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CNRO-2002-00053

November 22, 2002

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

SUBJECT: Entergy Operations, Inc.
Request to Use Alternate Testing Frequency for Inservice Testing

River Bend Station
Docket No. 50-458
License No. NPF-47

REFERENCE: Letter CNRO-2002-00038 from Entergy Operations, Inc. to the NRC, "Request to Use Alternative Testing Frequency for Inservice Testing," dated June 28, 2002

Dear Sir or Madam:

In the referenced letter, Entergy Operations, Inc. (Entergy) requested the NRC staff to authorize alternate testing frequencies for performing inservice testing (IST) of specific valves as detailed in Relief Requests RBS-VRR-005, -006, and -007. In telephone conversations on October 29 and November 5, 2002, the NRC staff raised questions concerning the use of risk evaluations to schedule IST activities and categorization of certain valves. In response to the staff's questions, Entergy is submitting revised relief requests RBS-VRR-005, -006, and -007 (see Enclosures 1, 2, and 3), which contain the requested information. These requests replace the previously submitted requests in their entirety.

Entergy requests the NRC staff review and authorize use of RBS-VRR-005, -006, and -007 on or before December 31, 2002, in order to support performing these IST activities prior to the upcoming refueling outage at River Bend, which is currently scheduled to begin in March 2003.

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

This letter contains no new commitments.

Very truly yours,

M. A. Krupa

MAK/GHD/bal

Enclosures:
1. Relief Request No. RBS-VRR-005
2. Relief Request No. RBS-VRR-006
3. Relief Request No. RBS-VRR-007

cc: Mr. W. R. Campbell (ECH)
Mr. P. D. Hinnenkamp (RBS)
Mr. G. A. Williams (ECH)

Mr. P. J. Alter, NRC Senior Resident Inspector (RBS)
Mr. E. W. Merschoff, NRC Region IV Regional Administrator
Mr. M. K. Webb, NRR Project Manager (RBS)

**ENCLOSURE 1**

**CNRO-2002-00053**

**REQUEST FOR RELIEF**
**RBS-VRR-005**

**SYSTEM 410 – HVK – HVAC – Chilled Water (Control Building)**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| HVK-V48 | 3 | 2 | C | CONTROL BLDG CHILLED WTR SURGE TANK 1A ALTERNATE MAKEUP HEADER CHECK VALVE |
| HVK-V97 | 3 | 2 | C | CONTROL BLDG CHILLED WTR SURGE TANK 1B ALTERNATE MAKEUP HEADER CHECK VALVE |

**SYSTEM 609 – DFR – Floor Drains (Reactor Building)**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| DFR-V78 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3A & 3G DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V79 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3A & 3G DISCHARGE HEADER DOWNSTREAM CHECK VALVE |
| DFR-V87 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3B & 3H DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V88 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3B & 3H DISCHARGE HEADER DOWNSTREAM CHECK VALVE |
| DFR-V97 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3C & 3J DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V98 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3C & 3J DISCHARGE HEADER DOWNSTREAM CHECK VALVE |

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| DFR-V107 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3D & 3K DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V108 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3D & 3K DISCHARGE HEADER DOWNSTREAM CHECK VALVE |
| DFR-V117 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3E & 3L DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V118 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3E & 3L DISCHARGE HEADER DOWNSTREAM CHECK VALVE |
| DFR-V127 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3F & 3M DISCHARGE HEADER UPSTREAM CHECK VALVE |
| DFR-V128 | 3 | 4 | C | AUXILIARY BUILDING FLOOR DRAIN SUMP PUMPS 3F & 3M DISCHARGE HEADER DOWNSTREAM CHECK VALVE |

## COMPONENT FUNCTION

HVK-V48 and HVK-V97 are the Chilled Water Loop A and B compression tank Standby Service Water (SSW) alternate makeup supply check valves. These valves have a safety function to open, which allows SSW makeup flow into the compression tanks to maintain chilled water inventory. (The normal supply to the compression tanks is from the Makeup Water System.) No closure function is credited for these valves.

The open function is currently verified by valve disassembly during each refueling outage using a sampling program as allowed by Position 2 of NRC Generic Letter (GL) No. 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," (Reference 3). These valves have no external exercising mechanism or position indication instrumentation. Exercising these valves open during power operation or cold shutdown would be accomplished using system flow. This method would introduce unwanted impurities from SSW into the Ventilation Chilled Water System.

DFR-V87, DFR-V88, DFR-V107, DFR-V108, DFR-V117, and DFR-V118 are check valves that open and close as necessary during normal operation to allow flow from the Auxiliary Building floor drain sump pumps to the Radwaste system. These valves have an active safety function in the close direction to prevent the possible transfer of water between sump cubicles if the non-safety-related piping inside the cubicles were to fail. No open function is credited for these valves.

The close function is currently verified by valve disassembly during each refueling outage using a sampling program as allowed in GL 89-04 Position 2. These valves are installed back-to-back with no test connections available to verify the closure functions. In addition, they have no external exercising mechanisms or position indication instrumentation. Non-intrusive techniques have been unsuccessful for verifying valve closure due to valve size.

DFR-V78, DFR-V79, DFR-V97, DFR-V98, DFR-V127, and DFR-V128 are check valves that open and close as necessary during normal operation to allow flow from the Auxiliary Building floor drain sump pumps to the Radwaste system. These valves have an active safety function in the close direction to prevent the possible transfer of water between sump cubicles if the non-safety-related piping inside the cubicles were to fail. No open function is credited for these valves.

The close function for valves DFR-V78, DFR-V97, and DFR-V127 is currently verified by valve disassembly during each refueling outage. The close function for valves DFR-V79, DFR-V98, and DFR-V128 is verified by monitoring back-flow through the valves while the upstream check valve is disassembled. These valves are installed back-to-back with no test connections available to verify the closure functions. In addition, they have no external exercising mechanisms or position indication instrumentation. Non-intrusive techniques have been unsuccessful for verifying valve closure due to valve size.

## ASME CODE TEST REQUIREMENTS

ASME/ANSI OM-10 paragraph 4.3.2.2 addresses exercising requirements for valves. Paragraph 4.3.2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages."

ASME/ANSI OM-10 paragraph 4.3.2.4 addresses methods that may be used to perform inservice testing activities for valves. Paragraph 4.3.2.4(c) states, "As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to verify operability of check valves may be used."

Although not a code requirement, Position 2 of GL 89-04 and its Supplement 1 (References 3 and 4) provide an alternative to full-stroking a check valve or to verifying closure capability through the use of sample disassembly and inspection requirements that are performed at a refueling outage frequency. This relief request also applies to these alternative requirements specified in GL 89-04 Position 2.

## BASIS FOR RELIEF

### Background

The components listed above are check valves with no external means for exercising and no external position indication mechanism Exercising the HVK check valves is impractical because opening them during power operation or cold shutdown would be accomplished using system flow. This method would introduce impurities from SSW into the Ventilation Chilled Water System, which is undesirable since it would require unnecessary operator actions to restore water purity. Verifying closure of the DFR check valves quarterly or during cold shutdown is impractical as these valves are installed back-to-back with no test connections available to verify the closure functions. In addition, non-intrusive techniques have been unsuccessful for verifying the closed position due to valve size.

Disassembly of the HVK and DFR valves is the most feasible method to verify OPERABILITY and can be accomplished during system outages, which may be conducted on-line. Prior to performing a system outage on-line, its effect on risk is evaluated in accordance with the requirements of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." §50.65(a)(4) states in part, "Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities."

Entergy complies with the requirements of §50.65(a)(4) at River Bend Station (RBS) via the application of a program governing maintenance scheduling. This program dictates the requirements for risk evaluations as well as the necessary levels of action required for risk management in each case. The program also controls operation of the on-line risk monitor system, which is based on the RBS probabilistic risk assessment (PRA). In addition, this program provides methods for assessing risk of maintenance activities for components not directly in the RBS PRA model. With the use of risk evaluation for various aspects of plant operations, Entergy has initiated efforts to perform additional maintenance, surveillance, and testing activities during normal operation. Planned activities are evaluated utilizing risk insights to determine the impact on safe operation of the plant and the ability to maintain associated safety margins. Individual system components, a system train, or a complete system may be planned to be out of service to allow maintenance, or other activities, during normal operation.

Paragraph 4.3.2.4(c) of ASME/ANSI OM-10 allows check valve disassembly every refueling outage to verify OPERABILITY in lieu of test methodologies described in paragraphs 4.3.2.4(a) or (b). Additionally, GL 89-04 Position 2 allows disassembly to verify OPERABILITY of check valves at refueling outage frequencies.

## Basis

As more system outages are performed on-line, it is evident that selected refueling outage inservice testing activities (e.g., valve exercising and disassembly) could be performed during these system outages without sacrificing the level of quality or safety. Entergy Operations, Inc. (Entergy) proposes the alternative inservice testing frequency for the associated check valves based on the following:

1. Inservice testing performed on a refueling outage frequency is currently acceptable in accordance with ASME/ANSI OM-10 and GL 89-04. By specifying testing activities on a frequency commensurate with each refueling outage, ASME/ANSI OM-10 recognizes and establishes an acceptable time period between testing. Historically, the refueling outage has provided a convenient and defined time period in which testing activities could be safely and efficiently performed. However, an acceptable testing frequency can be maintained separately without being tied directly to a refueling outage. Inservice testing performed on a frequency that maintains the acceptable time period between testing activities during the operating cycle is consistent with the intent of ASME/ANSI OM-10 and GL 89-04.

2. Over time, approximately the same number of tests will be performed using the proposed operating cycle test frequency as would be performed using the current refueling outage frequency. Thus, inservice testing activities performed during the

proposed operating cycle test frequency provide an equivalent level of quality and safety as inservice testing performed at a refueling outage frequency.

3. As discussed above, Entergy complies with the requirements of §50.65(a)(4) at RBS via the application of a program governing maintenance scheduling. Provided below is a discussion of disassembly and testing of the HVK and DFR check valves from a risk perspective.

   - HVK Valves

     As stated above, check valves HVK-V48 and HVK–V97 provide alternate makeup water to the Chilled Water Loop A and B compression tanks. These valves have a safety function to open, which allows SSW makeup water flow into the tanks to maintain chilled water inventory. They have no safety function to close.

     With these check valves disassembled, the impact would be a loss of alternate makeup capability to the compression tanks in the event normal makeup from the Makeup Water System is lost As a result of such an event, one division of the HVK chiller system would be lost resulting in an automatic start of the standby HVK chiller system to provide cooling to the control room, standby switchgear, and equipment room handling units. From a risk perspective, the primary function of interest is maintaining design temperatures in the standby switchgear and battery rooms. Analysis has shown that even if cooling is lost to these rooms, room temperature will not increase enough to cause a failure of the switchgear. Consequently, if the capability of the switchgear is maintained, emergency power will remain available to systems and components necessary to mitigate core damage.

     In summary, disassembly or testing of check valves HVK-V48 and HVK-V97 while on-line has an insignificant impact on core damage frequency.

   - DFR Valves

     The DFR valves identified in the table above are components in the plant drainage system. The drain system is not a system that is credited or used to mitigate core damage in the event of an accident. Consequently, the DFR check valves do not play a part in mitigating core damage. Therefore, disassembly or testing of these drain system check valves while on-line will not impact core damage or the ability of the plant to respond to accident conditions

   Entergy believes the use of risk assessment to plan and schedule check valve disassembly during normal operation will provide an acceptable level of quality and safety.

In approving similar relief requests for Arkansas Nuclear One, Unit 1 (Reference 6), the NRC staff stated, "Verifying closure of each valve once per refueling [operating] cycle using nonintrusive techniques provides reasonable assurance of the valves' operational readiness, considering the Code allows deferrals to once per refueling outage."

**PROPOSED ALTERNATE TESTING**

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy proposes an alternative testing frequency for performing inservice testing of the valves identified above. The valves will be tested on a frequency of at least once during each operating cycle in lieu of once during each refueling outage as currently allowed by ASME/ANSI OM-10 paragraphs 4.3.2.2(e) and 4.3.2.4(c), and GL 89-04 Position 2.

## CONCLUSIONS

10 CFR 50.55a(a)(3) states:

"Proposed alternatives to the requirements of (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i) The proposed alternatives would provide an acceptable level of quality and safety, or

(ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

Entergy believes the proposed alternative inservice testing presented above provides an acceptable level of quality and safety in that the proposed frequency is consistent with that allowed by ASME/ANSI OM-10 for performing inservice testing of valves. Entergy requests that the NRC staff authorize the proposed alternative frequency of testing as described above pursuant to 10 CFR 50.55a(a)(3)(i).

## REFERENCES

1. ASME/ANSI OM-1987, Part 1
2. ASME/ANSI OMa-1988, Part 10
3. NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 3, 1989
4. NRC Generic Letter 89-04, Supplement 1, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 4, 1995
5. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," published April 1995
6. Letter from the NRC to Entergy Operations, Inc., "Arkansas Nuclear One, Unit 1 – Inservice Testing Program Third Ten-Year Interval for Pumps and Valves (TAC No. MA0275)," dated October 9, 1998
7. Program Section No. CEP-IST-2, Inservice Testing Plan, Entergy Nuclear – South

ENCLOSURE 2

CNRO-2002-00053

REQUEST FOR RELIEF
RBS-VRR-006

**SYSTEM 106 – CNS-Condensate Makeup, Storage, & Transfer**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| CNS-V86 | 2 | 4 | AC | REACTOR CONTAINMENT BUILDING CNDS SUPPLY HEADER CNTMNT INBOARD CHECK VLV |

**SYSTEM 201 – SLS – Standby Liquid Control (SLC) GE Code: C41**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| C41-VF033A | 2 | 1.5 | C | STANDBY LIQUID CONTROL PUMP 1A DISCHARGE HEADER CHECK VALVE |
| C41-VF033B | 2 | 1.5 | C | STANDBY LIQUID CONTROL PUMP 1B DISCHARGE HEADER CHECK VALVE |

**SYSTEM 256 – SWP – Service Water – Standby (SSW)**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| SWP-V135 | 3 | 8 | C | HPCS DIESEL GEN ENGINE WATER HEAT EXCHANGER SERVICE WATER SUPPLY HEADER CHECK VALVE |
| SWP-V136 | 3 | 8 | C | HPCS DIESEL GEN ENGINE WATER HEAT EXCHANGER SERVICE WATER SUPPLY HEADER CHECK VALVE |
| SWP-V143 | 3 | 8 | C | HPCS DIESEL GEN ENGINE WATER HEAT EXCHANGER SERVICE WATER RETURN HEADER CHECK VALVE |
| SWP-V144 | 3 | 8 | C | HPCS DIESEL GEN ENGINE WATER HEAT EXCHANGER SERVICE WATER RETURN HEADER CHECK VALVE |
| SWP-V437 | 3 | 4 | C | AUXILIARY BUILDING UNIT COOLER 5 SERVICE WATER SUPPLY HEADER CHECK VALVE |

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| SWP-V516 | 3 | 4 | C | AUXILIARY BUILDING UNIT COOLER 5 SERVICE WATER SUPPLY HEADER CHECK VALVE |

**SYSTEM 410 – HVK – HVAC –Chilled Water (Control Building)**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| HVK-V49 | 3 | 2 | C | CNTRL BLDG CHILLED WTR SURGE TANK 1A NORMAL MAKEUP HEADER CHECK VALVE |
| HVK-V98 | 3 | 2 | C | CNTRL BLDG CHILLED WTR SURGE TANK 1B NORMAL MAKEUP HEADER CHECK VALVE |
| HVN-V1316 | 2 | 0.75 | AC | REACTOR BLDG CONTAINMENT UNIT COOLERS RETURN HDR BYPASS CHECK VALVE FOR HVN-MOV102 |

**SYSTEM 602 – SFC – Fuel Pool Cooling**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| SFC-V350 | 2 | 0.75 | AC | CONTAINMENT POOLS TO PURIFICATION SYSTEM HEADER INBOARD CONTAINMENT ISOL VALVE BYPASS CHECK VALVE |
| SFC-V351 | 2 | 0 75 | AC | CONTAINMENT POOLS TO PURIFICATION SYSTEM HEADER INBOARD CONTAINMENT ISOL VALVE BYPASS CHECK VALVE |

**COMPONENT FUNCTION**

CNS-V86 is the reactor building condensate supply header inboard containment isolation valve. This check valve has an active safety function in the closed direction to provide containment isolation and in the open direction to provide thermal overpressure protection for the containment penetration due to thermally expanded liquid within the penetration. CNS-V86 is subject to Category "A" seat leakage test requirements and Category "C" exercise test requirements in accordance with AMSE/ANSI OM-10 Subsections 4.2.2 and 4.3, respectively. It is currently tested in accordance with 10 CFR 50 Appendix J Option B.

The open function is verified quarterly by verifying that pressurized flow passes through the valve. The closure function is verified quarterly by performing non-intrusive testing (i.e., radiography). There is no other comparably clean pressurized water source within the area to facilitate back-flow testing to verify the closed position. This valve has no external exercising mechanism or position indication instrumentation.

C41-VF033A and C41-VF033B are the Standby Liquid Control pump discharge header check valves. These check valves have an active safety function to open to inject borated water into the reactor vessel. These valves have an active safety function in the close direction to prevent diversion of flow from the other division in the event of a failure of the relief valve on the pump discharge line.

The open function is verified quarterly by passing design flow through each valve. The closure function is verified quarterly by performing radiography testing. There are no test connections available to facilitate back-flow testing which could be used to verify the closed position. These valves have no external exercising mechanisms or position indication instrumentation.

SWP-V135, SWP-V136, SWP-V143, and SWP-V144 are the Division I and II Service Water supply and return check valves to the High Pressure Core Spray (HPCS) diesel generator jacket water cooler. These valves have a safety function in the open direction to allow Standby Service Water (SSW) flow to and from the HPCS diesel generator cooler. They have an active safety function in the close direction to isolate and prevent diversion of SSW flow for the HPCS diesel generator jacket water cooler to the opposite division supply and return headers.

The open function is verified quarterly by passing design flow through each valve. The closure function is verified by performing radiography testing during cold shutdown due to the size of the valves, which requires the use of specialized radiography equipment. There are no test connections available to facilitate back-flow testing which could be used to verify the closed position of SWP-V135 and SWP-V136 Due to system configuration and isolation valve design, it is difficult to establish test conditions that permit accurate closure verification of SWP-V143 and SWP-V144 using a back-flow test methodology. These valves have no external exercising mechanism or position indication instrumentation.

SWP-V437 and SWP-V516 are the Division I and II SSW to HPCS pump room unit cooler supply check valves. These valves have a safety function in the open direction to allow service water flow to the HPCS pump room unit cooler. They have an active safety function in the close direction to isolate the SSW supply header from the opposite division supply header.

The open function is verified quarterly by passing design flow through each valve. The closure function is verified quarterly by performing radiography testing. There are no test connections available to facilitate back-flow testing which could be used to verify the closed position These valves have no external exercising mechanism or position indication instrumentation.

HVK-V49 and HVK-V98 are the Chilled Water Loop A and B compression tank normal makeup water supply check valves. These valves have an active safety function in the close direction to prevent diversion from SSW makeup flow to the Chilled Water Compression Tank into the Makeup Water System. These valves are not credited with an open safety function.

The closure function is verified quarterly by performing radiography testing. There are no test connections available to facilitate back-flow testing which could be used to verify the closed position. These valves have no external exercising mechanism or position indication instrumentation.

HVN-V1316 is the chilled water-to-containment unit coolers return header inboard containment isolation check valve. This valve has an active safety function in the close direction to provide containment isolation. It has an active safety function in the open direction to provide thermal overpressure protection for the containment penetration. HVN-V1316 is subject to Category "A" seat leakage test requirements and Category "C" exercise test requirements in accordance with AMSE/ANSI OM-10 Subsections 4.2.2 and 4.3, respectively. It is currently tested in accordance with 10 CFR 50 Appendix J Option B.

The open function is verified during cold shutdown by verifying pressurized flow passes through the valve. The closure function is verified quarterly by radiography testing. Performance of the closure test using installed test connections requires isolation of containment cooling flow in order to determine leakage through the valve. Isolation of cooling flow would cause an increase in containment temperatures and eventually an automatic isolation of the Reactor Water Cleanup System (RWCU) due to area temperature sensors in the RWCU heat exchanger room or other RWCU equipment areas inside containment. This valve has no external exercising mechanism or position indication instrumentation.

SFC-V350 and SFC-V351 are the containment pool-to-spent fuel cooling containment penetration thermal relief check valves. These normally closed check valves have an active safety function in the open direction to provide thermal overpressure protection for the associated containment penetration. The valves have an active safety function in the close direction to provide containment isolation. SFC-V350 and SFC-V351 are subject to Category "A" seat leakage test requirements and Category "C" exercise test requirements in accordance with AMSE/ANSI OM-10 Subsections 4.2.2 and 4 3, respectively. They are currently tested in accordance with 10 CFR 50 Appendix J Option B.

The open function is verified quarterly by verifying pressurized flow passes through each valve. The closure function is verified quarterly by performing radiography testing. These valves are also leak-rate tested in accordance with the Appendix J program. There are no local test connections available to facilitate back-flow testing which could be used to verify the closed position. These valves have no external exercising mechanism or position indication instrumentation.

Based on the above discussions, closure verification for the identified check valves is most appropriately performed utilizing a non-intrusive technique such as radiography due to the absence of test connections or the inability to align the system to permit closure verification. Radiography for these valves has provided conclusive results.

## ASME CODE TEST REQUIREMENTS

ASME/ANSI OM-10 paragraph 4.3 2.2 addresses exercising requirements for valves. Paragraph 4.3 2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages."

## BASIS FOR RELIEF

### Background

The components listed above are check valves that have no external means for exercising and no external position indication mechanism. In Section 4.1.2 of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants" (Reference 5), the NRC states, "The staff has determined that non-intrusive techniques meet the Code requirements for verifying disk movement for the full-stroke exercising - opening and closing - of check valves."

Entergy Operations, Inc. (Entergy) has determined that closure verification utilizing the non-intrusive radiography technique is the most feasible testing methodology for the check valves identified above. This position is based on the following:

1. There is no other comparably clean pressurized water source within the area to facilitate back-flow testing of CNS-V86 to verify the closed position.
2. The piping systems including check valves C41-VF033A and B, SWP-V135, SWP-V136, SWP-V437, SWP-V516, HVK-V49, HVK-V98, SFC-V350, and SFC-V351 contain no test connections to allow back-flow testing, which could be used to verify the closed position.
3. Due to SSW system configuration and isolation valve design, establishing test conditions that permit accurate closure verification using a back-flow test methodology for valves SWP-V143 and SWP-V144 is not feasible.
4. The closure verification for HVN-V1316 using installed test connections requires isolation of containment cooling flow in order to determine leakage through the valve. Isolation of cooling flow would cause an increase in containment temperatures and eventually an automatic isolation of RWCU due to area temperature sensors in the RWCU heat exchanger room or other RWCU equipment areas inside containment.

Paragraph 4.3.2.2(e) of ASME/ANSI OM-10 allows valve testing to be performed during refueling outages if it is not practicable to be performed quarterly or during cold shutdown. Entergy has determined that radiography testing is not practicable on a quarterly basis during power operation due to increased personnel radiation exposure, large manpower requirements, and the extensive test set-up required. As discussed in Section 4.1.4 of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants" (Reference 5), the need to set up test equipment is adequate justification to defer testing to a refueling outage frequency based on the impracticality of testing quarterly or at cold shutdown.

### Basis

As more maintenance activities are performed on-line, it is evident that selected refueling outage inservice testing activities could be performed on-line without sacrificing level of quality or safety. Prior to performing an activity on-line, its effect on risk is evaluated in accordance with the requirements of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." §50.65(a)(4) states in part, "Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Appropriate controls are implemented based on this evaluation.

Entergy complies with the requirements of §50.65(a)(4) at River Bend Station (RBS) via the application of a program governing maintenance scheduling. This program dictates the requirements for risk evaluations as well as the necessary levels of action required for risk management in each case. The program also controls operation of the on-line risk monitor system, which is based on the RBS probabilistic risk assessment (PRA) In addition, this program provides methods for assessing risk of maintenance activities for components not directly in the RBS PRA model. With the use of risk evaluation for various aspects of plant operations, Entergy has initiated efforts to perform additional maintenance, surveillance, and testing activities during normal operation. Planned activities are evaluated utilizing risk insights to determine the impact on safe operation of the plant and the ability to maintain associated safety margins. Individual system components, a system train, or a complete system may be planned to be out of service to allow maintenance, or other activities, during normal operation.

Entergy proposes an alternative to radiography testing during each refueling outage for the valves identified above. The proposed alternative would permit radiography on an operating cycle frequency in lieu of a refueling outage frequency. The following provides justification for performing radiography testing at a frequency of at least once each operating cycle:

1. Radiography testing not only satisfies the requirements of the code to demonstrate valve closure position, it also aids in evaluating the health of valve internals

2. Inservice testing performed on a refueling outage frequency is currently acceptable in accordance with ASME/ANSI OM-10 and GL 89-04. By specifying testing activities on a frequency commensurate with each refueling outage, ASME/ANSI OM-10 recognizes and establishes an acceptable time period between testing. Historically, the refueling outage has provided a convenient and defined time period in which testing activities could be safely and efficiently performed. However, an acceptable testing frequency can be maintained separately without being tied directly to a refueling outage. Inservice testing performed on a frequency that maintains the acceptable time period between testing activities during the operating cycle is consistent with the intent of ASME/ANSI OM-10.

3. Over time, approximately the same number of radiography tests will be performed using the proposed operating cycle test frequency as would be performed at a refueling outage frequency. Thus, inservice testing activities performed at the proposed operating cycle test frequency provide an equivalent level of quality and safety as inservice testing activities performed at a refueling outage frequency.

4. As mentioned above, non-intrusive radiography is used to verify valve disc movement. Because the testing is non-intrusive, there is no impact on the ability of the valves to perform their safety functions. Therefore, radiographic testing of these valves while on-line would have an insignificant impact on core damage frequency.

In addition to these four points, performing radiography during refueling outages would increase the risk of radiation exposure due to an increased number of personnel in the plant. Conversely, testing once each operating cycle would reduce the risk of radiation exposure as fewer people will be subject to possible exposure.

## PROPOSED ALTERNATE TESTING

Pursuant to 10 CFR 50.55a(a)(3)(i), Entergy proposes an alternative testing frequency for performing inservice testing for the valves identified above in the closed direction. The valves will be tested on a frequency of at least once during each operating cycle in lieu of once during each refueling outage as currently allowed by ASME/ANSI OM-10, paragraph 4.3.2.2(e).

## CONCLUSIONS

10 CFR 50 55a(a)(3) states:

"Proposed alternatives to the requirements of (c), (d), (e), (f), (g), and (h) of this section or portions thereof may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that:

(i) The proposed alternatives would provide an acceptable level of quality and safety, or

(ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety."

Entergy believes the proposed alternative inservice testing presented above provides an acceptable level of quality and safety in that the proposed frequency is consistent with that allowed by ASME/ANSI OM-10 for performing inservice testing of valves. Entergy requests that the NRC staff authorize the proposed alternative frequency of testing as described above pursuant to 10 CFR 50.55a(a)(3)(i)

## REFERENCES

1. ASME/ANSI OM-1987, Part 1

2. ASME/ANSI OMa-1988, Part 10

3. NRC Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 3, 1989

4. NRC Generic Letter 89-04, Supplement 1, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 4, 1995

5. NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," published April 1995

6. Program Section No. CEP-IST-2, Inservice Testing Plan, Entergy Nuclear - South

**ENCLOSURE 3**

**CNRO-2002-00053**

**REQUEST FOR RELIEF**
**RBS-VRR-007**

**SYSTEM 202 – SVV – SVV Compressors/Dryers**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| SVV-V122 | 2 | 1.5 | C | MAIN STEAM LINE PRESSURE RELIEF VALVE OPERATOR SUPPLY LINE FROM DRYER SKID A CHECK VALVE |
| SVV-V123 | 2 | 1.5 | C | MAIN STEAM LINE PRESSURE RELIEF VALVE OPERATOR SUPPLY LINE FROM DRYER SKID A CHECK VALVE |
| SVV-V129 | 2 | 1.5 | C | MAIN STEAM LINE PRESSURE RELIEF VALVE OPERATOR SUPPLY LINE FROM DRYER SKID B CHECK VALVE |
| SVV-V130 | 2 | 1.5 | C | MAIN STEAM LINE PRESSURE RELIEF VALVE OPERATOR SUPPLY LINE FROM DRYER SKID B CHECK VALVE |

**SYSTEM 255 – LSV – Penetration Valve Leakage Control (PVLCS)**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| LSV-V114 | 2 | 1 | C | PENETRATION VALVE LEAKAGE CONTROL COMPRESSOR A DISCHARGE CHECK VALVE |
| LSV-V120 | 2 | 1 | C | PENETRATION VALVE LEAKAGE CONTROL COMPRESSOR B DISCHARGE CHECK VALVE |

**SYSTEM 309 – EGA – Diesel Generator Starting Air**

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| EGA-V147 | 3 | 6 | C | STANDBY DIESEL GENERATOR A AIR START SUPPLY LINE {FROM AIR COMPRESSOR 2A} INLET CHECK VLV |
| EGA-V148 | 3 | 6 | C | STANDBY DIESEL GENERATOR A AIR START SUPPLY LINE {FROM AIR COMPRESSOR 1A} INLET CHECK VLV |

| Component Identification | Code Class | Size (Inches) | Code Category | Component Function |
|---|---|---|---|---|
| EGA-V151 | 3 | 6 | C | STANDBY DIESEL GENERATOR B AIR START SUPPLY LINE {FROM AIR COMPRESSOR 2B} INLET CHECK VLV |
| EGA-V152 | 3 | 6 | C | STANDBY DIESEL GENERATOR B AIR START SUPPLY LINE {FROM AIR COMPRESSOR 1B} INLET CHECK VLV |

**COMPONENT FUNCTION**

SVV-V122, SVV-V123, SVV-V129, and SVV-V130 are the normal air supply line header check valves to the main steam safety/relief valve pneumatic operator accumulators. These valves have an active safety function in the close direction to prevent diversion of flow from the safety-related backup air supply provided by the Penetration Valve Leakage Control System (PVLCS). These valves are not credited with an open safety function.

The closure function is verified quarterly by performing non-intrusive testing (i.e., radiography). These valves are installed back-to-back with no test connections available to facilitate back-flow testing that could be used to verify the closed position. Additionally, they have no external exercising mechanisms or position indication instrumentation.

LSV-V114 and LSV-V120 are the PVLCS Division I and II accumulator inlet check valves. These valves have an active safety function in the open direction to allow air into the Division I and II PVLCS accumulators from the safety-related air compressors. These valves have an active safety function in the close direction to prevent loss of air pressure from the accumulators.

The open function is verified quarterly by verifying proper operation of the PVLCS compressors. The closure function is verified quarterly by radiography testing. There are no test connections to facilitate back-flow testing that could be used to verify the close position. These valves have no external exercising mechanisms or position indication instrumentation.

EGA-V147, EGA-V148, EGA-V151, and EGA-V152 are the Emergency Diesel Generator (EDG) starting air supply check valves. These normally closed valves have an active safety function to open to admit starting air to the EDG. The valves are credited with an active safety function in the close direction to maintain sub-system train separation in the EDG air start system to prevent blowdown from a pressurized air bank to a de-pressurized out-of-service air bank

The open function is verified quarterly by verifying the associated EDG properly starts while performing an air bank start. The closure function is verified quarterly by radiography testing. There are no test connections to facilitate back-flow testing that could be used to verify the close position. These valves have no external exercising mechanisms or position indication instrumentation.

Based on the above discussions, closure verification for the identified check valves is appropriately performed utilizing a non-intrusive technique such as radiography due to the absence of test connections, or the inability to align the system to permit closure verification. Radiography for these valves has provided conclusive results.

## ASME CODE TEST REQUIREMENTS

ASME/ANSI OM-10 paragraph 4.3.2.2 addresses exercising requirements for valves. Paragraph 4 3 2.2(e) states, "If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages "

## BASIS FOR RELIEF

### Background

The components listed above are check valves that have no external means for exercising and no external position indication mechanism. In Section 4.1.2 of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants" (Reference 5), the NRC states, "The staff has determined that non-intrusive techniques meet the Code requirements for verifying disk movement for the full-stroke exercising – opening and closing - of check valves."

Entergy Operations, Inc. (Entergy) has determined that closure verification utilizing the non-intrusive radiography technique is the most feasible testing methodology for the check valves identified above since they have no test connections to facilitate back-flow testing, which could be used to verify the closed position.

Paragraph 4.3.2.2(e) of ASME/ANSI OM-10 allows valve testing to be performed during refueling outages if it is not practicable to be performed quarterly or during cold shutdown. Entergy has determined that radiography testing is not practicable on a quarterly basis during power operation due to increased personnel radiation exposure, large manpower requirements, and the extensive test set-up required. As discussed in Section 4.1.4 of NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants" (Reference 5), the need to set up test equipment is adequate justification to defer testing to a refueling outage frequency based on the impracticality of testing quarterly or at cold shutdown.

### Basis

As more maintenance activities are performed on-line, it is evident that selected refueling outage inservice testing activities could be performed on-line without sacrificing level of quality or safety. Prior to performing an activity, its effect on risk is evaluated in accordance with the requirements of 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." §50.65(a)(4) states in part, "Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." Appropriate controls are implemented based on this evaluation.

Entergy complies with the requirements of §50.65(a)(4) at River Bend Station (RBS) via the application of a program governing maintenance scheduling. This program dictates the requirements for risk evaluations as well as the necessary levels of action required for risk management in each case. The program also controls operation of the on-line risk monitor system, which is based on the RBS probabilistic risk assessment (PRA). In addition, this program provides methods for assessing risk of maintenance activities for components not directly in the RBS PRA model. With the use of risk evaluation for various aspects of plant operations, Entergy has initiated efforts to perform additional maintenance, surveillance, and testing activities during normal operation. Planned activities are evaluated utilizing risk insights to determine the impact on safe operation of the plant and the ability to maintain associated safety margins. Individual system components, a system train, or a complete system may be planned to be out of service to allow maintenance, or other activities, during normal operation.

Entergy proposes an alternative to radiography testing during each refueling outage for the valves discussed herein. The proposed alternative would permit radiography on an operating cycle frequency in lieu of a refueling outage frequency. The following provides justification for performing radiography testing at a frequency of at least once each operating cycle:

1. Radiography testing not only satisfies the requirements of the code to demonstrate valve closure position, it can aid in evaluating the health of valve internals.

2. Inservice testing performed on a refueling outage frequency is currently acceptable in accordance with ASME/ANSI OM-10 and GL 89-04. By specifying testing activities on a frequency commensurate with each refueling outage, ASME/ANSI OM-10 recognizes and establishes an acceptable time period between testing. Historically, the refueling outage has provided a convenient and defined time period in which testing activities could be safely and efficiently performed. However, an acceptable testing frequency can be maintained separately without being tied directly to a refueling outage. Inservice testing performed on a frequency that maintains the acceptable time period between testing activities during the operating cycle is consistent with the intent of ASME/ANSI OM-10.

3. Over time, approximately the same number of radiography tests will be performed using the proposed operating cycle test frequency as would be performed at a refueling outage frequency. Thus, inservice testing activities performed at the proposed operating cycle test frequency provide an equivalent level of quality and safety as inservice testing activities performed at a refueling outage frequency.

4. As mentioned above, non-intrusive radiography is used to verify valve disc movement. Because the testing is non-intrusive, there is no impact on the ability of the valves to perform their safety functions. Therefore, radiographic testing of these valves while on-line would have an insignificant impact on core damage frequency.

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## CONCLUSIONS

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6. Program Section No. CEP-IST-2, Inservice Testing Plan, Entergy Nuclear - South