping from the penetration to first manual valve inside containment. The tapping valve and blind flange (if installed) are QA-1 and Duke Class F. The LPSW piping to the RBACs inside Containment past the first manual valve from the penetration is to remain Seismic Category II to prevent adverse interactions of the non-safety piping with safety related components during an earthquake. The pipe class will remain Class D. The electrical, instrumentation, and control components that are necessary to process and actuate ES signals and devices or to process and actuate signals and devices associated with the RBAC Isolation Circuitry are QA Condition 1. The RBAC Isolation Circuitry that closes the containment isolation valves on low LPSW pressure is QA-1, but can not be credited for preventing waterhammers to assure LPSW system functions at this time (References 4 and 35). The solenoid valves and the air supply line from the QA-1 containment isolation valves to the solenoid valves are QA-1 so that the air has a QA-1 flow path for air release when being closed. The non-QA instrumentation is in the Class F portion of the piping and is qualified for pressure boundary but is not QA-1 for function (Reference 23). The electrical cabinets are mounted QA-1 (Reference 33).

There are no adverse effects to structures, systems, or components associated with this NSM from missiles generated inside containment or missiles generated from natural phenomena events. There are also no adverse effects due to high or low trajectory missiles (Reference 1, Sections 3.1.40 and 3.5, and Reference 22).

The NSM includes pipe connections for the temporary chiller. Block valves (3LPSW-1051 and 1065) and flanges will be added in the Auxiliary Building between the LPSW supply and return main headers and the RBACs piping to allow the hook up and usage of the temporary chiller during outages through new block valves (3LPSW-1052 and 1064). This design allows the RBAC's to be operated without affecting containment operability or work on the ''B' RBCU. This NSM does not address the use of the temporary chiller (Reference 4). Thus, this 10 CFR 50.59 does not address the use or function of the temporary chiller.

The LPSW required flow to components (e.g., RBCUs, LPI) is not adversely affected due to this NSM. In addition, flow to non-required loads (e.g., RBACs during normal operation) is not adversely affected (Reference 22). There are control board changes and QA-1 cabinet changes and cabinet additions associated with this NSM. The control boards and QA-1 cabinets are seismically qualified after these changes and additions. The cabling and other electrical components are adequately sized. The modification meets the applicable electrical separation criteria and specifications for electrical components as listed and described in the UFSAR. The modification does not create any new seismic/non-seismic interactions for Part B. New safety to non-safety (QA-1 to non-QA-1) electrical interfaces will have QA-1 isolation devices. For Part B, an electrical 10 CFR 50 Appendix R fire review was performed for the design phase with no adverse effects to the Appendix R fire separation requirements. The electrical equipment is qualified for its environment (References 4, 22, and 23). The piping and supports of Part B are designed such that they meet applicable design codes when connected to the converted penetrations of Part A (Reference 25). The piping was reanalyzed to address the installation of the wet taps and associated hardware (e.g., tapping valves) for the condition of their being installed separately from Part B (Reference 36).

TECHNICAL SPECIFICATION REVIEW

Part A of this NSM does not require any technical specification changes.

Part B of this NSM does not require any technical specification changes.

10 CFR 50.59 EVALUATION QUESTIONS

Note: The following questions are answered for each part of the NSM separately. Any discussion needed for addressing the parts if installed together is included in the response to Part B. In addition, the question responses are valid for the installation of the new cabinets and/or the wet taps identified with Part B if installed independent of the rest of Part B. Thus, the responses address the NSM parts if they are installed in any of these implementation options or variations.

1) Does the proposed activity result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the UFSAR?

Part A

No. The containment is used to contain releases during accidents. The containment does not cause any accidents previously evaluated in the UFSAR.

Part B

No. The RBCUs and the RBACs are used to provide normal containment ventilation. This NSM does not change the operation or function of the RBCUs during normal operation. Currently, LPSW flow to the "B" RBCU also goes to the RBACs during normal operation. The NSM will separate the LPSW flow such that it uses a separate flowpath to the RBACs than the LPSW supply to the RBCUs. Flow to the LPSW loads are adequate with the changes associated with the NSM.

2) Does the proposed activity result in more than a minimal increase in the likelihood of occurrence of a malfunction of an SSC important to safety previously evaluated in the UFSAR?

Part A

No. The new mechanical fluid penetrations do not cause adverse effects with respect to the containment design conditions. Appropriate design conditions are used in the mechanical penetration design. Thus, the containment and associated penetrations are not more likely to malfunction as evaluated in the UFSAR.

Part B

No. All new piping is to be stainless steel. The piping outside Containment that extends from the supply and return headers connection to the penetrations is to be QA-1 and Duke Class F, including the piping from the penetration to first manual valve inside containment. The tapping valve and blind flange (if installed) are QA-1 and Duke Class F. The LPSW piping to the RBACs inside Containment past the first manual valve from the penetration is to remain Seismic Category II to prevent adverse interaction of the non-safety piping with safety related components during an earthquake. The pipe class will remain Class D. The electrical, instrumentation, and control components that are necessary to process and actuate ES signals and devices or to process and actuate signals and devices associated with the RBAC Isolation Circuitry are QA Condition 1. The RBAC Isolation Circuitry that closes the containment isolation valves on low LPSW pressure is QA-1, but can not be credited for preventing waterhammers to assure LPSW system functions at this time. The solenoid valves and the air supply line from the QA-1 containment isolation valves to the solenoid valves are QA-1 so that the air has a QA-1 flow path for air release when being closed. The non-QA instrumentation is in the Class F portion of the piping and is qualified for pressure boundary but is not QA-1 for function. The electrical cabinets are mounted QA-1.

The new penetrations are to have double isolation barriers which are to consist of two valves for each penetration. The supply of LPSW flow to the RBACs will go directly to the RBACs. This LPSW flow will be isolated on an ES signal like the current design. Thus, a single failure will not prevent the RBACs from being isolated on an ES signal.

The piping in this NSM will have Seismic Category I/Seismic Category II boundaries located beyond an automatic or remote – manual valve. For containment isolation purposes in this particular case, the Seismic Category II piping is treated as non-seismic since it is not QA-1. These boundaries are extended past the containment isolation valves into containment. The containment isolation valves can be operated from the control room or will be automatic if the LPSW low pressure setpoint is reached. Closure of the containment isolation valves mitigates the effects of failure of the piping that is treated as non-seismic.

To assist in meeting the requirements of Generic Letter 96-06 for thermal overpressure protection, each penetration is provided with a relief valve (3LPSW-1057 and 3LPSW-1089) between the penetration and the adjoining valve inside containment.

The LPSW piping is in an operable but degraded/non-conforming condition due to the waterhammer concerns. The operable but degraded/non-conforming condition was established in response to Generic Letter 96-06. To address the waterhammer issue, the NSM will install an instrumentation system that will monitor for low LPSW supply header pressure, indicative of a loss of LPSW, and close RBAC supply and return valves. This system will eliminate both column closure waterhammer as well as condensation induced waterhammers. A new technical specification is planned for this system that will govern its operation. Since the new technical specification will not be approved prior to the implementation of the NSM, the new system can not be credited in the licensing basis with mitigating the event. The operable but degraded/non-conforming condition is based on the existing piping configuration. This NSM will modify a portion of that piping. The effect of the modified piping on the response of the piping system to the waterhammer events was evaluated. The circuitry was assumed out of service such that it would not function. The evaluation concluded that the piping changes will not adversely impact the existing predicted waterhammer response of the LPSW piping going to the RBACs. SLC 16.9.12 includes conditions to minimize waterhammers for certain valve positions, which includes using a method of isolating the RBACs using valve LPSW-565 for units that do not have the RBAC modification installed. However, since the new waterhammer prevention circuitry can not be credited until the new technical specification is approved and implemented, SLC 16.9.12 was revised as a result of the comparable Unit 2 RBAC modification to account for a different method of isolating the RBACs if these same conditions exist for the units that have the RBAC modification installed.

To assist in mitigating the effects of waterhammer that could be caused by filling of the voided line following the restart of the pump, both system design and specified procedural actions will also be included as part of the NSM. These actions are not currently intended to satisfy the Generic Letter 96-06 issues and are not considered as being part of the licensing basis event mitigation strategy. These actions are only intended to enhance the mitigation of waterhammer forces. The closure speed of the containment isolation valves is selected so that water hammers will not occur.

The LPSW required flow to components (e.g., RBCUs, LPI) is not adversely affected due to this NSM. In addition, flow to non-required loads (e.g., RBACs during normal operation) is not adversely affected. There are control board changes and QA-1 cabinet changes and cabinet additions associated with this NSM. The control boards and QA-1 cabinets are seismically qualified after these changes and additions. The cabling and other electrical components are adequately sized. The modification meets the applicable electrical separation criteria and specifications for electrical components as listed and described in the UFSAR. The modification does not create any new seismic/non-seismic interactions for Part B. New safety to non-safety (QA-1 to non-QA-1) electrical interfaces will have QA-1 isolation devices. For Part B, an electrical 10 CFR 50 Appendix R fire review was performed for the design phase with no adverse effects to the Appendix R fire separation requirements. The electrical equipment is qualified for its environment. The piping and supports of Part B are designed such that they meet applicable design codes when connected to the converted penetrations of Part A. The piping was reanalyzed to address the installation of the wet taps and associated hardware (e.g., tapping valves) for the condition of their being installed separately from Part B.

There are no adverse effects to structures, systems, or components associated with this NSM from missiles generated inside containment or missiles generated from natural phenomena events. There are also no adverse effects due to high or low trajectory missiles.

The new AOVs are to fail closed on a loss of power or loss of air. The outside containment isolation valves each use a Moore controller to throttle the valves. Supply header containment isolation valve 3LPSW-1054 and return header containment isolation valve 3LPSW-1062 have non-QA positioners on them and they can be throttled open using non-QA Moore controllers that are setup as manual loaders. The Moore controllers are located on the control board. The Moore controllers are setup with an interlock from the solenoid valve control circuits for the two supply or two return header valves that will cause the valve demand signal from the Moore to runback to the closed position. This prevents flow from being admitted to the RBACs when LPSW supply pressure is reestablished to prevent a waterhammer. The valves must be slowly reopened. An automatic ramp open function is to perform this action. If the power is lost to the Moore controller, then the respective valve will fail open. Even if the Moore controller loses power, the valve will still close automatically on receiving an ES signal and the operators can manually close any of the new containment isolation valves with the control room OPEN/CLOSE button. The QA-1 solenoid valves for the outermost containment isolation valves are on one power supply and the QA-1 solenoid valves for the innermost valves are on a different power supply.

A single failure will not prevent the new low pressure logic from actuating on low pressure. But a single failure could cause the new low pressure logic to inadvertently actuate the new AOVs, causing isolation of the RBACs. The RBACs are not safety related or QA-1 and are not used for accident mitigation. The Reactor Building Ventilation System, which includes the RBACs, does not have to meet the single failure criterion. Thus, assuring the RBACs perform their cooling function, assuming a single failure, is not required as part of the Oconee licensing basis.

3) Does the proposed activity result in more than a minimal increase in the consequences of an accident previously evaluated in the UFSAR?

Part A

No. The new mechanical fluid penetrations do not cause adverse effects with respect to the containment design conditions. Thus, there is not more than a minimal increase in the consequences of an accident that requires containment integrity.

Part B

No. The new penetrations are to have double isolation barriers which are to consist of two valves for each penetration. The supply of LPSW flow to the RBACs will go directly to the RBACs. This LPSW flow will be isolated on an ES signal like the current design. Thus, a single failure will not prevent the RBACs from being isolated on an ES signal.

The existing monitoring to the RBCUs will remain. The new LPSW lines to and from the RBACs will have flow monitoring instrumentation (flow orifices) and control room alarm included as part of the NSM. The instrumentation will be used to determine a differential flow to assist in detecting a loss of LPSW flow to and from the RBACs. An ES signal would close the containment isolation valves associated with the RBAC penetrations.

There is no known specified closure time for containment isolation valves, but the time chosen is within the ranges of existing containment isolation valves.

The use of double AOVs outside of containment is to ensure that the RBACs are isolated prior to power being returned following an event assuming a single failure. The double isolation of the RBACs eliminates any post accident concerns associated with leakage of the RBACs with respect to containment integrity and sump dilution. The total volume of water that will be discharged from the thermal overpressure relief valve will be very small and will not adversely affect the volume of the sump's contents. This will have a negligible effect on boron concentration in the sump.

The LPSW required flow to components (e.g., RBCUs, LPI) is not adversely affected due to this NSM. In addition, flow to non-required loads (e.g., RBACs during normal operation) is not adversely affected.

The new AOVs are to fail closed on a loss of power or loss of air. The outside containment isolation valves each use a Moore controller to throttle the valves. Supply header containment isolation valve 3LPSW-1054 and return header containment isolation valve 3LPSW-1062 have non-QA positioners on them and they can be throttled open using non-QA Moore controllers that are setup as manual loaders. The Moore controllers are located on the control board. The Moore controllers are setup with an interlock from the solenoid valve control circuits for the two supply or two return header valves that will cause the valve demand signal from the Moore to runback to the closed position. This prevents flow from being admitted to the RBACs when LPSW supply pressure is reestablished to prevent a waterhammer. The valves must be slowly reopened. An automatic ramp open function is to perform this action. If the power is lost to the Moore controller, then the respective valve will fail open. Even if the Moore controller loses power, the valve will still close automatically on receiving an ES signal and the operators can manually close any of the new containment isolation valves with the control room OPEN/CLOSE button. The QA-1 solenoid valves for the outermost containment isolation valves are on one power supply and the QA-1 solenoid valves for the innermost valves are on a different power supply.

A single failure will not prevent the new low pressure logic from actuating on low pressure. But a single failure could cause the new low pressure logic to inadvertently actuate the new AOVs, causing isolation of the RBACs. The RBACs are not safety related or QA-1 and are not used for accident mitigation. The Reactor Building Ventilation System, which includes the RBACs, does not have to meet the single failure criterion. Thus, assuring the RBACs perform their cooling function, assuming a single failure, is not required as part of the Oconee licensing basis.

4) Does the proposed activity result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the UFSAR?

<u>Part A</u>

No. The new mechanical fluid penetrations do not cause adverse effects with respect to the containment design conditions. Thus, there is not more than a minimal increase in the consequences of failure of a component or system that could create radiological releases.

<u>Part B</u>

No. The RBACs are not required to be designed for the single failure criterion. Failure of an ES signal to close one set of containment isolation valves will not prevent the second set of containment isolation valves from closing. A single failure will not prevent the new low pressure logic from actuating on low pressure.

5) Does the proposed activity create a possibility for an accident of a different type than previously evaluated in the UFSAR?

Part A

No. This modification does not introduce the possibility of a new accident because the new mechanical fluid penetrations are not an initiator of any accident and no new failure modes are introduced.

Part B

No. Since the RBACs are not required to be designed to withstand a single failure, this modification does not introduce the possibility of a new accident because the new mechanical fluid penetrations are not an initiator of any accident and no new failure modes are introduced.

6) Does the proposed activity create a possibility for a malfunction of an SSC important to safety with a different result than any previously evaluated in the UFSAR?

Part A

No. This modification does not introduce the possibility for a malfunction of an SSC with a different result because the modification does not introduce a failure mode that is not bounded by those described in the UFSAR containment system description or the penetration descriptions.

Part B

No. There is a single failure that could cause an inadvertent actuation of the isolation valves that are supposed to close on low LPSW supply pressure. But the RBACs are not required to be designed to be able to perform their function in the event of a single failure. Thus, this modification does not introduce the possibility for a malfunction of an SSC with a different result because the modification does not introduce a failure mode that is not bounded by those described in the UFSAR containment system description or the penetration descriptions.

7) Does the proposed activity result in a design basis limit for a fission product barrier as described in the UFSAR from being exceeded or altered?

Part A

No. The fission product barriers are the fuel pellet, cladding, reactor coolant pressure boundary, and containment. This activity modifies the containment barrier, but does not alter plant safety limits, setpoints, or design basis limits for a fission product barrier.

Thus, the activity does not result in exceeding or altering a design basis limit for a fission product barrier as described in the UFSAR.

Part B

No. The fission product barriers are the fuel pellet, cladding, reactor coolant pressure boundary, and containment. This activity does not alter plant safety limits, setpoints, or design basis limits for a fission product barrier. Thus, the activity does not result in exceeding or altering a design basis limit for a fission product barrier as described in the UFSAR.

8) Does the proposed activity result in a departure from a method of evaluation described in the UFSAR used in establishing the design basis or in the safety analyses?

Part A

No. This activity does not involve a change in an evaluation methodology. Thus, the modification does not result in a departure from a method of evaluation in the UFSAR.

Part B

No. This activity does not involve a change in an evaluation methodology. Thus, the modification does not result in a departure from a method of evaluation in the UFSAR.

CONCLUSIONS

Note: Note that the implementation of Part A may be performed independent of Part B. Since the NSM parts may be installed separately, the NSM parts were evaluated individually. Thus, this 10 CFR 50.59 evaluated Part A independent of Part B. Since both parts may be installed together, any differences in the information for each part being installed separately were also addressed. Thus, this 10 CFR 50.59 is also valid for installed Parts A and B together. This evaluation is also valid for implementing the new cabinets and/or the wet taps identified with Part B if they are implemented independent of the rest of Part B.

Part A

This 10 CFR 50.59 evaluation determined that none of the 10 CFR 50.59 criteria were met for Part A of this NSM. UFSAR Section 3.8.1.5.4 and Figure 3-20 are to be revised to reflect Part A of this NSM. No technical specification or SLC changes are required.

Part B

This 10 CFR 50.59 evaluation determined that none of the 10 CFR 50.59 criteria were met for Part B of this NSM.

UFSAR Sections 3.7.3.9, 6.2.2.2.7, 6.2.3.2, 9.2.2.2.3, and 9.4.6.2 are to be revised to reflect changes due to Part B of this NSM. UFSAR Figures 6-3, 6-4, 6-9, 8-4, and 9-12 are also to be revised. For UFSAR Figures 6-3, 6-4, and 9-12, the original figure is to be revised to indicate it is for Units 1 and 2 and a second page for this figure is to be added to reflect the Unit 3 design. UFSAR Table 6-7 and 7-3 are to be revised. SLC Table 16.6-1 is to be revised. No technical specification changes are required.

If the cabinets and/or wet taps are installed independent of Part B, there are no UFSAR, Technical Specification, or SLC changes required.

The waterhammer prevention circuitry is to enhance prevention of waterhammer, but is currently not to be used to resolve the waterhammer issue identified in Generic Letter 96-06. This differentiation is important since taking credit for this circuitry to prevent Generic Letter 96-06 waterhammer issues during certain accidents and events may require a technical specification to address the circuitry.

The NSM includes pipe connections for the temporary chiller. This NSM does not address the use of the temporary chiller. Thus, this 10 CFR 50.59 does not address the use or function of the temporary chiller.

This evaluation is not addressing procedures, procedure changes, implementation, or testing activities.

REFERENCES

1) Oconee Nuclear Station Updated Final Safety Analysis Report (UFSAR), effective date of 12/31/03, Sections 1.2.2.3, 3.0, 3.1.1.1, 3.1.2, 3.1.10, 3.1.15, 3.1.21, 3.1.37, 3.1.38, 3.1.39, 3.1.40, 3.1.41, 3.1.49, 3.1.50, 3.1.52, 3.1.53, 3.1.54, 3.1.55, 3.1.56, 3.1.57, 3.2.1.1.1, 3.2.2, 3.4.1.1.2, 3.6.1.1, 3.7, 3.8.1, 3.8.1.5.4, 3.8.1.6.4, 3.8.2, 3.8.3, 6.1, 6.1.3, 6.2, 6.2.1, 6.2.2, 6.2.2.2.7, 6.2.3, 6.2.3.2, 6.5.1.2, 7.3, 7.5, 9.2.2.2.3, 9.4.6, 9.4.6.2, 9.5.1.4.3, 11.5.1,15.0, 15.14, 18.3.3, 18.3.17.12, Tables 3-13, 3-14, 6-6, 6-7, 6-14, 6-21, 6-22, 6-23, 6-24, 6-25, 6-26, 6-27, 6-28, 6-29, 6-30, 6-31, 6-32, 6-33, 6-34, 6-35, 7-3, 9-4, Figures 3-20, 3-32, 6-3, 6-4, 6-6, 6-7, 6-8, 6-9, 6-28 through 6-37, 6-42 through 6-48, 6-50, 6-51, 6-52. 8-4, 9-11, 9-12.

2) Oconee Nuclear Station Technical Specifications, revised as of 8/26/04, and associated bases, revised as of 8/26/04, Sections 3.3.5, 3.3.6, 3.3.7, 3.3.28, 3.6.1, 3.6.3, 3.7.7, 3.7.9, 3.7.16, 3.9.3.

3) Oconee Nuclear Station Selected Licensee Commitments and associated bases, revised as of 4/13/04 and 9/1/04, Sections 16.6.1, 16.6.3, Surveillance Requirement 16.6.13.1, 16.9.8a, 16.9.12, 16.10.4, Table 16.6-1.

4) Revision 2 to the final scope document for NSM ON-33107/0 Parts A and B, approved 9/14/04.

5) Flow Diagrams OFD-124B-3.1 (Revision 45 and 43A for Part BM1), OFD-124B-3.2 (Revisions16 and 16C for Part AM1 and 16B for Part BM1), OFD-124B-3.3 (Revisions 9 and 9B for Part BM1).

6) Reactor Building Liner Plate (which includes penetration information) Drawings O-62A (Revisions 42 and 40A), O-62C (Revisions 40 and 39A), O-62C-02 (Revisions 0 and B).

7) Reactor Building Penetration Drawing O-2875 (Revisions 11 and 11A).

8) Specification OSS-0254.00-00-4001, "Design Basis Specification for Reactor Building Containment Isolation", Revision 22.

9) Specification OSS-0254.00-00-1030, "Design Basis Specification for the Reactor Building Ventilation", Revision 6.

10) Specification OSS-0254.00-00-1026, "Design Basis Specification for the Reactor Building Cooling System", Revision 14.

11) Specification OSS-0254.00-00-1039, "Design Basis Specification for the Low Pressure Service Water System", Revision 30.

12) Review of UFSAR Revision Tracking System list of proposed changes, performed by Ken Sandel, Project Management, on 7/8/04.

13) Calculation OSC-8107, "Mechanical Design Inputs for NSM ON-x3107", Revision 2.

14) Calculation OSC-8380, "Electrical Design Inputs Calculation for NSM 3107 LPSW to RB Auxiliary Coolers Isolation", Revision 2.

15) Letter dated 9/30/96 from the NRC to Duke sending Generic Letter 96-06.

16) Letter dated 9/30/02 from Duke to the NRC providing supplemental response to Generic Letter 96-06.

17) Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following and Accident", Revision 2, December 1980.

18) Letter dated 9/28/84 from Duke to the NRC sending Regulatory Guide 1.97 response.

19) Letter dated 7/11/85 from the NRC to Duke addressing the Duke response on Regulatory Guide 1.97.

20) E-mail dated 1/20/03 from Henry Harling, Mechanical Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-13107 Part A (Attachment 2). Note that this e-mail is addressing the Unit 1 NSM, but it is applicable to the Unit 3 NSM also.

21) E-mail dated 1/22/03 from Greg Saxon, Mechanical System Engineering, to Ken Sandel, Project Management, providing information on NSM ON-13107 Part A (Attachment 3). Note that this e-mail is addressing the Unit 1 NSM, but it is applicable to the Unit 3 NSM also.

22) E-mail dated 5/3/04 from Henry Harling, Mechanical Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 Parts A and B (Attachment 4).

23) E-mail dated 4/26/04 from Tom Glenn, Electrical Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 Part B (Attachment 5).

24) E-mail dated 10/2/03 from Dick Benoit, General Office Civil, Structural, and Valve Group, to Ken Sandel, Project Management, providing information on NSM ON-33107 Part A (Attachment 6).

25) E-mail dated 4/26/04 from David Perry, Civil Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 Parts A and B. Also e-mail dated 4/28/04 from Chris Painter, Civil Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 Parts A and B (Attachments 7 and 8).

26) Electrical One Line Drawing O-2703-G (Revision 64 and 63A).

27) Code of Federal Regulations, Title 10, Part 50, Section 36, version 1-1-04.

28) PIP O-97-00311 (addresses waterhammer issues for LPSW flow to RBCUs and RBACs for Unit 3.

29) Memo to file dated 10/22/03 by Henry Harling addressing applicability of RBAC waterhammer test to new pipe route, File ON-13107/00, ON-23107/00, ON-33107/00, OS-210.24.

30) Letter dated 9/14/98 from Duke to the NRC sending revision 2 to LER 269/97-02 regarding waterhammer issues with LPSW supply to the RBCUs and RBACs with respect to Generic Letter 96-06.

31) Letter dated 9/30/02 from Duke to the NRC providing supplemental information on waterhammer with respect to Generic Letter 96-06.

32) Letter dated 9/29/03 from Duke to the NRC providing supplemental information on waterhammer with respect to Generic Letter 96-06.

33) E-mail dated 4/27/04 from Martin Hemphill, Civil Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 (Attachment 9).

34) Letter dated 6/17/04 from Duke to the NRC sending SLC revisions which include changes to Section 16.6.1 and 16.9.12.

35) E-mail dated 8/25/04 from Henry Harling, Mechanical Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 (Attachment 10).

36) E-mail dated 8/25/04 from Chris Painter, Electrical Modification Engineering, to Ken Sandel, Project Management, providing information on NSM ON-33107 (Attachment 11).

37) Letter dated 8/26/04 from Duke to the NRC sending License Amendment Request for new technical specification on RBAC Isolation Circuitry System.

Attachment 2
50.59 Eval
NSM ON-33107
Sheet 1 of 4

Henry E Harling Jr
01/20/2003 09:51 AM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc: Gregory B Saxon/Gen/DukePower@DukePower
Subject: Re: Question on Design of NSM ON-13107 Part A

I believe that only one (1) pipe cap is needed. Attached is my reasoning. Bottom line summary: Existing passive components only utilize a single barrier (e.g., equipment hatch, spare electrical penetrations, dished heads connecting the liner to process piping). This is allowed by the standard referenced in the UFSAR, is not specifically prohibited in the UFSAR, and is explicitly allowed in modern standards.

Evaluation of Single Pipe Cap on New Penetrations 63 and 64.r

Kenneth W Sandel

Kenneth W Sandel
01/20/2003 08:36 AM

To: Henry E Harling Jr/Gen/DukePower@DukePower, Gregory B Saxon/Gen/DukePower@DukePower
cc:
Subject: Question on Design of NSM ON-13107 Part A

Henry and Greg. Attached is the request for information that we have recently discussed.

I have completed a preliminary 50.59 for NSM ON-13017 Part A. I have a question concerning the design of the spare mechanical penetrations. Each penetration consists of a dished head that is attached to the containment liner and then attached to some Class F piping that has the inside portion of the pipe capped. In reviewing the UFSAR, there is some discussion about penetrations having double barriers. Most barriers consist of two valves, one inside containment and one outside containment. But one type of allowed barrier inside containment is described as being a closed loop inside containment. In some ways, the spare penetration could be construed as being a very short closed loop insider containment, thus requiring a second barrier. From a different perspective, the spare penetration may be able to be considered as being an extension of the steel containment. The steel containment only consists of one barrier.

There is also some discussion in the UFSAR about Oconee's penetrations conforming to the applicable sections of ASA N6.2-1965. I do not have access to this code, but I hope that this code specifically addresses spare penetrations and the quantity of barriers needed. Henry, you were able to find that a more recent code that addressed spare penetrations as only needing one pipe cap, although Oconee had not committed to that code. My understanding is that you are researching the Oconee committed codes for info on the spare penetration design requirements.

I need some information from you two folks concerning why one pipe cap is acceptable or that we need two barriers. I will likely use your responses in the design 50.59. Thank you for your assistance.

The preliminary 50.59 is attached.

on13107.Part A.5059.draft1.kws.dc

Evaluation of Single Pipe Cap on New Penetrations 63 and 64

Problem Statement

NSM ON-13107 Part A will install new penetrations, 63 and 64, which will consist of a dished head and housing with a 6'-6" stalk of 6" Sch. 80 pipe going through it. The pipe will be capped on the end that's inside the Reactor Building (RB). The question has been raised as to whether a second pipe cap is needed for the purposes of providing a double barrier.

Evaluation

The UFSAR contains several sections pertaining to piping penetrations that are primarily focused on penetrations containing valves:

UFSAR Section 3.1.53:

> "Piping penetrations that require closure under accident conditions are provided with double barriers so that no single credible failure or malfunction could result in a loss of isolation. Valves are manually, electrically or pneumatically operated. Check valves are used in certain applications. All isolation valves inside the Reactor Building requiring remote operation are electrically operated. As an alternative to valves, other types of apparatus which provide a suitable barrier for containment isolation may be utilized. Examples of such mechanisms include, but are not limited to flanges and closed loop piping systems that are designed to remain intact when containment isolation is required."

UFSAR in Section 6.2.3.1:

> "The general design basis governing isolation requirements is:
>
> > Leakage through all fluid penetrations not serving accident-consequence limiting systems is to be minimized by a double barrier so that no single, credible failure or malfunction of an active component can result in loss-of-isolation or intolerable leakage. The installed double barriers take the form of closed piping systems, both inside and outside the Reactor Building, and various types of isolation valves."

UFSAR Section 6.2.3.2 (for Type C fluid penetrations):

> "Each line not directly connected to the Reactor Coolant System or not open to the Reactor Building atmosphere has at least one valve, either a check valve or an automatic remotely operated valve. This valve is located outside the Reactor Building. A seismic closed loop forms the inside barrier for most Type C penetrations. Since the Component Cooling System has a non-seismic closed loop, penetrations for this system have an additional automatic remotely operated

valve or check valve located inside the Reactor Building (referred to as Type III penetrations in the DBD)."

The reason that double barriers are required is to preclude a breach of containment due to a single failure. UFSAR Section 6.3.2.1 essentially states this and the "Containment Isolation" DBD, OSS-0254.00-00-4001, Section 3.3.11 discusses the requirement that "No single failure or malfunction of an active component shall result in the loss-of-isolation or intolerable leakage." The DBD section further states that "Passive failures are not considered to affect containment isolation." Likewise, DBD Section 3.3.3 also states that the double barrier is required so that no single credible failure results in a loss of isolation.

UFSAR 3.1.53 specifically refers to containment isolation valves, not structural components. The "Single Failure" DBD, OSS-0254.00-00-4013, Section 3.2.2.2, discusses this further as well as UFSAR 6.2.3.1. These sections are interpreted as applying only to valves, since the section header is "Containment Isolation Valves." Thus, the above UFSAR sections cited in the preliminary 10 CFR 50.59 evaluation are interpreted as applying only to penetrations containing valves. In all cases, the current design of spare electrical penetrations only utilizes a single plate on the penetration pipe. Similarly, all dished heads on all existing fluid penetrations only represent a single barrier.

UFSAR 3.8.1.5.4 states that "Penetrations conform to the applicable sections of ASA N6.2-1965, 'Safety Standard for the Design, Fabrication and Maintenance of Steel Containment Structures for Stationary Nuclear Power Reactors'." This standard provides some general design and fabrication criteria for the entire containment including penetrations. Spare penetrations are not explicitly discussed. The single failure principle is only discussed in the context of automatically closing valves (Section 18). The standard states "Openings which will be used only at times when hazardous conditions cannot occur may be constructed as a single door or access panel." The equipment hatch is an example of such an existing component.

Though not an Oconee required standard, ANSI/ANS-56.2-1984, "Containment Isolation Provisions for Fluid Systems After a LOCA," Section 3.2 states, "Spare pipe penetrations having at least one end capped and welded, thereby providing a solid seamless barrier to the outside environment shall be considered to be part of, or an extension to, the containment liner, and do not require additional isolation barriers or test connections." This statement is consistent with the philosophy espoused in the aforementioned statement from ASA N6.2.

In conclusion, the single pipe cap in the penetration assembly that will be installed under NSM ON-13107 Part A is considered acceptable for the following reasons:

- The penetration assembly is a totally passive component which is not subject to the active single failure requirements that is the focus of the UFSAR.
- The UFSAR cited design standard, ASA N6.2, allows for single barriers
- Passive failures are not required to be "single-failure proof"
- The current design of the spare electrical penetrations only uses a single plate

Attachment 2
50.59 Eval
NSM ON-33107
Sheet 4 of 4

- The dished head between the liner and the process pipe in current fluid penetrations does not have a second barrier between containment and the environment
- More modern standards specifically allow only a single pipe cap for spare pipe penetrations.

Attachment 3
50.59 Eval
NSM ON-33107
Sheet 1 of 2

Gregory B Saxon
01/22/2003 07:43 AM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc: Henry E Harling Jr/Gen/DukePower@DukePower
Subject: Re: Question on Design of NSM ON-13107 Part A

Ken,

My position is still the same. This configuration does not follow the typical closed loop arrangement and, in my opinion, should not be considered as such.
Sorry for the delayed response - I was at home with kids yesterday.

Thanks,
Greg Saxon
885-4875
Kenneth W Sandel

Kenneth W Sandel
01/20/2003 12:48 PM

To: Gregory B Saxon/Gen/DukePower@DukePower
cc: Henry E Harling Jr/Gen/DukePower@DukePower
Subject: Re: Question on Design of NSM ON-13107 Part A

Greg.

Please be aware that the dished head has pipe running thru a hole in the center of it. The dished head is then welded to the Class F pipe. The pipe cap is then welded to the end of the containment side of the pipe. Does this change your position?

Gregory B Saxon

Gregory B Saxon
01/20/2003 11:00 AM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc: Henry E Harling Jr/Gen/DukePower@DukePower
Subject: Re: Question on Design of NSM ON-13107 Part A

Ken,

It is my opinion that the spare electrical penetration that is to be converted to a spare mechanical penetration should **not** be considered a closed loop system. Typically, a closed loop system is one which enters the RB through one penetration, performs a function (i.e., providing cooling water), and then exits the RB through a separate penetration. My understanding is that the new mechanical penetration will consist of the penetration and a dished head inside the reactor building for one innage period. This arrangement is not a loop of piping that enters and exits the RB. The single boundary (dished head) is consistent with other spare penetrations.

Let me know if you have further questions.

Thanks,
Greg Saxon
885-4875
Kenneth W Sandel

Kenneth W Sandel

To: Henry E Harling Jr/Gen/DukePower@DukePower, Gregory B

Attachment 3
50.59 Eval
NSM ON-33107
Sheet 2 of 2

01/20/2003 08:36 AM

Saxon/Gen/DukePower@DukePower

cc:

Subject: Question on Design of NSM ON-13107 Part A

Henry and Greg. Attached is the request for information that we have recently discussed.

I have completed a preliminary 50.59 for NSM ON-13017 Part A. I have a question concerning the design of the spare mechanical penetrations. Each penetration consists of a dished head that is attached to the containment liner and then attached to some Class F piping that has the inside portion of the pipe capped. In reviewing the UFSAR, there is some discussion about penetrations having double barriers. Most barriers consist of two valves, one inside containment and one outside containment. But one type of allowed barrier inside containment is described as being a closed loop inside containment. In some ways, the spare penetration could be construed as being a very short closed loop insider containment, thus requiring a second barrier. From a different perspective, the spare penetration may be able to be considered as being an extension of the steel containment. The steel containment only consists of one barrier.

There is also some discussion in the UFSAR about Oconee's penetrations conforming to the applicable sections of ASA N6.2-1965. I do not have access to this code, but I hope that this code specifically addresses spare penetrations and the quantity of barriers needed. Henry, you were able to find that a more recent code that addressed spare penetrations as only needing one pipe cap, although Oconee had not committed to that code. My understanding is that you are researching the Oconee committed codes for info on the spare penetration design requirements.

I need some information from you two folks concerning why one pipe cap is acceptable or that we need two barriers. I will likely use your responses in the design 50.59. Thank you for your assistance.

The preliminary 50.59 is attached.

on13107.Part A.5059.draft1.kws.dc

Attachment 4
50.59 Eval
NSM ON-33107
Sheet 1 of 2

Henry E Harling Jr
05/03/2004 11:10 AM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-33107 Parts A and B

Here's response (numbers correspond):

a) Correct.

b) Correct.

c) Correct.

d) Correct.

e) Correct.

f) Correct.

g) There are no changes to the piping going to the RBCU's except for the removal of LPSW-566. Since LPSW-566 is a full port gate valve, the hydraulic resistance of the replacement pipe is negligibly less. The RBAC's are currently isolated on an ES signal and will continue to be. Thus, this NSM has no effect on the performance, including LPSW flow rates, of the RBCU's during ES events.

h) Correct.

i) Correct.

j) Correct. See g) above.

k) Correct.

HEH

Kenneth W Sandel

Kenneth W Sandel
04/28/2004 09:14 AM

To: Henry E Harling Jr/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107 Parts A and B

Henry. Please verify/correct the following information for this NSM. I plan on using this information in the design 50.59. Thank you.

a) Containment repair/replacement activities are presently governed by the 1992 Edition including the 1992 Addenda of ASME Section XI. Section XI allows the use of the original design code, or a later edition of that code. The converted mechanical penetrations have been designed to the 1992 edition, including the 1992 addenda of Section III of the ASME Boiler and Pressure Vessel Code. This code was chosen since it is the current code of record for Containment In-Service Inspection.
b) UFSAR Section 3.8.1.5.4 provides information that penetrations conform to the applicable sections of ASA N6.2-1965. ASA N6.2-1965 requires penetrations to be designed to ANSI B31.1-1955 with 1963 addendum. The code that was used for this NSM part was the 1992 edition of ASME Section III, with 1992 addenda. The

design rules as far as loading combinations and such are unchanged from the original plant design.

c) The outside portions of these converted penetrations enter into the East Penetration Room.

d) No seismic interactions exist between non-seismically restrained structures, systems, or components and the new modified penetrations as designed in Part A.

e) The designs of the modified penetrations are such that containment integrity is not adversely affected, as compared to the UFSAR description of penetrations.

f) SLC Table 16.6-1 is not to be revised for Part A of this NSM since the spare penetrations do not contain an active or flanged component. Until parts of the NSM that add valves and uncap the penetration are completed, the spare piping penetrations will be covered by the integrated leak rate test (Appendix J Type A test). The spare mechanical penetrations are considered to be part of containment.

g) Numerous UFSAR tables and figure in Sections 6 and 15 contain results of LOCA accident analyses. Please verify at design completion that the information in the UFSAR Sections 6 and 15 tables and figures are not affected by the change in flowrates to the RBCUs. In addition, UFSAR Section 6.2.1 contains information pertaining to LPSW flowrates and BTU/hour performance for the RBCUs. Please verify that this information is not changed as a result of this NSM since the RBACs are currently isolated on an ES signal and that none of these figures and tables needs to be revised because of this NSM.

h) The closure speed of the containment isolation valves is selected so that water hammers will not occur. There is no known specified closure time for containment isolation valves, but the time chosen is within the ranges of existing containment isolation valves.

i) There are no adverse effects to structures, systems, or components associated with this NSM from missiles generated inside containment or missiles generated from natural phenomena events. There are also no adverse effects due to high or low trajectory missile.

j) The LPSW required flow to components (e.g., RBCUs, LPI) is not adversely affected due to this NSM. In addition, flow to non-required loads (e.g., RBACs during normal operation) is not adversely affected.

k) The modification does not create any new seismic/non-seismic interactions with respect to mechanical changes for Part B.

Attachment 5
50.59 Eval
NSM ON-33107
Sheet 1 of 1

Thomas N Glenn
04/26/2004 04:01 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc: Thomas N Glenn/Gen/DukePower@DukePower, Billy J Shepherd/Gen/DukePower@DukePower
Subject: Re: NSM ON-33107 Parts A and B

Ken,

Everything you wrote in the note below is correct.

Thanks!

Tom Glenn

Kenneth W Sandel

Kenneth W Sandel
04/26/2004 02:11 PM

To: Thomas N Glenn/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107 Parts A and B

Tom, Please verify/correct the following information for Parts A and B of this NSM. I plan on using this information in the design 50.59. Thank you.

a) The existing monitoring to the RBCUs will remain. The new LPSW supply lines to and from the RBACs will have flow monitoring instrumentation (flow orifices) and control room alarm included as part of the NSM. The instrumentation will be used to determine a differential flow to detect a loss of LPSW flow to and from the RBACs. Both the existing differential flow instrumentation for the RBCUs and the new instrumentation for the RBACs are non-QA for function. The existing RBCU differential flow instrumentation is not being changed. The new RBAC differential instrumentation is qualified for the pressure boundary.
b) The new LPSW flow instrumentation is only for non-accident monitoring. It is not considered Regulatory Guide 1.97 instrumentation. The existing LPSW flow instrumentation to the RBCU/RBACs monitors the flow to the RBCUs and, per UFSAR Section 7.5.2.41, is backup instrumentation that monitors Reactor Building fan heat removal. Thus, it is Regulatory Guide 1.97 instrumentation due to this backup function.
c) The outside containment isolation valves each use a Moore controller to throttle the valves. If the power is lost to the Moore controller, then the respective valve will fail open. Even if the Moore controller loses power, the valve will still close automatically on receiving an ES signal and the operators can manually close any of the new containment isolation valves with the control room OPEN/CLOSE switch. The QA-1 solenoid valves for the outermost containment isolation valves are on one power supply and the QA solenoid valves for the innermost valves are on a different power supply.
d) The existing LPSW flow differential is less accurate than this new flow instrumentation differential output.
e) The non-QA instrumentation is in the Class F portion of the piping and is qualified for pressure boundary but is not QA-1 for function.
f) The solenoid valves and the air supply line from the QA-1 containment isolation valves to the solenoid valves are QA-1 so that the air has a QA-1 flow path for air release when being closed.
g) There are control board changes and QA-1 cabinet changes and cabinet additions associated with this NSM. The control boards and QA-1 cabinets are seismically qualified after these changes and additions.
h) The cabling and other electrical components are adequately sized.
i) The modification meets the applicable electrical separation criteria and specifications for electrical components as listed and described in the UFSAR.
j) The modification does not create any new seismic/non-seismic interactions with respect to electrical changes for Part B.
k) New safety to non-safety (QA-1 to non-QA-1) electrical interfaces will have QA-1 isolation devices.
l) An electrical 10 CFR 50 Appendix R fire review was performed for the design phase with no adverse effects to the Appendix R fire separation requirements for Part B.

Attachment 6
50.59 Eval
NSM ON-33107
Sheet 1 of 2

Richard H Benoit
10/02/2003 07:58 AM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc: Donald E DeMart/Gen/DukePower@DukePower, Robert L Keiser/Gen/DukePower@DukePower
Subject: Re: NSM ON-23107 Part A - Convert Two Electrical Penetrations to Two Mechanical Fluid Penetrations

Ken -

I discussed the penetration modification with Henry Harling. The unit 2 and 3 modifications are physically identical to the modification for unit 1. Therefore all previous qualifications performed for unit 1 are also applicable to units 2 and 3. The unit 2 and 3 penetrations satisfy the design requirements of the UFSAR and relevant DBDs. Calculation OSC-8261 applies to all units.

Dick Benoit

Kenneth W Sandel

Kenneth W Sandel
09/29/2003 02:27 PM

To: Richard H Benoit/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-23107 Part A - Convert Two Electrical Penetrations to Two Mechanical Fluid Penetrations

Dick. Can you verify that the information you provided below is also valid for the Unit 2 NSM ON-23017 Part A? Again, I plan on using this information in the design 50.59. Thanks you.

----- Forwarded by Kenneth W Sandel/Gen/DukePower on 09/29/2003 02:21 PM -----

Richard H Benoit
03/11/2003 04:16 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-13107 Part A - Convert Two Electrical Penetrations to Two Mechanical Fluid Penetrations

Ken -

The penetrations are designed for pipe rupture loads as required by ONS UFSAR section 3.6.1.1 and Appendices A and B of the Oconee Pipe Rupture DBD, OSS-0254.00-00-4017. These are faulted condition loads which envelope the maximum hypothetical earthquake, or SSE, as well as all normal operating loads. This analysis and design is documented in calculation OSC-8261, "Conversion of a Type III Electrical Penetration to a Type X Mechanical Penetration".

Dick Benoit

Kenneth W Sandel

Kenneth W Sandel
03/11/2003 10:40 AM

To: Richard H Benoit/Gen/DukePower@DukePower
cc:
Subject: NSM ON-13107 Part A - Convert Two Electrical Penetrations to Two Mechanical Fluid Penetrations

Dick. Please verify/correct the following information on the subject NSM. Please reply by using the "Reply with History" option. I plan on using this information in the design 50.59. Thank you.

Attachment 6
50.59 Eval
NSM ON. 33/07
Sheet 2 of 2

a) The converted spare mechanical fluid penetrations are seismically qualified and designed to withstand UFSAR specified design loads.

Attachment 7
50.59 Eval 1
NSM ON-33107
Sheet 1 of 1

David S Perry
04/26/2004 03:55 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

True except B can not be installed without A. Don't know about the electrical cabinet part.

----- Forwarded by David S Perry/Gen/DukePower on 04/26/2004 03:52 PM -----

Clifford M Davis
04/26/2004 03:33 PM

To: David S Perry/Gen/DukePower@DukePower, Christopher J Painter/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

David/Chris,

Please provide the information requested to Ken.

Thanks, Cliff

----- Forwarded by Clifford M Davis/Gen/DukePower on 04/26/2004 03:31 PM -----

Kenneth W Sandel
04/26/2004 02:03 PM

To: Clifford M Davis/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Cliff, Please verify/correct the following information for Parts A and B of this NSM. Note that Part A may be installed independent of Part B, or Parts A and B may be installed together, or that the electrical cabinets of Part B may be installed independent of Part A or the rest of Part B. Thus the items below are written for Parts A and B separately. I plan on using this information in the design 50.59. Thank you.

a. The piping has been analyzed and supports are designed to ensure the piping meets piping codes for Part A.
b. The piping and supports of Part B are designed such that they meet applicable design codes when connected to the converted penetrations of Part A.
c.
d.

Christopher J Painter
04/28/2004 02:07 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Piping stress analysis is completed as described below.

----- Forwarded by Christopher J Painter/Gen/DukePower on 04/28/2004 02:06 PM -----

Clifford M Davis
04/26/2004 03:33 PM

To: David S Perry/Gen/DukePower@DukePower, Christopher J Painter/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

David/Chris,

Please provide the information requested to Ken.

Thanks, Cliff

----- Forwarded by Clifford M Davis/Gen/DukePower on 04/26/2004 03:31 PM -----

Kenneth W Sandel
04/26/2004 02:03 PM

To: Clifford M Davis/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Cliff, Please verify/correct the following information for Parts A and B of this NSM. Note that Part A may be installed independent of Part B, or Parts A and B may be installed together, or that the electrical cabinets of Part B may be installed independent of Part A or the rest of Part B. Thus the items below are written for Parts A and B separately. I plan on using this information in the design 50.59. Thank you.

a. The piping has been analyzed and supports are designed to ensure the piping meets piping codes for Part A.
b. The piping and supports of Part B are designed such that they meet applicable design codes when connected to the converted penetrations of Part A.
c.
d.

Attachment 9
50.59 Eval
NSM ON-33107
Sheet 1 of 1

Martin R Hemphill
04/27/2004 04:26 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-33107

Ken,

The mounting for electrical cabinets (3AT5, 3AT6, 3AT7 & 3AT8) to be installed under NSM ON-33107 have been analyzed as QA Condition 1 and documented in calculation OSC-8581.

Thanks
Martin

Kenneth W Sandel

Kenneth W Sandel
04/27/04 02:19 PM

To: Martin R Hemphill/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Martin. Please verify/correct the following information for this NSM. I plan on using this information in the design 50.59. Thank you.

a) The electrical cabinets are mounted QA-1.

Attachment 10
50.59 Eval
NSM ON-33107
Sheet 1 of 1

Henry E Harling Jr
08/25/2004 01:07 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-33107

This is correct.

Kenneth W Sandel

Kenneth W Sandel
08/25/2004 11:58 AM

To: Henry E Harling Jr/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Please verify/correct the following information on this NSM. I plan on using this information in the design 50.59. Thank you.

This infomation is needed since the wet taps may possibly be installed separately from the rest of ON-33107 Part B. Please verify/correct that:

a) The tapping valve and blind flange (if installed) are QA-1 and Duke Class F.

Attachment 11
50.59 Eval
NSM ON-33107
Sheet 1 of 1

Christopher J Painter
08/25/2004 12:45 PM

To: Kenneth W Sandel/Gen/DukePower@DukePower
cc:
Subject: Re: NSM ON-33107

Ken - The wet taps and associated hardware, if installed separately from Part B, will be installed in Part A. This is what all the drawings now define. All piping calculations have been revised and approved.
Kenneth W Sandel

Kenneth W Sandel
08/25/2004 12:01 PM

To: Christopher J Painter/Gen/DukePower@DukePower
cc:
Subject: NSM ON-33107

Chris. Please verify/correct the following information on this NSM. I plan on using this information in the design 50.59. Thank you.

This infomation is needed since the wet taps may possibly be installed separately from the rest of ON-33107 Part B. Please verify/correct that:

a) If the wet taps (including tapping valves) and blind flanges are installed separately from Part B, the piping is designed such that applicable design codes are met when connected to the supply and return headers.