Entergy

Entergy Operations, Inc.
1340 Echelon Parkway
Jackson, MS 39213-8298
Tel 601 368 5758

Michael A. Krupa
Director
Nuclear Safety & Licensing

December 9, 1999

U. S. Nuclear Regulatory Commission
Attn.: Document Control Desk
Mail Stop OP1-17
Washington, DC 20555-0001

Subject: Entergy Operations, Inc.
Alternatives to ASME Code Requirements

Arkansas Nuclear One - Units 1 & 2 Docket Nos. 50-313 & 50-368 License Nos. DPR-51 & NPF-6	Grand Gulf Nuclear Station Docket No. 50-416 License No. NPF-29
River Bend Station Docket No. 50-458 License No. NPF-47	Waterford Steam Electric Station – Unit 3 Docket No. 50-382 License No. NPF-38

Reference:
1. CNRO-99/00004, "Alternatives to ASME Code Requirements," dated April 29, 1999
2. CNRO-99/00016, "Alternatives to ASME Code Requirements," dated May 10, 1999

CNRO-99/00025

Ladies and Gentlemen:

In the referenced letters, Entergy Operations, Inc. (Entergy) proposed three alternatives to various requirements of ASME Boiler and Pressure Vessel Code Section XI, 1992 Edition, 1992 Addenda. By this letter, Entergy is providing revised Alternative Requests IWE-02 and IWE-03. These revised requests provide the NRC with more consistent, detailed information. The revised information is noted by bold, italicized text along with revision bars in the page margins. Entergy requests approval of the alternative requests on or before March 1, 2000, in order to support an upcoming refueling outage at River Bend Station.

Entergy personnel have discussed this submittal with Mr. Chris Nolan of the NRR Project Directorate IV staff.

A047

Should you have any questions regarding this submittal, please contact Guy Davant at (601) 368-5756.

Very truly yours,

MAK/GHD/baa
attachments
cc: Mr. C. M. Dugger (W-3)
Mr. R. K. Edington (RBS)
Mr. W. A. Eaton (GGNS)
Mr. C. R. Hutchinson (ANO)
Mr. M. R. Kansler (ECH)
Mr. J. R. McGaha (ECH)

Mr. R. L. Bywater, NRC Senior Resident Inspector (ANO)
Ms. J. L. Dixon-Herrity, NRC Senior Resident Inspector (GGNS)
Mr. T. R. Farnholtz, NRC Senior Resident Inspector (W-3)
Mr. R. J. Fretz, NRC Project Manager (RBS)
Mr. N. D. Hilton, NRC Project Manager (ANO-1)
Mr. E. W. Merschoff, NRC Region IV Regional Administrator
Mr. M. C. Nolan, NRC Project Manager (ANO-2)
Mr. C. P. Patel, NRC Project Manager (W-3)
Mr. T. W. Pruett, NRC Senior Resident Inspector (RBS)
Mr. S. P. Sekerak, NRC Project Manager (GGNS)

ARKANSAS NUCLEAR ONE – UNITS 1 & 2
GRAND GULF NUCLEAR STATION
RIVER BEND STATION
WATERFORD STEAM ELECTRIC STATION – UNIT 3

CONTAINMENT INSPECTION
BOLTING TORQUE / TENSION TEST
ALTERNATIVE REQUEST # IWE-02, Rev. 0

SYSTEMS/COMPONENTS FOR WHICH AN ALTERNATIVE IS PROPOSED

Class MC pressure retaining bolting, Examination Category E-G, Item 8.20 of IWE-2500, "Examination and Pressure Test Requirements" Table IWE-2500-1, ASME Section XI, 1992 Edition with the 1992 Addenda.

CODE REQUIREMENT

ASME Section XI, 1992 Edition with 1992 Addenda, Table IWE-2500-1 requires a bolt torque or tension test once each interval.

CODE REQUIREMENT FOR WHICH AN ALTERNATIVE IS PROPOSED

Pursuant to 10CFR50.55a(a)(3)(ii), Entergy proposes an alternative to performing the Code-required bolt torque or tension test on the bolt connections that are not disassembled and reassembled during the inspection interval. The torque or tension testing will result in hardship without commensurate increase in the level of safety or quality.

BASIS FOR ALTERNATIVE

10CFR50.55a was amended, as cited in the *Federal Register* (61 FR 41303), to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Bolt torque or tension testing is required on bolted connections that have not been disassembled and reassembled during the inspection interval. Determining the torque or tension value would require the bolting to be loosened and then re-torqued or re-tensioned. Discussions of bolted connections are presented below for each Entergy site. These discussions address pressure-seating and pressure-unseating bolted connections. Pressure-seating bolted connections are considered to be those connections that have additional seating loads due to accident pressures on the inboard (containment) side of the penetration. Thus pressure-seating connections have a low potential for leakage under accident loads. In contrast, pressure-unseating bolted connections see unseating loads due to accident pressures on the inboard (containment) side of the penetration. Therefore, the potential for leakage through a pressure-unseating connection is greater than for a pressure-seating connection. As a result, the integrity of the connection is more dependent on proper tensioning of the treaded fasteners, possibly increasing the potential for leakage.

1. Arkansas Nuclear One

Penetration bolted connections are pressure-seating, except in six cases as discussed below. Specifically, the equipment hatch bolted connections seat against the interior surface of containment during containment pressurization and are therefore pressure-seating. The bolted connections associated with the fuel transfer tube blind flange are also pressure-seating. The exceptions are:

a. Both bulkheads on both personnel air locks and both emergency air locks are fitted with an electrical penetration assembly. Each of the four electrical penetration assemblies has a pressure seating connection on the inboard side and a pressure unseating connection on the outboard side. Thus, pressure loading on the unseating connection would only occur upon failure of the pressure seating connection.

b. Both personnel air locks and emergency air locks have a bolted handwheel shaft seal retainer on both the inner and outer bulkheads. The emergency air locks also have an additional door operating mechanism on both inner & outer bulkheads. Thus, pressure loading on these unseating connections would occur only if the inboard door is open, or if the inboard bulkhead is breached.

c. Both personnel air locks and the emergency air lock on ANO-2 have a telephone penetration assembly that is pressure seating on the inboard side and unseating on the outboard side. This penetration is only located in the outboard bulkhead. Thus, pressure loading on the unseating connection would only occur upon failure of the pressure seating connection.

d. The ANO-1 emergency air lock has eight inservice inspection (ISI) penetrations in the top of the air lock barrel assembly. Four of these are inside the reactor building and are pressure seating. The other four are outside the reactor building and are pressure unseating. Pressure loading on the four outside containment penetrations would only occur upon failure of the pressure seating connections inside the containment.

e. The ANO-2 electrical penetration assemblies have a penetration header plate with redundant O-rings that is attached to the weld flange with bolting on the Auxiliary Building side. These connections are pressure unseating ***and are Type B leak-tested in the pressure-unseating direction in accordance with 10CFR50 Appendix J.***

f. The ANO-2 containment has two penetrations equipped with blind flanges and gaskets on either end. The inboard flange is pressure-seating while the outboard flange is pressure-unseating. Pressure loading on the outboard flange would only occur upon failure of the inboard flange. These penetrations are Type B leak tested in the pressure-unseating direction in accordance with 10CFR50 Appendix J.

2. Grand Gulf Nuclear Station

Penetration bolted connections are pressure-seating, except for the following two cases:

a. Both bulkheads on both containment personnel airlocks are fitted with an electrical penetration assembly. Each of the four electrical penetration assemblies has a pressure-seating connection on the inboard side and a pressure-unseating connection on the outboard side. Thus, pressure loading on the unseating connection would only occur upon failure of the pressure-seating connection.

b. Both containment airlocks have a bolted handwheel shaft seal retainer and a bolted blind flange used for testing on the outboard bulkhead. (The flange is local leak-rate tested.) Thus, pressure loading on these unseating connections would occur only if the inboard door is open, or if the inboard bulkhead is breached.

3. River Bend Station

Penetration bolted connections are pressure-seating, except for the following cases:

a. The equipment hatch seats against the exterior surface of the containment and is therefore pressure-unseating. The equipment hatch is removed during maintenance outages, when necessary, and during each refueling outage. Prior to plant startup, the hatch and flange are Type B leak-tested in accordance with 10CFR50 Appendix J.

b. The fuel transfer tube blind flange bolting connection is pressure-unseating. The blind flange is removed during each refueling outage. Prior to plant startup, the flange is Type B leak-tested ***in the pressure-unseating direction*** in accordance with 10CFR50 Appendix J.

c. ***Each airlock features a three-inch blind flange bolting connection that is pressure-unseating. The blind flange is removed during the airlock overall leakage rate test to connect test rig. Once reassembled the blind flanges are Type B leak-tested in the pressure-unseating direction in accordance with 10CFR50 Appendix J.***

4. Waterford-3

Penetration bolted connections are pressure-seating except for bolted connections located within the exterior personnel airlock doors. These connections are Type B pressure-tested in a pressure-unseating fashion during leak tests of the airlocks in accordance with 10CFR50 Appendix J.

Each containment penetration is leak-tested in accordance with 10CFR50 Appendix J. Successfully performing the test itself proves the bolt torque or tension remains adequate to provide a leak rate within acceptable limits. The torque or tension value of bolting becomes

an issue only if the leak rate is excessive. Once a bolt is torqued or tensioned, it is not subject to dynamic loading that could cause it to experience significant change. Appendix J testing and visual inspection are adequate to demonstrate the design function is met. Torque or tension testing is not required for any other ASME Section XI, Class 1, 2, or 3 bolted connection or its supports as part of the Inservice Inspection program.

The requirement to perform bolt torque or tension tests has been removed from the 1998 Edition of Subsection IWE of ASME Section XI. Entergy believes 10CFR50, Appendix J Type B testing provides an equivalent level of quality and safety to the bolt torque testing required by Table IWE-2500-1. Therefore, loosening and subsequent re-torquing bolted connections that are verified leak-tight per Appendix J testing results in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The NRC has approved a similar request for Davis-Besse Nuclear Power Station (#RR-E7)[1].

ALTERNATE EXAMINATIONS

The following examinations and tests required by Subsection IWE ensure the structural integrity and the leak-tightness of Class MC pressure retaining bolting; therefore, no additional alternative examinations are proposed:

1. Exposed surfaces of bolted connections shall be visually examined in accordance with requirements of Table IWE-2500-1, Examination Category E-G, Pressure Retaining Bolting, Item No. E8.10.

2. Bolted connections shall meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, All Pressure Retaining Components, Item E9.40.

In addition, 10CFR50 Appendix J testing is currently performed on each containment penetration at least once each inspection interval.

[1] Letter dated June 30, 1998, "Relief from Certain ASME Code Requirements for Inservice Inspection for Facility Operating License No. NPF-3 – Davis-Besse Nuclear Power Station, Unit 1 (TAC No. MA0414)"

ARKANSAS NUCLEAR ONE – UNITS 1 & 2
GRAND GULF NUCLEAR STATION
RIVER BEND STATION
WATERFORD STEAM ELECTRIC STATION – UNIT 3

CONTAINMENT INSPECTION
SEALS AND GASKETS
ALTERNATIVE REQUEST # IWE-03, Rev. 0

SYSTEMS/COMPONENTS FOR WHICH AN ALTERNATIVE IS REQUESTED

Seals and gaskets of Class MC pressure retaining components, Examination Category E-D, Items E5.10 and E5.20 of IWE-2500, "Examination and Pressure Test Requirements," Table IWE-2500-1, ASME Section XI, 1992 Edition, 1992 Addenda.

CODE REQUIREMENT

ASME Section XI, 1992 Edition, 1992 Addenda, IWE-2500, Table IWE-2500-1 requires seals and gaskets on airlocks, hatches, and other devices to be visually examined (VT-3) once each interval to assure containment leak-tight integrity.

CODE REQUIREMENT FOR WHICH AN ALTERNATIVE IS PROPOSED

Pursuant to 10CFR50.55a(a)(3)(i), Entergy proposes an alternative to the Code-required visual examination (VT-3) on containment seals and gaskets as discussed below. Entergy believes the alternative examination presented below provides an acceptable level of quality and safety by ensuring the integrity of containment penetration seals and gaskets.

BASIS FOR ALTERNATIVE

10CFR50.55a was amended, as cited in the *Federal Register* (61 FR 41303), to require the use of the 1992 Edition, 1992 Addenda of Section XI when performing containment examinations. As stated above, ASME Section XI, 1992 Edition, 1992 Addenda, IWE-2500, Table IWE-2500-1 requires seals and gaskets on airlocks, hatches, and other devices to be visually examined (VT-3) once each interval to assure containment leak-tight integrity. A discussion of penetrations containing seals and gaskets is presented below for each Entergy site.

1. Arkansas Nuclear One

   a. Electrical Penetrations

      ANO-1 uses electrical penetration assemblies manufactured by Conax. The penetration assembly flange face is welded to the penetration nozzle both inside and outside the Reactor Building. Modules through which electrical conductors pass are

installed in the header plate. The Conax assembly uses a set of compression fittings to assure leak-tight integrity with the exception of modules for medium voltage penetrations that use a double O-ring configuration to assure leak-tight integrity. A representative sample group is Type B leak-tested in accordance with 10CFR50, Appendix J every refueling outage.

ANO-2 uses electrical penetration assemblies manufactured by Amphenol and Conax. The penetration assembly flange face is welded to the penetration nozzle on the exterior face of the Reactor Building. A penetration header plate with redundant O-rings is attached to the weld flange with bolting. Modules through which electrical conductors pass are installed in the header plate. The Amphenol assembly uses seals and gaskets to assure leak-tight integrity. The Conax assembly, which is used as replacement modules on several ANO-2 electrical penetrations, uses a set of compression fittings and redundant O-rings to assure leak-tight integrity. Penetration assemblies are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

Both ANO-1 and ANO-2 seals and gaskets cannot be inspected without disassembly of the penetration to gain access to the seals and gaskets.

b. Containment Equipment Hatch

The containment equipment hatches at both ANO units have double O-ring seals on the hatch head assembly which when bolted tight to the hatch shell assembly forms a leak-tight seal. The equipment hatch is removed during maintenance outages, when necessary, and during each refueling outage. Prior to final closure, the hatch ***seals*** and door sealing face are inspected for damage that could prevent sealing. Seals are typically replaced each outage on the ANO-1 and -2 hatches. Additionally, the containment equipment hatch procedures for both units require seals to be coated with an approved silicone lubricant to preserve their integrity. After final closure, the hatches are subjected to a 10CFR50 Appendix J, Type B leak test.

A VT-3 inspection cannot be performed on the containment equipment hatch O-ring seals without disassembly of the hatch, which could damage the seals.

c. Containment Personnel Airlocks

The containment personnel airlocks at both ANO units use inner and outer doors with double gaskets without inflatable seals. These airlocks also contain other seals including handwheel shaft seals, electrical penetration seals, double O-ring seals for blank flanges, viewing port O-ring seals, and seals for the equalizing pressure connections. Each affected component requires disassembly of the joint or subassembly to gain access. The disassembly of these subcomponents, with the exception of the electrical and telephone penetration seals and the door gaskets, involves unbolting, visual examination of the seal or gasket for damage, reassembly and retightening the bolted connections.

A VT-3 examination of the airlock door gasket cannot ensure leak tightness because the backside of the airlock door gasket assemblies is inaccessible. In order for the VT-3 examination to be successfully completed the gasket or seal must be removed which could result in mechanical damage necessitating replacement. These seals and gaskets are replaced on a specified replacement interval based on vendor recommendations and engineering evaluations. The personnel airlocks and the subcomponents noted above are currently Type B leak tested in accordance with 10CFR50 Appendix J

d. Fuel Transfer Tube

The fuel transfer tube penetrations on both ANO units use a bolted blind flange with two gaskets to provide a leak-tight seal on this penetration. For ANO-1, these gaskets are replaced each time the penetration is opened due to plant preference. On ANO-2, these seals are inspected for damage prior to closure of the fuel transfer tube and replaced if damaged. The fuel transfer tube penetrations are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the fuel transfer tube seals without removing the blind flange, which could damage the seals.

2. Grand Gulf Nuclear Station

a. Electrical Penetrations

The electrical penetrations at Grand Gulf associated with this ***alternative request are manufactured by Westinghouse Electric Corporation. The penetration bulkhead plate, similar to a flange, is welded to the penetration tube. Modules through which the electrical conductors pass are held in place on the bulkhead by bolted retaining lugs and are sealed using four O-rings. Within the modules, epoxy surrounding the conductors forms an environmental seal.***

The seals and gaskets of the electrical penetrations cannot be inspected without disassembly of the penetration to gain access to the seals and gaskets. Currently, there is no scheduled maintenance task for periodic disassembly of the electrical penetrations that would allow inspection of the seals and gaskets. Penetration assemblies are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

b. Containment Equipment Hatch

The containment equipment hatch at Grand Gulf has double O-ring seals on the hatch head assembly which, when bolted tight to the hatch shell assembly, form a leak-tight seal. The equipment hatch is removed during maintenance outages, when necessary, and during each refueling outage. Prior to final closure, the hatch ***seals*** and door sealing face are inspected for damage that could prevent sealing. Seals

are replaced if found damaged. In addition, seals are typically replaced in accordance with the manufacturer's recommendations. The Preventive Maintenance program also requires the seals to be coated with an approved silicone lubricant to preserve their integrity. The equipment hatch is currently Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the containment equipment hatch O-ring seals without disassembly of the hatch, which could damage the seals.

c. Containment Personnel Airlocks

The containment personnel airlocks use inner and outer doors with double inflatable seals on each door to ensure leak-tight integrity. These inflatable seals are accessible for VT-3 inspection without disassembly. However, the VT-3 inspection is redundant to the 10CFR50 Appendix J, Type B test performed in accordance with the Primary Containment Leakrate Testing Program. These airlocks also contain other seals including handwheel shaft seals, electrical penetration seals, double O-ring seals for blank flanges, viewing port O-ring seals, and seals for the equalizing pressure connections. Each affected component requires disassembly to gain access. The Preventive Maintenance program typically requires replacement of the inflatable seals in accordance with the manufacturer's recommendations. The personnel airlocks are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

d. Horizontal Fuel Transfer Tube

By plant design and configuration, the horizontal fuel transfer tube remains submersed underwater at all times. The horizontal fuel transfer tube has double O-ring seals on the hatch head which, when clamped in place on the inside surface of the containment, provides a pressure-seating leak-tight seal. The seals are currently Type C water tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the horizontal fuel transfer tube O-ring seals without disassembly of the hatch, which could damage the seals. In addition, a VT-3 inspection would require the services of an underwater diver.

3. River Bend Station

a. Electrical Penetrations

River Bend uses electrical penetration assemblies manufactured by Conax. The assembly includes a canister subassembly, which is inserted in a penetration nozzle of suitable diameter. The header plate of the canister subassembly is attached by bolts to the penetration flange. Modules through which electrical conductors pass are installed in the header plate. These modules use ferruled compression fittings to

ensure leak tightness at the header plate. A double O-ring seal is used between the header plate and flange face to assure leak-tight integrity.

The seals and gaskets of the electrical penetrations cannot be inspected without disassembly of the penetration to gain access to the seals and gaskets. There is no task for periodic disassembly of the electrical penetrations to inspect or replace the seals and gaskets. Penetration assemblies are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

b. Containment Equipment Hatch

The containment equipment hatch has double O-ring seals on the hatch head assembly which, when bolted tight to the hatch shell assembly, form a leak-tight seal. The equipment hatch is removed during maintenance outages, when necessary, and during each refueling outage. Prior to final closure, the hatch ***seals*** and door sealing face are inspected for damage that could prevent sealing. Seals are replaced if found damaged. ***Additionally, the seals are coated with an approved silicone lubricant to preserve their integrity.*** The equipment hatch is currently Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the containment equipment hatch O-ring seals without disassembly of the hatch, which could damage the seals.

c. Containment Personnel Airlocks

The containment personnel airlocks use inner and outer doors with double inflatable seals on each door to ensure leak-tight integrity. These inflatable seals are accessible for VT-3 inspection without disassembly. However, the VT-3 inspection is redundant to the 10CFR50 Appendix J Type B test performed in accordance with the Primary Containment Leakrate Testing Program. These airlocks also contain other seals including handwheel shaft seals, electrical penetration seals, double O-ring seals for blank flanges, and viewing port O-ring seals. Each affected component requires disassembly to gain access. ***River Bend typically replaces the inflatable seals once every 5 years.*** The personnel airlocks are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

d. Inclined Fuel Transfer Tube

The inclined fuel transfer tube has triple O-ring seals on the blind flange which when in the closed position isolates the containment. The blind flange is removed during refueling outages for fuel transfer. The three O-rings are replaced every refueling outage with a leak test performed on the flange prior to plant startup. The inclined fuel transfer tube is currently Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the inclined fuel transfer tube O-ring seals without removing the blind flange, which could damage the seals.

e. Containment Control Rod Drive (CRD) Removal Tube

The CRD removal tube hatch uses double O-ring seals between the head cover and the flange at the bolted connection. The hatch cover is open during outages, as necessary, to support CRD removal. ***Prior to replacing the hatch, the O-rings are visually inspected and replaced, if necessary. Once the hatch is bolted in place,*** the containment CRD removal tube is Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the CRD removal tube hatch O-ring seals without disassembly of the hatch, which could damage the seals.

4. Waterford-3

a. Electrical Penetrations

Waterford uses electrical penetration assemblies manufactured by Conax. The penetration assembly flange face is welded to the penetration nozzle inside the containment vessel. Modules through which electrical conductors pass are installed in the header plate. These modules use ferruled compression fittings to ensure leak tightness at the header plate. Resin seals ensure leak tightness within the ferruled modules.

The seals and gaskets of the electrical penetrations cannot be inspected without disassembly of the penetration to gain access to the seals and gaskets. There is no task for periodic disassembly of the electrical penetrations to inspect or replace the seals and gaskets. Penetration assemblies are currently Type B leak-tested in accordance with 10CFR50 Appendix J.

b. Containment Equipment Hatch

The containment equipment hatch has double O-ring seals on the hatch head assembly which, when bolted tight to the hatch shell assembly, form a leak-tight seal. The equipment hatch is removed during maintenance outages, when necessary, and during each refueling outage. Prior to final closure, the hatch ***seals*** and door sealing face are inspected for damage that could prevent sealing. Seals are replaced if found damaged. In addition, the seals are periodically replaced in accordance with the manufacturer's recommendations. ***The seals are coated with an approved silicone lubricant to preserve their integrity.*** The equipment hatch is currently Type B leak-tested in accordance with 10CFR50 Appendix J.

A VT-3 inspection cannot be performed on the containment equipment hatch O-ring seals without disassembly of the hatch, which could damage the seals.

c. Containment Personnel Airlocks

The containment personnel airlocks use inner and outer doors with double seals on each door to ensure leak-tight integrity. ***The outer portions of the seals are accessible for VT-3 inspection without disassembly. However, to inspect 100% of the seals, they must removed from the seating surface, which could cause damage. Additionally,*** the VT-3 inspection is redundant to the 10CFR50 Appendix J Type B test in accordance with the Primary Containment Leakrate Testing Program. These airlocks also contain other seals including handwheel shaft seals, electrical penetration seals, seals for blank flanges, and seals for the equalizing pressure connections. Many of these components require disassembly of a complex door operating mechanism to gain access for inspection. Disassembly of the door mechanism would require disabling the door pair interlocks and would significantly increase the likelihood of damaging the door mechanism. The personnel airlocks are currently Type B leak-tested in accordance with 10CFR50 Appendix J ***at least every refueling outage. During leak rate testing, the outer surfaces of the door seals are inspected and the seals are replaced if necessary.***

d. Fuel Transfer Tube

The fuel transfer tube uses double O-ring seals on a bolted flange. ***The O-rings are replaced each refueling outage and inspected for damage.*** These seals are Type B leak-tested in accordance with 10CFR50 Appendix J prior to plant startup following each refueling outage.

A VT-3 inspection cannot be performed on the fuel transfer tube O-ring seals without removing the blind flange, which could damage the seals.

As discussed above, seals and gaskets receive a 10CFR50 Appendix J Type B test. As noted in 10CFR50 Appendix J, the purpose of Type B tests is to measure leakage of containment penetrations whose design incorporates resilient seals, gaskets, sealant compounds, and electrical penetrations fitted with flexible metal seal assemblies. Examination of seals and gaskets requires the joints that are proven adequate through Appendix J testing to be disassembled. For typical electrical penetrations, this would involve:

1. Pre-maintenance Appendix J testing
2. De-termination of cables at electrical penetrations if enough cable slack is not available
3. Disassembly of the joint
4. Removal and examination of the seals and gaskets
5. Reassembly of the joint

6. Re-termination of the cables if necessary

7. Post-maintenance testing of the cables

8. Post-maintenance Appendix J testing of the penetration

The work required for the containment hatches would be similar except for the de-termination, re-termination, and testing of cables. This imposes the risk that equipment could be damaged. The 1992 Edition, 1993 Addenda of ASME Section XI recognize that disassembly of joints to perform these examinations is not warranted. Note 1 in Examination Category E-D of ASME Section XI states that sealed or gasket connections need not be disassembled solely for performance of examinations. However, without disassembly, the seals and gaskets are inaccessible.

Seals and gaskets are not part of the containment pressure boundary under current Code rules [ASME Section III, Subarticle NE-2121(b)]. When the airlocks and hatches containing these materials are tested in accordance with 10CFR50 Appendix J, degradation of the seal or gasket material would be revealed by an increase in the leakage rate. If the leakage rate increases, corrective measures would be applied and the component retested. Repair or replacement of seals and gaskets is not subject to Code rules (1992 Edition, 1992 Addenda) in accordance with Paragraph IWA-4111(b)(5) of ASME Section XI.
As discussed in the plant-specific sections above, penetrations that are routinely disassembled are Type B leak-tested upon final assembly prior to startup. Since the Type B test assures the leak-tight integrity of primary containment, performing a visual examination would not provide an increase in the level of safety or quality.

The requirement to examine seals and gaskets has been removed in the rewrite of Subsection IWE of ASME Section XI. This rewrite has been approved by ASME and was published in the 1998 edition. In addition, the NRC has approved similar alternative requests for Davis-Besse Nuclear Power Station (#RR-E1)[2], Calvert Cliffs Nuclear Station (#E1)[3], and Cooper Nuclear Station (#RC-02)[4].

---

[2] Letter dated June 30, 1998, "Relief from Certain ASME Code Requirements for Inservice Inspection for Facility Operating License No. NPF-3 – Davis-Besse Nuclear Power Station, Unit 1 (TAC No. MA0414)"

[3] Letter dated November 16, 1998, "Evaluation of First Containment Inspection Interval IWE/IWL Program Requests for Relief at Calvert Cliffs Nuclear Power Plant, Unit Nos. 1 and 2 (TAC Nos. MA2084 and MA2085)"

[4] Letter dated November 18, 1998, "Relief Authorization for Alternative to the Requirements of ASME Section XI, as Endorsed by 10 CFR 50.55a for Containment Inspection for Cooper Nuclear Station (TAC No. MA1163)"

ALTERNATIVE EXAMINATION

The leak-tightness of seals and gaskets is verified by local leak-rate testing in accordance with 10CFR50 Appendix J. This testing is performed at least once each inspection interval. Testing the seals and gaskets in accordance with 10CFR50 Appendix J provides adequate assurance of the leak-tight integrity of the seals and gaskets.