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Address Reply to: Post Office Box 767
Chicago, Illinois 60690 - 0767

October 3, 1988

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
Zion Station Units 1 and 2
LaSalle Station Units 1 and 2
Byron Station Units 1 and 2
Braidwood Station Units 1 and 2
Response to NRC Bulletin 88-08 &
88-08: Supplement 1 & 2
NRC Docket Nos. 50-237/249, 50-254/265, 50-295/304,
50-373/374, 50-454/455 and 50-456/457

Reference: (a) NRC Bulletin No. 88-08
Dated June 22, 1988
(b) NRC Bulletin No. 88-08, Supplement 1
Dated June 24, 1988
(c) NRC Bulletin No. 88-08, Supplement 2
Dated August 4, 1988

Dear Sir:

The above referenced bulletin and supplements requested that licensees review the reactor coolant system (RCS) to identify any connected, unisolable piping that could be subjected to temperature distributions which would result in unacceptable thermal stresses and (2) take action, where such piping is identified, to ensure that the piping will not be subjected to unacceptable thermal stresses.

Commowealth Edison has completed its review pursuant to the request outlined in Bulletin 88-08 and it supplements for Dresden, Quad Cities, LaSalle, Zion, Byron and Braidwood Stations. The results of that review are attached in enclosures 1-4.

To the best of my knowledge and belief, the statements contained above are true correct. In some respect these statements are not based on my personal knowledge, but information furnished by other Commonwealth Edison employees, contractor employees, and consultants. Such information has been reviewed in accordance with company practice, and I believe it to be reliable.

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Please address any questions that you or your staff may have concerning this response to this office.

Respectfully,

Wayne E Morgan

W.E. Morgan
Nuclear Licensing Administrator

Attachments:
cc: A.B. Davis
Resident Inspector/D/QC/LCS/Z/BY/BW

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Subscribed and Sworn to
before me this 31st day
of October, 1988

Notary Public

ATTACHMENT 1

DRESDEN, QUAD CITIES and LASALLE
COUNTY STATION RESPONSE TO
NRC BULLETIN 88-08 and 88-08:
SUPPLEMENT 1&2

Dresden, Quad Cities and LaSalle County are BWR stations. Farley and Tihange are PWR stations; cracking occurred on unisolable lines under continuous pressure higher than RCS pressure. No such conditions exist at Quad Cities or Dresden; however, certain systems have pressures higher than the RCS. Since these systems are operated infrequently and are isolable, no further action in response to the subject bulletins is required.

At LaSalle County Station the only systems capable of producing inleakage to unisolable sections of the RCS which were not evaluated in the design analysis of the piping are the HPCS and RCIC systems. The HPCS and RCIC systems can produce inleakage during quarterly system functional tests when HPCS and RCIC system pressures exceed RCS pressure. Therefore, the HPCS and RCIC systems are capable of producing stresses from temperature stratification and temperature oscillations in unisolable sections of the RCS.

An engineering evaluation analyzing the effects of HPCS and RCIC inleakage in response to IE Bulletin 88-08 was conducted. This evaluation concluded that even using conservative assumptions for both quantity of inleakage and duration during which inleakage occurs, the effects on piping stress, fatigue usage factor, and support loads were found to be either negligible or bounded by current design loads. Therefore, no further actions are necessary because no unisolable sections of the RCS were or will be subjected to excessive thermal stresses from valve inleakage that could cause fatigue failure during the remaining life of the unit.

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ATTACHMENT 2

ZION STATION RESPONSE TO
NRC BULLETIN 88-08 and 88-08:
SUPPLEMENT 1&2

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C. ZION UNITS 1 and 2

I. Action requested: Review systems connected to the RCS for unisolable piping that could be subjected to the thermal cycling phenomenon. If none are identified then no additional actions are required except for the reporting requirement.

Response: A review of Zion Units 1 and 2 piping systems connected to the Reactor Coolant Systems (RCS) was performed to determine whether unisolable sections of connected piping could be subjected to stresses from temperature stratification or oscillation induced by leaking valves.

For each Zion unit, susceptible sections of piping were identified in:

a. One (01) Alternate charging line, RC065 (3 inches nominal pipe size);

b. One (01) Auxiliary Spray Line, RC145 (2 inches nominal pipe size);

c. Four (04) Charging Pump to Cold Leg Injection lines; RC005, RC038, RC071, RC079 (1.5 inches nominal pipe size);

II. Action Requested: For identified piping, perform non-destructive examination (NDE) of the welds, heat affected zones, and high stress locations including geometric discontinuities and base metal to provide assurance that there are no existing flaws.

Response: NDE will be performed on the following areas of the affected lines:

a. Alternate charging line (RC065), perform NDE on all horizontal sections and the first vertical section, base metal and welds, from the RCS connection back to the first check valve on line RC065. Examination areas are indicated on figure Z-1.

b. On the Auxiliary Spray line (RC145), perform NDE on the first horizontal section, base metal and welds back from the main spray line connection. Examination areas are indicated on figure Z-2.

c. On the SI Cold Leg Injection lines (RC005, RC038, RC071, RC079), perform NDE on the sections, base metal and welds, from the RCS connections back to the first check valves. Examination areas are indicated on figures Z-3, 4, 5 and 6.

NDE of the above piping sections include ultrasonic examinations on base metal and surface examination on sockolet welds. NDE will only be required during the next Unit 1 and 2 refueling outages, unless surveillance indicates otherwise. Completion dates for Unit 1 is by the end of its 1989 refueling outage, and for Unit 2 is by the end of its 1988 refueling outage.

Because Commonwealth Edison currently does not have a proven ultrasonic examination procedure for small diameter piping (3-inch nominal diameter or smaller), ultrasonic examination of base metal for the aforementioned areas during Zion Unit 1 refueling outage will be on a trial basis. If the ultrasonic technique does not perform satisfactorily for small diameter piping, ultrasonic examination on base metal of small diameter piping will not be performed for Zion Unit 2.

III. Action Requested: Develop and implement a program to provide continuing assurance that the identified piping will not be subject to conditions that could cause fatigue failure during the remaining life of the plant.

Response:

a. Temperature monitoring devices will be installed on the Alternate Charging line and on the Auxiliary Spray line in order to identify the temperature profiles downstream of the potentially leaking isolation valves. The temperature profiles will determine the existence and severity of the problem. These temperature profiles will be taken immediately upon each unit startup and immediately after manipulation of one of the subject valves. Completion dates are: Unit 1 - end of 1989 refueling outage, Unit 2 - end of 1988 refueling outage.

b. For the SI Cold Leg Injection Lines (RC005, RC038, RC071, RC079) the following actions will be taken.

   1. Develop and implement a procedure to test valve SI8925 "BIT Bypass" for seat leakage. If the valve is determined to have leakage through, a repair should be made at the earliest opportunity. This test should be performed each time the valve is manipulated and upon each unit start up. This is considered an interim measure as the BIT removal modification will remove the bypass line and valve from service. (Test Completion by September 20, 1988)

   2. After the BIT removal modification (M22-1(2)-88-021) is completed, a surveillance should be implemented to monitor and confirm the leak tightness of the BIT valves. Specifics as to type of testing required will be addressed in the modification design package.

LOOP 1 3" CHARGING

3" Sch. 160/.438"T

System RC
Subsystem 2VC-4

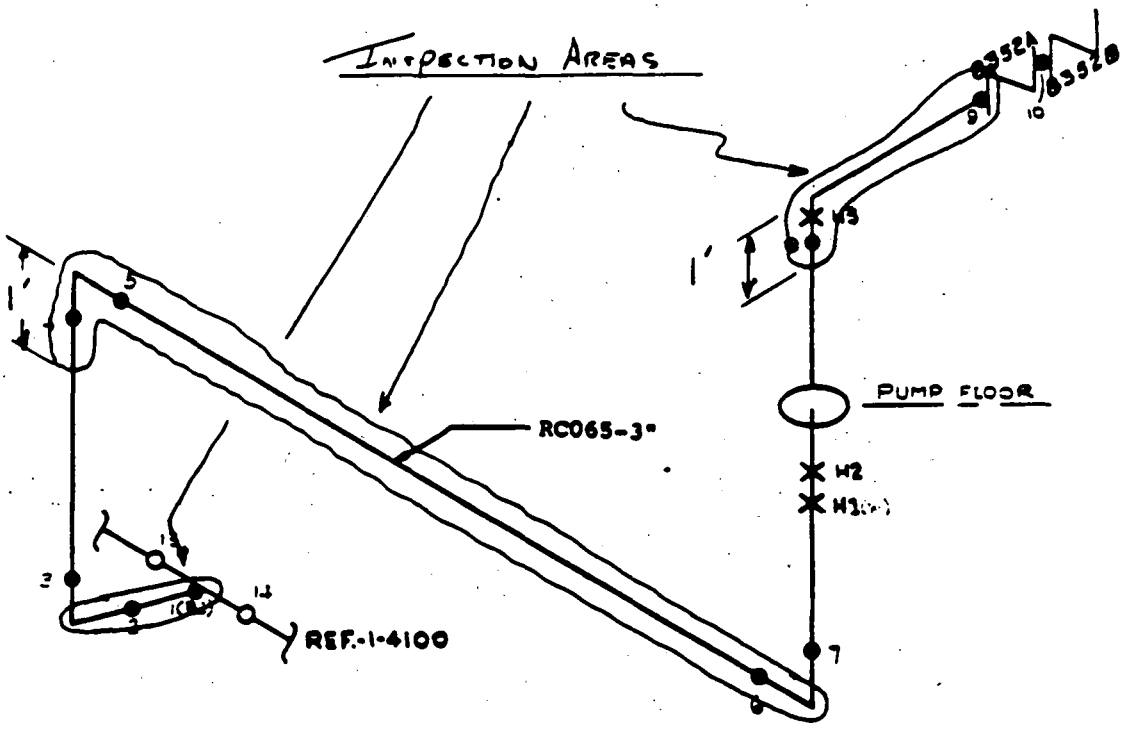

FIGURE Z-1
(Zion Units 1 & 2)

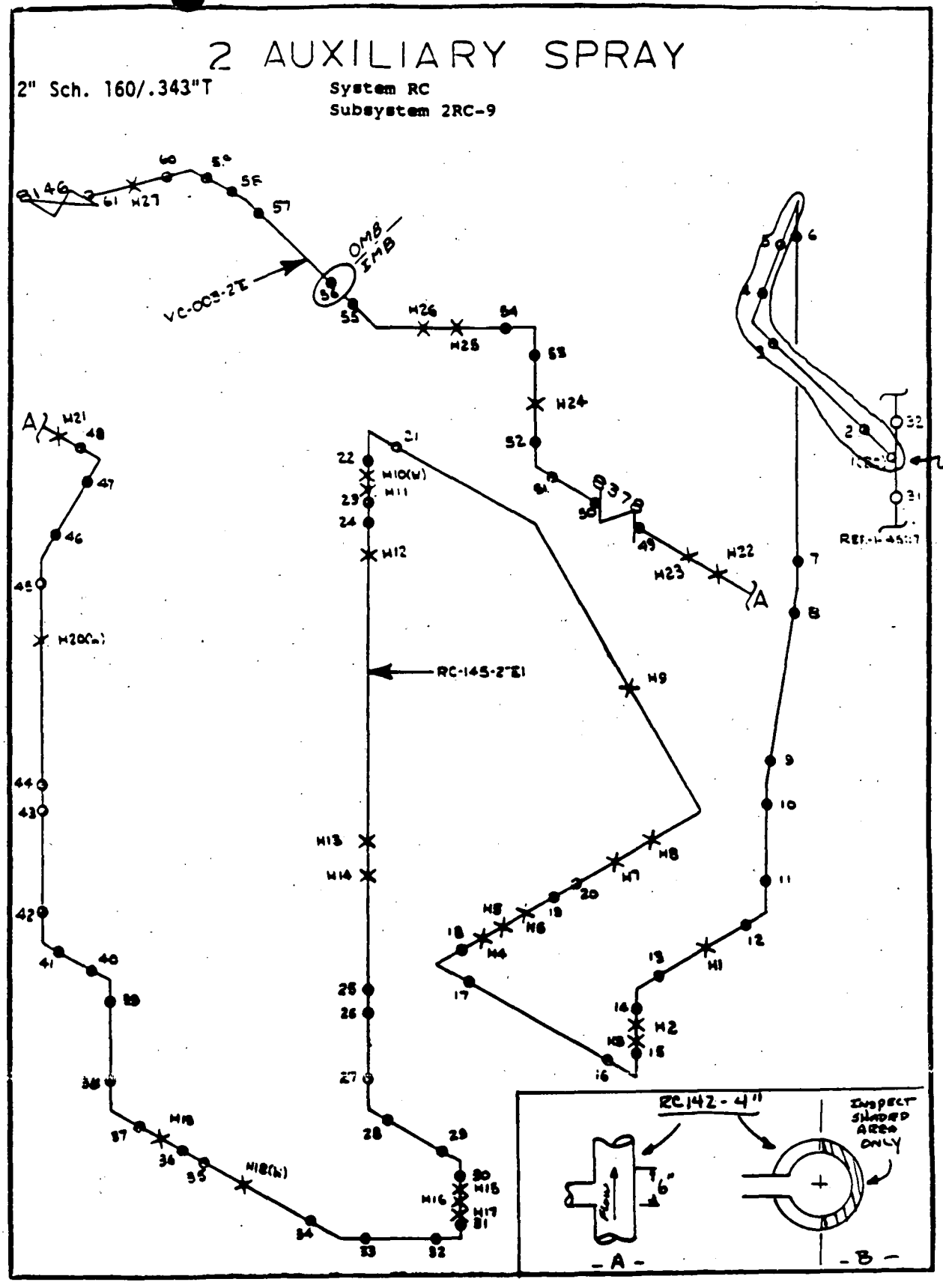

FIGURE Z-2

(Zion Units 1 & 2)

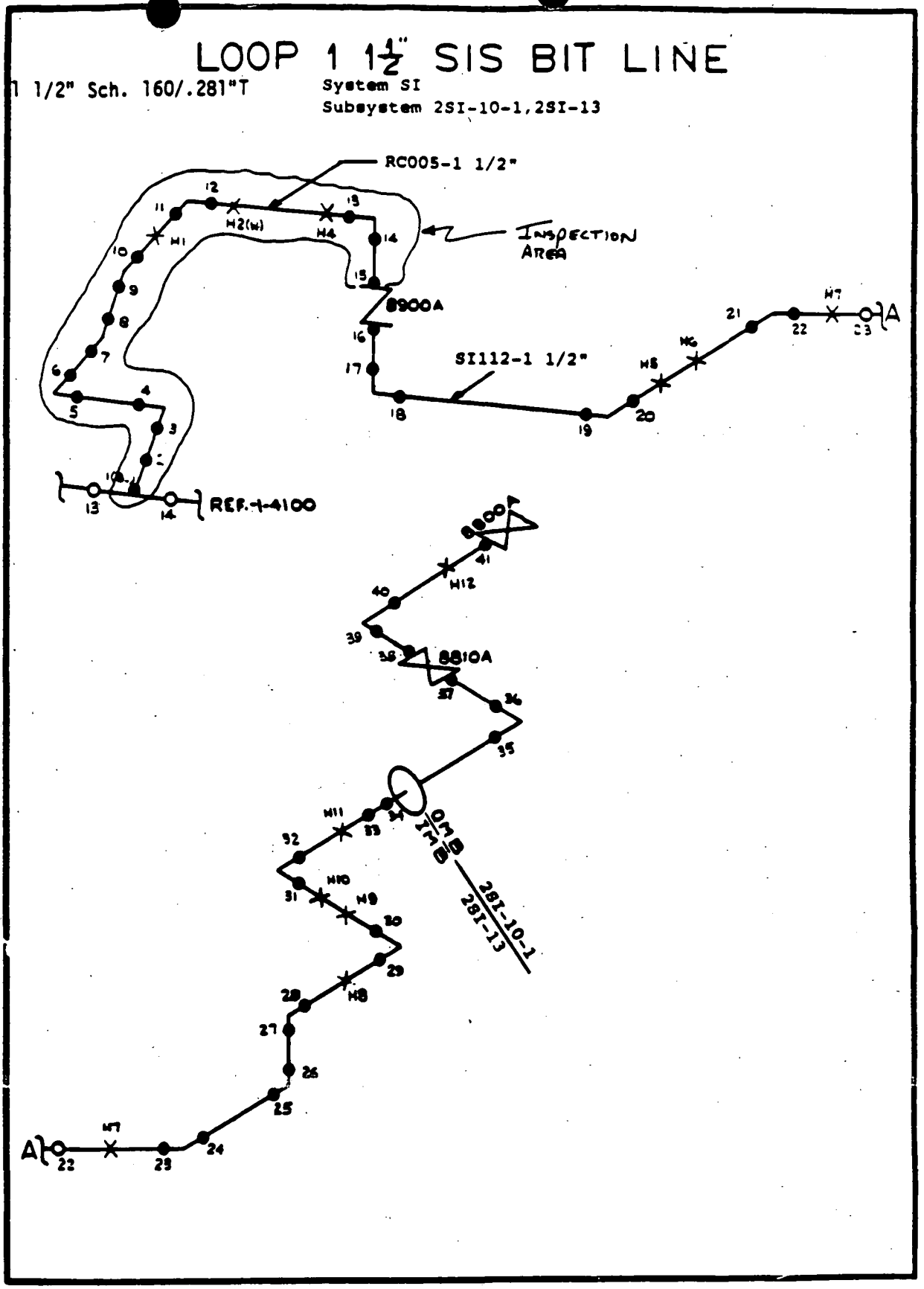

FIGURE Z-3
(Zion Units 1 & 2)

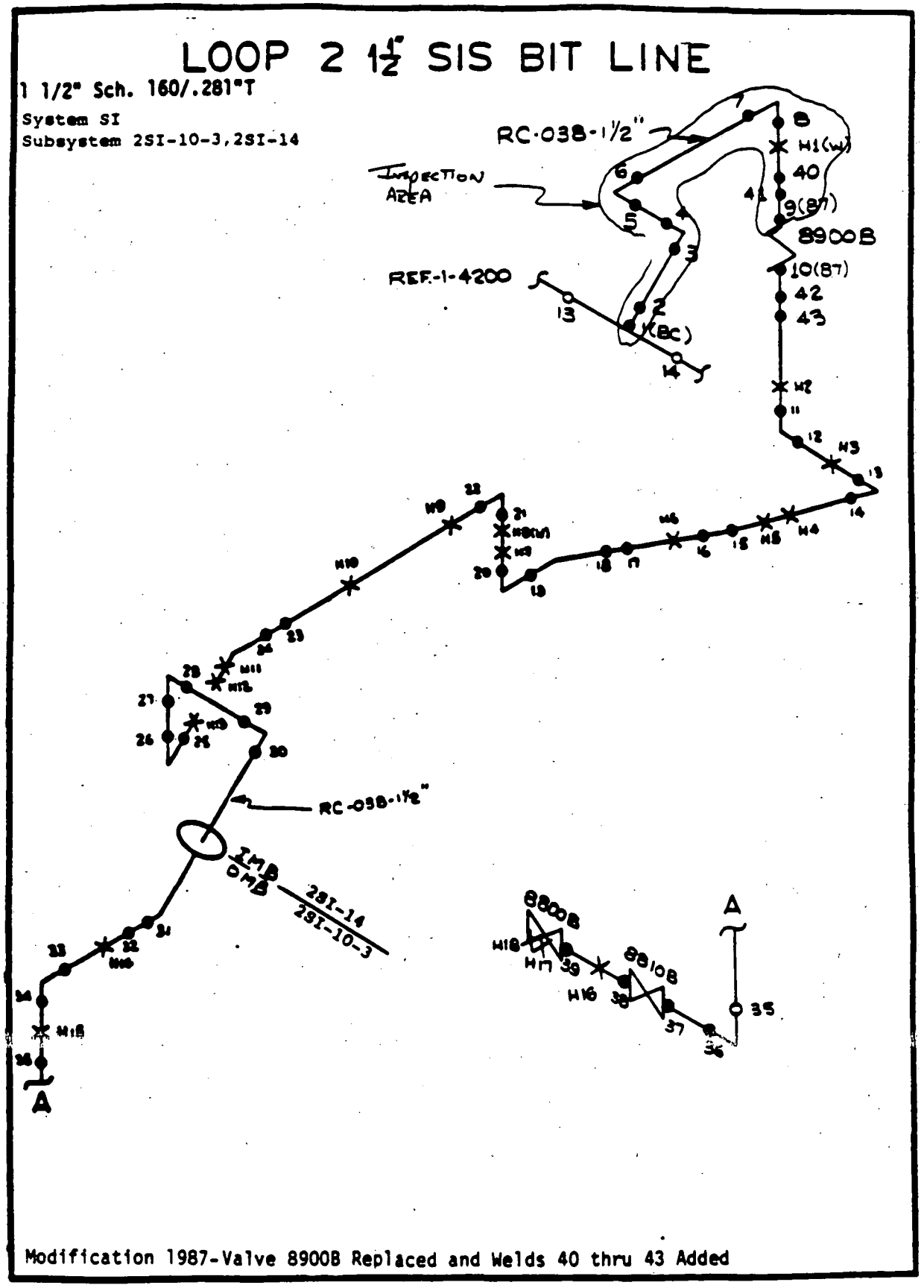

FIGURE Z-4
(Zion Units 1 & 2)

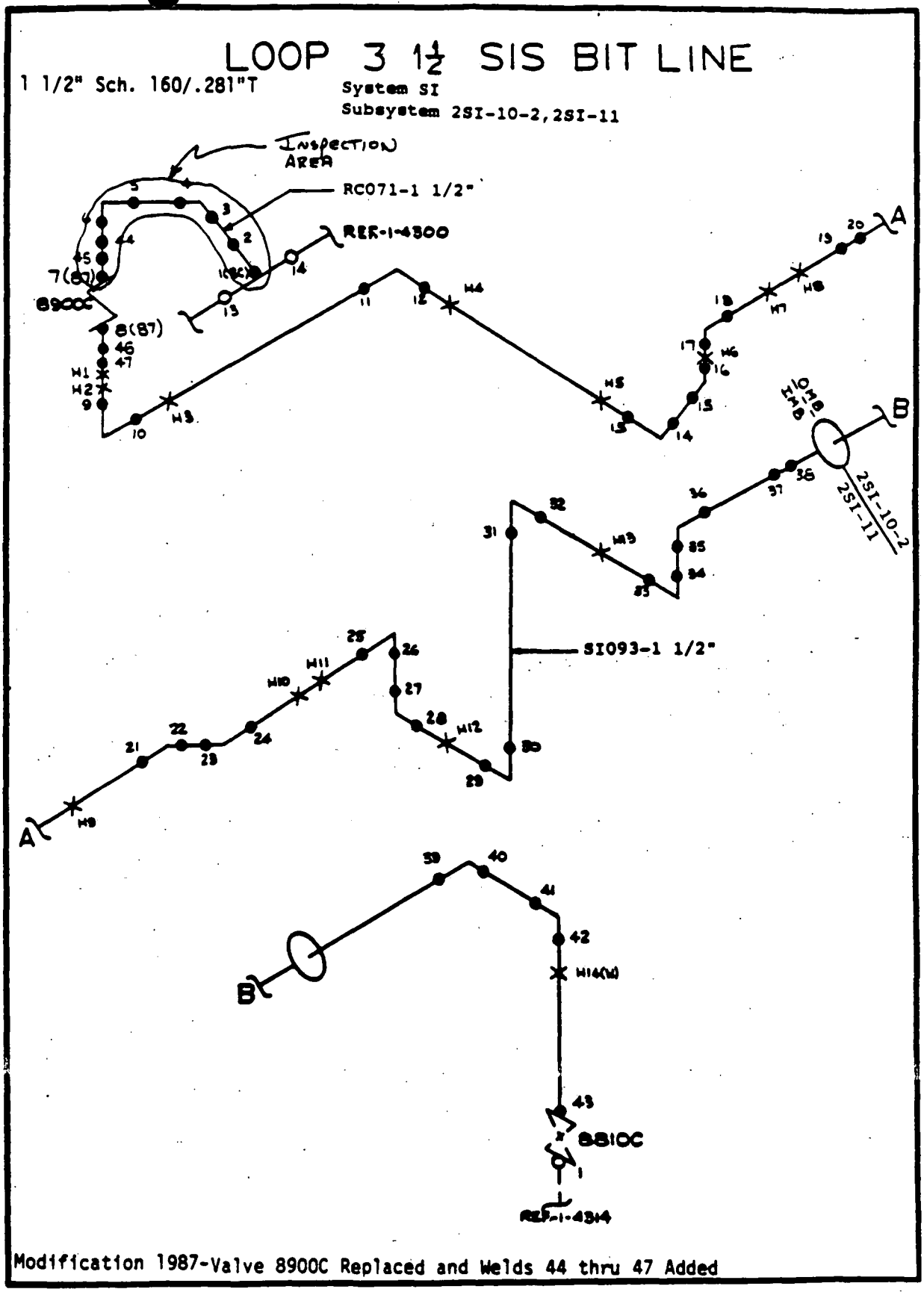

FIGURE Z-5
(Zion Units 1 & 2)

LOOP 4 1½ SIS BIT LINE

1 1/2" Sch. 160/.281"T

System SI

Subsystem 2SI-10-1,2SI-12

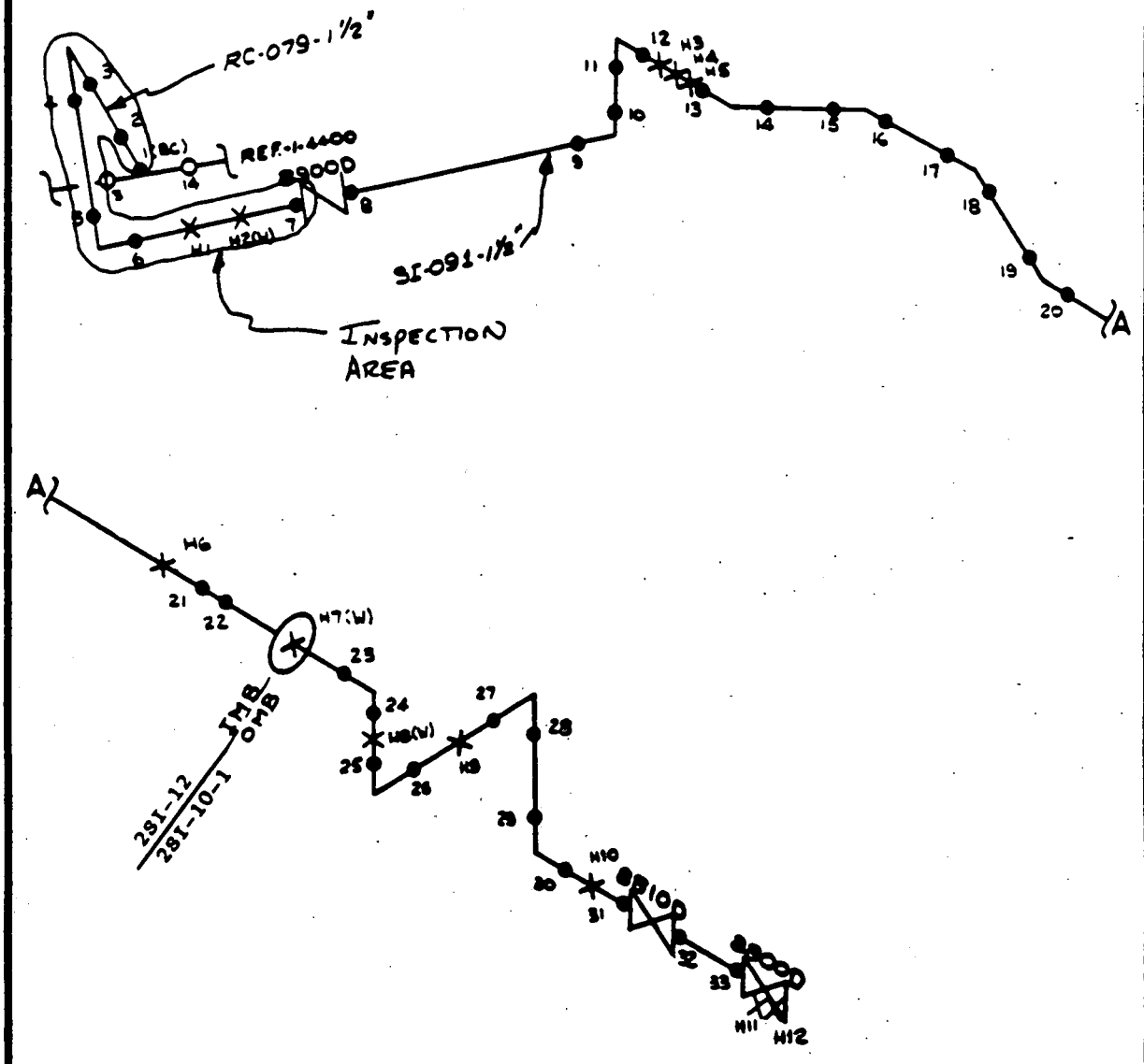

FIGURE Z-6

(Zion Units 1 & 2)

ATTACHMENT 3

BYRON STATION RESPONSE TO
NRC BULLETIN 88-08 and 88-08:
SUPPLEMENT 1&2

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B. BYRON UNITS 1 and 2

I. Action requested: Review systems connected to the RCS for unisolable piping that could be subjected to the thermal cycling phenomenon. If none are identified then no additional actions are required except for the reporting requirement.

Response: A review of Byron Units 1 and 2 piping systems connected to the Reactor Coolant Systems (RCS) was performed by Westinghouse to determine whether unisolable sections of connected piping could be subjected to stresses from temperature stratification or oscillation induced by leaking valves.

For each Byron unit, susceptible sections of piping were identified in:

a. One (01) Auxiliary Spray Line (2 inches nominal pipe size).

b. Four (04) Charging Pump to Cold Leg Injection lines (1.5 inches nominal pipe size).

II. Action Requested: For identified piping, perform non-destructive examination (NDE) of the welds, heat affected zones, and high stress locations including geometric discontinuities and base metal to provide assurance that there are no existing flaws.

Response:

a. During the current Byron Unit 1 refueling outage (began September 2, 1988) the high stress areas on the Auxiliary Spray line will be non-destructively examined. The 2-inch sockolet weld at the RCS piping connection will receive a surface examination and a portion of the 6-inch main spray piping will be ultrasonically examined. Because a proven Commonwealth Edison (CECo) ultrasonic examination procedure for small diameter piping (3-inch nominal diameter or less) does not exist at this time, an additional ultrasonic examination will not be performed at this time for the horizontal section of piping upstream of the 2-inch sockolet weld. Also, a stress analysis of the Auxiliary Spray line will be performed. If the stress analysis indicates that the Auxiliary Spray line is susceptible to fatigue failure and a proven unltrasonic examination procedure for small diameter piping is available, then the horizontal section of the Auxiliary Spray line immediately upstream of the 2-inch sockelet weld will be ultrasonically examined during the NEXT Unit 1 refueling outage (in 1990).

The necessity of performing NDE on the high stress areas on the Auxiliary Spray line at Byron Unit 2 will be determined by a stress analysis of the pipe. If the stress analysis indicates that the pipe is susceptible to fatigue failure, the 2-inch sockolet weld at the RCS connection will receive a surface examination and a portion of the 6-inch main spray piping will be ultrasonically examined. Additionally, if a proven CECo ultrasonic examination procedure for small diameter piping is available in time, the horizontal section of piping upstream of the 2-inch sockolet weld will be examined ultrasonically. In the event that NDE of the Byron Unit 2's Auxiliary Spray line is required, the examinations will be performed during the next Unit 2 refueling outage scheduled to begin in January, 1989. See figure B-1 for the applicable NDE areas.

b. The four (04) Charging Pump to Cold Leg Injection lines will not be examined non-destructively because reasonable assurances can be provided that the thermal stress phenomenon potentially caused by the leakage of the Charging Pump to Cold Leg Injection Isolation Valves (1/2SI8801A,B) has not occurred at Byron Station. Performance of "Reactor Coolant System Isolation Valves" leak test (surveillance procedure 1/2 BVS 4.6.2.2-1) determines back leakage from the Reactor Coolant System through the Charging/Safety Injection Check Valves (1/2SI8815, 1/2SI8900A,B,C,D) to a test tap located between 1/2SI8815 and 1/2SI8801A,B valves. By virtue of the test tap's location, the detection of forward leakage from the Charging Pump through the 1/2SI8801A,B isolation valves is an unintended result of the 1/2 BVS 4.6.2.2-1 performance. Procedure 1/2 BVS 4.6.2.2-1 is routinely performed as follows for the 1/2SI8815 check valves:

1. At least once per 18 months.
2. Prior to entering Mode 2 (Startup) whenever the plant has been in Cold Shutdown for 72 hours or more and if leakage testing has not been performed in the previous 9 months.
3. Prior to returning valves 1/2SI8815 to service following maintenance, repair or replacement work on the valves.
4. Within 24 hours following 1/2SI8815 valve actuation due to automatic or normal action or flow through the valve.

Data from past performance of procedure 1/2 BVS 4.6.2.2-1 were reviewed and indicated zero leakage in a total of eleven (11) performances and one instance in which leak rate was recorded as 0.000317 gallon per minute, which was considered neglible. Since all twelve leak tests of the 1/2SI8815 valves conducted from January 1985 to April 1988 indicated that zero leakage or negligible leakage existed, indicating that 1/2SI8801A,B valves have not leaked, the Charging Pump to Cold Leg Injection Lines have not been subjected to excessive thermal stresses.

III. Action Requested: Develop and implement a program to provide continuing assurance that the identified piping will not be subject to conditions that could cause fatigue failure during the remaining life of the plant.

Response:

a. In order to assure that the Auxiliary Spray Line on Byron Unit 1 will not be subjected to cyclic thermal stresses that could cause fatigue failure, appropriate sections of the piping will be instrumented with external temperature monitoring devices. The outputs of these devices will be evaluated to determine if leakage past the single isolation valve from the charging system is occurring. The temperature monitoring devices will be installed on Unit 1 prior to the end of the second refueling outage (scheduled to begin September 2, 1988). If a pending stress analysis of the line concludes that the Auxiliary Spray line is not susceptible to fatigue failure, then the temperature monitoring devices may be removed. The necessity to

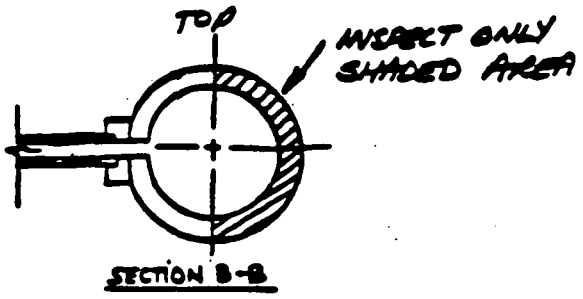
instrument the Unit 2 Auxiliary Spray line will be determined by the pending stress analysis of the pipe. In the event that temperature monitoring of Unit 2 is required, the instrumentation will be installed prior to the end of the Unit 2 first refueling outage (scheduled to begin January, 1989).

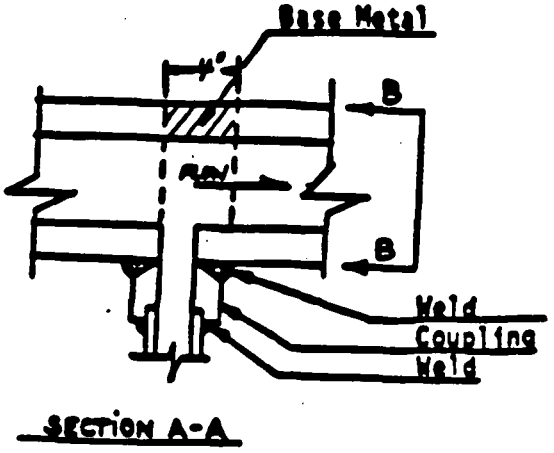
b. In order to assure that the four Charging Pump to Cold Leg Injection lines on each Byron unit will not be subjected to cyclic thermal stresses that could cause fatigue failure during the remaining lives of Byron Units 1 and 2, surveillance procedures will be developed or revised as necessary to require periodic tests specifically for leakage past the 1/2SI8801A,B isolation valves. If the 1/2SI8801A,B valves leak, the leakage will be discovered during the conduct of the surveillance, and action would ensue to determine the leakage source and to correct the cause. Leak testing for the 1/2SI8801A,B valves will be routinely performed as follows:

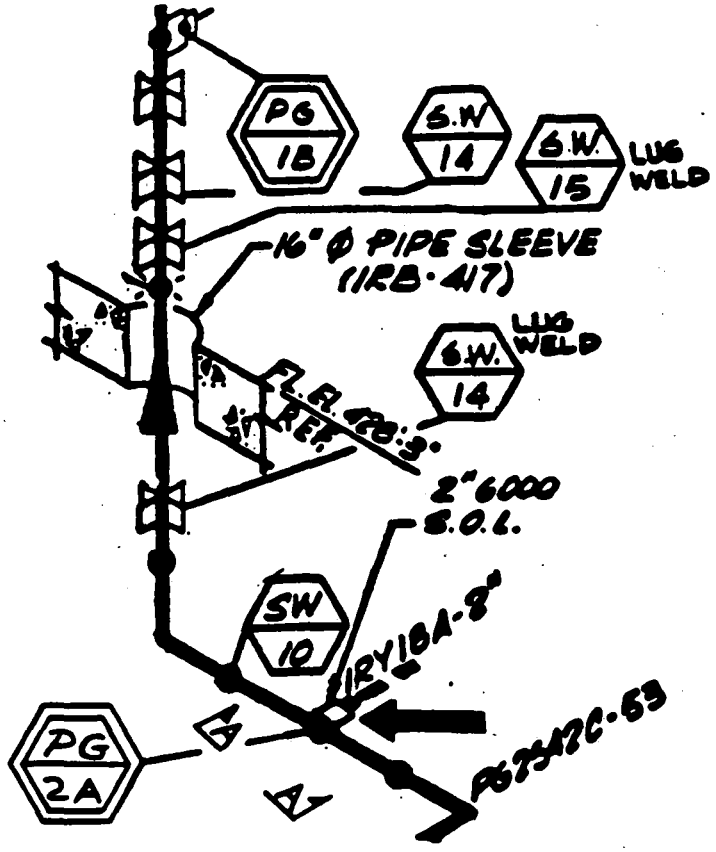
    1. At least once per 18 months.
    2. Prior to entering Mode 2 whenever the plant has been in Cold Shutdown for 72 hours or more and if leakage testing has not been performed in the previous 9 months.
    3. Prior to returning valves 1/2SI8801A,B to service following maintenance which impacts the valves seat tightness.
    4. Within 24 hours following 1/2SI8801A,B valve actuation due to automatic or normal action or flow through the valve.

The periodic performance of the leak test minimizes the potential for long term thermal cycling of the four unisolable Charging Pump to Cold Leg Injection lines by detecting and resolving isolation valve leakage. The 1/2SI8801A,B leak test procedures will be approved for use prior to the end of the Unit 1 current refueling outage (began September 2, 1988).

All Class 1 piping receives a VT-2 Visual leak test before and after each refueling outage in accordance with the ASME Code. The examinations are intended to detect leakage from Class 1 piping. The Auxiliary Spray and Charging Pump to Cold Leg Injection lines are examined as part of the test, and any leakage due to thermal stress induced pipe cracking would be noted and resolved. Additionally, the high stress welds identified on these lines are routinely surface examined as part of the ASME Inservice Inspection Program.







Reference: Isometric Drawing IC-RY-5 Rev B. (Sargent and Lundy)

FIGURE B-1: Auxiliary Spray Line
(Braidwood/Byron Units 1 & 2)

ATTACHMENT 4

BRAIDWOOD STATION RESPONSE TO
NRC BULLETIN 88-08 and 88-08:
SUPPLEMENT 1&2

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A. BRAIDWOOD UNITS 1 and 2

I. Action requested: Review systems connected to the RCS for unisolable piping that could be subjected to the thermal cycling phenomenon. If none are identified then no additional actions are required except for the reporting requirement.

Response: A review of Braidwood Units 1 and 2 piping systems connected to the Reactor Coolant Systems (RCS) was performed by Westinghouse to determine whether unisolable sections of connected piping could be subjected to stresses from temperature stratification or oscillation induced by leaking valves.

For each Braidwood unit, susceptible sections of piping were identified in:

a. One (01) Auxiliary Spray Line (2 inches nominal pipe size);

b. Four (04) Charging Pump to Cold Leg Injection lines (1.5 inches nominal pipe size).

II. Action Requested: For identified piping, perform non-destructive examination (NDE) of the welds, heat affected zones, and high stress locations including geometric discontinuities and base metal to provide assurance that there are no existing flaws.

Response:

a. The necessity of performing NDE on the high stress areas on the Auxiliary Spray line will be determined by a stress analysis of the pipe. If the stress analysis indicates that the pipe is susceptible to fatigue failure, the 2 inch sockolet at the RCS piping connection will receive a surface examination and a portion of the 6 inch main spray piping will be ultrasonically examined. Additionally, if a proven Commonwealth Edison (CECo) ultrasonic examination procedure for small diameter piping (3-inch nominal diameter or less) is available in time, the horizontal section of piping upstream of the 2-inch sockolet weld will be examined ultrasonically. In the event that NDE of the Auxiliary Spray line is required, the examinations will be performed during the Unit 1 first refueling outage scheduled to begin in September 1989, and during the Unit 2 first refueling outage scheduled to begin in March, 1990. See figure B-1 for the applicable NDE areas.

b. The four (04) Charging Pump to Cold Leg Injection lines will not be examined non-destructively because reasonable assurances can be provided that the thermal stress phenomenon potentially caused by the leakage of the Charging Pump to Cold Leg Injection Isolation Valves (1/2SI8801A,B) has not occurred at Braidwood Station. Performance of "Reactor Coolant System Isolation Valves" leak test (surveillance procedure 1/2 BWVS 4.6.2.2-1) determines back leakage from the Reactor Coolant System through the Charging/Safety Injection Check Valves (1/2SI8815, 1/2SI8900A,B,C,D) to a test tap located between 1/2SI8815 and 1/2SI8801A,B valves. By virtue of the test tap's location, the detection of forward leakage from the Charging Pump through the 1/2SI8801A,B isolation valves is an unintended result of the 1/2 BWVS 4.6.2.2-1 performance. Procedure 1/2 BWVS 4.6.2.2-1 is routinely performed as follows for the 1/2SI8815 check valves:

a. At least once per 18 months.
b. Prior to entering Mode 2 (Startup) whenever the plant has been in Cold Shutdown for 72 hours or more and if leakage testing has not been performed in the previous 9 months.
c. Prior to returning valves 1/2SI8815 to service following maintenance, repair or replacement work on the valves.
d. Within 24 hours following 1/2SI8815 valve actuation due to automatic or normal action or flow through the valve.

Data from past performance of procedure 1/2 BWVS 4.6.2.2-1 were reviewed and indicated zero leakage in a total of six (06) performances for both units, including pre-operational testing. Since all six leak tests of the 1/2SI8815 valves conducted since start-up indicated zero leakage, indicating that 1/2SI8801A,B valves have not leaked, the Charging Pump to Cold Leg Injection Lines have not been subjected to excessive thermal stresses.

III. Action Requested: Develop and implement a program to provide continuing assurance that the identified piping will not be subject to conditions that could cause fatigue failure during the remaining life of the plant.

Response:

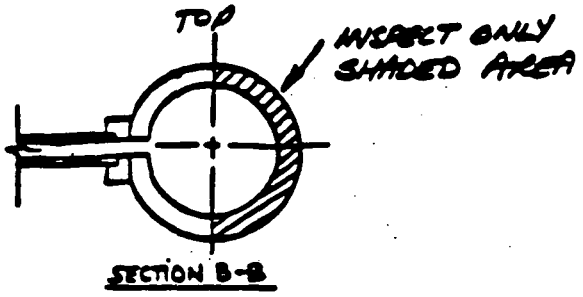
a. If the stress analysis indicates that the Auxiliary Spray line at Braidwood Units 1 and 2 is susceptible to fatigue failure, appropriate sections of the piping will be instrumented with external temperature monitoring devices. In the event that temperature monitoring devices are required, they will be installed during the Unit 1 first refueling outage scheduled to begin in September, 1989, and during the Unit 2 first refueling outage scheduled to begin in March, 1990.

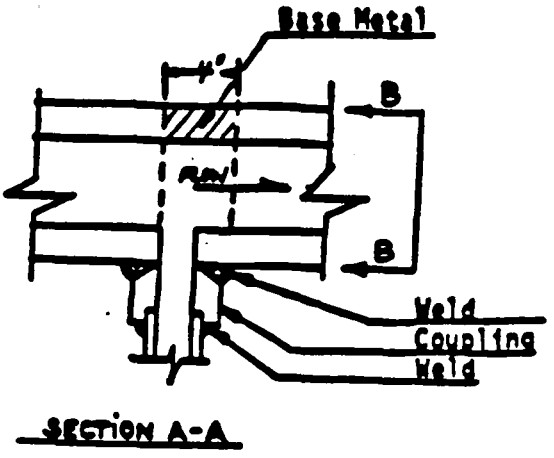
b. In order to assure that the four Charging Pump to Cold Leg Injection lines on each Braidwood unit will not be subjected to cyclic thermal stresses that could cause fatigue failure during the remaining lives of Braidwood Units 1 and 2, surveillance procedures will be developed or revised as necessary to require periodic tests specifically for leakage past the 1/2SI8801A,B isolation valves. If the 1/2SI8801A,B valves leak, the leakage will be discovered during the conduct of the surveillance, and action would ensue to determine the leakage source and correct the cause. Leak testing for the 1/2SI8801A,B valves will be routinely performed as follows:

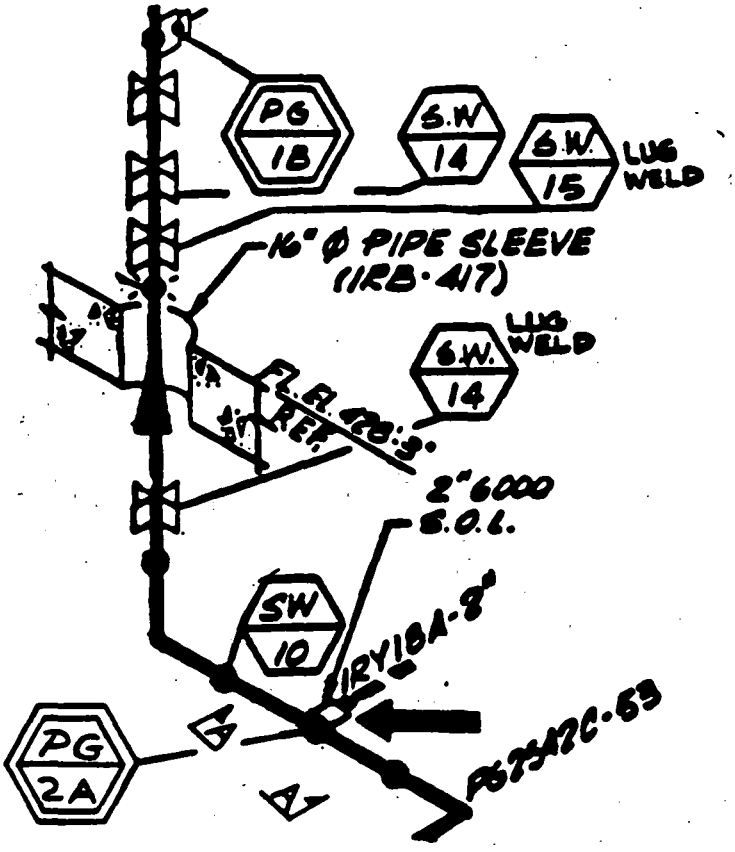
    a. At least once per 18 months.
    b. Prior to entering Mode 2 whenever the plant has been in Cold Shutdown for 72 hours or more and if leakage testing has not been performed in the previous 9 months.
    c. Prior to returning valves 1/2SI8801A,B to service following maintenance which impacts the valves seat tightness.
    d. Within 24 hours following 1/2SI8801A,B valve actuation due to automatic or normal action or flow through the valve.

The periodic performance of the leak test minimizes the potential for long term thermal cycling of the four unisolable Charging Pump to Cold Leg Injection lines by detecting and resolving isolation valve leakage. The 1/2SI8801A,B leak test procedure will be approved for use prior to the end of the Unit 1 first refueling outage (scheduled to begin September, 1989).

All Class 1 piping receives a VT-2 Visual leak test before and after each refueling outage in accordance with the ASME Code. The examinations are intended to detect leakage from Class 1 piping. The Auxiliary Spray and Charging Pump to Cold Leg Injection lines are examined as part of the test, and any leakage due to thermal stress induced pipe cracking would be noted and resolved. Additionally, the high stress welds identified on these lines are routinely surface examined as part of the ASME Inservice Inspection Program.







Reference: Isometric Drawing IC-RY-5 Rev B. (Sargent and Lundy)

FIGURE B-1: Auxiliary Spray Line
(Braidwood/Byron Units 1 & 2)