Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324
Telephone 319 851 7611
Fax 319 851 7611

IES UTILITIES

October 3, 1996
NG-96-2088

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Inservice Inspection Relief Requests

References: 1) NG-96-0809, from J. Franz (IES) to W. Russell (NRC) dated April 26, 1996, Third 10-Year Interval Inservice Inspection Plan
2) NG-96-1807, from J. Franz (IES) to NRC dated September 30, 1996, Response to NRC Request for Additional Information on Third 10-Year Interval Inservice Inspection Program Plan and Associated Requests for Relief

File: A-100, A-286

Dear Sirs:

Reference 1 transmitted the Duane Arnold Energy Center (DAEC) Third 10-Year Interval Inservice Inspection (ISI) Plan, along with several relief requests requiring NRC approval prior to the upcoming refueling outage (RFO) 14. Included were second ten year interval relief requests HT-014 and NDE-020. These relief requests were the subject of a conference call with the Staff, their contractor and IES personnel on October 1, 1996. Based on this discussion, we have revised these two relief requests, as well as the corresponding third ten-year interval relief requests.

The revisions to relief requests HT-014 (and third ten-year interval relief requests PR-006 and PR-007) and NDE-020 (and third ten-year interval relief request NDE-R011) are provided in the attachment. Relief requests HT-014, PR-006 and PR-007 have been revised to provide additional justification. In addition, the hold time has been revised from 20 minutes to "a minimum of 30 minutes and a maximum of 60 minutes." Relief requests NDE-020 and NDE-R011 have been revised to reflect that appropriate documentation exists for the DAEC vessel calibration blocks.

1/1

A047

In addition, IES hereby withdraws relief request NDE-R022, which was submitted in Reference 1 and revised in Reference 2.

The following new NRC commitment is made in relief requests HT-014, PR-006 and PR-007:

The DAEC will implement the alternative rules for 10-year hydrostatic testing for class 2 pressure retaining piping and components in the High Pressure Coolant Injection (HPCI) System as provided in Code Case N-498-1 with the following exception: A system pressure test shall be performed in accordance with IWC-5210 (1), [IWA-5211(b)]. This test shall consist of performing the required visual (VT-2) inspections in conjunction with a periodic HPCI turbine test performed in accordance with the ASME Section XI Inservice Testing Program. This VT-2 inspection shall be performed once per period rather than once per interval. The test hold time shall be a minimum of 30 minutes and a maximum of 60 minutes starting when the Technical Specification flow and pressure requirements have been met.

Should you have any questions regarding this matter, please contact this office.

Sincerely,

Kenneth E. Peveler
Manager, Nuclear Licensing and Emergency Planning

KEP/CJR/cjr
n:\iowa\lic\ng-96\96-2088.doc

Attachment

cc: C. Rushworth
L. Liu
G. Kelly (NRC-NRR)
A. B. Beach (Region III)
NRC Resident Office
Docu

**IES UTILITIES INC.**
**DUANE ARNOLD ENERGY CENTER**
**2ND 10-YEAR INTERVAL**
**REQUEST FOR RELIEF NO. HT-014**

I SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Class 2 Pressure Retaining Piping and Components in the High Pressure Coolant Injection (HPCI) System (water side) downstream of MO-2321 and MO-2300, extending to MO-2312, CV-2315, and MO-2318.

EXAMINATION CATEGORY C-H, ITEM(S) C7.40, C7.80

II CODE REQUIREMENT

The pressure retaining components within each system boundary shall be subject to the system pressure test and visually examined by the method specified in table IWC-2500-1 (ie. IWC-5222), Examination Category C-H.

(1) A system hydrostatic pressure test in accordance with IWA-5211 (d) conducted during a plant shutdown at a pressure above nomi al operating pressure or system pressure for which overpressure protection is provided.

III CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED

Hydrostatic pressure tests can be difficult to perform, often requiring complicated or abnormal valve line-ups in order to properly vent, fill and isolate the systems requiring testing (ref. Code Case N498).

Operation of this system at the Code required pressure and temperature for the required 4 hour test condition "hold time" in accordance with IWA-5213 would result in an undesirable torus water temperature.

IV BASIS FOR RELIEF

Hydrostatic pressure tests can be difficult to perform, often requiring complicated or abnormal valve line-ups in order to properly vent, fill and isolate the systems requiring testing.

Operation of this system at the Code required pressure and temperature for the required 4 hour test condition "hold time" in accordance with IWA-5213 would result in an undesirable torus water temperature.

The DAEC Technical Specifications states in 3.7.G.2.c "If the suppression pool average water temperature is > 105°F during testing which adds heat to the suppression pool, immediately suspend all testing which adds heat to the suppression pool, verify suppression pool average water temperature is < 110°F once per hour, and restore suppression pool average temperature to ≤ 95°F within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours."

A test was performed on August 28, 1996 in accordance with the Inservice Testing (IST) Program during which the torus water temperature was trended. The average torus water temperature was 77.3°F at the beginning of the test. The HPCI system was run for approximately 50 minutes to complete the testing requirements. The average torus water temperature was 101°F at the end of the 50 minutes. This is a increase in torus water temperature of 23.7°F in the 50 minutes (1°F every two minutes).

It has been determined that it would take four VT-2 qualified examiners 15 minutes to walk down the HPCI system. This would allow a 35 minute hold time for this particular case. During colder months of the year, the HPCI system may be run for a longer period of time since the torus water temperature is colder at the beginning of the test, resulting in a longer hold time. For example if the torus water temperature was 60°F at the beginning of the test, based on a 1°F increase every two minutes and 15 minutes to perform the examination, a hold time of 67 minutes would be reached (101°F minus 60°F, times two, minus 15 minutes for examination).

A research of past torus water temperature during the winter months (November 1, 1995 to April 1, 1996) showed the following coldest temperatures:

| | |
|---|---|
| December 15, 1995 | 59.1°F |
| January 16, 1996 | 59.1°F |
| March 13, 1996 | 59.7°F |

## V ALTERNATE EXAMINATIONS

DAEC proposes to implement the alternative rules for 10-year Hydrostatic Testing for class 2 systems as provided in Code Case N-498-1 with the following exception: A system pressure test shall be performed in accordance with IWC-5210 (1), [IWA-5211(b)] for the above subject system or portion of a system not required to operate during normal reactor operation but for which periodic system or component functional testing is performed to meet Owner's requirements. This test shall consist of performing the required visual (VT-2) inspections in conjunction with a periodic HPCI turbine test performed in accordance with the

ASME Section XI Inservice Testing Program. This VT-2 inspection shall be performed once per period rather than once per interval. The test hold time shall be a minimum of 30 minutes and a maximum of 60 minutes starting when the Technical Specification flow and pressure requirements have been met.

## VI JUSTIFICATION FOR THE GRANTING OF RELIEF

With the pressures currently required by Section XI, elevated pressure hydrostatic tests do not offer a commensurate increase in safety with cost benefit and places undue burden upon a licensee to perform these tests. Use of Code Case N-498-1 with a 30 to 60 minute hold-time rather than a 4 hour hold-time and performing this test every period rather than every interval will not jeopardize the public health and safety.

## VII IMPLEMENTATION SCHEDULE

This relief request will be implemented during the third period of the 2nd Ten Year Interval.

**IES UTILITIES INC.**
**DUANE ARNOLD ENERGY CENTER**
**2ND 10-YEAR INTERVAL**
**REQUEST FOR RELIEF NO. NDE-020**

I SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Reactor Vessel Welds Inspection Program

EXAMINATION CATEGORY B-A, ITEM(S) B1.10,

II CODE REQUIREMENT

10CFR50.55a(g)(6)(ii)(A)(2) requires all licensees to augment their reactor vessel examination by implementing once, as part of the Inservice Inspection Interval in effect on September 8, 1992, the examination requirements for reactor vessel shell welds specified in Item B1.10 of Examination Category B-A in the 1989 Edition of ASME Section XI.

Section XI (1989), IWA-2232 states that ultrasonic examination shall be conducted in accordance with Appendix I.

Appendix I, I-2100 states that ultrasonic examination of vessel welds greater than 2 inches in thickness shall be conducted in accordance with Article 4 of Section V, as supplemented by Appendix Supplements identified in table I-2000-1.

Article 4 of ASME Section V states that the calibration block fabrication and material shall be one of the following; (1) a nozzle dropout, (2) a component prolongation; (3) material of the same material specification product form, and heat treatment condition as one of the materials being joined.

Appendix I, Supplement 4 states the alternative calibration block design of fig. I-S4 may be used in lieu of blocks fabricated in accordance with Articles 4 and 5 of Section V provided the block meets Supplement 1 of Article 4 and 5 of Section V.

III CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED

Relief is requested from the ASME Section XI 1989 Edition, Appendix I requirements for calibration block design and fabrication requirements as specified in the augmented reactor vessel inspection program in 10CFR50.55a.

## IV BASIS FOR RELIEF

The Reactor Pressure Vessel (RPV) calibration blocks currently being used at DAEC, when reviewed against the 1980 with winter 1981 addenda of ASME Section XI and V, were identified as marginal in certain block design characteristics. This is because the requirements and examination techniques existing at the time of their fabrication were significantly different than those employed today. The current block dimensions, while in compliance with the original fabrication requirements, satisfy all but two of the side drilled hole dimensional requirements of the 1989 Section XI Code for calibration standards. Calibration reflectors (side drilled holes), though they do not meet the 1989 Code requirements, have been proven adequate during previous inspections. Any alterations to the existing calibration standards would be undesirable since the potential is high that the alterations may effect comparisons of past calibration and examinations results with future examinations. ASME Section XI requirements to detect service induced flaws is directly associated with the ability for traceability to previous examination results available from these existing calibration blocks. This is supported by Regulatory Guide 1.150, Position C.2, which states in part, "Where possible, the same calibration block should be used for successive inservice examination of the same RPV."

It would be impractical to fabricate a new set of calibration blocks and establish new baseline examination values for those affected examinations in order to satisfy current block dimensional requirements. Based on the above, DAEC requests relief from the ASME Section XI, Appendix I requirements for calibration block design and fabrication requirements, in order to allow the continued use of the existing calibration blocks in the following table:

| Cal Blk# | Nominal Pipe Size | Pipe Schedule | Thickness (inches) | Heat No. | Cal Blk Dwg. No. |
|---|---|---|---|---|---|
| IE-30 | PLATE | N/A | 5.5" | B0402 | SK-4-7-78 |
| IE-31 | PLATE | N/A | 6.625" | P2112 | SK-4-7-78 |
| IE-32 | PLATE | N/A | 6.625" | P2130 | SK-4-7-78 |
| IE-33 | PLATE | N/A | 6.625" | T1937 | SK-4-7-78 |
| IE-34 | PLATE | N/A | 6.625" | P2076 | SK-4-7-78 |
| IE-35 | PLATE | N/A | 4.0" | B0390 | SK-4-7-78 |

## V ALTERNATE EXAMINATIONS

All future calibration blocks will meet the design, fabrication, and material specification requirements of ASME Section XI Appendix I, III, and Article 4 of ASME Section V, and will be provided with the documentation necessary to demonstrate compliance with these requirements.

A demonstration was conducted to verify that the vessel calibration block IE-30 is compatible with ultrasonic equipment that will be utilized for the vessel examination. The results were found to be acceptable under the 1989 Section XI requirements (edition which will be used for the Third Ten Year Interval ISI program) and will be documented under IWA-2240 requirements.

## VI JUSTIFICATION FOR THE GRANTING OF RELIEF

To fabricate new calibration blocks to meet the requirements of ASME Section XI and Section V, Article 4 would only have a small potential of increasing plant safety margins and a very disproportionate impact on expenditures of plant manpower. In order to maintain the comparison of previous examination results the current calibration blocks will be utilized during the Second Ten Year ISI Program Interval.

## VII IMPLEMENTATION SCHEDULE

This relief request will be implemented during the 2nd Ten Year Interval.

**RELIEF REQUEST NUMBER: PR-006**

## COMPONENT IDENTIFICATION

| | |
|---|---|
| Code Classes: | 2 |
| References: | IWC-2500-1<br>IWC-5210(a) |
| Examination Categories: | C-H |
| Item Number: | C7.40, C7.80 |
| Description: | Class 2 Pressure Retaining Piping and Components in the High Pressure Coolant Injection (HPCI) turbine steam system and related turbine auxiliaries downstream of MO-2202, extending to V-22-16, V-22-19, and CV-2234. |

## CODE REQUIREMENT

The pressure retaining components within each system boundary shall be subject to the system pressure test and visually examined by the method specified in table IWC-2500-1 (i.e. IWC-5222), Examination category C-H;

(1) A system hydrostatic pressure test in accordance with IWA-5211 (d) conducted during a plant shutdown at a pressure above nominal operating pressure or system pressure for which overpressure protection is provided.

## BASIS FOR RELIEF

There is no practical method of isolating and pressurizing the section of piping from the HPCI Turbine casing, downstream to the subject valves without having seal gland leakage. Regulatory Guide 1.26 provides guidance for classification of ASME Class components. The HPCI turbine unit is considered exempt from the ASME Class requirements, excluding this portion of the system from the ASME requirements for hydrostatic testing. Operation of this system at the Code required pressure and temperature for the required 4 hour test condition "hold time" in accordance with IWA-5213 would result in an undesirable torus water temperature.

The DAEC Technical Specifications state in 3.7.G.2.c "If the suppression pool average water temperature is > 105°F during testing which adds heat to the suppression pool, immediately suspend all testing which adds heat to the suppression pool, verify suppression pool average water temperature is < 110°F once per hour, and restore suppression pool average temperature to ≤ 95°F within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours."

A test was performed on August 28, 1996 in accordance with the Inservice Testing (IST) Program during which the torus water temperature was trended. The average torus water temperature was 77.3°F at the beginning of the test. The HPCI system was run for approximately 50 minutes to complete the testing requirements. The average torus water temperature was 101°F at the end of the 50 minutes. This is a increase in torus water temperature of 23.7°F in the 50 minutes (1°F every two minutes).

It has been determined that it would take four VT-2 qualified examiners 15 minutes to walk down the HPCI system. This would allow a 35 minute hold time for this particular case. During colder months of the year, the HPCI system may be run for a longer period of time since the torus water temperature is colder at the beginning of the test, resulting in a longer hold time. For example if the torus water temperature was 60°F at the beginning of the test, based on a 1°F increase every two minutes and 15 minutes to perform the examination, a hold time of 67 minutes would be reached (101°F minus 60°F, times two, minus 15 minutes for examination).

A research of past torus water temperature during the winter months (November 1, 1995 to April 1, 1996) showed the following coldest temperatures:

| | |
|---|---|
| December 15, 1995 | 59.1°F |
| January 16, 1996 | 59.1°F |
| March 13, 1996 | 59.7°F |

## ALTERNATE EXAMINATION

DAEC proposes to implement the alternative rules for 10-year Hydrostatic Testing for class 2 systems as provided in Code Case N-498-1 with the following exception: A system pressure test shall be performed in accordance with IWC-5210 (1), [IWA-5211(b)] for the above subject system or portion of a system not required to operate during normal reactor operation but for which periodic system or component functional testing is performed to meet Owner's requirements. This test shall consist of performing the required visual (VT-2) inspections in conjunction with a periodic HPCI turbine test performed in accordance with the ASME Section XI Inservice Testing Program. This VT-2 inspection shall be performed once per period rather than once per interval. The test hold time shall be a minimum of 30 minutes and a maximum of 60 minutes starting when the Technical Specification flow and pressure requirements have been met.

## APPLICABLE TIME PERIOD

For the DAEC third Interval Inservice Inspection program, a system pressure test in accordance with Code Case N-498-1, IWA-5000 and IWC-5221 will be performed.

## RELIEF REQUEST NUMBER: PR-007

### COMPONENT IDENTIFICATION

Code Classes: 2
References: IWC-2500-1
IWC-5210(a)

Examination Categories: C-H
Item Number: C7.40, C7.80
Description: Class 2 Pressure Retaining Piping and Components in the High Pressure Coolant Injection System (water side) downstream of MO-2321 and MO-2300, extending to MO-2312, CV-2315, and MO-2318.

### CODE REQUIREMENT

The pressure retaining components within each system boundary shall be subject to the system pressure test and visually examined by the method specified in table IWC-2500-1 (i.e. IWC-5222), Examination category C-H;

(1) A system hydrostatic pressure test in accordance with IWA-5211 (d) conducted during a plant shutdown at a pressure above nominal operating pressure or system pressure for which overpressure protection is provided.

### BASIS FOR RELIEF

Hydrostatic pressure tests can be difficult to perform, often requiring complicated or abnormal valve line-ups in order to properly vent, fill and isolate the systems requiring testing.

Operation of this system at the Code required pressure and temperature for the required 4 hour test condition "hold time" in accordance with IWA-5213 would result in an undesirable torus water temperature.

The DAEC Technical Specifications states in 3.7.G.2.c "If the suppression pool average water temperature is > 105°F during testing which adds heat to the suppression pool, immediately suspend all testing which adds heat to the suppression pool, verify suppression pool average water temperature is < 110°F once per hour, and restore suppression pool average temperature to ≤ 95°F within 24 hours or be in at least HOT SHUTDOWN within the next 12 hours and COLD SHUTDOWN within the following 24 hours."

A test was performed on August 28, 1996 in accordance with the Inservice Testing (IST) Program during which the torus water temperature was trended. The average torus water temperature was 77.3°F at the beginning of the test. The HPCI system was run for approximately 50 minutes to complete the testing requirements. The average torus water temperature was 101°F at the end of the 50 minutes. This is a increase in torus water temperature of 23.7°F in the 50 minutes (1°F every two minutes).

It has been determined that it would take four VT-2 qualified examiners 15 minutes to walk down the HPCI system. This would allow a 35 minute hold time for this particular case. During colder months of the year, the HPCI system may be run for a longer period of time since the torus water temperature is colder at the beginning of the test, resulting in a longer hold time. For example if the torus water temperature was 60°F at the beginning of the test, based on a 1°F increase every two minutes and 15 minutes to perform the examination, a hold time of 67 minutes would be reached (101°F minus 60°F, times two, minus 15 minutes for examination).

A research of past torus water temperature during the winter months (November 1, 1995 to April 1, 1996) showed the following coldest temperatures:

| | |
|---|---|
| December 15, 1995 | 59.1°F |
| January 16, 1996 | 59.1°F |
| March 13, 1996 | 59.7°F |

## ALTERNATE EXAMINATION

DAEC proposes to implement the alternative rules for 10-year Hydrostatic Testing for class 2 systems as provided in Code Case N-498-1 with the following exception: A system pressure test shall be performed in accordance with IWC-5210 (1), [IWA-5211(b)] for the above subject system or portion of a system not required to operate during normal reactor operation but for which periodic system or component functional testing is performed to meet Owner's requirements. This test shall consist of performing the required visual (VT-2) inspections in conjunction with a periodic HPCI turbine test performed in accordance with the ASME Section XI Inservice Testing Program. This VT-2 inspection shall be performed once per period rather than once per interval. The test hold time shall be a minimum of 30 minutes and a maximum of 60 minutes starting when the Technical Specification flow and pressure requirements have been met.

## APPLICABLE TIME PERIOD

For the DAEC third Interval Inservice Inspection program, a system pressure test in accordance with Code Case N-498-1, IWA-5000 and IWC-5221 will be performed.

**RELIEF REQUEST NUMBER: NDE-R011**

## COMPONENT IDENTIFICATION

| | |
|---|---|
| Code Classes: | 1 |
| References: | IWA-2232<br>Appendix I, I-2100, Article 4 ASME Section V |
| Examination Categories: | B-A |
| Item Numbers: | B1.10, B1.20, B1.30, B1.40 |
| Description: | Use of Existing Calibration Blocks for Ultrasonic Examination of Pressure retaining welds in Reactor Vessel. |
| Component Numbers : | N/A |

## CODE REQUIREMENT

IWA-2232 states that ultrasonic examination shall be conducted in accordance with Appendix I.

Appendix I, I-2100 states that ultrasonic examination of vessel welds greater than 2 inches in thickness shall be conducted in accordance with Article 4 of section V, as supplemented by Appendix Supplements identified in table I-2000-1.

Article 4 ASME Section V states that the calibration block fabrication and material shall be one of the following; (1) a nozzle dropout, (2) a component prolongation or; (3) material of the same material specification product form, and heat treatment condition as on of the materials being joined.

Appendix I, Supplement 4, states the alternative calibration block design of fig. I-S4 may be used in lieu of blocks fabricated in accordance with Articles 4 and 5 of Section V provided the block meets Supplement 1 of Article 4 and 5 of Section V.

## BASIS FOR RELIEF

The Reactor Pressure Vessel (RPV) calibration blocks currently being used at DAEC, when reviewed against the 1989 ASME Section XI and Section V, were identified as marginal in certain block design characteristic. This is because the requirements and examination techniques existing at the time of their fabrication were significantly different than those employed today. The current block dimensions, while in compliance with the original fabrication requirements, satisfy all but two of the side drilled hole dimensional requirements of the 1989 Section XI Code for calibration standards. Calibration reflectors (side drilled holes), though they do not meet the 1989 Code requirements, have been proven adequate during the last two inspection intervals. Any

alterations to the existing calibration standards would be undesirable since the potential is high that the alterations may effect comparisons of past calibration and examination results with future examinations. ASME Section XI requirements to detect service induced flaws is directly associated with the ability for traceability to previous examination results available from these existing calibration blocks. This is supported by Regulatory Guide 1.150, Position C.2 which states in part "Where possible, the same calibration block should be used for successive inservice examinations of the same RPV."

It would be impractical to fabricate a new set of calibration blocks and establish new baseline examination values for those affected examinations in order to satisfy current block dimensional requirements. Based on the above, DAEC requests relief from the ASME Section XI, Appendix-I requirements for calibration block design and fabrication requirements, in order to allow the continued use of the existing calibration blocks in the following table:

| Cal Blk# | Nominal Pipe Size | Pipe Schedule | Thickness (inches) | Heat No. | Cal Blk Dwg. No. |
|---|---|---|---|---|---|
| IE-30 | PLATE | N/A | 5.5" | B0402 | SK-4-7-78 |
| IE-31 | PLATE | N/A | 6.625" | P2112 | SK-4-7-78 |
| IE-32 | PLATE | N/A | 6.625" | P2130 | SK-4-7-78 |
| IE-33 | PLATE | N/A | 6.625" | T1937 | SK-4-7-78 |
| IE-34 | PLATE | N/A | 6.625" | P2076 | SK-4-7-78 |
| IE-35 | PLATE | N/A | 4.0" | B0390 | SK-4-7-78 |

## ALTERNATE EXAMINATION

All future calibration blocks will meet the design, fabrication, and material specification requirements of ASME Section XI, Appendix I, III, and Article 4 and 5 of ASME Section V, and will be provided with the documentation necessary to demonstrate compliance with these requirements.

A demonstration was conducted to verify that the vessel calibration block (IE-30) is compatible with the ultrasonic equipment that will be utilized for the vessel examination. The results were found to be acceptable under the 1989 Section XI requirements and will be documented under IWA-2240.

## APPLICABLE TIME PERIOD

Relief is requested for the third ten-year interval of the Inservice Inspection Program for DAEC.