

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

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 FACIL: 50-331 Duane Arnold Energy Center, Iowa Electric Light & Pow 05000331  
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 DENTON, H. Office of Nuclear Reactor Regulation, Director

SUBJECT: Requests relief from ASME Section XI, Paragraph TWV-3200 re valve testing following maint. Several valves can only be tested during sys or plant operation. Justification & alternative testing methodology encl.

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Iowa Electric Light and Power Company

July 12, 1985  
NG-85-3209

Mr. Harold Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Op. License No: DPR-49  
Request for Relief from ASME Section XI,  
IWV-3200  
File: A-286

Dear Mr. Denton:

In accordance with 10 CFR 50.55a(g)(5)(iii) and 10 CFR 50.12, we have determined that conformance with certain Code requirements is impractical for the Duane Arnold Energy Center. Specifically, Paragraph IWV-3200 of ASME Section XI requires that when a valve or its control system has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. However, several of the valves can only be tested during system or plant operation, which is contrary to the requirements of IWV-3200.

The attachment to this letter provides justification for the requested relief and describes the alternative testing methodology. Upon approval of these relief requests, our Inservice Testing Program for Pumps and Valves will be revised accordingly.

In accordance with the requirements of 10 CFR Part 170, we are enclosing the required application fee of \$150.

Should you have any questions, please feel free to contact me.

Very truly yours,

*R. W. McGaughy*

Richard W. McGaughy  
Manager, Nuclear Division

RWM/MSG/ta\*

Attachments: 1) Relief Requests VR-40 through VR-47  
2) Application Fee Check No. 070098

cc: M. Grim  
L. Liu  
S. Tuthill  
M. Thadani  
NRC Resident Office  
H. McLamb (Iowa Bureau of Boiler Inspection)

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July 12, 1985

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SUBJECT: Request for Relief

REFERENCE: \_\_\_\_\_

FILE CODES: A-286

DCR NO.: N/A

TASK NO.: N/A

SP FILE: N/A

SYSTEM: Nuclear Boiler, Reactor Feedwater

COMPONENTS: MO-4441  
MO-4442

CATEGORY: A/C

FUNCTION: Provide primary containment outboard isolation for the reactor feedwater supply piping.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

BASIS FOR RELIEF:

These valves are lift-type stop check valves and have no mechanism for opening other than that induced by feedwater flow to the reactor vessel. If maintenance (e.g., disassembly, lapping, or component replacement) is performed which could potentially affect their capability to close, post-maintenance testing would require plant startup and operation at full-power to fully open the valve, followed by plant shutdown to close the valve. Testing in this manner would be contrary to the requirements of IWV-3200 which prohibit plant operation prior to testing. Since the disk does not possess position indication, a leakage test would be required subsequent to plant shutdown to demonstrate that the valve had stroked to its fully-closed position. Cycling the plant in this manner, in order to perform a test, is considered undesirable and impractical.

Maintenance activities associated with these valves fall under the cognizance of the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Gross errors would be detected during leak rate testing that would follow reassembly.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, a leak rate test will be performed to ensure that the valve has been properly reassembled.

RELIEF REQUEST NO. VR-41

SYSTEM: Nuclear Boiler, Reactor Feedwater

COMPONENTS: V-14-1  
V-14-3

CATEGORY: A/C

FUNCTION: These valves have a dual function capability as they perform safety-related functions in both the open and closed positions. Specifically, they provide primary containment inboard isolation for the reactor feedwater supply piping. Valves V-14-1 and V-14-3 provide injection paths to the reactor vessel for RCIC and HPCI, respectively.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

These check valves have no mechanism for opening other than that induced by feedwater (or HPCI or RCIC) flow to the reactor vessel. If maintenance (e.g., disassembly, lapping, or component replacement) is performed which could potentially affect their capability to close, post-maintenance testing would require plant startup and operation at full-power to fully open the valve, followed by plant shutdown to close the valve. Testing in this manner would be contrary to the requirements of IWV-3200 which prohibit plant operation prior to testing. Cycling the plant in this manner, in order to perform a test, is considered undesirable and impractical.

## BASIS FOR RELIEF, continued

Maintenance activities associated with these valves fall under the cognizance of the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Gross errors would be detected during leak rate testing that would follow reassembly. Proper stroking of these valves to the open position is verified by satisfactory operation of the reactor feedwater system during power operation of the plant.

## ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, a leak rate test will be performed to ensure that the valve has been properly reassembled.

SYSTEM: Control Rod Drive (CRD)

COMPONENTS: V-17-52  
V-17-53

CATEGORY: A/C

FUNCTION: Provide primary containment isolation for the Control Rod Drive return line piping.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

BASIS FOR RELIEF:

These check valves open by CRD return line water flow to the reactor vessel. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on either of these valves that could potentially affect their capability to close, post-maintenance testing would require reversal of a spectacle flange in the CRD piping and injection of water into the reactor vessel. However, as required by NUREG-0619, the CRD line is no longer used. Since the disk does not possess position indication, a leakage test would be required subsequent to injection to demonstrate that the valve had stroked to its fully-closed position.

Maintenance activities associated with these valves fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Gross errors would be detected during leak rate testing that would follow reassembly. The effort of reversing the CRD spectacle flange and injecting CRD water into the reactor vessel is undesirable and could result in unnecessary personnel exposure, potential contamination hazards, unnecessary plant downtime and is also contrary to the guidance of NUREG-0619.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, a leak rate test will be performed to ensure that the valve has been properly reassembled.

RELIEF REQUEST NO. VR-43

SYSTEM: Control Rod Drive (CRD) Hydraulic

COMPONENTS: V-18-919 through V-18-1007  
V-18-1453 through V-18-1541

CATEGORY: C

FUNCTION: V-18-919  
through 1007 - Prevent backflow into the cooling water header  
during a SCRAM; allow cooling water circulation  
during normal operation.

V-18-1453  
through 1541 - Open to allow flow from the top of the CRD pistons  
to the SCRAM discharge header.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

These valves open with CRD process system flow. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on any of these valves that could potentially affect their capability to open or close, post-maintenance testing would require operation of the CRD system and the affected control rod to determine proper valve operation.

Maintenance activities associated with these valves fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely.



BASIS FOR RELIEF, continued

As required by the DAEC Technical Specifications, proper operation of these valves is verified by satisfactory operation of the reactor CRD system and individual control rods during startup and power operation of the plant.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, control rod operation and response will be monitored during the normal course of plant startup and operation following completion of maintenance activities.

RELIEF REQUEST NO. VR-44

SYSTEM: High Pressure Coolant Injection (HPCI)

COMPONENTS: V-22-16  
V-22-17  
V-22-21  
V-22-22

CATEGORY: A/C

FUNCTION: Provide primary containment (torus) isolation for the HPCI steam exhaust (V-22-16 and V-22-17) and HPCI condensate return (V-22-21 and V-22-22) piping.

V-22-16 and V-22-17 provide an exhaust path to the suppression pool for the HPCI turbine.

V-22-21 and V-22-22 provide a path for condensate from the HPCI exhaust drain pot to the suppression chamber.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

These valves are check valves and have no mechanism for opening other than that induced by steam exhaust or condensate flow to the suppression pool. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on any of these valves that could potentially affect its capability to open or close, post-maintenance testing would require plant startup and HPCI system operation to open the valve(s), then shutting down the HPCI

BASIS FOR RELIEF, continued

system to close the valve. Following shutdown of the HPCI system, a leaktest would be required to prove that the valve(s) stroked from the open to the closed positions. Plant startup cannot be initiated with any of these valves in an inoperable status as this would be contrary to the requirements of IWV-3200. Since conducting a leaktest of these valves would render the HPCI system inoperable during the test, it would be imprudent to conduct such a test with the plant in any condition other than cold shutdown. Cycling the plant in such a manner would be undesirable and impractical.

Maintenance activities associated with these valves fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Gross errors would be detected during leak rate testing that would follow reassembly. Proper stroking of these valves to the open position is verified by satisfactory operation of the HPCI turbine during surveillance testing as required by the Technical Specifications.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, operability testing will be performed to ensure that the valve(s) is operable.

RELIEF REQUEST NO. VR-45

SYSTEM: High Pressure Coolant Injection (HPCI)

COMPONENTS: V-22-26  
V-22-28  
V-22-29

CATEGORY: C

FUNCTION: V-22-26 HPCI condensate pump discharge  
V-22-28 HPCI condensate return to the HPCI pump suction  
V-22-29 HPCI condensate to the HPCI turbine lube oil cooler

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

These check valves have no mechanism for opening other than that induced by condensate flow from the HPCI condensate pump. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on either of these valves that could potentially affect its capability to open, post-maintenance testing would require plant startup and HPCI system operation to operate the condensate pump and thus open the valve(s). Plant startup cannot be initiated with either of these valves in an inoperable status, as this would be contrary to the requirements of IWV-3200.

Maintenance activities associated with these valves fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Proper stroking of these valves to the open position is verified by satisfactory operation of the HPCI turbine during surveillance testing as required by the DAEC Technical Specifications.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, operability to the open position will be demonstrated during HPCI system testing following plant startup.

RELIEF REQUEST NO. VR-46

SYSTEM: High Pressure Coolant Injection (HPCI)

COMPONENTS: V-23-14

CATEGORY: C

FUNCTION: V-23-14 HPCI minimum flow check valve

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

This check valve has no mechanism for opening other than that induced by flow from the HPCI pump. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on this valve that could potentially affect its capability to open, post-maintenance testing would require plant startup and HPCI system operation to open the valve. Plant startup cannot be initiated with this valve in an inoperable condition, as it would be contrary to the requirements of IWV-3200.

Maintenance activities associated with this valve fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Proper stroking of these valves to the open position is verified by satisfactory operation of the HPCI turbine during surveillance testing as required by the DAEC Technical Specifications.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, operability to the open position will be demonstrated during HPCI system testing following plant startup.

SYSTEM: Reactor Core Isolation Cooling (RCIC)

COMPONENTS: V-24-8  
V-24-23

CATEGORY: A/C

FUNCTION: Provide primary containment (torus) isolation for the RCIC steam exhaust.  
Provide an exhaust path to the suppression pool for the RCIC turbine.

TEST REQUIREMENT:

When a valve or its control system has been replaced or repaired or has undergone maintenance that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits. (IWV-3200)

Valves that are normally open during plant operation and whose function is to prevent reversed flow shall be tested in a manner that proves that the disk travels to the seat promptly on cessation or reversal of flow. Confirmation that the disk is on its seat shall be by visual observation, by an electrical signal initiated by a position indicating device, by observation of appropriate pressure indications in the system, or by other positive means. (IWV-3522[a]) (CT-CC)

Valves that are normally closed during plant operation and whose function is to open on reversal of pressure differential shall be tested by proving that the disk moves promptly away from the seat when the closing pressure differential is removed and flow through the valve is initiated. (IWV-3522[b]) (CT-CO)

BASIS FOR RELIEF:

Valves V-24-8 and V-24-23 are stop and swing check valves and have no mechanism for opening other than that induced by steam exhaust flow to the suppression pool. If maintenance (e.g., disassembly, lapping, or component replacement, etc.) is performed on any of these valves that could potentially affect its capability to open or close, post-maintenance testing would require plant startup and RCIC system operation to open the valve(s), then shutting down the RCIC system to close the valve. Following shutdown of the RCIC system, a leaktest would be required to prove that the valve(s) stroked from the open to the closed positions. Plant startup cannot be initiated with any of these valves in an inoperable status, as this would be contrary to the requirements of IWV-3200. Since conducting a leaktest of these valves would render the RCIC system inoperable during the test, it would be imprudent to conduct such a test with the plant in any condition other than cold shutdown. Cycling the plant in this manner, in order to perform a test, is undesirable and impractical.

BASIS FOR RELIEF, continued

Maintenance activities associated with these valves fall under the DAEC Operational Quality Assurance Program. Thus, reassembly errors, the most probable source of failure, are unlikely. Gross errors would be detected during leak rate testing that would follow reassembly. Proper stroking of these valves to the open position is verified by satisfactory operation of the HPCI turbine during surveillance testing as required by the DAEC Technical Specifications.

ALTERNATE TESTING:

When these valves are subjected to repair or maintenance that could affect their performance, a leak rate test will be performed to ensure that the valve(s) is operable.