# **ATTACHMENT 3**

IST PROGRAM 3RD TEN YEAR INTERVAL SUBMITTAL

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#### SECTION 1. INTRODUCTION

Under the provisions of 10CFR50.55a, inservice testing of safety-related pumps and valves will be performed in …cordance with Section XI of the ASME Boiler and Pressure Vessel Code to the extent practical. As specified in 10CFR50.55a, the effective edition of Section XI with regard to this program is the 1989 Edition. Subsections IWP and IWV of the 1989 ASME Code require that pump and valve testing be performed using Parts 6 and 10 of OM-1987 ASME Operation and Maintenance (OM) Standard, "Operation and Maintenance of Nuclear Power Plants", ASME/ANSI with 1988a addenda. This program identifies the pump and valve inservice to the that will be performed at ANO-1 to comply with the requirements of 10CFR50.55a. This program applies to the Third Ten Year Inservice Inspection Interval beginning December 2, 1997, and ending December 19, 2007.

#### 1.1 Relationship with Technical Specifications

Based on technical specification requirements, in the event of any conflicts between ASME Section XI requirements and the requirements of technical specifications, the plant technical specifications shall govern if more conservative. Entergy Operations will meet all requirements of both ASME Section XI and plant technical specifications unless there is a specific conflict between the two. If any requirements of ASME Section XI cannot be met due to technical specification limitations, relief will be requested.

#### 1.2 Qualification of Test Personnel

Personnel performing pump and valve testing per ASME Section XI Subsections IWP and IWV will be available in accordance with the ANO Quality Assurance Program.

#### 1.3 ASME Code Relationship with Generic Letter 89-04

Paragraph 50.55a(f) of 10CFR50, "Domestic Licensing of Production and Utilization Facilities," equires that certain ASME Code Class 1, 2, and 3 pumps and valves be designed to enable inservice testing and that testing be performed to assess operational readiness in accordance with the Section . I requirements of the ASME Boiler and Pressure Vessel Code. The inservice testing of ASME ( ode Class 1, 2, and 3 pumps and valves should be viewed as one part of a broad effort to ensure operational readiness of equipment rather than viewed in the narrow sense as compliance with 10CFR50.55a(f). The intent of the testing is to detect degradation affecting operation and assess whether adequate margins are maintained. While GL 89-04 has been written to provide guidance relative to meeting the requirements of 10CFR50.55a(f), it is only one part of other ongoing industry and regulatory activities. Entergy Operations follows the guidance in NUREG 1482 as appropriate.

#### 1.4 ANO-1 Status as a Hot Shutdown Plant

The 1987 OM Code, 1988 Addenda states that the pumps and valves necestary to achieve and maintain cold shutdown are required to be included in the scope of the inservice testing program. NUREG 1482, Section 2.2 states that if a plant is licensed as hot shutdown that it is not necessary to write a relief request but the hot shutdown status of the plant must be documented in the introductory section of the program submittal. ANO-1 is licensed as a hot shutdown plant. The steam generators provide the long term capability for decay heat removal which mosts General Design Criterion 34 dealing with residual heat removal requirements.

#### 2.0 PUMP INSERVICE TESTING PROGRAM

The pump test program shall be conducted in accordance with Subsection IWP of Section XI of the 1989 Edition, of the ASME Boiler and Pressure Vessel Code, except for relief requested under the provisions of 10CFR50.55a(f). Subsection IWP of the 1989 Code requires the use of the 1987 OM Code, 1988a addenda Part 6 for pump testing. Appendix 3 details the inservice testing program for all safety related pumps at ANO-1. These tables list each pump required to be tested in accordance with OMa-1988, Part 6, Section 1.1. Each parameter to be measured, as well as specific relief requests concerning non-conformance, are also listed.

#### 2.1 Multiple Reference Values/Reference Curves

Based on plant operating conditions and the pump testing hydraulic circuit, Entergy Operations may choose to generate multiple sets of reference values in order to more fully describe pump hydraulic condition. Each set of pump reference values will meet all appropriate requirements of OMa-1988, Part 6, Section 4.0. In addition, it may be desirable to establish a reference curve to accommodate plant operational constraints relating to test parameters. Pump curves will be developed using the guidance in NUREG 1482, Section 5.2. ANO-1 utilizes pump curves to access the operational readiness of the service water pumps - reference Relief Request 6

#### 3.0 VALVE INSERVICE TESTING PROGRAM

The valve test program for ANO-1 shall be conducted in accordance with Subsection IWV of Section  $\lambda$ I of the 1989 Edition, of the ASME Boiler and Pressure Vessel Code, except where relief is requested under the provisions of 10CFR50.55a(f) (5)(iii). Subsection IWV of the 1989 Code requires the use of the 1987 OM Code, 1988a addenda Part 10 for valve testing. The valve test program is included as Appendix 2. The codes and symbols used to abbreviate the tables in Appendix 2 are explained in Appendix 1.

#### 3.1 Category A Valves

Valves for which scat leak age is important may generally be classified as pressure isolation valves (PIV), containment isolation valves (CIV), both pressure and containment isolation valves, etc. ANO-1 does not have any valves that perform both a containment isolation function and pressure isolation function.

#### 3.2 Containment Isolation Valves

Category A valves which perform a containment isolation function are leak tested in accordance with the 10CFR50, Appendix J, Type C, CIV test program. For valves performing a containment isolation function, individual valve leak rates are not in themselves significant. The only pertinent leak rate criteria for CIVs is that the total leak rate for all penetrations and valves be less than  $0.60 L_a$ . ANO-1 was designed to perform the Appendix J, Type C tests, not the individual Category A leak test (i.e., some penetration test connections test more than one valve at a time). Accordingly, all CIV seat leakage testing shall be performed in accordance with the requirements of 10CFR50, Appendix J, Type C, in lieu of the Category A requirements of Section XI.

All CIVs performing a containment isolation safety function have been categorized as A-Active or P-Passive, and will, as a minimum, be leak tested per 10CFR50 Appendix J. Passive valves will, in general, have no other testing performed unless they have remote position indication in which case their remote position indication will be verified in accordance with OMa-1988, Part 10, Section 4.1.

#### 3.3 Pressure Isolation Valves

The purpose of the plant Pressure Isolation Valves is to reduce the possibility of an inter-system LOCA which would pressurize low pressure systems to pressures exceeding their design limits. Such valves will be tested per OMa-1988, Part 10, Section 4.2.2, except where relief has been requested.

Certain systems connected to the reactor coolant system have design pressures less than the reactor coolant system operating pressure. Redundant isolation valves within the RCS pressure boundary forming the interface between these high and low pressure systems protect the low pressure systems from exceeding their design limits. The redundant isolation provided by these valves assures that system integrity will be maintained in the event of a single valve failure. The following is a listing of valves that perform a safety-related pressure isolation function.

| Valve No. | Valve Designation                                    |
|-----------|--|
| CV-1050   | Decay heat removal from RCS                          |
| CV-1410   | Decay heat removal from RCS                          |
| DH-13A    | Low pressure injection/decay heat removal            |
| DH-13B    | Low pressure injection/decay heat removal            |
| DH-14A    | Low pressure injection/decay heat removal/core flood |
| DH-14B    | Low pressure injection/decay heat removal/core flood |
| DH-17     | Low pressure injection/decay heat removal            |
| DH-18     | Low pressure injection/decay heat removal            |
| CF-1A     | Core flood injection                                 |
| CF-1B     | Core flood injection                                 |

#### 3.4 Cold Shutdown Testing

Where the test frequency is specified as "Cold Shutdown" the guidance in NUREG 1482, Section 3.1.1.1 for cold shutdown testing applies.

#### 3.5 Part-Stroke Testing

The goal of the ANO-1 Inservice Test Program is to perform full-stroke tests of all appropriate valves. With the exception of those valves for which specific relief requests, refueling outage justifications, or cold shutdown justifications have been prepared, all valves will be full stroke tested.

Part-stroke testing of power-operated valves is often not possible, due to valve logic circuitry which only allows full-open or full-closed valve movement. Moreover, the intent of Section XI is to assess valve operability through inservice testing; while a part-stroke exercise does provide some measure of confidence in valve operability, it does not provide assurance of valve safety-related function. In addition, a part-stroke of a power-operated valve has the possibility, through human or mechanical error, to cause adverse plant consequences (isolation of cooling water, plant transients, etc.). Based on the above, Entergy Operations will full-stroke test power-operated valves in accordance with the Valve Test Program (with associated cold shutdown justifications as appropriate). Specific part-stroking of power-operated valves to meet Section XI will not be performed, with the exception of the main feedwater and main steam isolation valves which are provided with part stroke test circuitry.

Check valves whose safety function is to open will be full-stroke exercised in accordance with the requirements of OMa-1988, Part 10. Section 4.3.2. Since disk position is not always observable, the NRC has stated in Generic Letter 39-04 that "A check valve's full-stroke to open position may be verified by passing the maximum required accident condition flow through the valve. This is considered by the staff as an acceptable full-stroke. Any flow rate less than this will be considered a partial-stroke exercise." Based on this position, check valves within the scope of this test program will be at least part-stroke exercised whenever any flow is passed through the valve. Check valves are considered to be full-stroke tested on at least the Code-required frequency, unless identified by a cold shutdown justification, refueling outage justification, or relief request.

Valve disassembly and inspection can be used as an alternative means of determining that a valve's disk will full-stroke exercise open or will close under reverse pressure if non-intrusive techniques are not practical.

In cases where full design flow cannot be confirmed, ANO-1 may use, where practical, nonintrusive techniques to confirm the ability of a check valve to open or close depending on its safety function. Depending on the valves involved, non-intrusive techniques are used either during refueling outages or on a once per refuel cycle. The test frequency is documented in relief requests and refueling outage justifications as applicable. In certain cases, ANO-1 uses the guidance in NUREG 1482, Section 4.1.2. When the guidance in NUREG 1482, Section 4.1.2 is not used then all of the valves in the group are non-intrusively tested.

#### 3.6 Fail-Safe Actuators

Many valves which have a fail-safe actuator employ the fail-safe feature through normal exercising of the valve. Thus, the fail-safe actuator is regularly tested when the valve is tested. No special tests will be performed solely to verify the fail-safe function of these valves beyond the normal stroke tests. Those valves whose normal operation does not verify fail-safe operation will be subjected to a special test designed to verify proper operation of the fail-safe feature.

#### 3.7 Valve Position Indication Verification

Verification of valve position indicator accuracy will be performed in accordance with OMa-1988, Part 10, Section 4.1.

#### 3.8 Passive Valves

Valves which are in safety-related systems that are not required to change position in order to perform their safety-related function are classified as passive valves. Passive valves are tested in accordance with OMa-1988, Part 10, Table 1 requirements.

#### 3.9 Stroke Times

Valve stroke times may change due to modification, maintenance, etc. over the plant's lifetime. Entergy Operations will change these stroke times as necessary, incorporating the requirements of ASME Section XI, without notification of the NRC.

Entergy Operations meets the requirements of OMa-1988, Part 10, Section 4.2.1 for exercising power operated valves. Section 4.2.1.4 states that "The limiting value(3) of full-stroke time of each power-operated valve shall be specified by the Owner." ANO-1 complies with this requirement as follows:

• Electric motor operated valves with reference stroke times greater than 10 seconds shall have a limiting value of no more than 1.3 times the reference value.

- Other power operated valves with reference stroke times greater than 10 seconds shall have a limiting value of no more than 1.5 times the reference value.
- Electric motor operated valves with reference stroke times less than 10 seconds shall have a limiting value of no more than 1.5 times the reference value.
- Other power operated values with reference stroke times less than 10 seconds shall .ave a limiting value of no more than 2 times the reference value.

If a valve has a stroke time requirement from a engineering calculation, safety analysis report, or Technical Specifications that is more limiting than the Code or Owner specified values listed above then the more conservative stroke time requirement is used.

#### 3.10 Relief Valve Testing

Entergy Operations will perform all Relief Valve Testing in accordance with OMa-1988, Part 1.

#### REFERENCES

- 10CFR50.55a(f); Inservice Testing
- ANO-1 Piping and Instrument Diagrams (See Appendix 7)
- ANO-1 Technical Specifications
- ANSI/ASME OM Standards (1988 Addenda)
  OM-6 Inservice Testing of Pumps in Light-Water Reactor Power Plants
  OM-10 Inservice Testing of Valves in Light-Water Reactor Power Plants
- ANSI/ASME OM Standard (1987)

OM-1 Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices

- ANO-1 Safety Analysis Report
- NRC Generic Letter No. 89-04, "Guidance on Developing Acceptable Inservice Testing
  Programs," dated April 3, 1989
- NUREG-1482, Guidelines for Inservice Testing at Nuclear Power Plants

# **APPENDIX 1**

# EXPLANATION OF CODES AND SYMBOLS USED

# IN THE ANO-1 VALVE TEST TABLE

### SYMBOLS USED TO DESIGNATE SYSTEM CODE CLASSES

| Symbols | Meaning                            |
|---------|------------------------------------|
| Ν       | A non-ASME Code Class<br>component |
| 1       | ASME Code Class 1 component        |
| 2       | ASME Code Class 2 component        |
| 3       | ASME Code Class 3 component        |
|         |                                    |

#### TABLE 1-2

# SYMBOLS USED TO DESIGNATE SECTION XI VALVE CATEGORY

| Symbol | Meaning  |
|--------|--|
| A      | Valves with specified maximum leakage rate<br>(pressure isolation valves and containment<br>isolation valves). |
| В      | Valves with no specified maximum leakage rate.   |
| С      | Self-actuating (check, relief valves)  |
| D      | Actuated by energy source capable of only one operation.   |
| AC     | Category C valves subject to Category A requirements.  |

### SYMBOLS USED TO DESIGNATE VALVE TYPE

| Symbol | Meaning               |
|--------|-----------------------|
| СК     | Check Valve           |
| BF     | Butterfly Valve       |
| G      | Gate Valve            |
| GL     | Globe Valve           |
| RV     | Pressure Relief Valve |
| SC     | Stop Check            |
| BA     | Ball Valve            |
| DIA    | Diaphragm             |
| SG     | Sluice Gate           |
| Р      | Plug                  |

#### TABLE 1-4

### SYMBOLS USED TO DESIGNATE VALVE ACTUATOR TYPE

| Symbol | Meaning        |
|--------|----------------|
| М      | Motor          |
| AO     | Air Operated   |
| S      | Solenoid       |
| Н      | Hand (manual)  |
| SA     | Self Actuating |

# SYMBOLS USED TO DESIGNATE VALVE POSITION

| Symbols | Meaning |
|---------|---------|
| 0       | Open    |
| С       | Closed  |

#### TABLE 1-6

#### SYMBOLS USED TO DESIGNATE VALVE STATUS

| ymbols | Meaning |
|--------|---------|
| A      | Active  |
| Р      | Passive |

### TEST SYMBOLS

### TESTING REQUIREMENT

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| Symbol | Meaning   |  |  |  |  |  |
|--------|---|--|--|--|--|--|
| FE     | Stroke Test (with time measurement, as appropriate) per OMa-1988, Part 10, Sections 4.2 and 4.3 on a Quarterly Basis  |  |  |  |  |  |
| FS     | Fail Safe Test on a Quarterly Basis. Note: if<br>a valve has both open and closed safety<br>functions then the fail safe test direction is<br>denoted by parenthesis, i.e., $FS(O)$ for fail<br>safe open or $FS(C)$ for fail safe close. |  |  |  |  |  |
| PI     | Position Indicator Test   |  |  |  |  |  |
| LJ     | Leak Test per 10CFR50, Appendix J.  |  |  |  |  |  |
| LK     | Leak Test per OMa-1988, Part 10, Section 4.2.2  |  |  |  |  |  |
| SP     | Set Point Test per OM-1987, Part 1  |  |  |  |  |  |
|        |   |  |  |  |  |  |

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# **TESTING PERFORMED**

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| Symbol | Meaning  |
|--------|--|
| FEP    | Partial Stroke Test on a Quarterly Basis   |
| FCP    | Partial Stroke Test on a Cold Shutdown<br>Basis  |
| FC     | Stroke Test per OMa-1988, Part 10,<br>Sections 4.2 and 4.3 on a Cold Shutdown<br>Basis |
| FRP    | Partial Stroke Test on a Refueling Basis   |
| FR     | Stroke Test per OMa-1988, Part 10, Section 4.3 on a Refueling Basis                    |

# TABLE 1-7 (cont.)

# **TESTING PERFORMED (cont.)**

| Symbol | Meaning  |
|--------|--|
| FSC    | Fail Safe Test on a Cold Shutdown Basis<br>Note: If a valve has both an open and closed<br>safety functions then the fail safe test<br>direction is denoted by parenthesis, i.e.,<br>FSC(O) for fail safe open or FSC(C) for fail<br>safe close. |
| DI     | Disassembly and Inspection   |

# **APPENDIX 2**

# VALVE TEST TABLE

| EMERGE           | NCY F          | EEDV | ATER             |                        |       |                  |                    |        |                    | M-204, SH.        | 3      |                              |              | (Page 1 of ?)      |
|------------------|----------------|------|------------------|------------------------|-------|------------------|--------------------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE TAG<br>NO. | P&ID<br>COORD. | CODE | CODE<br>CATEGORY | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL<br>POSITION | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CS-1196          | F4             | 3    | С                | 0.5                    | CK    | SA               | 0                  | 0      | A                  | FE                | NONE   | 9                            | NONE         | FEP,FR             |
| CS-1198          | F4             | 3    | С                | 05                     | CK    | SA               | 0                  | 0      | A                  | FE                | NONE   | 9                            | NONE         | FEP,FR             |
| CV-2620          | C-2            | 2    | В                | 4                      | G     | M                | 0                  | 0/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2626          | D-2            | 2    | В                | 4                      | G     | M                | 0                  | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2627          | F-2            | 2    | В                | 4                      | G     | M                | 0                  | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2645          | F-3            | 3    | В                | 4                      | GL    | S                | 0                  | O/C    | A                  | FE,FS(O),PI       | NONE   | NONE                         | NONE         | FE,FS(C),PI        |
| CV-2646          | G-3            | 3    | В                | 4                      | G!_   | S                | 0                  | 0/C    | A                  | FE,FS(O),PI       | NONE   | NONE                         | NONE         | FE,FS(O),PI        |
| CV-2647          | C-3            | 3    | B                | 4                      | GL    | S                | 0                  | O/C    | A                  | FE,FS(O),PI       | NONE   | NONE                         | NONE         | FE,FS(O),PI        |
| CV-2648          | D-3            | 3    | В                | 4                      | GL    | S                | 0                  | O/C    | A                  | FE,FS(O),PI       | NONE   | NONE                         | NONE         | FE,FS(O),PI        |
| CV-2670          | G-2            | 2    | B                | 4                      | G     | М                | 0                  | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2800          | F-7            | 3    | В                | 8                      | G     | M                | 0                  | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2802          | C-7            | 3    | В                | 8                      | G     | M                | 0                  | 0/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2803          | G-7            | 3    | B                | 6                      | G     | M                | С                  | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2806          | B-7            | 3    | В                | 6                      | G     | М                | С                  | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2869          | E-3            | 3    | B                | 4                      | G     | М                | С                  | С      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-2870          | E-3            | 3    | B                | 4                      | G     | M                | C                  | С      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-3850          | H-8            | 3    | В                | 6                      | G     | M                | С                  | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3851          | A-8            | 3    | В                | 6                      | G     | м                | С                  | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| FW-10A           | B-4            | 3    | С                | 6                      | СК    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |                  |                        |       |                  |                    | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| FW-10B           | G-4            | 3    | С                | 6                      | СК    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |                  |                        | 1     |                  |                    | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| FW-13A           | G-1            | 2    | С                | 4                      | СК    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | 21           | FC                 |
|                  |                |      |                  |                        |       |                  |                    | C      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |

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| EMERG            | ENCY F         | EEDV | VATER |                        |       |                  |                    |        |                    | M-204, SH.        | 3      |                              |              | /Pege 2 of 2)      |
|------------------|----------------|------|-------|------------------------|-------|------------------|--------------------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAC NO. | P&ID<br>COORD. | CODE | CODE  | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | CORMAL<br>POSITION | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| FW-13B           | C-1            | 2    | С     | 4                      | CK    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | 21           | FC                 |
|                  |                |      |       |                        |       |                  |                    | С      | A                  | FE                | NONE   | NONE                         | NO E         | FE                 |
| FW-55A           | C-3            | 3    | С     | 4                      | CK    | SA               | C                  | 0      | A                  | FE                | NONE   | NONE                         | NO. E        | FE                 |
|                  |                |      |       |                        |       |                  |                    | C      | A                  | FE                | NONE   | NONE                         | 2            | FC                 |
| FW-55B           | F-2            | 3    | С     | 4                      | СК    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |                  |                    | С      | A                  | FE                | NONE   | NONE                         | 2            | FC                 |
| FW-56A           | G-3            | 3    | С     | 4                      | СК    | SA               | C                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |                  |                    | С      | A                  | FE                | NONE   | NONE                         | 2            | FC                 |
| FW-56B           | D-3            | 3    | C     | 4                      | CK    | SA               | C                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |                  |                    | C      | R                  | FE                | NONE   | NONE                         | 2            | FC                 |
| FW-61            | C-4            | 3    | С     | 2                      | CK    | SA               | C                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |                  |                    | C      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| FW-62            | G-4            | 3    | С     | 2                      | CK    | SA               | С                  | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |                  |                    | C      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| SW-11            | H-8            | 3    | С     | 6                      | CK    | SA               | С                  | 0      | A                  | FE                | NONE   | 6                            | NONE         | FEP,FR             |
| SW-13            | A-8            | 3    | С     | e                      | CK    | SA               | C                  | 0      | A                  | FE                | NONE   | 6                            | NONE         | FEP,FR             |

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| EMERGE           | ENCY F         | EEDV | VATER            |                        |       |                  |        |        |                    | M-204, SH.        | 5      |                              |              | (Page 1 of 1)      |
|------------------|----------------|------|------------------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE<br>CATEGORY | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TES7S<br>PERFORMED |
| CS-293           | D-8            | 3    | С                | 10                     | СК    | SA               | С      | 0      | A                  | FE                | 4      | NONE                         | NONE         | FEP, FR(NIT)       |
| CS-294           | D-8            | 3    | С                | 10                     | СК    | SA               | C      | 0      | A                  | FE                | 4      | NONE                         | NONE         | FEP,FR(NIT)        |

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| EMERGE           | NCY F          | EEDV | VATER |                        |       |          |        |        |                    | M-204, SH. | 6      | 16                           |              | (Page : 0( 1)      |
|------------------|----------------|------|-------|------------------------|-------|----------|--------|--------|--------------------|------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE  | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED   | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-2613          | F-5            | 3    | B     | 4                      | G     | М        | С      | 0      | A                  | FE,PI      | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2617          | G-7            | 2    | B     | 4                      | G     | M        | 0      | O/C    | A                  | FE,PI      | NONE   | NONE                         | NONE         | FE,PI              |
| CV-2667          | F-7            | 2    | В     | 4                      | G     | M        | 0      | O/C    | A                  | FE,PI      | NONE   | NONE                         | NONE         | FE,PI              |
| CV-6601A         | E3             | SR   | B     | 4                      | GL    | SA       | 0      | 0      | P                  | PI         | NONE   | NONE                         | NONE         | PI                 |
| SV-2613          | F-6            | 3    | В     | 0.75                   | GL    | S        | С      | 0      | A                  | FE,PI      | NONE   | NONE                         | NONE         | FE,PI              |
| MS-271           | G-7            | 3    | С     | 4                      | CK    | SA       | С      | 0      | A                  | FE         | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE         | 3      | NONE                         | NONE         | FR(NIT)            |
| MS-272           | F-7            | 3    | С     | 4                      | CK    | SA       | С      | 0      | A                  | FE         | NONE   | NONE                         | NONE         | FE                 |
|                  |                |      |       |                        |       |          |        | c      | A                  | FE         | 3      | NONE                         | NONE         | FR(NIT)            |

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| STEAM            | GENER          | ATOP | RSECON | DARY                   |       |          |        |        |                    | M-206, SH.        | 1 -    |                              |              | (Page 1-of 1)      |
|------------------|----------------|------|--------|------------------------|-------|----------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-2619          | H-2            | 2    | B      | 10                     | G     | М        | С      | С      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-2630          | D-2            | 2    | B      | 18                     | G     | М        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | 3            | FEP,FC,PI          |
| CV-2676          | H-7            | 2    | В      | 10                     | G     | M        | C      | С      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-2680          | D-7            | 2    | В      | 18                     | G     | М        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | 3            | FEP,FC,PI          |
| HV-139           | D-1            | 2    | A      | 4                      | G     | н        | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |
| HV-140           | D-1            | 2    | A      | 4                      | G     | Н        | С      | С      | P                  | W                 | NONE   | NONE                         | NONE         | IJ                 |
| HV-150           | D-8            | 2    | A      | 4                      | G     | Н        | С      | С      | P                  | LJ                | NONE   | NONE                         | NONE         | IJ                 |
| HV-151           | D-8            | 2    | A      | 4                      | G     | Н        | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |
| PSV-2684         | G-3            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2685         | G-3            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2686         | G-3            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| P: -2687         | G-3            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2688         | G-4            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2689         | G-4            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | VONE   | NONE                         | NONE         | SP                 |
| PSV-2690         | G-4            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2691         | G-4            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2692         | G-5            | 2    | C      | 6                      | RV    | SA       | C      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2693         | G-5            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2694         | G-5            | 2    | C      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2695         | G-5            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2696         | G-5            | 2    | C      | 6                      | RV    | SA       | C      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2697         | G-6            | 2    | C      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2698         | G-6            | 2    | С      | 6                      | RV    | SA       | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-2699         | G-6            | 2    | С      | 6                      | RV    | SA       | C      | 0      | A                  | SP                | NONE   | MONE                         | NONE         | SP                 |

| STEAM (          | GENER          | ATOR | SECON            | DARY                   |       |                  |        |        |                    | M-206, SH.        | 2      |                              |              | (PAGE 1 OF 1)      |
|------------------|----------------|------|------------------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE<br>CATEGORY | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-2691          | E-7            | 2    | В                | 36                     | GL    | AO               | 0      | С      | A                  | FE,FS,PI          | NONE   | NONE                         | 1            | FEP, FC, FSC, PI   |
| CV-2692          | E-5            | 2    | В                | 36                     | GL    | AO               | 0      | С      | A                  | FE,FS,PI          | NONE   | NONE                         | 1            | FEP, FC, FSC, PI   |

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| INTAKE           | STRUC          | TUR  | E    |                        |       |          | $\overline{\langle}$ |        |                    | M-209, SH.        | 1      |       | -            | P                  |
|------------------|----------------|------|------|------------------------|-------|----------|----------------------|--------|--------------------|-------------------|--------|-------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL               | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-3640          | C-3            | 3    | В    | 18                     | BF    | M        | O/C                  | 0/0    | A                  | FE,PI             | NONE   | NONE  | NONE         | i-E,PI             |
| CV-3641          | B-3            | 3    | B    | 18                     | BF    | M        | 0                    | 0      | P                  | PI                | NONE   | NONE  | NONE         | PI                 |
| CV-3642          | C-3            | 3    | B    | 18                     | BF    | M        | O/C                  | O/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| CV-3643          | D-3            | 3    | A    | 18                     | BF    | M        | 0                    | С      | A                  | FE,PI,LK          | NONE   | NONE  | 6            | FC,PI,LK           |
| CV-3644          | E-3            | 3    | B    | 18                     | BF    | M        | 0/C                  | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE.        | FE,PI              |
| CV-3645          | F-3            | 3    | В    | 18                     | BF    | м        | 0                    | 0      | P                  | PI                | NONE   | NONE  | NONE         | PI                 |
| CV-3646          | E-3            | 3    | В    | 18                     | BF    | м        | 0/C                  | O/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| SW-1A            | F-3            | 3    | AC   | 18                     | СК    | SA       | O/C                  | 0      | A                  | FE                | NONE   | NONE  | NONE         | FE                 |
|                  |                |      |      |                        |       |          |                      | С      | A                  | FE,LK             | NONE   | NONE  | 4            | FC,LK              |
| SW-1B            | D-3            | 3    | AC   | 18                     | СК    | SA       | O/C                  | 0      | A                  | FE                | NONE   | NONE  | NONE         | FE                 |
|                  |                |      |      |                        |       |          |                      | С      | A                  | FE,LK             | NONE   | NONE  | 4            | FC,LK              |
| SW-1C            | C-3            | 3    | AC   | 18                     | СК    | SA       | 0/C                  | 0      | A                  | FE                | NONE   | NONE  | NONE         | FE                 |
|                  |                |      |      |                        |       |          |                      | C      | A                  | FE,LK             | NONE   | NONE  | 4            | FC,LK              |
| SG-1             | F-4            | 3    | A    | 6 X 36                 | G     | м        | 0                    | С      | A                  | FE,PI,LK          | NONE   | NONE  | NONE         | FE,PI,LK           |
| SG-2             | C-4            | 3    | A    | 6 X 36                 | G     | M        | 0                    | С      | A                  | FE,PI,LK          | NONE   | NONE  | NONE         | FE,PI,LK           |
| SG-3             | E-2            | 3    | В    | 6 X 36                 | G     | М        | 0/C                  | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| SG-4             | D-2            | 3    | В    | 6 X 36                 | G     | M        | 0/C                  | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| SG-5             | F-1            | 3    | В    | 6 X 36                 | G     | м        | С                    | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| SG-6             | D-1            | 3    | В    | 6 X 36                 | G     | M        | С                    | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |
| SG-7             | C-1            | 3    | B    | 6 X 36                 | G     | М        | С                    | 0/C    | A                  | FE,PI             | NONE   | NONE  | NONE         | FE,PI              |

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| SERVICE          | WAT            | ER   |      |                        |       |                  |        |        |                    | M-210             |        |                              |              | (PAGE 1 0 1)       |
|------------------|----------------|------|------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-3804          | F-8            | 3    | 8    | 1.5                    | GL    | AO               | С      | 0      | A                  | FE,FS,PI          | NONE   | NONE                         | NONE         | FE,FS,PI           |
| CV-3805          | E-8            | 3    | В    | 1.5                    | GL    | AO               | С      | 0      | A                  | FE,FS,PI          | NONE   | NONE                         | NONE         | FE,FS,PI           |
| CV-3806          | F-5            | 3    | В    | 6                      | G     | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3807          | E-5            | 3    | B    | 6                      | G     | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3811          | H-4            | 3    | A    | 14                     | 8F    | M                | 0      | С      | A                  | FE,LK,PI          | NONE   | NONE                         | NONE         | F5,LK,PI           |
| CV-3812          | C-4            | 2    | 8    | 10                     | G     | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3813          | B-4            | 2    | B    | 10                     | G     | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3814          | D-2            | 2    | В    | 10                     | BF    | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3815          | C-2            | 2    | 8    | 10                     | BF    | м                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3820          | H-3            | 3    | A    | 14                     | BF    | м                | 0      | С      | A                  | FE,LK,PI          | NONE   | NONE                         | NONE         | FE,LK,PI           |
| CV-3821          | H-8            | 3    | В    | 12                     | BF    | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3822          | H-8            | 3    | В    | 12                     | BF    | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3823          | A-5            | 3    | В    | 18                     | BF    | M                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-3824          | E-2            | 3    | A    | 18                     | BF    | M                | 0      | С      | A                  | FE,PI,LK          | NONE   | NONE                         | NONE         | FE,PI,LK           |
| CV-3840          | C-8            | 3    | В    | 1.5                    | GL    | AO               | С      | 0      | A                  | FE,FS,PI          | NONE   | NONE                         | NONE         | FE,FS,PI           |
| CV-3841          | D-8            | 3    | В    | 1.5                    | GL    | AO               | С      | 0      | A                  | FE,FS,PI          | NONE   | NONE                         | NONE         | FE,FS,Pi           |
| SW-9             | E-2            | 3    | AC   | 14                     | СК    | SA               | 0      | C      | A                  | FE,LK             | NONE   | NONE                         | 5            | FC,LK              |
| SW-72            | A-4            | 3    | В    | 2                      | G     | н                | С      | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| SV-3812          | D-3            | 2    | В    | 2                      | G     | S                | 0      | 0      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| SV-3813          | D-3            | 2    | В    | 2                      | G     | S                | 0      | 0      | P                  | Pi                | NONE   | NONE                         | NONE         | Pí                 |

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| LAUNDR           | YWAS           | STE A | ND CONT          | AINM                   | ENT 8         | AUX. BI          | JILDING | SUMP   | DRAIN              | 4-213, Sh.        | 2      | N.                           |              | (PAGE 1 0F 7)      |
|------------------|----------------|-------|------------------|------------------------|---------------|------------------|---------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE<br>CATEGORY | VALVE<br>SIZE<br>(IN.) | VALVE<br>TYPE | ACTUATOR<br>TYPE | NORMAL  | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-4400          | C-3            | 2     | A                | 4                      | G             | AO               | С       | С      | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-4446          | C-2            | 2     | A                | 4                      | G             | М                | С       | С      | P                  | LJ,PI             | NONE   | NONE                         | NCNE         | LJ,PI              |
| DWD-4411         | B-3            | 2     | A                | 0.75                   | GL            | Н                | С       | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |

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| CLEAN I         | RADIO          | ACTIV | ELIQUID | WAS                    | TE    |          |        |        |                    | M-214, Sh. 3      |        |                              | C            | (PAOF 1 OF 1)      |
|-----------------|----------------|-------|---------|------------------------|-------|----------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| RBD             | 1 F-3          | N     | A       | 4                      | G     | н        | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |
| RBD-24          | F-3            | N     | A       | 4                      | G     | н        | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |

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| GASEOU           | S RAC          | NOAC | TIVE WA | STE                    |       |                  |                    |        |                    | M-215    | •      |                              |              | (PAGE ( )) I)      |
|------------------|----------------|------|---------|------------------------|-------|------------------|--------------------|--------|--------------------|----------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL<br>POSITION | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-4803          | H-7            | 2    | A       | 2                      | G     | M                | С                  | С      | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-4804          | H-6            | 2    | A       | 2                      | GL    | AO               | С                  | С      | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI              |

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| EMERG            | ENCI           | DIESE | L GENER          | ATOR                  | S FUI | EL OIL S         | TORAG  | E      |                    | M-217, Sh.        | 1      | 9                            |              | (PACE 18F 1)       |
|------------------|----------------|-------|------------------|-----------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE<br>CATEGORY | VALVE<br>SIZE<br>(N.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIREL<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| FO-8A            | C-7            | N     | С                | 2                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| FO-8B            | C-3            | N     | C                | 2                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | NGNE                         | NONE         | FE                 |
| FO-10A           | C-6            | N     | B                | 3                     | G     | н                | С      | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| FO-10B           | C-4            | N     | В                | 3                     | G     | Н                | С      | 0      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |

| EMERGE           | NCY            | DIESEI | LGENER | ATOR                   | K-44  | /K-4B ST | ARTINO | G AIR S | YSTEM              | M-217, Sh.        | 4        |                              | •            | (PAGE 1 OF 1) |
|------------------|----------------|--------|--------|------------------------|-------|----------|--------|---------|--------------------|-------------------|----------|------------------------------|--------------|---------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE   | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY  | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF   | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS         |
| CV-5218          | E-6            | N      | В      | 1.5                    | P     | AO       | С      | 0/C     | A                  | FE,FS(C)          | NONE     | NONE                         | NONE         | FE,FS(C)      |
| CV-5233          | D-6            | N      | B      | 1.5                    | P     | AO       | С      | O/C     | A                  | FE,FS(C)          | NONE     | NONE                         | NONE         | FE,FS(C)      |
| CV-5237          | E-4            | N      | В      | 1.5                    | P     | AO       | С      | 0/C     | A                  | FE,FS(C)          | NONE     | NONE                         | NONE         | FE,FS(C)      |
| CV-5239          | D-4            | N      | В      | 1.5                    | P     | AO       | С      | 0/C     | A                  | FE,FS(C)          | NONE     | NONE                         | NONE         | FE,FS(C)      |
| FO-54A1          | H-7            | N      | C      | 1.5                    | СК    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-54A2          | A-7            | N      | С      | 1.5                    | CK    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-54B1          | H-3            | N      | С      | 1.5                    | СК    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-54B2          | A-3            | N      | С      | 1.5                    | СК    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-55A1          | H-7            | N      | С      | 1.5                    | CK    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-55A2          | A-7            | N      | С      | 1.5                    | CK    | SA       | O/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-55B1          | H-3            | N      | С      | 1.5                    | CK    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-5582          | A-3            | N      | С      | 1.5                    | СК    | SA       | 0/C    | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-163           | D-4            | N      | С      | <1                     | CK    | SA       | С      | 0       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
|                  |                |        |        |                        |       |          |        | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-164           | E-4            | N      | С      | <1                     | CK    | SA       | С      | 0       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
|                  |                |        |        |                        |       |          |        | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-165           | D-6            | N      | С      | <1                     | CK    | SA       | С      | 0       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
|                  |                |        |        |                        |       |          |        | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| FO-166           | D-6            | N      | С      | <1                     | СК    | SA       | С      | 0       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
|                  |                |        |        |                        |       |          |        | С       | A                  | FE                | NONE     | NONE                         | NONE         | FE            |
| PSV-5215         | G-7            | N      | С      | 0.5                    | RV    | SA       | С      | 0       | A                  | SP                | 10,11,12 | NONE                         | NONE         | SP            |
| PSV-5216         | G-8            | N      | С      | 0.5                    | RV    | SA       | С      | 0       | A                  | SP                | 10,11,12 | NONE                         | NONE         | SP            |
| PSV-5231         | C-7            | N      | С      | 0.5                    | RV    | SA       | С      | 0       | P.                 | SP                | 10,11,12 | NONE                         | NONE         | SP            |
| PSV-5232         | C-8            | N      | с      | 0.5                    | RV    | SA       | С      | 0       | A                  | SP                | 10,11,12 | NONE                         | NONE         | SP            |
| PSV-5237         | G-2            | N      | С      | 0.5                    | RV    | SA       | C      | 0       | A                  | SP                | 10,11,12 | NONE                         | NONE         | SP            |

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# Append<sup>1</sup>x 2 VALVE TEST TABLE

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| EMERGENCY DIESEI, GENERATOR K-4A/K-4B STARTING AIR SYSTEM M-217, Sh. 4 |                |               |      |                        |       |                  |        |        |                    |                   |            |                              | (PAGE 1 0F 2) |                    |
|--|----------------|---------------|------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|------------|------------------------------|---------------|--------------------|
| VALVE<br>TAG NO.   | P&ID<br>COORD. | CODE<br>CLASS | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF     | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST.  | TESTS<br>PERFORMED |
| PSV-5238   | G-2            | N             | С    | 0.5                    | RV    | SA               | С      | 0      | A                  | SP                | 10, 11, 12 | NONE                         | NONE          | SP                 |
| PSV-5240   | C-2            | N             | С    | 0.5                    | RV    | SA               | С      | 0      | A                  | SP                | 10, 11, 12 | NONE                         | NONE          | SP                 |
| PSV-5241   | C-2            | N             | С    | 0.5                    | RV    | SA               | С      | 0      | A                  | SP                | 10,11,12   | NONE                         | NONE          | SP                 |
| SV-5218  | E-6            | N             | В    | 1.5                    | G     | S                | С      | O/C    | A                  | FE,FS(C)          | NONE       | NONE                         | NONE          | FE,FS(C)           |
| SV-5233  | D-6            | N             | В    | 1.5                    | G     | S                | С      | O/C    | A                  | FE,FS(C)          | NONE       | NONE                         | NONE          | FE,FS(C)           |
| SV-5237  | E-3            | N             | B    | 1.5                    | G     | S                | С      | O/C    | A                  | FE,FS(C)          | NONE       | NONE                         | NONE          | FE,FS(C)           |
| SV-5239  | D-3            | N             | B    | 1.5                    | G     | S                | С      | O/C    | A                  | FE,FS(C)          | NONE       | NONE                         | NONE          | FE,FS(C)           |

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| INSTRU           | MENT           | ND S | ERVICE | AIR                    | •     |          |                 |                   |                    | (Page ) sf 1).    |                    |                              |              |                    |
|------------------|----------------|------|--------|------------------------|-------|----------|-----------------|-------------------|--------------------|-------------------|--------------------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | HORMAL POSITION | SAFETY<br>POSPION | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF<br>REQUEL 7 | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| IA-15            | G-4            | 2    | A      | 1.5                    | G     | н        | C               | С                 | P                  | IJ                | NONE               | NONE                         | NONE         | IJ                 |
| IA-37            | E-4            | 2    | A      | 1                      | G     | н        | С               | С                 | P                  | IJ                | NONE               | NONE                         | NONE         | W                  |

| BREATH           | IING AI        | R SYS | STEM - RI | EACTO                  | RBU   | ILDING           | M-218, Sh. 5 |        |                    |                   |        |                              |              |                    |
|------------------|----------------|-------|-----------|------------------------|-------|------------------|--------------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE      | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL       | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| BA-140           | E-3            | 2     | A         | 2                      | G     | н                | С            | С      | P                  | W                 | NONE   | NONE.                        | NONE         | W                  |
| BA-141           | D-3            | 2     | A         | 2                      | G     | Н                | С            | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |

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| FIRE WA          | TER            | 4    |      |                        |       |                  |        | M-219, Sh. 1 |                    |                   |        |                              |              |                    |
|------------------|----------------|------|------|------------------------|-------|------------------|--------|--------------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY       | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-5611          | E-5            | 2    | A    | 3                      | G     | м                | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-5612          | E-6            | 2    | A    | 3                      | G     | м                | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |

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| PLANT            | ANT HEATING AND STARTUP BOILER |      |      |                        |       |                  |        |        |                    | M-220, Sh. 3 (Page 2 of 1) |        |                              |              |                    |  |  |
|------------------|--------------------------------|------|------|------------------------|-------|------------------|--------|--------|--------------------|----------------------------|--------|------------------------------|--------------|--------------------|--|--|
| VALVE<br>TAG NO. | P&ID<br>COORD.                 | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACT77E/<br>PASSIVE | REQUIRED                   | RELIFF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |  |  |
| PH-17            | D-7                            | 2    | A    | 3                      | G     | н                | С      | С      | P                  | IJ                         | NONE   | NONE                         | NONE         | IJ                 |  |  |
| PH-18            | D-7                            | 2    | A    | 3                      | G     | н                | С      | С      | P                  | IJ                         | NONE   | NONE                         | NONE         | IJ                 |  |  |
| PH-19            | D-7                            | 2    | A    | 3                      | G     | н                | С      | С      | P                  | W                          | NONE   | NONE                         | NONE         | W                  |  |  |
| PH-20            | D-6                            | 2    | A    | 3                      | G     | н                | С      | С      | P                  | W                          | NONE   | NONE                         | NONE         | W                  |  |  |

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| EMERGE           | NCY C          | HILLI | ED WATE | R · EL                 | ECTR  | ICAL RO          | OMS    |        |                    | M-221, Sh. | 2      |                              |              | (Page 1 + 1 1)     |
|------------------|----------------|-------|---------|------------------------|-------|------------------|--------|--------|--------------------|------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED   | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| SW-604A          | F-8            | 3     | С       | 2                      | CK    | SA               | 0      | 0      | A                  | FE         | NONE   | 8                            | NONE         | FEP,FR             |
| SW-604B          | C-8            | 3     | С       | 2                      | CK    | SA               | 0      | 0      | A                  | FE         | NONE   | 8                            | NONE         | FEP,FR             |

| CHILLED          | HILLED WATER - REACTOR & AUX. BUILDINGS M-222, Sh. 1 |      |      |                        |       |          |        |        |                    |                |        |                              |              | (Page ) of T       |
|------------------|--|------|------|------------------------|-------|----------|--------|--------|--------------------|----------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD.                                       | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED       | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| AC-60            | F-4  | 2    | AC   | 6                      | CK    | SA       | 0      | С      | A                  | FE,LJ          | NONE   | NONE                         | 7            | FC,LJ              |
| CV-6202          | F-5  | 2    | A    | 6                      | G     | AO       | 0      | С      | A                  | FE,FS,PI,LJ    | NONE   | NONE                         | 8            | FC,FSC,PI,LJ       |
| CV-6203          | F-5  | 2    | A    | 6                      | G     | AO       | 0      | С      | A                  | FE, FS, PI, LJ | NE     | NONE                         | 8            | FC,FSC,PI,LJ       |
| CV-6205          | F-4  | 2    | A    | 6                      | G     | М        | 0      | С      | A                  | FE,LJ,PI       | AN NE  | NONE                         | 8            | FC,LJ,PI           |

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# Appendix 2 VALVE TEST TABLE
| REACTO           | RCOO           | LANT | SYSTE | N                      |       |          |        |        |                    | M-230, Sh.        | 1      |                              |              | (Page 1 of 3)      |
|------------------|----------------|------|-------|------------------------|-------|----------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE  | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CF-1A            | H-3            | 1    | AC    | 14                     | CK    | SA       | С      | 0      | A                  | FE                | NONE   | 1                            | NONE         | FCP,FR(NIT)        |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | NONE   | 1                            | NONE         | FR,LK              |
| CF-1B            | G-3            | 1    | AC    | 14                     | CK    | SA       | C      | 0      | A                  | FE                | NONE   | 1                            | NONE         | FCP,FR(NIT)        |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | NONE   | 1                            | NONE         | FR,LK              |
| CV-1000          | G-5            | 1    | A     | 4                      | G     | M        | 0      | O/C    | A                  | FE,PI,LK          | Note1  | NONE                         | NONE         | FE,PI,LK           |
| CV-1050          | F-5            | 1    | A     | 12                     | G     | м        | 0/C    | 0/C    | A                  | FE,PI,LK          | NONE   | NONE                         | 22           | FC,PI,LK           |
| DH-13A           | H-3            | 1    | AC    | 12                     | CK    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 23           | FC                 |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | 1      | NONE                         | NONE         | FE,LK              |
| DH-138           | G-3            | 1    | AC    | 12                     | CK    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 23           | FC                 |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | 1      | NONE                         | NONE         | FE,LK              |
| DH-14A           | F-5            | 1    | AC    | 14                     | СК    | SA       | С      | 0      | A                  | FE                | NONE   | 2                            | NONE         | FCP,FR(NIT)        |
|                  |                |      |       |                        |       |          |        | C      | A                  | FE,LK             | NONE   | NONE                         | NONE         | FE,LK              |
| DH-148           | F-4            | 1    | AC    | 14                     | CK    | SA       | С      | 0      | A                  | FE                | NONE   | 2                            | NONE         | FCP,FR(NIT)        |
|                  |                |      |       |                        |       |          |        | C      | A                  | FE,LK             | NONE   | NONE                         | NONE         | FE,LK              |
| DH-17            | H-3            | 1    | AC    | 5                      | CK    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 23           | FC                 |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | 1      | NONE                         | NONE         | FE,LK              |
| DH-18            | G-3            | 1    | AC    | 8                      | CK    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 23           | FC                 |
|                  |                |      |       |                        |       |          |        | С      | A                  | FE,LK             | 1      | NONE                         | NONE         | FE,LK              |
| DH-96            | G-4            | 2    | A     | 1.5                    | CK    | SA       | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | IJ                 |
| MU-34A           | A-4            | 1    | С     | 2.5                    | СК    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 16           | FC                 |
| MU-34B           | A-4            | 1    | С     | 2.5                    | СК    | SA       | С      | 0      | A                  | FE                | NONE   | NONE                         | 15           | FC                 |

Note 1: CV-1000 leak test performed as described in 1CAN058702

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| REACTO           | R COO          | DLANT | T SYSTE | VI                     |       |                  | Half   | 1441   |                    | M-230, Sh.        | 1      |                              |              | (Page 2 of 3)      |
|------------------|----------------|-------|---------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| MU-34C           | A-5            | 1     | С       | 2.5                    | СК    | SA               | С      | 0      | A                  | FE                | NONE   | NONE                         | 16           | FC                 |
| MU-34D           | A-5            | 1     | С       | 2.5                    | CK    | SA               | 0/C    | 0      | A                  | FE                | NONE   | NONE                         | 16           | FC                 |
| MU-66A           | A-4            | 1     | С       | 2.5                    | СК    | SA               | С      | 0      | A                  | FE                | NONE   | NONE                         | 17           | FC                 |
| MU-668           | A-4            | 1     | С       | 2.5                    | CK    | SA               | С      | 0      | A                  | FE                | NONE   | NONE                         | 17           | FC                 |
| MU-66C           | A-5            | 1     | С       | 2.5                    | СК    | SA               | С      | 0      | A                  | FE                | NONE   | NONE                         | 17           | FC                 |
| MU-66D           | A-5            | 1     | С       | 2.5                    | СК    | SA               | 0/C    | 0      | A                  | FE                | NONE   | NONE                         | 17           | FC                 |
| N2-61            | G-7            | 2     | A       | 1                      | G     | н                | С      | С      | P                  | IJ                | NONE   | NONE                         | NONE         | W                  |
| PSV-1000         | G-3            | 1     | В       | 4                      | GL    | S                | С      | O/C    | A                  | FE,FS(C)          | NONE   | NONE                         | 12           | FC,FSC(C)          |
| PSV-1001         | G-4            | 1     | С       | 6                      | RV    | SA               | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SP                 |
| PSV-1002         | G-5            | 1     | С       | 6                      | RV    | SA               | С      | 0      | A                  | SP                | NONE   | NONE                         | NONE         | SF                 |
| RC-1009          | E-4            | 1     | С       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
|                  |                |       |         |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| RC-1010          | E-4            | 1     | С       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
|                  |                |       |         |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| RC-1011          | F-4            | 1     | С       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| no ion           |                |       |         |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| RC-1012          | F-4            | 1     | С       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| no ioiz          |                |       |         |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| RC-1013          | F-4            | 1     | C       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| no ioio          |                |       |         |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| PC-1014          | E-4            | 1     | C       | 14                     | СК    | SA               | С      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| 10-1014          |                |       | Ŭ       |                        |       |                  |        | С      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| RC-1015          | E-4            | 1     | C       | 14                     | СК    | SA               | C      | 0      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| 10-1010          |                |       |         |                        |       |                  |        | C      | A                  | FE                | NONE   | 3                            | NONE         | DI                 |

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| REACTO           | RCOC           | LANT | SYSTEM | A                      |       |                  |        |                    |                    | M-230, Sh. 1      | l s    |                              | ~            | (agranto)          |
|------------------|----------------|------|--------|------------------------|-------|------------------|--------|--------------------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY<br>POSITION | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFCRMED |
| RC-1016          | E-4            | 1    | C      | 14                     | СК    | SA               | С      | 0                  | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| 110 1010         |                |      |        |                        |       |                  |        | C                  | A                  | FE                | NONE   | 3                            | NONE         | DI                 |
| SV-1077          | H-7            | 1    | 3      | 1                      | GL    | S                | С      | 0/C                | A                  | FE,FS(C),PI       | NONE   | NONE                         | 9            | FC,FSC(C),PI       |
| SV-1079          | G-7            | 1    | В      | 1                      | GL    | S                | C      | O/C                | A                  | FE,FS(C),PI       | NONE   | NONE                         | 9            | FC,FSC(C),PI       |

| REACI            | JR COC         | JLAN | T SYSTE | M                      |       |                  | -11    |        |                    | M-230, Sh.  | 2      | •         |             | (Fag: 1 of 3)  |
|------------------|----------------|------|---------|------------------------|-------|------------------|--------|--------|--------------------|-------------|--------|-----------|-------------|----------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED    | RELIEF | REFUELING | CSD<br>JUST | TESTS          |
| CS-26            | C-5            | 2    | A       | 3                      | CK    | SA               | С      | C      | P                  |             | -      | JUST.     |             |                |
| CV-1052          | A-6            | 2    | A       | 3                      | G     | AO               | C      | C      | 0                  | <i>ω</i>    | NONE   | NONE      | NONE        | L 2            |
| CV-1053          | A-6            | 2    | A       | 3                      | G     | M                | 0      |        | P                  | LJ,P!       | NONE   | NONE      | NUNE        | LJ,PI          |
| CV-1054          | B-6            | 2    | A       | 1                      | G     | - mi             | 0      | C      | P                  | LJ,PI       | NONE   | NONE      | NONE        | LJ,Pi          |
| CV-1065          | C-4            | 2    | A       | 2                      | 0     | M                | C      | C      | Р                  | LJ,PI       | NONE   | NONE      | NONE        | LJ.PI          |
| SV-1071          | G-5            | 1    |         |                        | 6     | AO               | C      | C      | P                  | LJ,PI       | NONE   | NONE      | NONE        | LJPI           |
| SV-1072          | HE             |      | 0       | 1                      | GL    | S                | C      | O/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 10          | FC ESC/CL PI   |
| SV 1072          | n-5            |      | B       | 1                      | GL    | S                | C      | O/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 10          | EC ESC(C) PI   |
| SV-1073          | 6-0            | 7    | В       | 1                      | GL    | S                | C      | O/C    | A                  | FE,FS(C).PI | NONE   | NONE      | 10          | FC,FSC(C),PI   |
| SV-10/4          | H-5            | 1    | B       | 1                      | GL    | S                | C      | 0/0    | A                  | FE FS(C) PI | NONE   | NONE      | 10          | FC,FSC(C),PI   |
| SV-1081          | G-7            | 1    | B       | 1                      | GL    | S                | C      | 0/0    | A                  | FE ESICI DI | ALONE  | NONE      | 10          | FC,FSC(C),PI   |
| SV-1082          | H-7            | 5    | B       | 1                      | GL    | S                | c      | 0/0    | A                  | EE ES(C) DI | NONE   | NONE      | 11          | FC,FSC(C),PI   |
| SV-1083          | G-7            | :    | B       | 1                      | GL    | S                | C      | 0/0    |                    | FE,FS(C),M  | NONE   | NONE      | 11          | FC,FSC(C),PI   |
| SV-1084          | H-7            | 1    | B       | 1                      | GI    | 5                | ~ +    | 00     |                    | FE,FS(C),PI | NONE   | NONE      | 11          | FC,FSC(C),PI   |
| SV-1091          | G-3            | 1 1  | B       | 1                      | G     |                  |        | 0.0    | A                  | FE,FS(C),PI | NONE   | NONE      | 11          | FC, FSC(C), PI |
| SV-1092          | H-3            | 1    | B       |                        | GL    |                  | C      | 0/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 11          | FC, FSC(C), PI |
| SV-1093          | G-3            | 1    | 0       |                        | GL    | 5                | C      | O/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 11          | FC.FSC(C).PI   |
| V-1094           | H3             | 1    | 0       | 1                      | GL    | S                | C      | O/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 11          | EC ESCICI PI   |
| 1004             | 11-5           | 1    | В       | 1                      | GL    | S                | C      | 0/C    | A                  | FE,FS(C),PI | NONE   | NONE      | 11          | FC ESC(C) PI   |

.

| MAKEUP           | AND            | PURIF | CATION | SYST                   | EM    |          |        |        |                    | M-231, Sh. 1      |        |                              |              | (Page J of 1)      |
|------------------|----------------|-------|--------|------------------------|-------|----------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| BW-2             | B-7            | 2     | С      | 6                      | SC    | SA       | С      | 0      | A                  | FE                | NONE   | 4                            | NONE         | FCP,FR             |
|                  |                |       |        |                        |       |          |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| BW-3             | G-7            | 2     | С      | 6                      | SC    | SA       | С      | 0      | A                  | FE                | NONE   | 4                            | NONE         | FCP,FR             |
|                  |                |       |        |                        |       |          |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| CV-1233          | F-2            | 2     | В      | 2.5                    | G     | M        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1234          | G-2            | 2     | В      | 2.5                    | G     | м        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1275          | D-7            | 2     | В      | 4                      | SC    | M        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | 19           | FC,PI              |
| CV-1276          | G-7            | 2     | В      | 4                      | G     | M        | С      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1277          | B-7            | 2     | В      | 4                      | G     | м        | С      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1300          | G-4            | 2     | B      | 2                      | G     | М        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | 20           | FC,PI              |
| CV-1301          | F-4            | 2     | В      | 2                      | G     | м        | 0      | С      | A                  | FE,PI             | NONE   | NONE                         | 20           | FC,PI              |
| CZ-46            | H-6            | 2     | С      | 2.5                    | СК    | SA       | С      | С      | A                  | FE                | NONE   | 7                            | NONE         | DI                 |
| MU-19A           | G-4            | 2     | C      | 4                      | CK    | SA       | 0/C    | 0      | A                  | FE                | NONE   | NONE                         | 13           | FEP,FC             |
|                  |                |       |        |                        |       |          |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| MU-19B           | E-4            | 2     | С      | 4                      | СК    | SA       | 0/C    | 0      | A                  | FE                | NONE   | NONE                         | 13           | FEP,FC             |
|                  |                |       |        |                        |       |          |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| MU-19C           | C-4            | 2     | C      | 4                      | СК    | SA       | 0/C    | 0      | A                  | FE                | NONE   | NONE                         | 13           | FEP,FC             |
|                  |                |       |        |                        |       |          |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| MU-22A           | F-4            | 2     | С      | 2                      | SC    | SA       | 0/0    | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| MU-22B           | D-4            | 2     | C      | 2                      | SC    | SA       | 0/C    | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| MU-22C           | B-4            | 2     | С      | 2                      | SC    | SA       | 0/C    | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| PSV-1241         | G-6            | 2     | С      | 0.75                   | RV    | SA       | С      | 0      | A                  | SP                | 11, 12 | NONE                         | NONE         | SP                 |
| PSV-1242         | D-6            | 2     | с      | 0.75                   | RV    | SA       | С      | 0      | A                  | SP                | 11, 12 | NONE                         | NONE         | SP                 |
| PSV-1243         | B-6            | 2     | C      | 0.75                   | RV    | SA       | C      | 0      | A                  | SP                | 11, 12 | NONE                         | NONE         | SP                 |

.

## Appendix 2 VALVE TEST TABLE

| MAKEUP           | AND            | PURIF | ICATION | SYST                   | EM    | •                |        |        |                    | M-231, Sh.        | 2           |                              |              | (Page 1-st 1)      |
|------------------|----------------|-------|---------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|-------------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF      | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-1214          | H-7            | 1     | A       | 2.5                    | G     | М                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | NONE         | FE,LJ,PI           |
| CV-1216          | E-7            | 1     | A       | 2.5                    | G     | м                | 0      | С      | A                  | FE,LJ,PI          | <b>MONE</b> | NONE                         | NONE         | FE,LJ,PI           |
| CV-1221          | G-6            | 2     | A       | 2.5                    | G     | M                | 0      | С      | A                  | FE, LJ, PI        | NONE        | NONE                         | NONE         | FE,LJ,PI           |
| CV-1270          | A-6            | 2     | A       | 1                      | G     | м                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | 18           | FC,LJ,PI           |
| CV-1271          | C-6            | 2     | A       | 1                      | G     | м                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | 18           | FC,LJ,PI           |
| CV-1272          | D-6            | 2     | A       | 1                      | G     | м                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | 18           | FC,LJ,PI           |
| CV-1273          | E-6            | 2     | A       | 1                      | G     | М                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | 18           | FC,LJ,PI           |
| CV-1274          | E-5            | 2     | A       | 1                      | G     | м                | 0      | С      | A                  | FE,LJ,PI          | NONE        | NONE                         | 18           | FC,LJ,PI           |

| MAKEUP           | AND            | PURIF         | ICATION | SYST                   | EM    |                  |                    |        |                    | M-231, Sh. 3 | •      |                              |              | (Page 1 of 1)      |
|------------------|----------------|---------------|---------|------------------------|-------|------------------|--------------------|--------|--------------------|--------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE<br>CLASS | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL<br>POSITION | SAFETY | ACTIVE/<br>PASSIVF | REQUIRED     | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-1219          | D-7            | 2             | В       | 2.5                    | GL    | м                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1220          | C-7            | 2             | В       | 2.5                    | GL    | м                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1227          | G-3            | 2             | В       | 2.5                    | GL    | M                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1228          | F-3            | 2             | В       | 2.5                    | GL    | м                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1278          | D-3            | 2             | В       | 2.5                    | GL    | M                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1279          | C-3            | 2             | B       | 2.5                    | GL    | м                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1284          | G-7            | 2             | В       | 2.5                    | GL    | M                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1285          | F-7            | 2             | В       | 2.5                    | GL    | м                | С                  | 0      | A                  | FE,PI        | NONE   | NONE                         | NONE         | FE,PI              |
| MU-1211          | D-6            | 2             | С       | 3                      | CK    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 14           | FC                 |
| MU-1212          | C-5            | 2             | С       | 3                      | CK    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 14           | FC                 |
| MU-1213          | C-6            | 2             | С       | 3                      | СК    | S4               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 14           | FC                 |
| MU-1214          | G-3            | 2             | С       | 3                      | СК    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 14           | FC                 |
| MU-1215          | F-3            | 2             | С       | 3                      | СК    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 14           | FC                 |
| MU-1306          | D-2            | 2             | С       | 2.5                    | CK    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 15           | FC                 |
| MU-1307          | C-2            | 2             | С       | 2.5                    | CK    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 15           | FC                 |
| MU-1308          | G-6            | 2             | С       | 2.5                    | CK    | SA               | С                  | 0      | A                  | FE           | NONE   | NONE                         | 15           | FC                 |
| MU-1309          | F-6            | 2             | C       | 2.5                    | CK    | SA               | C                  | 0      | A                  | FE           | NONE   | NONE                         | 15           | FC                 |

| DECAY            | IEAT F         | REMO | VAL SYS | TEM                    |               |                  |        |        |                    | M-232             |        |                              |              | (Cage 3 653)       |
|------------------|----------------|------|---------|------------------------|---------------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE<br>TYPE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| BW-4A            | F-7            | 2    | С       | 14                     | CK            | SA               | C      | 0      | A                  | FE                | NONE   | 5                            | NONE         | FEP,FR             |
|                  |                |      |         |                        |               |                  |        | C      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| BW-4B            | F-7            | 2    | С       | 14                     | CK            | SA               | С      | 0      | A                  | FE                | NONE   | 5                            | NONE         | FEP,FR             |
|                  |                |      |         |                        |               | Į                |        | С      | A                  | FE                | NONE   | NONE                         | NONE         | FE                 |
| CA-61            | F-7            | 2    | С       | 4                      | SC            | SA               | C      | 0      | A                  | FE                | 5      | NONE                         | NONE         | FEP,DI             |
|                  |                |      |         |                        |               |                  |        | С      | A                  | FE                | 5      | NONE                         | NONE         | Di                 |
| CA-62            | E-7            | 2    | С       | 4                      | SC            | SA               | С      | 0      | A                  | FE                | 5      | NONE                         | NONE         | FEP,DI             |
|                  |                |      |         |                        |               |                  |        | С      | A                  | FE                | 5      | NONE                         | NONE         | DI                 |
| CV-1400          | F-1            | 2    | В       | 10                     | G             | М                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1401          | G-1            | 2    | В       | 10                     | G             | М                | С      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1404          | C-7            | 2    | B       | 12                     | G             | М                | C      | O/C    | A                  | FE,PI             | NONE   | NONE                         | 31           | FC,PI              |
| CV-1405          | B-7            | 2    | В       | 14                     | G             | М                | С      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1406          | A-7            | 2    | В       | *4                     | G             | м                | C      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1407          | F-7            | 2    | B       | 14                     | G             | М                | С      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1408          | F-7            | 2    | B       | 14                     | G             | М                | С      | O/C    | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1410          | B-8            | 2    | A       | 12                     | G             | M                | O/C    | O/C    | A                  | FE,LK,PI          | NONE   | NONE                         | 22           | FC,LK,PI           |
| CV-1414          | B-8            | 2    | В       | 14                     | G             | м                | 0      | 0      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-1415          | A-8            | 2    | B       | 14                     | G             | м                | 0      | 0      | P                  | PI                | NONE   | NONE                         | NONE         | PI                 |
| CV-1416          | D-1            | 2    | A       | 1.5                    | GL            | м                | C      | С      | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-1429          | G-3            | 2    | В       | 10                     | GL            | М                | 0      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |
| CV-1429          | E-3            | 2    | В       | 10                     | GL            | M                | 0      | 0      | A                  | FE,PI             | NONE   | NONE                         | NONE         | FE,PI              |

| DECAY            | IEAT R         | REMO | AL SYS | TEM                    |       |                  |        |        |                    | M-232             | 2                |                              |              | (Page 2 of I)      |
|------------------|----------------|------|--------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|------------------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE   | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOP<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF           | REFUELING<br>OUTAJE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-1432          | B-3            | 2    | В      | 6                      | BF    | AO               | С      | 0/C    | A                  | FE,FS(C)          | NONE             | NONE                         | NONE         | FE,FS(C)           |
| CV-1433          | E-J            | 2    | В      | δ                      | BF    | AO               | C      | 0/C    | A                  | FE,FS(C)          | NONE             | NONE                         | NONE         | FE,FS(C)           |
| CV-1434          | D-6            | 2    | B      | 12                     | G     | м                | С      | 0/C    | A                  | FE,PI             | NONE             | NONE                         | NONE         | FE,PI              |
| CV-1435          | D-6            | 2    | B      | 12                     | G     | м                | С      | 0/C    | A                  | FE,P!             | NONE             | NONE                         | NONE         | FE,PI              |
| CV-1436          | E-7            | 2    | В      | 14                     | G     | м                | 0      | O/C    | A                  | FE,PI             | NONE             | NONE                         | NONE         | FE,PI              |
| CV-1437          | B-7            | 2    | B      | 14                     | G     | м                | 0      | 0/C    | A                  | FE,PI             | NONE             | NONE                         | NONE         | FE,PI              |
| DH-2A            | E-4            | 2    | С      | 10                     | CK    | SA               | С      | 0      | A                  | FE                | NONE             | NONE                         | NONE         | FE                 |
| DH-2B            | C-4            | 2    | С      | 10                     | CK    | SA               | С      | 0      | A                  | FE                | NONE             | NONE                         | NONE         | FE                 |
| PSV-1403         | C-7            | 2    | С      | 0.75                   | RV    | SA               | С      | 0      | A                  | SP                | 11,12            | NONE                         | NONE         | SP                 |
| PSV-1404         | A-7            | 2    | С      | 0.75                   | RV    | SA               | С      | 0      | A                  | SP                | 11,12            | NONE                         | NONE         | SP                 |
| PSV-1405         | E-7            | 2    | С      | 0.75                   | RV    | SA               | С      | 0      | A                  | S,P               | 11,12            | NONE                         | NONE         | SP                 |
| PSV-1406         | C-4            | 2    | С      | 0.75                   | RV    | SA               | С      | 0      | A                  | SP                | 11,12            | NONE                         | NONE         | SP                 |
| PSV-1407         | F-4            | 2    | С      | 0.75                   | RV    | SA               | С      | 0      | A                  | SP                | 11,12            | NONE                         | NONE         | SP                 |
| PSV-1412         | H-7            | 2    | с      | 8                      | RV    | SA               | с      | 0      | A                  | SP                | 8,9,10,<br>11,12 | NONE                         | NONE         | SP                 |
| SV-1440          | A-6            | 2    | A      | 1                      | GL    | S                | C      | С      | P                  | LJ,PI             | NONE             | NONE                         | NONE         | LJ,PI              |
| SV-1443          | A-6            | 2    | A      | 1                      | GL    | S                | C      | С      | P                  | LJ,PI             | NONE             | NONE                         | NONE         | LJ,PI              |

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| CHEMIC/          | AL AD          |      | SYSTE | M                      |       |                  |        |        |                    | M-233             | 1                |                             |              | (Fage ] of 1)      |
|------------------|----------------|------|-------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|------------------|-----------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE  | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF           | REFUELWG<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-1616          | E-1            | 3    | В     | 4                      | G     | М                | С      | 0/C    | A                  | FE,P1             | NONE             | NONE                        | NONE         | SE,PI              |
| CV-16:17         | E-1            | 3    | В     | 4                      | G     | м                | С      | O/C    | A                  | FE,PI             | NONE             | NONE                        | NONE         | FE,PI              |
| CV-1667          | D-4            | 2    | A     | 1                      | GL    | A.O              | С      | С      | P                  | LJ,PI             | NONE             | NONE                        | NONE         | LJ,PI              |
| N2-32            | D-4            | 2    | A     | 1                      | CK    | SA               | С      | С      | P                  | W                 | NONE             | NONE                        | NONE         | W                  |
| N2-47            | D-4            | 2    | A     | 1                      | G     | н                | С      | С      | P                  | W                 | NONE             | NONE                        | NONE         | W                  |
| PSV-1617         | H-2            | 3    | с     | 2                      | RV    | SA               | с      | 0      | A                  | SP                | 8,9,10,<br>11,12 | NONE                        | NONE         | SP                 |

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| INTERM           | EDIATE         | e coo | LING SY | STEM                   |       |                  |        |        | 1                  | M-234, Sh. 1 |        |                              |              | (Page 1 of 1)      |
|------------------|----------------|-------|---------|------------------------|-------|------------------|--------|--------|--------------------|--------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED     | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-2220          | H-4            | 2     | A       | 8                      | G     | M                | 0      | С      | A                  | FE,LJ,PI     | NONE   | NONE                         | 29           | FC,LJ,PI           |
| CV-2221          | H-4            | 2     | A       | 8                      | G     | M                | 0      | С      | A                  | FE,LJ,PI     | NONE   | NONE                         | 29           | FC,LJ,PI           |
| CV-2234          | F-6            | 2     | A       | 8                      | G     | .40              | 0      | С      | A                  | FE,FS,LJ,PI  | NONE   | NONE                         | 27           | FC,FSC,LJ,PI       |
| CV-2235          | E-4            | 2     | A       | 3                      | G     | M                | 0      | С      | A                  | FE,LJ,PI     | NONE   | NONE                         | 28           | FC,LJ,PI           |
| 14-775           | E-5            | 3     | C       | 0.38                   | СК    | SA               | С      | С      | A                  | FE           | NONE   | NONE                         | 27           | FC                 |
| 1014/26          | E-6            | 2     | AC      | 3                      | СК    | SA               | 0      | С      | A                  | FE,LJ        | NONE   | NONE                         | 24           | FC,LJ              |
| ICW-30           | E-5            | 2     | AC      | 3                      | CK    | SA               | 0      | С      | A                  | FE,LJ        | NONE   | NONE                         | 25           | FC,LJ              |

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| INTERM           | EDIATE         | E COO | LING SY | STEM                   |       |          |        |        |                    | M-234, Sh.        | 2      | •                            |              | (Page 1 of ))      |
|------------------|----------------|-------|---------|------------------------|-------|----------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE  | CODE    | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-2214          | G-6            | 2     | A       | 8                      | G     | AO       | 0      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | 30           | FC,FSC,LJ,PI       |
| CV-2215          | F-6            | 2     | A       | 8                      | G     | M        | 0      | С      | A                  | FE,LJ,PI          | NONE   | NONE                         | 30           | FC,LJ,PI           |
| CV-2233          | C-4            | 2     | A       | 8                      | G     | AO       | 0      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | 30           | FC,FSC,LJ,PI       |
| IA-767           | G-5            | 3     | С       | 0.38                   | CK    | SA       | С      | С      | A                  | FE                | NONE   | NONE                         | 30           | FC                 |
| IA-771           | E-4            | 3     | С       | 0.38                   | СК    | SA       | С      | С      | A                  | FE                | NONE   | NONE                         | 30           | FC                 |
| ICW-114          | C-4            | 2     | AC      | 8                      | CK    | SA       | 0      | С      | A                  | FE,LJ             | NONE   | NONE                         | 26           | FC,LJ              |

| SPENT FUEL COOLING SYSTEM |                |      |      |                        |       |                  |        | M-235  |                    |                   | (Page 2 of 1) |                              |              |                    |
|---------------------------|----------------|------|------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|---------------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO.          | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF        | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| SF-42                     | E-6            | 2    | A    | 8                      | G     | н                | С      | С      | P                  | IJ                | NONE          | NONE                         | NONE         | IJ                 |

| REACTO           | RBUI           | DING | SPRAY | & COR                  | REFLO | DODING           |        |        |                    | M-236             |            |                              |              | (Page 1 of 1) |
|------------------|----------------|------|-------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|------------|------------------------------|--------------|---------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE  | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REGUIRED<br>TESTS | RELIEF     | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TELS          |
| BS-4A            | F-6            | 2    | С     | 8                      | СК    | SA               | С      | 0      | A                  | FE                | 2          | NONE                         | NONE         | DI            |
| BS-4B            | F-6            | 2    | С     | 8                      | СК    | SA               | С      | 0      | A                  | FE                | 2          | NONE                         | NONE         | DI            |
| BW-6A            | F-2            | 2    | С     | 10                     | СК    | SA               | С      | 0      | A                  | FE                | NONE       | NONE                         | NONE         | FE            |
| BW-6B            | F-2            | 2    | С     | 10                     | СК    | SA               | С      | 0      | A                  | FE                | NONE       | NONE                         | NONE         | FE            |
| CF-2             | 8-4            | 2    | A     | 1                      | G     | н                | С      | С      | P                  | LJ,PI             | NONE       | NONE                         | NONE         | LJ,PI         |
| CV-2400          | F-5            | 2    | B     | 8                      | GL    | М                | С      | 0      | A                  | FE,PI             | NONE       | NONE                         | NONE         | FE,PI         |
| CV-2401          | F-5            | 2    | В     | 8                      | GL    | м                | С      | 0      | A                  | FE,PI             | NONE       | NONE                         | NONE         | FE,PI         |
| CV-2415          | B-5            | 2    | В     | 14                     | G     | м                | 0      | 0      | P                  | PI                | NONE       | NONE                         | NONE         | PI            |
| CV-2416          | C-5            | 2    | A     | 1                      | GL    | м                | С      | С      | P                  | LJ,PI             | NONE       | NONE                         | NONE         | LJ,PI         |
| CV-2417          | D-5            | 2    | B     | 1                      | GL    | м                | С      | С      | P                  | PI                | NONE       | NONE                         | NONE         | PI            |
| CV-2418          | C-4            | 2    | A     | 1                      | GL    | м                | С      | С      | P                  | LJ,Pi             | NONE       | NONE                         | NONE         | LJ,P!         |
| CV-2419          | B-3            | 2    | B     | 14                     | G     | м                | 0      | 0      | P                  | PI                | NONE       | NONE                         | NONE         | PI            |
| CV-2420          | D-3            | 2    | B     | 1                      | GL    | м                | С      | С      | P                  | PI                | NONE       | NONE                         | NONE         | PI            |
| MU-35A           | D-7            | 2    | A     | 1                      | GL    | н                | С      | С      | P                  | IJ                | NONE       | NONE                         | NONE         | W             |
| MU-358           | D-2            | 2    | A     | 1                      | GL    | Н                | С      | С      | P                  | LJ                | NONE       | NONE                         | NONE         | W             |
| MU-36A           | D-6            | 2    | A     | 1                      | CK    | SA               | С      | С      | P                  | IJ                | NONE       | NONE                         | NONE         | IJ            |
| MU-36B           | D-2            | 2    | A     | 1                      | CK    | SA               | С      | С      | P                  | IJ                | NONE       | NONE                         | NONE         | IJ            |
| N2-3             | C-7            | 2    | A     | 1                      | GL    | н                | C      | С      | P                  | IJ                | NONE       | NONE                         | NONE         | LJ            |
| N2-5             | C-2            | 2    | A     | 1                      | GL    | н                | С      | С      | P                  | LJ                | NONE       | NONE                         | NONE         | IJ            |
| PSV-2415         | D-5            | 2    | С     | 1                      | RV    | SA               | С      | 0      | A                  | SP                | 10, 11, 12 | NONE                         | NONE         | SP            |
| PSV-2421         | D-3            | 2    | C     | 1                      | RV    | SA               | С      | 0      | A                  | SP                | 10,11,12   | NONE                         | NONE         | SP            |

| SAMPLI           | NG SYS         | STEM |      |                        |       |          | M-237, Sh. 1       |                    |                    |          |        |                              |              | () to I specify   |
|------------------|----------------|------|------|------------------------|-------|----------|--------------------|--------------------|--------------------|----------|--------|------------------------------|--------------|-------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR | NORMAL<br>POSITION | SAFETY<br>POSITION | ACTIVE/<br>PASSIVE | REQUIRED | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORM" |
| CV-1814          | G-7            | 1    | A    | 0.75                   | G     | M        | С                  | С                  | P                  | LJ,P!    | NONE   | NONE                         | NONE         | Lu,M              |
| CV-1816          | G-7            | 1    | A    | 0.75                   | G     | M        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |
| CV-1820          | F-7            | 2    | A    | 1                      | GL    | M        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |
| CV-1826          | E-7            | 2    | A    | 1                      | GL    | м        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |
| CV-1845          | A-7            | 2    | A    | 0.5                    | GL    | AO       | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,Pi             |
| SS-146           | F-7            | 2    | A    | 0.75                   | GL    | н        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |
| SV-1818          | G-7            | 1    | A    | 1                      | GL    | S        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |
| SV-1840          | F-7            | 1    | A    | 1                      | GL    | S        | С                  | С                  | P                  | LJ,PI    | NONE   | NONE                         | NONE         | LJ,PI             |

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| REACTOR BUILDING HVAC |                 |      |                  |                        |       |                  |        | M-261, Sh. 1 |                    |                   |        |                              |              | (Page 1 of 1)      |
|-----------------------|-----------------|------|------------------|------------------------|-------|------------------|--------|--------------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO.      | P&IF<br>C00-4D. | CODE | CODE<br>CATEGORY | VALVE<br>SIZE<br>(INL) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY       | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-7401               | G-8             | 2    | A                | 54                     | BF    | AO               | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-7402               | F-8             | 2    | A                | 54                     | BF    | AO               | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-7403               | G-7             | 2    | A                | 54                     | BF    | м                | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |
| CV-7404               | F-7             | 2    | A                | 54                     | BF    | М                | С      | С            | P                  | LJ,PI             | NONE   | NONE                         | NONE         | LJ,PI              |

| REACTO           | RBUI           | DING | HVAC |                        |       |                  |        |        |                    | M-261, Sh. 3      |        |                              |              | (Page 1of I)       |
|------------------|----------------|------|------|------------------------|-------|------------------|--------|--------|--------------------|-------------------|--------|------------------------------|--------------|--------------------|
| VALVE<br>TAG NO. | P&ID<br>COORD. | CODE | CODE | VALVE<br>SIZE<br>(IN.) | VALVE | ACTUATOR<br>TYPE | NORMAL | SAFETY | ACTIVE/<br>PASSIVE | REQUIRED<br>TESTS | RELIEF | REFUELING<br>OUTAGE<br>JUST. | CSD<br>JUST. | TESTS<br>PERFORMED |
| CV-7444          | E-8            | 2    | A    | 2                      | GL    | м                | 0      | С      | A                  | FE,LJ,PI          | NONE   | NONE                         | NONE         | FE,LJ,PI           |
| CV-7445          | D-6            | 2    | A    | 2                      | GL    | м                | С      | С      | P                  | W                 | NONE   | NONE                         | NONE         | W                  |
| CV-7446          | D-8            | 2    | A    | 2                      | GL    | м                | 0      | С      | A                  | FE,LJ,FI          | NONE   | NONE                         | NONE         | FE,LJ,PI           |
| CV-7448          | F-8            | 2    | A    | 2                      | GL    | м                | 0      | С      | A                  | FE,LJ,PI          | NONE   | NONE                         | NONE         | FE,LJ,PI           |
| CV-7449          | G-7            | 2    | A    | 2                      | GL    | М                | С      | С      | P                  | ω                 | NONE   | NONE                         | NONE         | ω                  |
| CV-7450          | G-8            | 2    | A    | 2                      | GL    | м                | 0      | С      | A                  | FE,LJ,PI          | NONE   | NONE                         | NONE         | FE,LJ,PI           |
| CV-7453          | A-8            | 2    | A    | 1                      | GL    | м                | 0      | С      | A                  | FE,LJ,PI          | NONE   | NONE                         | NONE         | FE,LJ,PI           |
| SV-7454          | A-6            | 2    | A    | 1                      | GL    | S                | 0      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | NONE         | FE,FS,LJ,PI        |
| SV-7456          | 8-4            | 2    | A    | 1                      | GL    | S                | 0      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | NONE         | FE,FS,LJ,PI        |
| SV-7457          | C-5            | 2    | A    | 1                      | GL    | S                | C      | 0/C    | A                  | FE,FS(C),LJ,PI    | NONE   | NONE                         | NONE         | FE,FS(C),LJ,PI     |
| SV-7459          | 8-5            | 2    | A    | 1                      | GL    | S                | С      | 0/C    | A                  | FE,FS(C),LJ,PI    | NONE   | NONE                         | NONE         | FE,FS(C),LJ,PI     |
| SV-7467          | C-5            | 2    | A    | 1                      | GL    | S                | С      | O/C    | A                  | FE,FS(C),LJ,PI    | NONE   | NONE                         | NONE         | FE,FS(C),LJ,PI     |
| SV-7469          | B-6            | 2    | A    | 1                      | GL    | S                | С      | 0/C    | A                  | FE,FS(C),LJ,PI    | NONE   | NONE                         | NONE         | FE,FS(C),LJ,PI     |
| SV-7479          | B-6            | 2    | A    | 0.75                   | GL    | S                | 0      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | NONE         | FE,FS,LJ,PI        |
| SV-7510          | B-5            | 2    | A    | 1                      | GL    | S                | С      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | NONE         | FE,FS,LJ,PI        |
| SV-7512          | B-6            | 2    | A    | 1                      | GL    | S                | С      | С      | A                  | FE,FS,LJ,PI       | NONE   | NONE                         | NONE         | FE,FS,LJ,PI        |

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# **APPENDIX 3**

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# PUMP TEST TABLE

### Appendix 3 PUMP TEST TABLE

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| SYSTEM/                          | CODE            | PARAMETERS MONITORED / RELIEF REQUESTS |                      |                |                          |  |  |  |  |
|----------------------------------|-----------------|--|----------------------|----------------|--------------------------|--|--|--|--|
| PUMP TAG NO.                     | CLASS           | ROTATIONAL<br>SPEED                    | BEARING              | PUMPED<br>FLOW | DIFFERENTIAL<br>PRESSURE |  |  |  |  |
| SERVICE WATER                    |                 |  |                      |                |                          |  |  |  |  |
| P-4A                             | 3               | N/A                                    | ~                    | RR-6           | PR-6                     |  |  |  |  |
| P-48                             | 3               | N/A                                    | ~                    | RR-6           | RR-6                     |  |  |  |  |
| P-4C                             | 3               | N/A                                    | 1                    | RR-6           | RR-6                     |  |  |  |  |
| EMERGENCY FEEDWATER              |                 |  |                      |                |                          |  |  |  |  |
| P-7A                             | 3               | ~                                      | ~                    | 1              |                          |  |  |  |  |
| P-7B                             | 3               | N/A                                    | 1                    | ~              | ~                        |  |  |  |  |
| EDG OIL TRANSFER                 |                 |  |                      |                |                          |  |  |  |  |
| P-16A                            | N               | N/A                                    | 1                    | NOTE 1         | NOTE 1                   |  |  |  |  |
| P-16B                            | N               | N/A                                    | ~                    | NOTE 1         | NOTE 1                   |  |  |  |  |
| LOW PRESSURE INJECTION           |                 |  |                      |                |                          |  |  |  |  |
| P-34A                            | 2               | N/A                                    | ~                    |                |                          |  |  |  |  |
| P-34B                            | 2               | N/A                                    | 1                    | ~              | ~                        |  |  |  |  |
| REACTOR BUILDING SPRAY           |                 |  |                      |                |                          |  |  |  |  |
| P-35A                            | 2               | N/A                                    | ~                    | ~              | 1                        |  |  |  |  |
| P-35B                            | 2               | A*/A                                   | 1                    | ~              | ~                        |  |  |  |  |
| HIGH PRESSURE INJECTION          |                 |  |                      |                |                          |  |  |  |  |
| P-36A                            | 2               | N/A                                    | 1                    | RR-7           | RR-7                     |  |  |  |  |
| P-36B                            | 2               | N/A                                    | 1                    | RR-7           | RR-7                     |  |  |  |  |
| P-36C                            | 2               | N/A                                    | ~                    | RR-7           | RR-7                     |  |  |  |  |
| OTE 1: Deviations from OMa-1988. | Part 6 requiren | nents are contain-                     | rithin on site docum | ante           |                          |  |  |  |  |

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# **APPENDIX 4**

# **RELIEF REQUESTS**

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# **RELIEF REQUEST - 1**

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| System:              | Decay Heat / Low Pressure Injection (LPI)  |
|----------------------|--|
| Component:           | DH-13A, DH-13B, DH-17, DH-18   |
| Function:            | These check valves, considered to be pressure isolation valves, serve to isolate the decay heat removal system from the Reactor Coolant System (RCS) and must open to allow flow from that attached system duri. g certain accident conditions.  |
| Code<br>Class:       | Class 1  |
| Code<br>Category:    | Catego y AC  |
| Code<br>Requirement: | OMa-1988, Part 10, Section 4.2.2.3(c)  |
|                      | "Valve seat leakage shall be determined by one of the following methods:   |
|                      | (1). measuring leakage through a downstream telltale connection while maintaining test pressure on one side of the value; or"  |
| Relief<br>Requested: | The subject values cannot be tested in a manner to determine the amount of individual leakage through each value.  |
| Basis for<br>Relief: | Valves DH-13A and DH-17 are arranged in a parallel configuration in<br>that one valve is located in each of two lines which originate as a single<br>line from one pump. No isolation cap, bility is available for separation<br>upstream of the two valves prior to the line split. DH-13B and DH-18<br>are arranged identically. Therefore, leakage rate measurements always<br>reflect the combined leakage of two valves. Because the total leakage<br>measured is applied to each valve, this methodology insures that the<br>allowable pathway leakage per the Technical Specifications is not<br>exceeded and that the valves are capable of fulfilling their safety<br>function of maintaining reactor coolant system integrity. |

## **RELIEF REQUEST - 1 (cont.)**

#### Alternative Testing:

Entergy Operations proposes that the combined parallel valve leakage be measured and that the acceptance criteria be that required by the ANO-1 Technical Specification Table 3.1.6.9 (5 GPM for each two valve combination.). This leakage test will otherwise be conducted in accordance OMa-1988, Part 10 Section 4.2.2 requirements. If a valve pair leakage rate exceeds the acceptance criteria, then both valves in that valve pair are declared inoperable and are not returned to operable status until the condition is corrected.

Note:

A similar relief request was approved in the previous ten year IST program via a safety evaluation report dated September 15, 1994. In the previous ten year program this was Relief Request - 8.

# **RELIEF REQUEST - 2**

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| System:              | Reactor Building Spray   |
|----------------------|--|
| Components:          | BS-4A, BS-4B   |
| Function:            | These check valves have an active open safety function during an ES actuation to provide flowpaths for reactor building spray from the reactor building spray pumps to the reactor building spray headers.   |
| Code Class:          | 2  |
| Code Category:       | С  |
| Code<br>Requirement: | OMa-1988, Part 10, Sections 4.3.2 and 4.3.2.4(c))  |
|                      | "Check valves shall be exercised nominally every 3 months, except as provided by Sections 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5."   |
|                      | "As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used."   |
| Relief               |  |
| Requested:           | These are check valves with no external means for exercising and no external position indicating mechanism. Non-intrusive testing (open) of these valves is impractical during any mode of plant operation. Full-stroke exercising these valves to the open position would require operating each containment spray pump at nominal accident flowrate. Since no recirculation flowpath exists downstream of these valves, the only flowpath available for such a test would result in injecting borated water into the containment building via the spray nozzles. |
|                      | At five year intervals, the building spray nozzles are flow tested with air<br>to verify no blockage. The test consists of connecting a compressor to<br>the building spray system, pumping the heated air through the spray<br>headers, and using thermography to detect a temperature rise in the<br>spray nozzles. It would be a hardship to perform this test at any other<br>frequency due to the amount of coordination and difficulty in<br>performing the test   |

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#### **RELIEF REQUEST - 2 (cont.)**

Basis for Relief:

Each of these valves has been discontrolled and inspected in the past and they have not displayed any indication of degradation that would impede their capability to perform their safety function to open. The alternate testing proposed below meets the intent of NRC Generic Letter 89-04, Position 2 for sample inspection programs.

Alternative Testing:

During each reactor refueling outage at least one of these valves will be disassembled, inspected, and manually exercised on a sequential and rotating schedule. If, in the course of an inspection, a valve is found to be inoperable with respect to its function to fully open, then the other valve will be inspected during the same outage. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautions will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods, and final close-out inspections.

Note:

A similar relief request was approved in the previous ten year program via a safety evaluation report dated September 15, 1994. In the previous ten year program this was Relief Request - 17.

# **RELIEF REQUEST - 3**

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| System:              | Emergency Feedwater  |
|----------------------|--|
| Components:          | MS-271, MS-272   |
| Function:            | These check valves have an active open safety function to admit steam<br>from the steam generators to the emergency feedwater (EFW) pump<br>turbine steam supply header. They have an active closed safety<br>function to provide isolation between the steam generators to prevent<br>blowdown of both steam generators in the event of a steam line<br>rupture.  |
| Code Class:          | 3  |
| Code Category:       | c  |
| Code<br>Requirement: | OMa-1988, - Part 10, Section. 4.3.2.1 Exercising Test Frequency<br>"Check valves shall be exercised nominally every 3 months except as   |
|                      | provided by Sections. 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5."   |
| Relief<br>Requested: | These are check valves with no external means for exercising and no external position indication mechanism. Reverse flow (closure) testing of these valves is impractical during power operation and under cold shutdown conditions. Non-intrusive techniques can be used during power operation to confirm valve closure, however concerns related to interpreting the test results and an unacceptable burden on the plant staff causes it to be impractical on a quarterly basis.   |
| Basis for<br>Relief: | These valves remain closed during normal plant power operation<br>except for those periods when EFW Pump P-7A is being tested. The<br>only means of verifying the closure of these valves while the plant is at<br>power or under steaming conditions, other than by non-intrusive<br>means, would be to establish a differential pressure between the two<br>steam generators. If such a differential pressure were to be established,<br>an associated imbalance in reactor cold leg temperatures as well as<br>other undesirable plant conditions would be created. |

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#### RELIEF REQUEST - 3 (cont.)

Basis for Relief: (cont.)

During cold shutdown periods there is no steam pressure by which a differential pressure could be produced. Pressurizing with other sources (e.g. compressed air) is impractical due to the large volumes involved.

Although non-intrusive testing can be performed quarterly during pump testing to confirm check valve closure, the following issues provide justification for deferring non intrusive testing to once per refueling cycle.

- a. Non-intrusive testing not only satisfies the requirements of the Code to demonstrate either full open or full closed (depending on the application), the health of the valve internals is also evaluated. This information can be used to predict future valve degradation and trending is also possible.
- b. Quarterly testing using non-intrusive testing methods could provide indeterminate results caused by unrelated system dynamic conditions which could, in turn, result in unnecessary additional testing or disassembly or possibly an unnecessary plant shutdown.
- c. Each of these valves has been disassembled several times with no unexpected service related deterioration identified during these inspections.
- d. These valves only operate during pump testing, thus valve degradation due to wear factors is not likely.
- e. These valves are full-stroke (open) exercised on a quarterly frequency.
- f. As stated in NUREG 1482, Section 4.1.4 and the Summary of Public Workshops Held in NRC Regions on Inspection Procedure 73759 "Inservice Testing of Pumps and Valves" and Answers to Panel Questions on Inservice Testing Issues, reference question 2.3.19, it is a burden to setup special test equipment on a quarterly basis to monitor the closed stroke of these valves.

# RELIEF REQUEST - 3 (cont.)

Alternative Testing:

Each of these valves will be full-stroke exercised (open) in conjunction with pump testing on a quarterly frequency.

At least once during each refueling cycle each of these valves will be confirmed to close upon the cessation of flow in the line using nonintrusive testing methods.

Note: A similar relief request was approved in the previous ten year program via a safety evaluation report dated April 17, 1996. In the previous ten year program this was Relief Request - 22.

## **RELIEF REQUEST - 4**

| Components: CS-293   | 00.004   |
|--|--|
|  | 5, CS-294  |
| Function: These<br>flowpa<br>Conden<br>inadven<br>howev<br>valves<br>isolate<br>respect  | check valves have an active open safety function to provide<br>the the energency feedwater pump suction header from<br>insate Storage Tank (CST) T-41B. They close to prevent<br>tent transfer of water from the service water system or T-41;<br>er, this is not a safety function due to closure of motor-operated<br>CV-2800 and CV-2802 and manual valve CS-275 that normally<br>the service water headers and Condensate Storage Tank T-41,<br>ively.   |
| Code Class: 3  |  |
| Code Category: C   |  |
| Code<br>Requirement: OMa-1<br>"Check   | 988, - Part 10, Section. 4.3.2.1 Exercising Test Frequency<br>to valves shall be exercised nominally every 3 months, except as   |
| Relief<br>Requested: These<br>externa<br>these t<br>them i<br>feedwa<br>capabil<br>conditi<br>operato<br>It is th<br>that re<br>valves<br>would<br>paralle | are check valves with no external means for exercising and no<br>al position indication mechanism. The system configuration with<br>two valves in parallel with no isolation valves prevents testing<br>individually. During plant operation at power both emergency<br>after pumps cannot be operated due to limitations in the flowrate<br>lity of the test/recirculation line. Under cold shutdown<br>ons only the motor-operated emergency feedwater pump can be<br>ed since steam is unavailable for operating the steam-driven unit.<br>herefore not practical to pump at a flowrate greater than twice<br>quired for accident mitigation and, presumably, verify that both<br>open to the extent to satisfy their safety function. In addition, it<br>be impossible to verify that flow would be balanced in the<br>l lines. Consequently, the only available means of verifying full |

#### RELIEF REQUEST - 4 (cont.)

Basis for Relief:

These valves remain closed (idle) during normal plant power operation except for those periods when an emergency feedwater pump is being tested.

Although non-intrusive testing can be performed quarterly during pump testing to confirm the ability of the valves to open, the following issues provide justification for deferring testing to once per refueling cycle.

- a. Non-intrusive testing not only satisfies the requirements of the Code to demonstrate either full open or full closed (depending on the application), the health of the valve internals is also evaluated. This information can be used to predict future valve degradation and trending is also possible
- b. Quarterly testing using non-intrusive testing methods could provide indeterminate results, caused by unrelated system dynamic conditions which could, in turn, result in unnecessary additional testing or disassembly or possibly an unnecessary plant shutdown.
- c. Each of these valves has been disassembled several times with no unexpected service related deterioration identified during these inspections.
- d. These valves only operate during pump testing, thus valve degradation due to wear factors is not likely.
- e. These valves are full-stroke exercised (open) without monitoring individual flowrates on a quarterly frequency.
- f. As stated in NUREG 1482, Section 4.1.4 and the Summary of Public Workshops Held in NRC Regions on Inspection Procedure 73759 "Inservice Testing of Pumps and Valves" and Answers to Panel Questions on Inservice Testing Issues, reference question 2.3.19, it is a burden to setup special test equipment on a quarterly basis to monitor the open stroke of these valves.

## RELIEF REQUEST - 4 (cont.)

#### Alternative Testing:

Each of these valves will be stroke exercised (open) in conjunction with pump testing without monitoring individual flowrates (considered a partial stroke exercise due to the lack of flowrate information) at a quarterly frequency.

At least once during each refueling cycle each of these valves will be confirmed to stroke full open using non-intrusive testing methods.

Note:

A similar relief request was approved in the previous ten year program via a safety evaluation report dated April 17, 1996. In the previous ten year program this was Relief Request - 23.

#### **RELIEF REQUEST - 5**

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System: Chemical Addition Components: CA-61, CA-62 These stop-check valves have an active open safety function during an Function: ES actuation to provide flowpaths for sodium hydroxide from the Sodium Hydroxide Storage Tank to the suctions of the reactor building spray pumps. They have an active closed safety function to prevent backflow from the decay heat removal suction header to the Sodium Hydroxide Storage Tank during post-accident recirculation. This latter function is redundant with the function of upstream valves CV-1616 and CV-1617 but provides single-failure protection. Code Class: 2 Code Category: C Code **Requirement:** OMa-1988 Part 10, Sections 4.3.2 and 4.3.2.4(c) "Check valves shall be exercised nominally everv 3 months, except as provided by Sections 4.3.2.2, 4.3.2.3, 4.3.2.4, and 4.3.2.5." "As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to determine operability of check valves may be used." Relief **Requested:** These are stop-check valves with no external means for exercising (open) and no external disc position indication mechanism. Due to the system configuration it is impractical to induce a significant flow in the line or a meaningful reverse flow/differential pressure, thus both reverse flow (closure) and non-intrusive testing (open) of these valves is impractical during any mode of plant operation. Full-stroke exercising these valves to the open position would require system operation that would result in the unacceptable introduction of sodium hydroxide into the Borated Water Storage Tank (BWST) outlet header, the BWST and connected plant systems. Sodium hydroxide contamination of these systems is extremely undesirable for chemistry and piping integrity concerns.

#### RELIEF REQUEST - 5 (cont.)

#### Relief

Requested: (cont.)

.) Partial stroking of these valves can be achieved by limited flow via the condensate flush line to each header. This can be done to a limited extent without unduly diluting the boric acid concentration in the BWST.

Basis for Relief:

Each of these valves has been disassembled and inspected in the past and they have not shown any indication of degradation that would impede their capability to perform their safety functions to open or close.

The alternate testing proposed below meets the intent of NRC Generic Letter 89-04, Position 2 for sample inspection programs.

These valves only operate during quarterly partial flow exercising, thus valve degradation due to wear factors is not likely.

The INPO SOER 86-03 Check Valve Program at ANO-1 has included these valves on a 10-year inspection interval based on valve design and service conditions. This reflects the low probability of an emergent problem over the relatively short interval between inspections based on the proposed inspection plan.

#### Alternative Testing:

On a quarterly schedule each of these valves will be partial-flow exercised (open) using the condensate flush line.

During each refueling outage at least one of these valves will be disassembled, inspected, and manually exercised on a sequential and rotating schedule. If, in the course of this inspection a valve is found to be inoperable with respect to its functions to fully open or close, then the other valve will be inspected during the same outage. During activities associated with valve disassembly and inspection and prior to system closure, appropriate precautior s will be applied and inspections performed to ensure internal cleanliness standards are maintained and foreign materials are excluded from valve and system internals. These measures may include creating controlled work areas, maintaining a tool and equipment accounting system, installation of covers during non-work periods, and final close-out inspections.

# RELIEF REQUEST - 5 (cont.)

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| Alternative<br>Testing: (cont.) | Following valve re-assembly, the subject valve will be partial-stroked in<br>the open direction. These functional testing activities will ensure that<br>the subject valve has been re-assembled and aligned properly. |
|---------------------------------|--|
| Note:                           | A similar relief request was approved in the previous ten year program<br>via a safety evaluation report dated September 15, 1994. In the<br>previous ten year program this was Relief Request - 25.                   |

# **RELIEF REQUEST - 6**

| System:              | Service Water  |
|----------------------|--|
| Components:          | Service Water Pumps P-4A, P-4B, and P-4C   |
| Function:            | Under emergency conditions these vertical line-shaft pumps provide an assured source of cooling water and the ultimate heat sink to various safety related and safe shutdown components. In addition, they provide cooling water to non-safety related plant components during normal plant operation.   |
| Code Class:          | 3  |
| Code<br>Requirement: | OMa-1988, Part 6, Section 5.2  |
|                      | "An inservice test shall be conducted with the pump operating at specified test reference conditions. The test parameters shown in Table 2 shall be determined and recorded as directed in this paragraph."  |
| Relief               |  |
| Requested:           | These pumps will be tested on a quarterly basis with the specific unique<br>test reference values, as defined in Section 1.3 and discussed in Section<br>4.3, replaced by a set of variable reference values in the form of a<br>representative curve denoting reference differential pressure as a<br>function of pump indicated flowrate for each pump.  |
| Basis for            |  |
| Relief:              | The service water system provides a continuous supply of cooling<br>water to the two safety-related (essential) service water headers as well<br>as the non-essential header related to main turbine generator and other<br>plant support auxiliaries. During normal plant operation at power the<br>heat removal demands of the service water system require the operator<br>of at least two and frequently three pumps. After the system operation<br>reaches a degree of stability, perturbation of flow to any of the on-line<br>heat exchangers could have a severe adverse impact on plant operation<br>with the potential for unacceptable flow and temperature transients.<br>This situation precludes flow adjustments on specific heat loads and<br>certainly throttling of pump or header isolation valves. As such,<br>returning the system operating parameters to a prescribed unique<br>reference value (either flow or differential pressure) is impractical and |

#### **RELIEF REQUEST - 6 (cont.)**

Basis for Relief: (cont.)

could result in an unreasonable and unwarranted risk to plant operation with little or no ap, went gain in plant safety or reliability.

The prescribed alternate testing for these pumps meets or exceeds the requirements as set forth in NUREG-1482, Section 5.3.

Historical test data indicates that over the operating range of interest there is little or no variation in pump vibration characteristics (e.g. vibration levels are independent of flowrate over the allowed range of flows).

The alternate testing will provide adequate test information and assurance equivalent to that of the Code requirement needed to assess the operational readiness of the subject pumps and adequately detect significant pump degradation.

#### Alternative Testing:

A reference pump curve will be determined for each pump when the pump is known to be operating acceptably as follows:

- a. At a time when plant conditions allow, the subject pump's flowrate will be varied over a specified range with the pump operating at or near its design basis flowrate. This specified range will be beyond the theoretical "flat" portion of the pump performance curve.
- b. At least five (5) points over the test range, corresponding differential pressure and flowrate measurements will be recorded after flow stability is achieved at each point (minimum 2 minutes run time). Instruments used for obtaining pump performance data will satisfy the accuracy and range requirements as set forth in Part 6, Section 4.6.
- c. The recorded "curve" data will be plotted graphically or electronically and an equivalent pump curve will be derived.
- d. After any maintenance or repair to a pump that may have affected or significantly altered the previous pump performance curve, a new reference pump curve will be developed or the previous curve revalidated by an appropriate inservice test.

#### **RELIEF REQUEST - 6 (cont.)**

### Alternative

Testing: (cont.)

Individual acceptance criteria will be developed for each pump as follows:

- a. An "acceptable range" of operation will be established when pump differential pressure, corresponding to a specified flowrate, deviates by no more than 0.95 times the reference value for the lower limit and 1.10 times the reference value for the upper limit.
- b. An "alert range" of operation will be established when pump differential pressure, corresponding to a specified flowrate, falls between 0.95 times the reference value to 0.93 times the reference value.
- c. Each of the pump's acceptance criteria curves shall be compared to the applicable and corresponding requirements for these pumps as set forth in the ANO-1 Technical Specifications, Safety Evaluation Report, and Safety Analysis Report. This review will ensure that a pump cannot be declared operable if it is operating outside the requirements of any of these documents.
- d. In the event that a pump's operational parameters fall outside of these stated ranges (0.93 times the reference value for the lower range and 1.1 times the reference value for the upper range) in what is known as the "required action range", appropriate corrective actions will be implemented in accordance with Section 6.1.
- e. The acceptance criteria for pump/motor vibration will be derived from Part 6, Table 3a based on reference values measured during typical pump operation at or near the pump's design basis flowrate. A curve of vibration levels vs. flowrate is not required to be developed since vibration levels are essentially the same over the flow rates of interest.
#### RELIEF REQUEST - 6 (cont.)

Alternative Testing: (cont.)

Each of these pumps will be tested on a quarterly basis as follows: With the subject pump operating at a condition based on system demands, measurements for pump flowrate, differential pressure, and vibration will be recorded. Should any of the pump's operating points fall outside the plotted areas of acceptability, the appropriate corrective action as prescribed in Section 6.1 will be applied.

Note:

A similar relief request was approved in the previous ten year program via a safety evaluation report dated September 15, 1994. In the previous ten year program this was Relief Request - 34.

# **RELIEF REQUEST - 7**

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| System:      | High Pressure Injection   |
|--------------|---|
| Components:  | High Pressure Injuction Pumps P-36A, P-36B, and P-36C   |
| Function:    | The High Pressure Injection Pumps provide a source of high pressure<br>safety injection to the reactor coolant system. These pumps also serve<br>as the normal makeup source for the reactor coolant system.  |
| Code Class:  | 2   |
| Code         |   |
| Requirement: | OMa-1988, Part 6, Section 5.2   |
|              | "An inservice test shall be conducted with the pump operating at<br>specified test reference conditions. The test parameters shown in<br>Table 2 shall be determined and recorded as directed in this<br>paragraph."  |
| Relief       |   |
| Requested:   | These pumps are tested quarterly. During the quarterly test a portion<br>of the pump flow is directed through a non-flow instrumented mini-<br>flow line and the rest of the flow is directed through an instrumented<br>injection line. During cold shutdowns total pump flow is directed<br>through instrumented flow paths.  |
| Basis for    |   |
| Relief:      | During the quarterly pump test a portion of the high prossure injection<br>flow is directed through a non-instrumented mini-flow path. If the<br>mini-flow path was isolated during the quarterly pump test and the<br>normal injection path was inadvertently isolated then the potential<br>exists to damage the pump.  |
| Alternative  |   |
| Testing:     | These pumps will continued to be tested quarterly by directing a portion of the pump flow through the mini-flow line and the remaining flow to the reactor coolant system. During the quarterly test, pump flow to the reactor coolant system will be set and differential pressure will be monitored in accordance with OMa-1988, Part 6 requirements. Pump vibration will also be monitored in accordance with Part 6 requirements. |

## **RELIEF REQUEST - 7 (cont.)**

Alternative Testing: (cont.)

In addition to the quarterly testing, during cold shutdowns the miniflow line will be isolated and flow will be set following NUREG 1482, Section 5.3 guidance. Differential pressure and vibration data will be collected and limits established in accordance with OM-6 requirements.

Note:

This is a new relief request. This relief request is pre-approved by Generic Letter 89-04, Position 9.

#### **RELIEF REQUEST - 8**

System: Decay Heat Removal Reactor Building Spray

Components: PSV-1412, PSV-1617

Function: PSV-1412 - This relief valve has an active open safety function to relieve an over-pressure condition in the BWST and an active open safety function to ensure a vacuum is not created in the tank as water is pumped out of the tank. Although the tank vent, BW-9, is normally open and is bypassed with a 1-inch pipe, there is concern that the vacuum breaking capability of this arrangement is inadequate based on the estimated outflow from the tank.

PSV-1617 - This relief valve has an active open safety function to relieve over-pressure and vacuum conditions in the Sodium Hydroxide Storage Tank. Note that, although the tank vent valve AV-10 is normally open to perform these functions, PSV-1617 is considered to be the primary and most reliable mechanism for performing this function.

Code Class:

Class 2 - PSV-1412 Class 3 - PSV-1617

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Code Category:

Code

**Requirement:** 

OM-1987, Part 1, Paragraph 1.4.1.2

"Set Pressure Measurement Accuracy. Test equipment and readability accuracy of same, inclusive of gages, transducers, load cells, assist devices, calibration standards, etc. used in conjunction with determination of valve set pressure, shall have an overall combined accuracy within +2% to -1% at the pressure level of interest.

The measured set pressure must comply with the tolerance limits specified in the appropriate acceptance criteria sections: paras. 1.3.3.1(d), 1.3.4.1(d), 4.1.1.9, 4.1.2.9, 4.1.3.8, 8.1.1.9, 8.1.2.9, and 8.1.3.8.

#### RELIEF REQUEST - 3 (cont'd)

Code

**Requirement:** The effect of the overall combined accuracy specified above is that the (Cont'd) limits of the actual set pressure may be 1% above to 2% below the indicated (measured) set pressure." Relief **Requested:** Liberalization of the instrumentation requirements related to testing vacuum relief devices. **Basis** for Characteristically, vacuum breakers are set to relieve at very low Relief: differential pressures. In these cases the set pressures are: PSV-1412 - 0.127 in. HG (0.062 psig) PSV-1617 - 0.382 in. HG (0.187 psig) In order to meet the Code accuracy requirements for testing these valves the maximum allowable deviation from setpoint would be 0.0006 psig and 0.00187 psig, respectively. Pressure measurement instrumentation providing this level of accuracy and resolution is not typically maintained in a power plant facility. Alternative Testing: When determining the vacuum breaker setpoint, instrument accuracy and "target setpoint" for these vacuum relief valves will be established such that the overall combined accuracy specified in the test placedure will limit the actual set pressure to 2 percent above the stamped set pressure. Pressure relief setpoint testing will be performed in accordance with the applicable Code requirements.

Note:

This is a new relief request.

#### **RELIEF REQUEST - 9**

System: Decay Heat Removal Reactor Building Spray

Components: PSV-1412, PSV-1617

Function: PSV-1412 - This relief valve has an active open safety function to relieve an over-pressure condition in the BWST and an active open safety function to ensure a vacuum is not created in the tank as water is pumped out of the tank. Although the tank vent, BW-9, is normally open and is bypassed with a 1-inch pipe, there is concern that the vacuum breaking capability of this arrangement is inadequate based on the estimated outflow from the tank.

PSV-1617 - This relief valve has an active open safety function to relieve over-pressure and vacuum conditions in the Sodium Hydroxide Storage Tank. Note that, although the tank vent valve AV-10 is normally open to perform these functions, PSV-1617 is considered to be the primary and most reliable mechanism for performing this function.

Code Class: Class 2 - PSV-1412 Class 3 - PSV-1617

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OM-1987, Part 1, Paragraph 8.2

Code Category:

#### Code

Requirement:

"Seat Tightness Testing. Seat tightness testing shall be performed in accordance with the Owner's valve test procedure."

#### Relief Requested:

Eliminate the requirement related to seat tightness testing of vacuum relief devices.

#### **Basis** for

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These vacuum breaker valves have no significant safety function in the closed position. Furthermore, seat leakage is irrelevant since, in effect, the valves are normally bypassed by a line with either a normally-open valve or no closure device whatsoever.

# RELIEF REQUEST - 9 (cont'd)

Alternative Testing:

Seat leakage testing of these vacuum breaker valves will not be performed.

Note:

\* \$\* This is a new relief request.

# **RELIEF REQUEST - 10**

| System:              | Various  |
|----------------------|--|
| Components:          | All safety and relief valves tested used for compressible and non-fluid services other than steam:   |
|                      | PSV-1412, PSV-1617, PSV-2415, PSV-2421, PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237, PSV-5238, PSV-5240, PSV-5241   |
| Function:            | Provide over-pressure protection to safety-related systems.  |
| Code Class:          | Class 2 - PSV-1412, PSV-2415, PSV-2421<br>Class 3 - PSV-1617<br>Non-Code - PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237,<br>PSV-5238, PSV-5240, PSV-5241   |
| Code Category:       | С  |
| Code<br>Requirement: | OM-1987, Part 1, Paragraph 8.1.2.2<br>"Accumulator Volume There shall be a minimum accumulator   |
|                      | volume below the valve inlet, based on the valve capacity (cu ft) and calculated from the following formula:   |
|                      | Minimum Volume = [valve capacity (cu ft per sec) X time open (sec) / $10''$  |
| Relief<br>Requested: | Eliminate the requirement for a specified accumulator.   |
| Basis for<br>Relief: | The specified accumulator volume requirement is not needed for simple determination of the valve set pressure. This was recognized by the Code working group and committees and is corrected in more recent versions of the OM Code. (Ref. ASME OM Code-1990, OMc-1994 Addenda, Paragraph I 8.1.2, and OMa Code 1996, Paragraph I 8.1.2(b).) |

# RELIEF REQUEST - 10 (cont'd)

Alternative Testing:

The volume of the accumulator drum and the pressure source flow rate will be sufficient to determine the valve set-pressure. (Ref. ASME OM Code-1990, OMc-1994 Addenda, Paragraph I 8.1.2 and OMa Code 1996, Paragraph I 8.1.2(b).)

Note:

This is a new relief request.

# **RELIEF REQUEST - 11**

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| System:              | Various  |
|----------------------|--|
| Components:          | All safety and relief valves tested under ambient conditions using a test medium at ambient conditions:  |
|                      | PSV-1241, PSV-1242, PSV-1243, PSV-1403, PSV-1404, PSV-1405, PSV-1406, PSV-1407, PSV-1412, PSV-1617, PSV-2415, PSV-2421, PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237, PSV-5238 PSV-5240, PSV-5241  |
| Function:            | Provide over-pressure protection to safety-related systems.  |
| Code Class:          | Class 2 - PSV-1241, PSV-1242, PSV-1243, PSV-1403, PSV-1404,<br>PSV-1405, PSV-1406, PSV-1407, PSV-1412, PSV-2415, PSV-2421<br>Class 3 - PSV-1617  |
|                      | Non-Code - PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237, PSV-5238, PSV-5240, PSV-5241  |
| Code Category:       | С  |
| Code<br>Requirement: | OM-1987, Part 1, Paragraphs 8.1.2.4 and 8.1.3.4  |
|                      | "Temperature Stability. The test method shall be such that the temperature of the value body shall be known and stabilized before commencing set pressure testing, with no change in measured temperature of more than 10 deg $F$ (5 deg $C$ ) in 30 minutes." (Same text for both paragraphs)   |
| Relief               |  |
| Requested:           | Eliminate the requirement for temperature stabilization when safety/relief valves are tested at ambient conditions.  |
| Basis for            |  |
| Relief:              | For valves tested under normal prevailing ambient conditions with the test medium at approximately the same temperature, the requirement for verifying temperature stability is inappropriate and a waste of time and resources. Based on discussions with valve vendors, there is no significant effect on valve setpoint at pressures below 150 degF. Thus, there is little or no consequence of any minor changes in ambient temperature. |

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# RELIEF REQUEST - 11 (cont'd)

| Basis for<br>Relief (cont'd): | This has been identified by the OM-1 Code Working Group and the ASME Code Committees and is reflected in the latest version of the Code (ASME OM Code-1996) Paragraphs I 4.1.2(d) and I 4.1.3(d). In addition, for liquid service valves, this is consistent with the NRC recommendation in NUREG-1482, Paragraph 4.3.9(6). |
|-------------------------------|---|
| Alternative                   |   |
| Testing:                      | For safety and relief valves tested under ambient conditions at test<br>temperatures less than 150 degF, using a test medium at or near the<br>prevailing ambient condition the test temperature will be recorded prior<br>to each test but there will be no verification of thermal equilibrium or<br>stability performed. |
| Note:                         | This is a new relief request.   |

# **RELIEF REQUEST - 12**

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| System:        | Various   |
|----------------|---|
| Components:    | All safety and relief valves tested under ambient conditions using a test medium at ambient conditions:   |
|                | PSV-1241, PSV-1242, PSV-1243, PSV-1403, PSV-1404, PSV-1405, PSV-1406, PSV-1407, PSV-1412, PSV-1617, PSV-2415, PSV-2421, PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237, PSV-5238 PSV-5240, PSV-5241   |
| Function:      | Provide over-pressure protection to safety-related systems.   |
| Code Class:    | Class 2 - PSV-1241, PSV-1242, PSV-1243, PSV-1403, PSV-1404, PSV-1405, PSV-1406, PSV-1407, PSV-1412, PSV-2415, PSV-2421 Class 3 - PSV-1617   |
|                | Non-Code - PSV-5215, PSV-5216, PSV-5231, PSV-5232, PSV-5237, PSV-5238, PSV-5240, PSV-5241   |
| Code Category: | С   |
| Code           |   |
| Requirement:   | OM-1987, Part 1, Paragraphs 8.1.2.5 and 8.1.3.5   |
| •              | "Ambient Temperature. The ambient temperature of the operating<br>environment shall be simulated during the set pressure test. If the<br>effect of ambient temperature on set pressure can be established for a<br>particular valve type, then the valve may be set tested using an<br>ambient temperature different "om the operating ambient<br>temperature. Correlations between the operating and testing ambient<br>temperatures shall comply with the requirements of paras. 8.3.2 and<br>8.3.3." (Same test for both paragraphs) |
| Relief         |   |
| Requested:     | Eliminate the requirement for developing temperature correlations<br>between operating and testing ambient temperatures and test valves at<br>ambient conditions at their respective cold set differential set pressure   |

#### RELIEF REQUEST - 12 (cont'd)

This is a new relief request.

Basis for Relief:

At the time the ANO-1 plant systems were designed, valve specifications were determined by the cognizant design engineer who then established the respective technical purchasing specification for each valve. Typically this includes a "cold differential test pressure" that is documented for each valve. Inherent in this effort is the correlation performed by the engineer or the valve manufacturer. Thus, adjustment of the set pressure during periodic testing could result in compensating twice for the temperature difference.

Alternative Testing:

For safety and relief valves tested under ambient conditions the setpoint acceptance criteria will be based on the "cold differential test pressure" provided by the manufacturer or cognizant engine. Temperature correlation will not be performed.

Note:

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# **APPENDIX 5**

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# **REFUELING OUTAGE JUSTIFICATIONS**

| System:           | Core Flooding System   |
|-------------------|--|
| Valve(s):         | CF-1A, CF-1B   |
| Code<br>Class:    | 1  |
| Code<br>Category: | AC   |
| Function:         | These check valves have a closed safety function to act as a pressure boundary between the RCS and the core flood system. They have an active open safety function to provide flowpaths for flow from the core flooding tanks to the Reactor Vessel. |

#### Refueling Outage

Justification: These are check valves with no external means for excreising and no external position indication mechanism. The only practical means of exercising them is to discharge from the core flooding tanks to the Reactor Vessel.

> During plant operation at power exercising is not possible since the pressure in the core flooding tanks cannot overcome the RCS pressure.

At cold shutdown with the RCS intact (reactor head in place), the limited volume in the pressurizer is insufficient to accommodate the influx of water if a core flood tank were to be discharged into the RCS in sufficient volume to fully stroke these valves. In addition, there are system limitations related to low temperature over-pressurization (LTOP) concerns that severely limit test conditions.

There is not a practical method to establish a differential pressure or reverse flow, i.e. closure testing, across CF-1A or CF-1B during either power operation or cold shutdown periods.

#### Alternate Test

Schedule:

Each of these values will be partial-stroke exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

# **REFUELING OUTAGE JUSTIFICATION - 1 (cont.)**

#### Alternate Test

Schedule:

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These valves will be full-stroke exercised during refueling outages using nonintrusive testing sampling techniques to verify valve operability. The nonintrusive testing performed on these valves is in accordance with NUREG 1482, Section 4.1.2 guidelines.

Also, each of these valves will be subjected to a seat leak test at least every two (2) years. The leak testing performed on these valves will also satisfy the reverse flow test requirements for these valves.

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System: Core Flooding /Decay Heat System Valve(s): DH-14A, DH-14B Code Class: 1 Code Category: AC These check valves have a closed safety function to act as a pressure boundary Function:

between the RCS and the core flood and decay heat removal (LPI) systems. They have an active open safety function to provide flowpaths for flow from the core flooding tanks and decay heat removal (LPI) pumps to the Reactor Vessel. The maximum flow through the valves is related to the discharge of a core flooding tank during a large break LOCA.

#### **Refueling Outage**

Justification: These are check valves with no external means for exercising and no external position indication mechanism. The only practical means of exercising them is to discharge from the core flooding tanks to the Reactor Vessel. The capacity of the decay heat removal pumps is insufficient to fully open these valves.

> During plant operation at power exercising is not possible since the pressure in the core flooding tanks or available pumps cannot overcome the reactor coolant system (RCS) pressure.

> At cold shutdown with the RCS intact (reactor head in place), the limited volume in the pressurizer is insufficient to accommodate the influx of water if a core flooding tank were to be discharged into the RCS of sufficient volume to fully stroke these valves. In addition, there are system limitations and concerns related to low pressure over-pressurization (LTOP) concerns that severely it test conditions.

#### Alternate Test

Schedule:

Each of these valves will be partial-stroke exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2. In addition, these valves will be full-stroke exercised during refueling outages using non-intrusive testing sampling techniques to verify valve The non-intrusive testing performed on these valves is in operability. accordance with NUREG 1482, Section 4.1.2 guidelines. Also, each of these valves will be subjected to a seat leak test at least every two (2) years and valve closure is confirmed quarterly.

| 3ystem:           | Reactor Coolant System  |
|-------------------|---|
| Valve(s):         | Reactor Vessel Internal Vent Valves - RC-1009, RC-1010, RC-1011, RC-1012, RC-1013, RC-1014, RC-1015, RC-1016  |
| Code<br>Class:    | 1   |
| Code<br>Category: | с   |
| Function:         | Each of these eight (8) check valves he is an active open safety function to<br>vent the Reactor Vessel upper plenum to the downcomer annulus preventing a<br>hot leg loop seal from forcing the core water level to drop excessively due to<br>steam binding (pressure buildup above the core) following a rupture of the cold<br>leg piping. They have an active closed safety function to prevent reactor<br>coolant from flowing from the inlet nozzle to the core outlet thus effectively<br>bypassing the reactor core. |

#### **Refueling Outage**

Justification: These are check valves of a special design located within the Reactor Vessel. They are not equipped with external actuators and do not have position indicators. There is also no practical method whereby system parameters can be used to stroke these valves nor to observe their operation during either power operation or during cold shutdowns.

#### Alternate Test

Schedule:

Each of these valves will be full-stroke exercised manually during each refueling outage while the reactor vessel head is removed. Both the open and closed position of these valves will be confirmed by this manual exercising. This complies with the requirement of OMa-1988, Part 10, Section 4.3.2.4(c).

| System:           | Makeup and Purification/ High Pressure Injection   |
|-------------------|--|
| Valve(s):         | BW-2, BW-3   |
| Code<br>Class:    | 2  |
| Code<br>Category: | с  |
| Function:         | These stop-check valves have an active open safety function following an ES actuation to provide a flowpath to the makeup pump suction header from the Borated Water Storage Tank (BWST). They have an active closed safety function during "piggy-back" operation to prevent backflow to the BWST in the event that the associated BWST MOV isolation valve fails to close (single failure protection). During normal plant operation they close to prevent backflow of water into the decay heat removal system (non-safety function). |

#### **Refueling Outage**

Justification: These are stop-check valves with no external means of moving the obturators in the open direction. The only practical means of exercising them open during power operation is to pump water from the BWST via the makeup pumps. Because a makeup pump is normally in operation pumping to the reactor coolant system, a flowpath for testing is available, however, adding water in this way is undesirable for the following reasons.

> a. The boron concentration in the BWST is considerably greater than that of the RCS, thus injecting this water into the RCS would cause an undesirable negative power transient.

b. This additional volume of water would cause an undesirable upset in the makeup system flow balance with a transient in the Reactor Coolant Makeup Tank water level.

These valves cannot be full stroke excreised during cold shutdown since operation of the makeup pumps in other than a makeup mode is not permitted due to the possibility of low temperature over-pressure (LTOP) concerns.

# **REFUELING OUTAGE JUSTIFICATION - 4 (cont.)**

#### Alternate Test

Schedule:

The ability of these valves to close will be confirmed quarterly using system parameters.

These values will be partial-stroke exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

These valves will be full-stroke exercised, using flow, during refueling outages.

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System: Decay Heat Removal/ Low Pressure Injection

Valve(s): BW-4A, BW-4B

C

Code Class:

Class: 2

Code Category:

**Function:** These check valves have an active open safety function during an ES actuation to provide flowpaths for borated water from the BWST to the suctions of the low pressure injection pumps and reactor building spray pumps. The design basis flow for these lines is 4,500 gpm. They have a closed safety function to prevent water from flowing back to the BWST during recirculation cooling. In the sequence of shifting to recirculation cooling (decay heat pump suction from reactor building sump) the sump suction valves are opened first then the BWST isolation valves are closed. During this time these check valves must close to prevent gross movement of water from the sump to the BWST.

#### **Refueling Outage**

Justification: These check valves are in the suction lines to the low pressure injection and reactor building spray pumps from the BWST. They are not equipped with external actuators and do not have position indicators. To provide maximum accident flow in these lines during power operation would require simultaneous operation of a low pressure injection pump and reactor building spray pump. These pumps share common pump discharge test header piping. The first check valve in the reactor building spray pump piping is on the suction side of the pump. Consequently, a trip or failure of the reactor building spray pump would allow the low pressure injection pump to pressurize the failed reactor building spray pump piping back to the first check valve in the reactor building spray pump to pressurize the failed reactor building spray system. Therefore, the suction piping of the reactor building spray pump could be overpressurized by an operating low pressure injection pump.

These check valves cannot be full flow tested during cold shutdowns since during decay heat removal operations the low pressure injection pumps cannot be aligned to the BWST.

#### **REFUELING OUTAGE JUSTIFICATION - 5 (cont.)**

## Alternate Test

Schedule:

These check valves are partial stroke tested quarterly during the testing performed on the low pressure injection pumps and the reactor building spray pumps. In addition, these valve are reverse flow (closure) tested quarterly by establishing a differential pressure across the valve.

These check valves will be full flow tested during refueling outages. This test will be accomplished by utilizing each low pressure injection pump in succession in filling the fuel transfer canal in preparation for refueling activities in conjunction with operation of the associated reactor building spray pump on the test header.

2

System:Service Water SystemValve(s):SW-11, SW-13CodeClass:Created as Class 3Code

Category: C

**Function:** These check valves have an active open safety function to provide flowpaths from the service water headers to the suction of the emergency feedwater pumps when the service water system is selected as the suction source.

#### **Refueling Outage**

Justification: These are check valves with no external means for exercising and no external position indication mechanism. The only practical means of exercising them open is to move water from the service water system through each valve. Significant flow through these valves can only be induced by aligning the system for flow to the associated emergency feedwater pumps or attaching a temporary line to an installed flange connection where the water can be directed to an appropriate drain path. Pumping service water into the condensate or feedwater system that could catastrophically upset plant chemistry. Installing a temporary connection can be done but the manpower resources required by frequent testing in this way would put an undue burden on the plant staff if this were performed at a frequency more than once each refueling.

#### Alternate Test

Schedule:

These valves will be partial-flow exercised quarterly by opening the associated upstream MOV and observing flow through the tell-tale drain lines per the provisions of OMa-1988, Part 10, Section 4.3.2.2.

During each refueling outage these valves will be full-stroke exercised with flow.

 System:
 Makeup and Purification System

 Valve(s):
 CZ-46

 Code
 2

 Category:
 C

Functio..: This check valve has a closed safety function to provide a boundary between the Makeup and Purification System and non-code piping.

#### **Refueling Outage**

Justification: This is a check valve with no external means for exercising and no external position indication mechanism. Non-code piping upstream of CZ-46 has the same pressure rating as the piping downstream of CZ-46. The upstream piping is isolated by normally closed isolation valves. There are no vents or drains between CZ-46 and these normally closed isolation valves. If these isolation valves were to be open to test CZ-46 and CZ-46 were to fail then a LOCA outside containment could be created. Given the passive status of CZ-46, the remote potential for failure, and the lack of a reasonable way to establish sufficient reverse differential pressure/flow across the valve the only practical means of confirming the capability of CZ-46 to accomplish its safety function is by disassembly.

This value is in the flowpath from the clean waste system to the makeup and purification system. During cold shutdowns and refueling outages this line typically remains isolated since water in the clean waste system is of insufficient quality to be mixed with makeup water to the RCS.

#### Alternate Test

#### Schedule:

**ile:** This valve will be disassembled and inspected during each refueling outage. Following reassembly, there is not a practical way to establish the closed position of this valve with system parameters or by non-intrusive testing nor is it practical to induce forward flow through this valve.

System: Service Water System Valve(s): SW-604A, SW-604B

3

C

Code Class:

Code Category:

**Function:** These check valves have an open safety function to provide a discharge flow path from the auxiliary building electrical rooms emergency chiller VCH-4A and VCH-4B.

#### **Refueling Outage**

Justification: These are check valves with no external means for exercising and no external position indication mechanism. There is not any flow instrumentation in these lines. The only means of quantifying flow in these lines would be to use portable flow instrumentation. ANO considers it a hardship to setup the portable flow instrumentation on a quarterly or cold shutdown basis.

#### Alternate Test

Schedule:

These valves will be partial stroked exercised at least quarterly during the monthly chiller test. During refueling outages, the ability of these valves to pass their design flow is confirmed by the use of portable flow instrumentation.

System: Emergency Feedwater System

Valve(s): CS-1196, CS-1198

3

C

Code Class:

Code Category:

**Function:** These check valves have an open safety function to provide a discharge flow path from the emergency feedwater pump bearings cooling system.

#### **Refueling Outage**

Justification: These are check valves with no external means for exercising and no external position indication mechanism. These check valves are in one half inch piping downstream of manual throttle valves. The manual valves were throttled by monitoring the emergency feedwater pump bearing temperature. There is not any flow instrumentation in this piping. There is not any installed temperature indication on the emergency feedwater pump bearings. The only way to monitor emergency feedwater pump bearing temperatures is with a contact pyrometer. Due to the fact that bearing temperature has to stabilize, operator burden, and equipment run time it is not practical to perform this testing at any frequency other than once per refuel cycle.

The piping in which these valves are located does not have sufficient isolation valves to verify the ability of CS-1196 and CS-1198 to open.

#### Alternate Test

Schedule:

These valves are in piping with a constant flow through them. The ability of these valves to satisfy their open safety function will be verified once per refueling outage cycle by monitoring the emergency feedwater pump bearing temperature with contact pyrometers. The bearing temperatures obtained will be compared to limits established in the pump operating procedures to confirm valve operability.

# **APPENDIX 6**

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# **COLD SHUTDOWN JUSTIFICATIONS**

System: Steam Generator Secondary System

Valve(s): CV-2691, CV-2692

2

B

Code Class:

Code Category:

**Function:** These spring-loaded normally-open air-operated valves have an active closed safety function to isolate the steam generators on a MSLI actuation signal to prevent unrestricted blowdown of both steam generators in the event of a downstream steam leak, help ensure a source of steam for EFW pump operation, and to isolate the steam generators in the event of a tube rupture. In the open position this valve provides a pathway for steam from the steam generators to the main turbine generator and auxiliaries. There is no safety function associated with steam flow downstream of this valve.

#### Cold Shutdown

# Justification: Closure of either of these valves under power conditions effectively isolates the associated steam generator. This, in turn, would result in an extreme power transient and a plant trip. There is a valve control mechanism that allows a partial stroke (approximately 10%) during power operation.

#### Alternate Test

Schedule: These valves will be full-stroke exercised in the closed direction and fail safe tested during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2. In addition, these valves will be partial stroke tested during power operation.

System: Emergency Feedwater (EFW) System

Valve(s): FW-55A, FW-55B, FW-56A, FW-56B

Code Class:

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Code Category: 3

C

**Function:** These check valves have an active open safety function to provide a flowpath from the emergency feedwater pumps to the steam generators following an EFIC actuation. They have an active closed safety function to prevent recirculation and provide the required EFW flow to a steam generator in the event that the associated EFW pump should fail.

#### Cold Shutdown

Justification: Reverse flow closure testing of these check valves during operation is not possible because it requires the disablement of both emergency feedwater trains. Testing evolutions which disable multiple trains of a safety system are not considered prudent in any mode in which that safety system is required to be operable. Specifically, the suction isolation valves to one train of emergency feedwater are required to be isolated in conjunction with the connection of a test jumper to the opposite train from the condensate transfer header for the performance of this test.

#### Alternate Test

Schedule:

These check valves are full stroke exercised with flow in the open direction quarterly.

These check valves will be reverse flow exercised during cold shutdowns in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

 

 System:
 Steam Generator Secondary System

 Valve(s):
 CV-2630 CV-2680

 Code Class:
 2

 Code Category:
 B

 Function:
 These normally-open motor-operated valves have an active closed safely function to isolate the main feedwater system from the steam generators

function to isolate the main feedwater system from the steam generators following a MSLI actuation signal. They are normally open to provide feedwater supply to the steam generators - non-safety function.

#### **Cold Shutdown**

Justification: Closure of either of these valves during power operation results in the loss of feedwater to the associated steam generator. This, in turn, would cause a loss of steam generator level control, severe plant transient, and ultimately a plant trip. There is, however, a valve control mechanism that allows a partial stroke (approximately 10%) during power operation.

#### Alternate Test

Schedule: These valves will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2. In addition, these valves will be partial stroke tested during power operation.

| System:   | Service Water System - Intake Structure  |
|-----------|--|
| Calve(s): | SW-1A, SW-1B, SW-1C  |
| Code      |  |
| Class:    | 3  |
| Code      |  |
| Category: | AC   |
| Function: | These check values have an active open safety function to provide service<br>water flow from the service water pumps to the service water headers. They      |
|           | have an active closed safety function to prevent reverse flow through an idle<br>pump. This valve is required to be leak tested to ensure maintenance of ECP |

inventory per DBA analysis requirements.

#### Cold Shutdown

Justification: These are check valves with no external means of moving the obturator or any external position indication devices. The service water system provides a continuous supply of cooling water to the two safety-related (essential) service water headers as well as the non-essential header related to main turbine generator and other plant support auxiliaries. During normal plant operation at power the heat removal demands of the service water system require the operation of at least two and sometimes three pumps. After the system operation reaches a degree of stability, perturbation of flow to any of the online heat exchangers could have a severe adverse impact on plant operation with the potential for unacceptable flow and temperature transients. This situation also precludes any major flow adjustments on specific heat loads. As such, there is no assurance that, under certain heat load requirements, a pump can be secured to reverse-flow test its associated discharge check valve.

#### Alternate Test

Schedule:

These check valves will be full-stroke exercised with flow in the open direction quarterly.

These check valves will be reverse flow exercised during cold shutdown periods (or more frequently when practical) in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

| System:   | Service Water System  |
|-----------|---|
| Valve(s): | SW-9  |
| Code      |   |
| Class:    | 3   |
| Code      |   |
| Category: | AC  |
| Function: | This check valve has an a<br>from the service water sy<br>coolers upon isolation of |

This check valve has an active closed safety function to prevent reverse flow from the service water system through the intermediate cooling water (ICW) coolers upon isolation of the service water supply to the coolers. It opens to provide return flow from the coolers - non-safety function. This valve is required to be leak tested to ensure maintenance of ECP inventory per DBA analysis requirements.

## Cold Shutdown

Justification: This is a check valve with no external means of moving the obturator or any external position indication devices, thus reverse flow testing of this valve requires an extended shutdown of cooling water to the ICW coolers. During normal plant operation at power the heat removal demands of the ICW system requires the supply of cooling water to the ICW coolers. Perturbation of flow to any of the on-line heat exchangers served by ICW (including reactor plant auxiliaries) could have a severe adverse impact on plant operation with the potential for unacceptable flow and temperature transients, equipment damage, and a plant trip.

#### Alternate Test

Schedule:

1

This check valve will be reverse flow exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

| System:   | Service Water System   |
|-----------|--|
| Valve(s): | CV-3643  |
| Code      |  |
| Class:    | 3  |
| Code      |  |
| Category: | A  |
| Function: | This normally-open motor-operated value<br>to maximize service water flow to the I<br>auxiliary cooling water (ACW) loop |

This normally-open motor-operated valve has an active closed safety function to maximize service water flow to the Loop 1 and 2 headers by isolating the auxiliary cooling water (ACW) loop under emergency conditions. It is required to be leak tested to ensure maintenance of ECP inventory per DBA analysis requirements.

#### Cold Shutdown

Justification: Closing this valve squires a shutdown of cooling water to various coolers supplied by the ACW cooling line. During normal plant operation at power the heat removal demands of the ACW system requires the supply of cooling water to the various coolers. Perturbation of flow to any of the on-line heat exchangers served by ACW (including main turbine generator auxiliaries) could have a severe adverse impact on plant operation with the potential for unacceptable flow and temperature transients, equipment damage, and a plant trip.

## Alternate Test

Schedule:

This valve will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:   | Chilled Water System   |
|-----------|--|
| Valve(s): | AC-60  |
| Code      |  |
| Class:    | 2  |
| Code      |  |
| Category: | AC   |
| Function: | This normally-open check valve has containment isolation. The open fur |

nction: This normally-open check valve has an active closed safety function to provide containment isolation. The open function of allowing chilled water flow to the reactor building coolers is not a safety function and this line is normally isolated under accident conditions.

#### **Cold Shutdown**

Justification: This is a check valve with no external means of moving the obturator or any external position indication devices, thus reverse flow testing of this valve requires an extended shutdown of the reactor building coolers, and, since these coolers are the only significant chilled water heat load, the main chillers would also be secured. Performing the evolutions of securing the main chillers and of providing an alternate means of coolin, to the reactor building on a quarterly interval is not practical. The demands on the plant staff and temperature effects on other parts of the plant are not commensurate with any gain in safety resulting from performing this test every three months.

#### Alternate Test

Schedule:

This check valve will be reverse flow exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

| System:           | Chilled Water System  |
|-------------------|---|
| Valve(s):         | CV-6202, CV-6203, CV-6205   |
| Code<br>Class:    | 2   |
| Code<br>Category: | A   |
| Function:         | These normally-open power-operated values have an active closed safety function on an ES actuation signal to provide containment isolation. In the open position they provide flowpaths for the supply and return of chilled water for cooling in the reactor building - non-safety function. |

#### Cold Shutdown

Justification: Testing of these valves requires a shutdown of the reactor building coolers, and, since these coolers are the only significant chilled water heat load, the main chillers would also be secured. Performing the evolutions of securing the main chillers and of providing an alternate means of cooling to the reactor building on a quarterly interval is not practical. The demands on the plant staff and temperature effects on other parts of the plant are not commensurate with any gain in safety resulting from performing this test every three months.

### Alternate Test

Schedule: These valves will be full-stroke exercised in the closed (fail-saft .ested for CV-6202 and CV-6203) direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Reactor Coolant System   |
|-------------------|--|
| Valve(s):         | SV-1077, SV-1079   |
| Code<br>Class:    | 1  |
| Code<br>Category: | В  |
| Function:         | These normally-closed solenoid-operated valves provide the pressure boundary<br>between the RCS and the containment atmosphere. They have an active open<br>safety function to vent non-condensable gases from the pressurizer to ensure |

natural circulation under accident conditions.

#### Cold Shutdown

Justification: These valves connect directly to the reactor coolant system (RCS) and are the Class 1 isolation valves for the system, forming part of the RCS boundary. Opening any of these valves during power operation exposes the plant to the possibility of a valve failure in the open position and the potential of developing a significant reactor coolant leak. Although the maximum leakage potential from this line is less than that defined as a loss of coolant accident it could be of sufficient magnitude as to exceed the ANO-1 Technical Specification limits and force an expedited plant shutdown and cooldown. In addition, historical data and operational experience related to these valves indicate a high potential for seat leakage - a problem that would be exacerbated by repeated (quarterly) operation at RCS operating pressure.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in both the open and closed (includes fail-safe testing) directions during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.
| System:           | Reactor Coolant System  |
|-------------------|---|
| Valve(s):         | SV-1071, SV-1072, SV-1073, SV-1074  |
| Code<br>Class:    | 1   |
| Code<br>Category: | В   |
| Function:         | These normally-closed solenoid-operated valves provide the pressure boundary<br>between the RCS and the containment atmosphere. They have an active open<br>safety function to vent non-condensable gases from the reactor vessel to ensure<br>natural circulation under accident conditions. |

#### **Cold Shutdown**

Justification: These valves connect directly to the reactor coolant system (RCS) and are the Class 1 isolation valves for the system, forming part of the RCS boundary. Opening any of these valves during power operation exposes the plant to the possibility of a valve failure in the open position and the potential of developing a significant reactor coolant leak. Although the maximum potential from this line is less than that defined as a loss of coolant accident it could be of sufficient magnitude as to exceed the ANO-1 Technical Specification limits and force an expedited plant shutdown and cooldown. In addition, hist- ical data and operational experience related to these valves indicate a high potential for seat leakage - a problem that would be exacerbated by repeated (quarterly) operation at RCS operating pressure.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in both the open and closed (includes fail-safe testing) directions during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Reactor Coolant System  |
|-------------------|---|
| Valve(s):         | SV-1081, SV-1082, SV-1083, SV-1084<br>SV-1091, SV-1092, SV-1093, SV-1094  |
| Code<br>Class:    | 1   |
| Code<br>Category: | В   |
| Function:         | These normally-closed solenoid-operated valves provide the pressure boundary<br>between the RCS and the containment atmosphere. They have an active open<br>safety function to vent non-condensable gases from the reactor coolant loop<br>high points to ensure natural circulation under accident conditions. |
|                   |   |

#### Cold Shutdown

Justification: These valves connect directly to the reactor coolant system (RCS) and are the Class 1 isolation valves for the system, forming part of the RCS boundary. Opening any of these valves during power operation exposes the plant to the possibility of a valve failure in the open position and the potential of developing a significant reactor coolant leak. Although the maximum potential from this line is less than that defined as a loss of coolant accident it could be of sufficien 1 agnitude as to exceed the ANO-1 Technical Specification limits and force an expedited plant shutdown and cooldown. In addition, historical data and operational experience related to these valves indicate a high potential for seat leakage - a problem that would be exacerbated by repeated (quarterly) operation at RCS operating pressure.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in both the open and closed (includes fail-safe testing) directions during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

 System:
 Reactor Coolant System

 Valve(s):
 PSV-1000

 Code
 1

 Code
 1

 Code
 B

 Function:
 This pilot-operated electromatic relief valve (PORV) has active open safety functions to relieve BCS pressure to preclude challenging the Code safety

function: This phot-operated electromatic rener valve (PORV) has active open safety functions to relieve RCS pressure to preclude challenging the Code safety valves, mitigate a tube rupture event, and when the reactor coolant system is operated at low temperatures this valve provides over-pressure protection (LTOP) to reactor coolant system components.

#### Cold Shutdown

Justification: This value is part of the Class 1 isolation for the RCS, forming part of the RCS boundary. Opening this value during power operation exposes the plant to the possibility of a value failure in the open position and the potential of developing a significant reactor coolant leak. In addition, historical data and operational experience related to this value indicate a high potential for failure of this value to re-close.

#### Alternate Test

Schedule: This valve will be full-stroke exercised in both the open and closed (includes fail-safe testing) directions during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Primary Makeup and Purification System/High Pressure Injection   |
|-------------------|--|
| Valve(s):         | MU-19A, MU-19B, MU-19C   |
| Code<br>Class:    | 2  |
| Code<br>Category: | с  |
| Function:         | These check valves have an active open safety function during an ES actuation<br>to provide flowpaths from the primary makeup pumps via the high pressure<br>injection headers to the RCS. They have an active closed safety function to<br>maximize high pressure injection flow following an ES actuation by preventing<br>recirculation through an idle pump. |

#### **Cold Shutdown**

Justification: These are check valves with no external means of moving the obturator in the open or closed directions or any external position indication devices. During plant operation at power the maximum flow that can be directed through these valves is limited to that of the reactor coolant system makeup rate which is substantially less than that required under accident conditions. This limit is based on the following:

> With a pump operating at the design accident flow, the flowrate into the reactor coolant system will exceed the letdown capacity and there is insufficient space available in the pressurizer to accommodate the influx of water.

- At the accident flowrate, normal makeup flow would necessarily be augmented by additional flow directed into the RCS via the high pressure injection nozzles. This would result in additional thermal stress cycles at these critical areas.
- The capacity of the normal makeup pump suction source (Reactor Coolant Makeup Tank) is not sufficient to provide flow to the pump suction at the accident flowrate, thus water from the borated water storage tank (BWST) would be needed to supplement this water source. Water in the BWST is maintained at a higher boric acid concentration than that of the RCS and, as a result, injection of BWST water into the RCS would result in an unacceptable power transient that would jeopardize plant operation.

#### COLD SHUTDOWN JUSTIFICATION - 13 (cont.)

#### Alternate Test

Schedule: These check valves will be reverse flow exercised quarterly.

These check valves will be full-stroke exercised with flow in the open direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

These check valves are partial stroke exercised with flow quarterly.

| System:           | Primary Makeup and Purification System/High Pressure Injection   |
|-------------------|--|
| Valve(s):         | MU-1211, MU-1212, MU-1213, MU-1214, MU-1215  |
| Code<br>Class:    | 2  |
| Code<br>Category: | с  |
| Function:         | These check valves have an active open safety function during an ES actuatio<br>to provide flowpaths from the primary makeup pumps via the high pressur<br>injection headers to the RCS. MU-1212 has an active non-safety close<br>function to direct all normal makeup flow to the RCS. |

#### **Cold Shutdown**

- Justification: These are check valves with no external means of moving the obturator in the open or closed directions or any external position indication devices. During plant operation at power flow cannot be directed through these valves to the reactor coolant system based on the following:
  - \* With a pump operating at the design accident flow, the flowrate into the reactor coolant system will exceed the letdown capacity and there is insufficient space available in the pressurizer to accommodate the influx of water.
  - \* At the accident flowrate water would necessarily be directed into the RCS via the high pressure injection nozzles. This would result in additional thermal stress cycles at these critical areas.
  - The capacity of the normal makeup pump suction source (Reactor Coolant Makeup Tank) is not sufficient to provide flow to the pump suction at the accident flowrate, thus water from the borated water storage tank (BWST) would be needed to supplement this water source. Water in the BWST is maintained at a higher boric acid concentration than that of the RCS and, as a result, injection of BWST water into the RCS would result in an unacceptable power transient that would jeopardize plant operation.

#### Alternate Test

Schedule: These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

System:Primary Makeup and Purification System/High Pressure InjectionValve(s):MU-1306, MU-1307, MU-1308, MU-1309Code<br/>Class:2Code<br/>Category:CFunction:These check valves have an active open safety function during an ES actuation<br/>to provide flowpaths from the primary makeup pumps via the high pressure<br/>injection headers to the RCS.

#### **Cold Shutdown**

Justification: These are check valves with no external means of moving the obturator in the open or closed directions or any external position indication devices. During plant operation at power flow cannot be directed through these valves to the reactor coolant system based on the following:

- \* With a pump operating at the design accident flow, the flowrate into the reactor coolant system will exceed the letdown capacity and there is insufficient space available in the pressurizer to accommodate the influx of water.
- \* At the accident flowrate water would necessarily be directed into the RCS via the high pressure injection nozzles. This would result in additional thermal stress cycles at these critical areas.
- \* The capacity of the normal makeup pump suction source (Reactor Coolant Makeup Tank) is not sufficient to provide flow to the pump suction at the accident flowrate, thus water from the borated water storage tank (BWST) would be needed to supplement this water source. Water in the BWST is maintained at a higher boric acid concentration than that of the RCS and, as a result, injection of BWST water into the RCS would result in an unacceptable power transient that would jeopardize plant operation.

#### Alternate Test

Schedule: These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

| System:           | Primary Makeup and Purification System/High Pressure Injection   |
|-------------------|--|
| Valve(s):         | MU-34A, MU-34B, MU-34C, MU-34D   |
| Code<br>Class:    | 1  |
| Code<br>Category: | с  |
| Function:         | These check valves have an active open safety function during an ES actuation<br>to provide HP injection flow into the reactor vessel from HP injection loops. |
|                   |  |

#### Cold Shutdown

Justification: These are check valves with no external means of moving the obturator in the open or closed directions or any external position indication devices. During plant operation at power full flow cannot be directed through these valves to the reactor coolant system based on the following:

- \* With a pump operating at the design accident flow, the flowrate into the reactor coolant system will exceed the letdown capacity and there is insufficient space available in the pressurizer to accommodate the influx of water.
- At the accident flowrate water would be directed into the RCS via the high pressure injection nozzles. This would result in additional thermal stress c, ites at these critical areas (applicable to MU-34A/B/C; MU-34D is in normal makeup path).

The capacity of the normal makeup pump suction source (Reactor Coolant Makeup Tank) is not sufficient to provide flow to the pump suction at the accident flowrate, thus water from the borated water storage tank (BWST) would be needed to supplement this water source. Water in the BWST is maintained at a higher boric acid concentration than that of the RCS and, as a result, injection of BWST water into the RCS would result in an unacceptable power transient that would jeopardize plant operation.

#### Alternate Test

Schedule:

These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

System:Primary Makeup and Purification Systemre InjectionValve(s):MU-66A, MU-66B, MU-66C, MU-56D

Code Class:

Code Category: C

Function: These check valves have an active open safety function during an ES actuation to provide HP injection flow into the reactor vessel from HP injection loops.

#### **Cold Shutdown**

- Justification: These are stop to ck valves, their handwheels are secured in the open direction, with no practical means of moving the obturator in the open or closed directions or any external position indication devices. During plant operation at power full flow cannot be directed through these valves to the reactor coolant system based on the following:
  - \* With a pump operating at the design accident flow, the flowrate into the relation coolant system will exceed the letdown capacity and there is insufficient space available in the pressurizer to accommodate the influx of water.

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- \* At the accident flowrate water would be directed into the RCS via the high pressure injection nozzles. This would result in additional thermal stress cycles at these critical areas (applicable to MU-66A/B/C; MU-66D is in normal makeup path).
- The capacity of the normal makeup pump suction source (Reactor Coolant Makeup Tank) is not sufficient to provide flow to the pump suction at the accident flowrate, thus water from the borated water storage tank (BWST) would be needed to supplement this water source. Water in the BWST is maintained at a higher boric acid concentration than that of the RCS and, as a result, injection of BWST water into the RCS would result in an unacceptable power transient that would jeopardize plant operation.

#### Alternate Test

Schedule:

These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

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| System:           | Primary Makeup and Purification System   |
|-------------------|--|
| Valve(s):         | CV-1270, CV-1271, CV-1272, CV-1273, CV-1274  |
| Code<br>Class:    | 2  |
| Code<br>Category: | A  |
| Function:         | These normally-open motor-operated valves provide flowpaths for seal water<br>leakoff from the reactor coolant pumps - non-safety function. They have an<br>active closed safety function on an ES actuation signal to provide containment<br>isolation. |
| Cald Should       |  |

#### Cold Shutdown

Justification: Isolation of the reactor coolant pump seal bleedoff lines or alternate seal bleedoff line to the quench tank would subject the seals to severe hydraulic and/or thermal transients, potentially resulting in seal damage or even failure.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:   | Primary Makeup and Purification System   |
|-----------|--|
| Valve(s): | CV-1275  |
| Code      |  |
| Class:    | 2  |
| Code      |  |
| Category: | В  |
| Function: | This normally-open motor-operated stop-check valve has an active closed<br>safety function to preclude losing suction flow to the HPI pumps by emptying<br>the Reactor Coolant Makeup Tank when the BWST is aligned to the HPI<br>pump suction. In addition, during "piggy-back" operation it prevents coolant<br>from entering the Reactor Coolant Makeup Tank and the remainder of the |

#### **Cold Shutdown**

purification system.

Justification: Closing this valve would necessitate the shut down of the running makeup pump due to the loss of suction. This, in turn, would result in a transient of pressurizer level and the loss of seal injection flow to the reactor coolant pump (RCP) seals. The resulting hydraulic and/or thermal transient has the potential to result in damage to the RCP seals.

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#### Alternate Test

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Schedule: This valve will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Primary Makeup and Purification System  |
|-------------------|---|
| Valve(s):         | CV-1300, CV-1301  |
| Code<br>Class:    | 2   |
| Code<br>Category: | В   |
| Function:         | These normally-open motor-operated valves have an active closed safety<br>function on an ES actuation signal to isolate the minimum flow recirculation<br>flowpath in order to maximize high pressure injection flow to the reactor |

#### **Cold Shutdown**

coolant system.

Justification: These valves remain open during normal operation to provide minimum flow for pump protection to the running makeup pump. Isolation of his flowpath in a non-ES actuated condition places the pump at risk. A small perturbation in makeup flow requirements could reduce pump flow to less than that required to preclude pump damage. The makeup pumps are particularly vulnerable to this phenomenon in a very short time due to their high speed, high head design.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Emergency Feedwater System  |
|-------------------|---|
| Valve(s):         | FW-13A, FW-13B  |
| Code<br>Class:    | 2   |
| Code<br>Category: | С   |
| Function:         | These check values have an active or en safety function to provide flowmaths  |
|                   | from the EFW pumps to the steam generators. They have a closed safety<br>function to prevent reverse flow from the steam generator when EFW system<br>is not in service to preclude steam binding of the EFW pumps or damage the<br>pump suction header due to over-pressurization. |

#### Cold Shutdown

Justification: These are check valves with no external means for exercising and no external position indication mechanism. The only practical means of exercising is to operate an EFW pump discharging to the steam generators. During plant operation at power this is not practical due to the potential for thermal shock of the steam generator nozzles and internals. During quarterly testing of the EFW pumps, flow is routed through a test recirculation line branching off upstream of these check valves that returns condensate to the respective pump's suction line, thus testing via this flowpath is also impossible.

#### Alternate Test

Schedule:

These check valves will be reverse flow tested quarterly during plant operation.

These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

System:Decay Heat Removal SystemValve(s):CV-1050, CV-1410CodeClass:CV-1050 - Class 1

CV-1410 - Class 2

#### Code

Category: A

**Function:** These normally-closed motor-operated values have a closed safety function to act as a redundant pressure boundary between the reactor coolant system and the decay heat removal system during power operation. Due to past commitments, isolation of the reactor coolant system is considered to be significantly important and, in response to this, this value is seat leakage tested. They have an active open function to provide a decay heat removal flowpath to effect plant cooldown. Note that although this function supports plant cooldown, it is not required since ANO-1 is licensed for hot shutdown only, decay heat removal is considered to be significantly important to safety and testing in the open direction is justified.

#### Cold Shutdown

Justification: These valves are provided with an interlock feature that prevents opening when reactor coolant pressure exceeds 290 psig. Overriding this interlock and opening either of these valves would subject the low pressure rated portions of the decay heat removal/low pressure coolant injection system to reactor coolant pressures separated by only a single closed valve. This is considered to be imprudent under normal RCS operating pressure.

#### Alternate Test

Schedule:

These valves will be full-stroke exercised in both the open and closed directions during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

 System:
 Decay Heat Removal System/Low Pressure Coolant Injection

 Valve(s):
 DH-13A, DH-13B, DH-17, DH-18

 Code
 1

 Code
 1

 Code
 AC

 Function:
 These normally-closed check valves have an active open safety function to provide for decay heat removal and low pressure injection flow to the reactor vessel. They have a closed safety function during normal plant operation to act as a pressure boundary between the RCS and the low pressure decay heat

#### **Cold Shutdown**

removal system.

Justification: These are check valves with no external means for exercising and no external position indication mechanism. Exercising (open) requires operating a LPI (decay heat removal) pump at full flow and injecting into the reactor coolant system. At power operation this is not possible because the LPI pumps cannot develop sufficient discharge pressure to overcome reactor coolant system pressure.

#### Alternate Test

Schedule: These check valves will be reverse flow tested quarterly.

These check valves will be full-stroke exercised in the open direction with flow during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

System: Intermediate Cooling Water System

Valve(s): ICW-26

2

AC

Code Class:

Code Category:

**Function:** This check valve opens to provide a flowpath for cooling water to the reactor coolant pump (RCP) coolers. Cooling of these components is not required for accident mitigation nor for reactor cooldown, thus this is not considered to be a safety function. It has an active closed safety function to provide containment isolation.

#### **Cold Shutdown**

Justification: This is a check valve with no external means for exercising and no external position indication mechanism. Exercising (closed) requires shutting down the system and performing a back leakage test. Isolation of this cooling water flow at power would result in, at a minimum, undesirable temperature transients of RCP seals and motors.

#### Alternate Test

Schedule:

This check valve will be reverse flow exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

 

 System:
 Intermediate Cooling Water System

 Valve(s):
 ICW-30

 Code Class:
 2

 Code Category:
 AC

 Function:
 This cheo valve opens to provide a flowpath for cooling water to the control rod drive (CRD) coolers - non safety function. Cooling of these components is not required for accident mitigation nor for reactor cooldown. It has an active closed safety function to provide containment isolation.

#### **Cold Shutdown**

2

Justification: This is a check valve with no external means for exercising and no external position indication mechanism. Exercising (closed) requires shutting down the system and performing a back leakage test. Subsequent high temperature alarms would require a plant shutdown.

#### Alternate Test

Schedule:

This check valve will be reverse flow exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Fart 10, Section 4.3.2.2.

| System:           | Intermediate Cooling Water System  |
|-------------------|--|
| Valve(s):         | ICW-114  |
| Code<br>Class:    | 2  |
| Code<br>Category: | AC   |
| Function:         | This check valve opens to provide a flowpath for cooling water to the reacto coolant letdown coolers. Cooling of these components is not required fo accident mitigation nor for reactor cooldown, thus this is not considered to be a safety function. It has an active closed safety function to provide |

#### Cold Shutdown

containment isolation.

Justification: This is a check valve with no external means for exercising and no external position indication mechanism. Exercising (closed) requires shutting down the system and performing a back leakage test. At power operation this would result in securing letdown flow. Securing letdown flow during power operation would result in thermal transients to nozzles and piping and perturbations to the makeup system which among other effects will result in a transient in RCP seal injection which could result in damage to the RCP seals.

#### Alternate Test

Schedule:

This check valve will be reverse flow exercised during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.3.2.2.

System: Intermediate Cooling Water System
Valve(s): CV-2234, IA-775
Code Class: 2 (CV-2234), 3 (IA-775)
Code Category: A (CV-2234), C (IA-775)
Function: CV-2234 opens to provide a flowpath for cooling water to the reactor coolant pump (RCP) motor air and lube oil coolers - non safety function. Cooling of these components is not required for accident mitigation nor for reactor cooldown. It has an active closed safety function to provide containment

cooldown. It has an active closed safety function to provide containment isolation. IA-775 is the check valve which maintains accumulator pressure following a loss of instrument air to provide motive force for closure of CV-2234 given a subsequent engineering safeguards isolation signal.

#### **Cold Shutdown**

Justification: Closing CV-2234 isolates cooling water flow to the RCP motor air and lube oil coolers. The loss of cooling water would quickly require shutting off RCP motors as bearing and motor winding temperatures rise. Therefore, closing CV-2234 would jeopardize continue operation of the plant in addition to the actual temperature transient. Likewise, testing IA-775 would requiring closure of CV-2234.

#### Alternate Test

Schedule:

CV-2234 will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Sections 4.2.1.2 and 4.3.2.2. CV-2234 will also be fail safe tested at that time which additionally provides IW-775 closure verification.

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| System:           | Intermediate Cooling Water System  |
|-------------------|--|
| Valve(s):         | CV-2235  |
| Code<br>Class:    | 2  |
| Code<br>Category: | Α  |
| Function:         | This motor-operated valve opens to provide a flowpath for cooling water to<br>the control rod drive (CRD) coolers. Cooling of these components is not<br>required for accident mitigation nor for reactor cooldown, thus this is not<br>considered to be a safety function. It has an active closed safety function to<br>provide containment isolation. |
| Cold Shutd        | own  |

hard aication: Closing this valve requires isolating cooling water flow to the CRD's. High temperature alarm response for multiple CRD's requires a plant trip.

#### Alternate Test

Schedule:

This valve will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Intermediate Cooling Water System  |
|-------------------|--|
| Valve(s):         | CV-2220, CV-2221   |
| Code<br>Class:    | 2  |
| Code<br>Category: | A  |
| Function:         | These motor-operated valves open to provide a flowpath for cooling water<br>from the reactor coolant pump (RCP) and control rod drive coolers Cooling<br>of these components is not required for accident mitigation nor for reactor<br>cooldown, thus this is not considered to be a safety function. It has an active<br>closed safety function to provide containment isolation |

#### Cold Shutdown

Justification: Closing these valves requires isolating cooling water flow to the RCP's and the CRD's. High temperature alarm response for multiple CRD's requires a plant trip.

#### Alternate Test

#### Schedule:

These valves will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

| System:           | Intermediate Cooling Water System  |
|-------------------|--|
| Valve(s):         | CV-2214, CV-2215, CV-2233, IA-767, IA-771  |
| Code<br>Class:    | 2 (CV-2214, CV-2215, CV-2233), 3 (IA-767, IA-771)  |
| Code<br>Category: | A (CV-2214, CV-2215, CV-2233), C (IA-767, IA-771)  |
| Function:         | CV-2214, CV-2215, and CV-2233 open to provide a flowp<br>water to and from the reactor coolant letdown heat exchange<br>these components is not required for accident mitigation re<br>cooldown, thus this is not considered to be a safety function,<br>active closed safety function to provide containment isolation. |

ath for cooling rs. Cooling of or for reactor They have an The associated check valves, IA-767 and IA-771, maintain accumulator pressures following a loss of instrument air to provide motive force for closure of CV-2214 and CV-2233 given a subsequent engineering safeguards isolation signal.

#### Cold Shutdown

Justification: At power operation closing CV-2214, CV-2215, or CV-2233 would result in securing letdown flow. Securing letdown flow during power operation would result in thermal transients to nozzles and piping and perturbations to the makeup system which among other effects will result in a transient in RCP seal injection which could result in damage to the RCP seals. Likewise, testing IA-767 or IA-771 would require closure of CV-2214 or CV-2233, respectively.

#### Alternate Test

Schedule:

CV-2214, CV-2215 and CV-2233 will be full-stroke exercised in the closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Sections 4.2.1.2 and 4.3.2.2. CV-2214 and CV-2233 will also be fail safe tested at that time which additionally provides IW-767 and IA-771 closure verification.

System: Decay Heat Removal System

Valve(s): CV-1404

Code Class: 2

Code Category: B

Function: CV-1404

#### Cold Shutdown

sustification: This valve is deenergized and is locked in its closed position during power operation due to Appendix R motor operated valve (hot short) concerns.

#### Alternate Test

Schedule:

This valve will be full-stroke exercised in both the open and closed direction during cold shutdown periods in accordance with the provisions of OMa-1988, Part 10, Section 4.2.1.2.

## **APPENDIX 7**

# DRAWINGS USED IN PROGRAM PREPARATION

#### **APPENDIX 7**

## DRAWINGS USED IN PREPARATION OF ASME SECTION XI TEST PROGRAM

| Drawing No.  | Title  |
|--------------|--|
| M-204, SH. 3 | Emergency Feedwater                                    |
| M-204, SH. 5 | Emergency Feedwater Storage                            |
| M-204, SH. 6 | EFW Pump Turbine                                       |
| M-206, H. 1  | Steam Generator Secondary                              |
| M-206, SH. 2 | MSIV Operator Controls                                 |
| M-209, SH 1  | Intake Structure                                       |
| M-210        | Service Water  |
| M-213, SH. 2 | Laundry Waste & Containment & Aux. Bldg. Sump Drainage |
| M-214, SH. 3 | Clean Radioactive Liquid Waste                         |
| M-215, SH. 1 | Gaseous Radioactive Waste                              |
| M-217, SH. 1 | Emergency Diesel Generators Fuel Oil System            |
| M-217, SH. 4 | Emergency Diesel Generators Starting Air System        |
| M-218, SH. 4 | Instrument and Service Air                             |
| M-218, SH. 5 | Breathing Air  |
| M-219, SH. 1 | Fire Water   |
| M-220, SH. 3 | Plant Heating and Startup Boiler                       |
| M-221, SH. 2 | Emergency Chilled Water - Electrical Rooms             |
| M-222, SH. 1 | Chilled Water System Reactor and Auxiliary Buildings   |
| M-230, SH. 1 | Reactor Coolant  |
| M-230, SH. 2 | Reactor Coolant  |
| M-231, SH. 1 | Makeup and Purification                                |
| M-231, SH. 2 | Makeup and Purification                                |
| M-231, SH. 3 | Makeup and Purification                                |
| M-232, SH. 1 | Decay Heat Removal                                     |
| M-233        | Chemical Addition                                      |
| M-234, SH. 1 | Intermediate Cooling                                   |
| M-234, SH. 2 | Intermediate Cooling                                   |
| M-235, SH. 1 | Spent Fuel Cooling                                     |
| M-236        | Reactor Building Spray and Core Flooding               |
| M-237, SH. 1 | Sampling   |
| M-261, SH. 1 | Reactor Building HVAC                                  |
| M-261, SH. 3 | Reactor Building HVAC                                  |

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