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November 7, 1989

Director of Nuclear Reactor Regulation
US Nuclear Regulatory Commission
Mail Station P1-137
Washington, DC 20555

Subject: Zion Nuclear Power Station, Units 1 and 2
Revisions to Second Interval Inservice
Testing and Inspection Program
NRC Docket Nos. 50-295 and 50-304

Reference: a) June 27, 1983 letter from F.G. Lentine
to H.R. Denton
b) February 11, 1986 Technical Evaluation Report (TER)
for Second ISI Interval

Gentlemen:

Reference (a) was the initial submittal of the proposed Inservice Testing and Inspection Program (ISI) for the second ten-year interval that was intended to be performed at Zion Station. Subsequent submittals addressed NRC requests for additional information, and a Technical Evaluation Report (TER) was issued as indicated in reference (b).

The purpose of this letter is to revise two previously submitted relief requests, and to forward two new relief requests for your review and approval. Attachment 1 contains the two relief requests that have been revised. The first of these relief requests is IWB Relief #3, which requests relief from the requirement to perform a 100% inspection of the weld between the pressurizer nozzle and the pressurizer itself. The second of these revisions to previous relief requests is valve Relief #24, which requests relief from the requirement to perform a full stroke of the Reactor Coolant Pump seal injection manual valves on a quarterly basis. An explanation and justification of the revised relief requests are provided in Attachment 1, in addition to the updated corresponding pages of the ISI document.

Attachment 2 contains two new relief requests to the ISI program. The first of the requests is IWB #11 which requests relief from the requirement to perform a volumetric examination of the weld for the Unit 2 pressurizer surge nozzle to vessel interface. This request is specific to Unit 2 only, because the Unit 1 pressurizer is exempt due to differences in manufacture of the vessel itself. The second of these requests is Pump Relief Request #9, which requests relief from the requirement concerning the range of pressure/flow gauges employed in the periodic test of the Residual Heat Removal pumps.

We are available to address any questions that you may have regarding these issues.

Very truly yours,

Glenn E. Trzyna

G.E. Trzyna
Nuclear Licensing Administrator

/scl:0373T:1
Attachment
cc: Chandu Patel-NRR
Senior Resident Inspector-Zion

A047

ATTACHMENT 1

ZION NUCLEAR POWER STATION

REVISIONS TO

SECOND INTERVAL ISI PROGRAM

ZION UNITS 1 and 2

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IWB Relief #3

Relief is requested from examining 100% of the required volume on the pressurizer nozzle to vessel welds. (Item B3.110 Examination Category B-D)

In addition to this relief request is the Unit 2 pressurizer surge nozzle to vessel weld relief request (Reference IWB Relief #11).

Code Requirement

Examination volume shall cover 100% of the weld length, 1/2 T from the weld toe.

Basis and Alternative

Zion Unit No. 1 pressurizer nozzles are integrally cast with the vessel heads. There are no welds requiring examination in this category.

Zion Unit No. 2 nozzles are welded to the vessel heads. The configuration around the weld permits examination from the vessel head and on top of the weld. Examination cannot be performed on the nozzle side due to configuration which prohibits the total volume from being examined as required by code.

As an alternative, volumetric examinations shall be performed on the maximum volume reasonably achievable with the current methodology.

Additionally, a surface examination will be performed on the areas where volumetric examination is prohibited. This alternative as proposed will provide assurance of the continued structural integrity and will maintain an adequate level of safety.

Pages Revised
to the IST Program

Page 183: Add a C_4 Category for test frequency

195: Change test frequency to C_4 for valves VC8369 A,B,C,D, and VC8372 A,B,C,D

196: Revised Relief Request #24

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7. Test

a. the tests performed on each valve are abbreviated by the following:

1. first letter

E - Exercise Test
L - Leak Test
B - Backflow Test or Disassemble and Inspect

2. second letter

Q - Quarterly
R - Refueling Outage
R_2 - Refueling while Reactor Vessel Head is Removed
I - As defined by IWV-3510
C - Cold Shutdown
C_1 - Cold Shutdown, no Reactor Coolant Pumps Operating
C_3 - Cold Shutdown, Feedwater and Condensate systems not operating
C_4 - Cold Shutdown, Reactor Coolant Pumps secured and uncoupled.
F - Once Every 5 Years

3. third letter

J - denotes 10CFR50 Appendix J testing

4. a slash "/" divides tests if more than one test is applicable

5. a frequency code of "C", "C_1", "C_3", "C_4", "R", "R_2" indicates valves which cannot be full stroked as required by IWV-3412 or IWV-3522 as applicable (see relief listed for specific information on "C, 1, 3, 4" and "R, R_2" valves)

8. Maximum Stroke Time

a. time in seconds

9. Relief Request

a. indicates the valve relief number which identifies a specific relief request.

10. Valve Position

a. indicates the station's position which identifies why the valves are stroke during all cold shutdowns and not full stroked quarterly per the ASME code.

11. Passive Valve

a. indicates a valve which is not required to change position to accomplish a specific function.

System: VOLUME CONTROL

Drwg. # 1/M-54, 2/M-517

ZION UNIT 1 and 2
INSERVICE TEST PROGRAM
ASME CODE CLASS 1, 2, AND 3 VALVES

Revision 1 Date 8-09-85

VALVE NUMBER	CODE CLASS	U1 DRAWING LOCATION	VALVE CATEGORY A	B	C	VALVE SIZE	VALVE TYPE	ACTUATOR TYPE	TEST	MAXIMUM STROKE TIME	RELIEF REQUEST	U2 DRAWING LOCATION	REMARKS
AOV-VC8152	2	A-6	X			2	Gb	AO	EQ LRJ	60	VR-2	A-6	
AOV-VC8153	2	A-6	X			2	Gb	AO	EQ LRJ	60	VR-2	A-6	
VC8369A	2	F-1	X			1	N	M	EC_4,LRJ	--	VR-2,24	F-10	
VC8369B	2	F-3	X			1	N	M	EC_4,LRJ	--	VR-2,24	F-8	
VC8369C	2	F-5	X			1	N	M	EC_4,LRJ	--	VR-2,24	F-7	
VC8369D	2	F-7	X			1	N	M	EC_4,LRJ	--	VR-2,24	F-5	
VC8372A	2	F-1	X			1	Gb	M	EC_4,LRJ	--	VR-2,24	F-10	
VC8372B	2	F-3	X			1	Gb	M	EC_4,LRJ	--	VR-2,24	F-8	
VC8372C	2	F-5	X			1	Gb	M	EC_4,LRJ	--	VR-2,24	F-7	
VC8372D	2	F-7	X			1	Gb	M	EC_4,LRJ	--	VR-2,24	F-5	
VC8117	2	A-3			X	2	R	S	I	--	--	A-8	
VC8121	2	B-9			X	2	R	S	I	--	--	B-2	

Valve Relief #24

Relief is requested from full stroke exercising Reactor Coolant Pump Seal Injection Manual valves VC8369A, B, C, D and VC8372A, B, C, D quarterly.

Code Requirement

IWV-3411 (test frequency)

Basis and Alternative

Relief is requested from full stroke exercising manual valves VC8369A, B, C, D and VC8372A, B, C, D quarterly during operation of the reactor coolant pumps because this may damage the pump seals and would require re-adjusting the seal flow to the reactor coolant pump.

These valves will be full stroke exercised during cold shutdown if the reactor coolant pumps are secured and uncoupled. The reactor coolant pump must be uncoupled to prevent foreign materials from lodging in the seals and potentially damaging the pump seals. This alternative will provide adequate assurance of the required level of safety and that operational readiness is maintained.

ATTACHMENT 2

ZION NUCLEAR POWER STATION

NEW RELIEF REQUESTS

TO SECOND INTERVAL ISI PROGRAM

IWB Relief #11

. Relief is requested from volumetric examination of the Unit 2 pressurizer surge nozzle to vessel weld (Item B3.110, Examination Category B-D).

Code Requirement

Examination volume shall cover 100% of the weld length, 1/2 T from the weld toe.

Basis and Alternative

Zion Unit 1 pressurizer nozzles are integrally cast with the vessel heads. There are no welds requiring examination in this category. Zion Unit 2 pressurizer nozzles are welded to the vessel heads.

During the Unit 2 1987 refueling outage, an investigation was conducted on performing surface and volumetric examinations on the Unit 2 pressurizer surge nozzle to vessel weld. The investigation entailed a study that included field verifications of component geometries and physical locations, accessibility of the examination area, and the inspection area environment.

In order to perform surface and volumetric examinations, direct contact with the inspection surface is required. The bottom of the pressurizer vessel head is covered with stainless steel mirror type insulation that was not designed or originally installed to be removed for inspection purposes. This insulation is integrally configured into one piece. In order to expose the examination area, the insulation which covers the entire pressurizer vessel lower head must be removed. The insulation removal would first require disconnection and removal of all 78 pressurizer immersion heater electrical cables, (reference Zion Figures B12 and B13). The immersion heater connectors are a very delicate system which were not designed for cable removal and reinstallation. Since the component materials and configurations make it fragile and difficult to remove, permanent damage would result if there was any attempt to disconnect the cables from the heaters. This would require additional man hours to repair the damage. Furthermore, even if all the cables were disconnected, the 78 convection stops that are riveted to the insulation would individually be required to be cut and removed so that the insulation could be removed over the pressurizer heaters (reference Zion Figure B14).

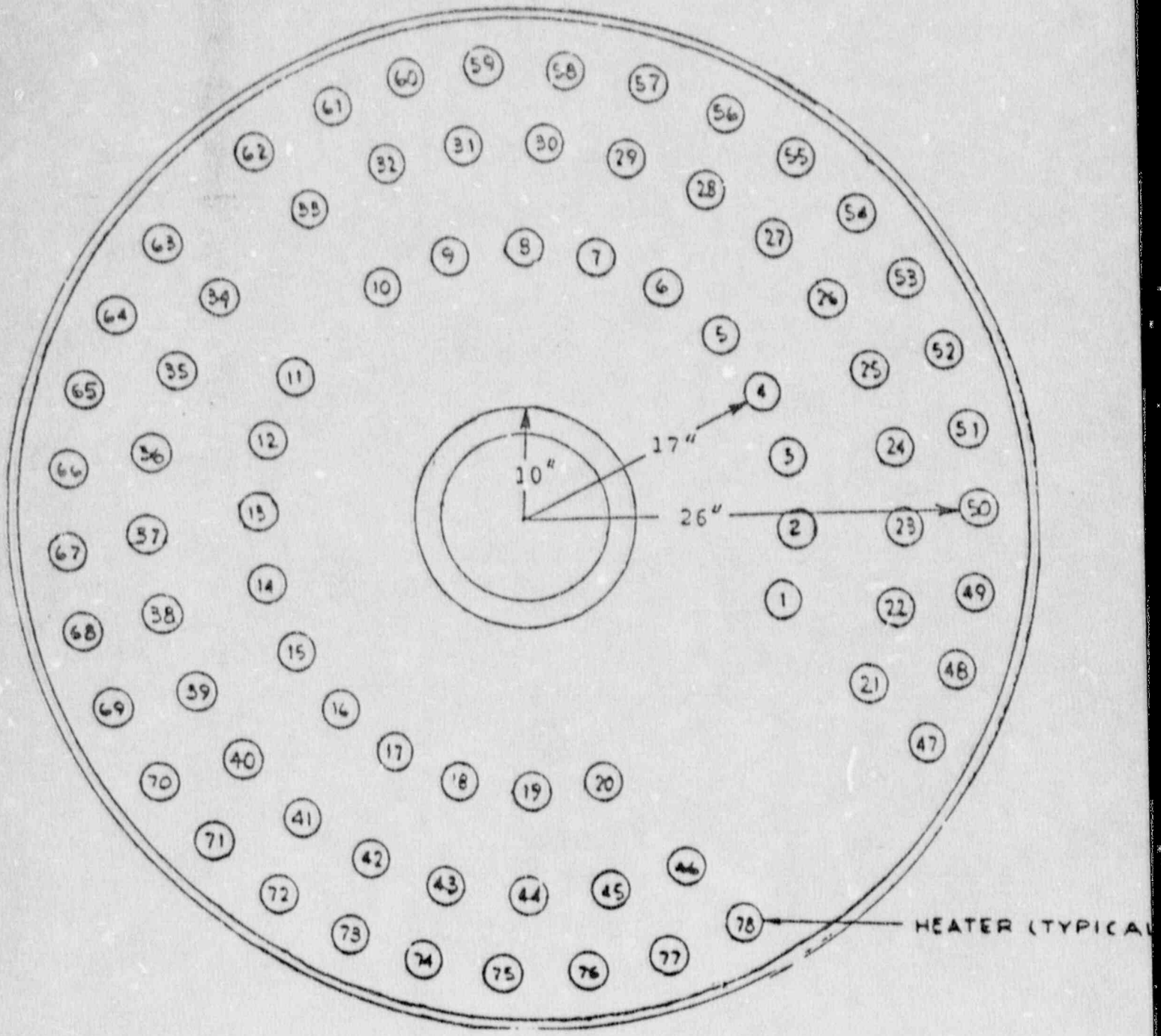
A radiological survey was performed in the general area directly below the pressurizer lower head during the Unit 2 1987 refueling outage. The area with the highest dose rate is located in the immediate proximity of the pressurizer heater connectors, where the majority of the work would be performed. The dose reading that was taken in this area with the insulation intact was 2.25 Rem/hr. It should be noted that the survey was taken with the insulation on. Due to the type of insulation covering the bottom of the pressurizer, it is estimated that the dose rates could increase as much as twice the level of the surveyed readings if the insulation is removed. This is an extremely high radiation field to perform inservice inspection and particularly high to perform the amount of work that is required to expose and prepare the examination surface. It is estimated that the total work exposure would be approximately 100 man-Rem (based on 2.25 Rem/hr). This dose estimate does not include any heater cable/connector repairs which would significantly increase the exposure. The total work exposure goal for the entire 1988 Unit 2 refueling outage is 275 man-Rem, and this dose estimate does not include any pressurizer surge nozzle work.

Even if all the disconnections and insulation removal were made, the pressurizer surge nozzle and neighboring geometries restrict the inspectable amount of required Code weld volume to a very small percentage. No examinations can be performed from the nozzle side of the weld due to the nozzle geometry (ref. Zion Figure B15). Additionally, examinations are restricted from the shell side of the weld due to the configuration and locations of the pressurizer heater rod locations (ref. Zion Figure B13). With this situation present, any data that could be obtained would represent only a very small portion of the total weld volume. The work exposure is extremely high for the amount of information which could be gained from this examination.

The conditions present around the surge nozzle impose significant increase in individual and cumulative occupational radiation exposure and involve some significant work hazard considerations, which conflict with Zion Station's ALARA and Safety program principles.

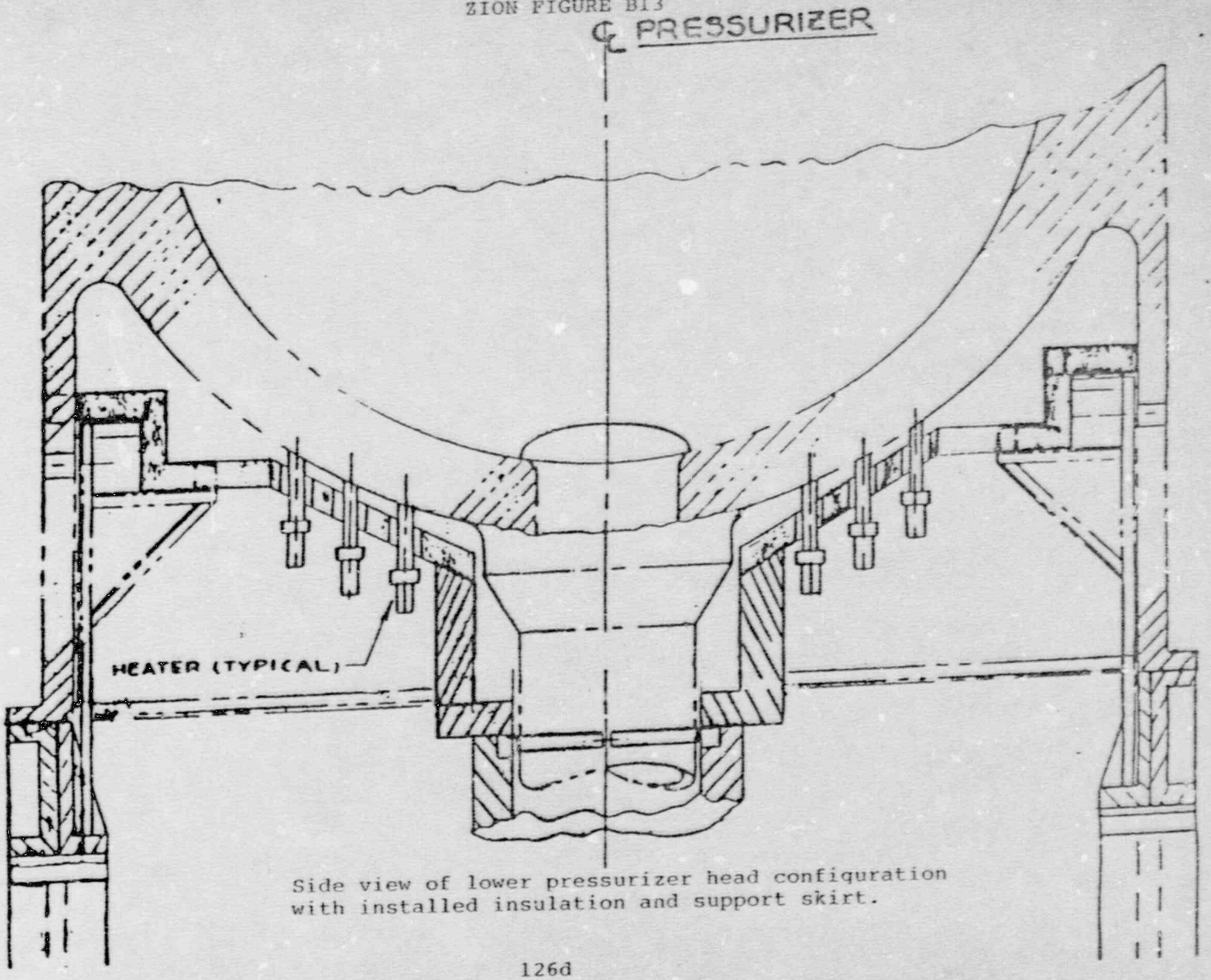
Zion Station therefore requests relief from conducting volumetric examinations of the Unit 2 pressurizer surge nozzle to vessel weld. As an alternative, visual examinations shall be performed at normal operating pressure after each refueling outage, as well as, during the ten year hydrostatic pressure test. Additionally, volumetric and surface inspection data obtained this interval from the other pressurizer nozzle to vessel welds and the surge nozzle to pipe weld, (the next weld immediately downstream of the surge nozzle to vessel weld), will be utilized as indicators for general conditions of the welds and surrounding material including the pressurizer surge nozzle to vessel weld. Zion Station believes that the proposed alternative examinations will provide the necessary assurance of the structural reliability and integrity of the Unit 2 pressurizer surge nozzle to vessel weld.

ZION FIGURE B12



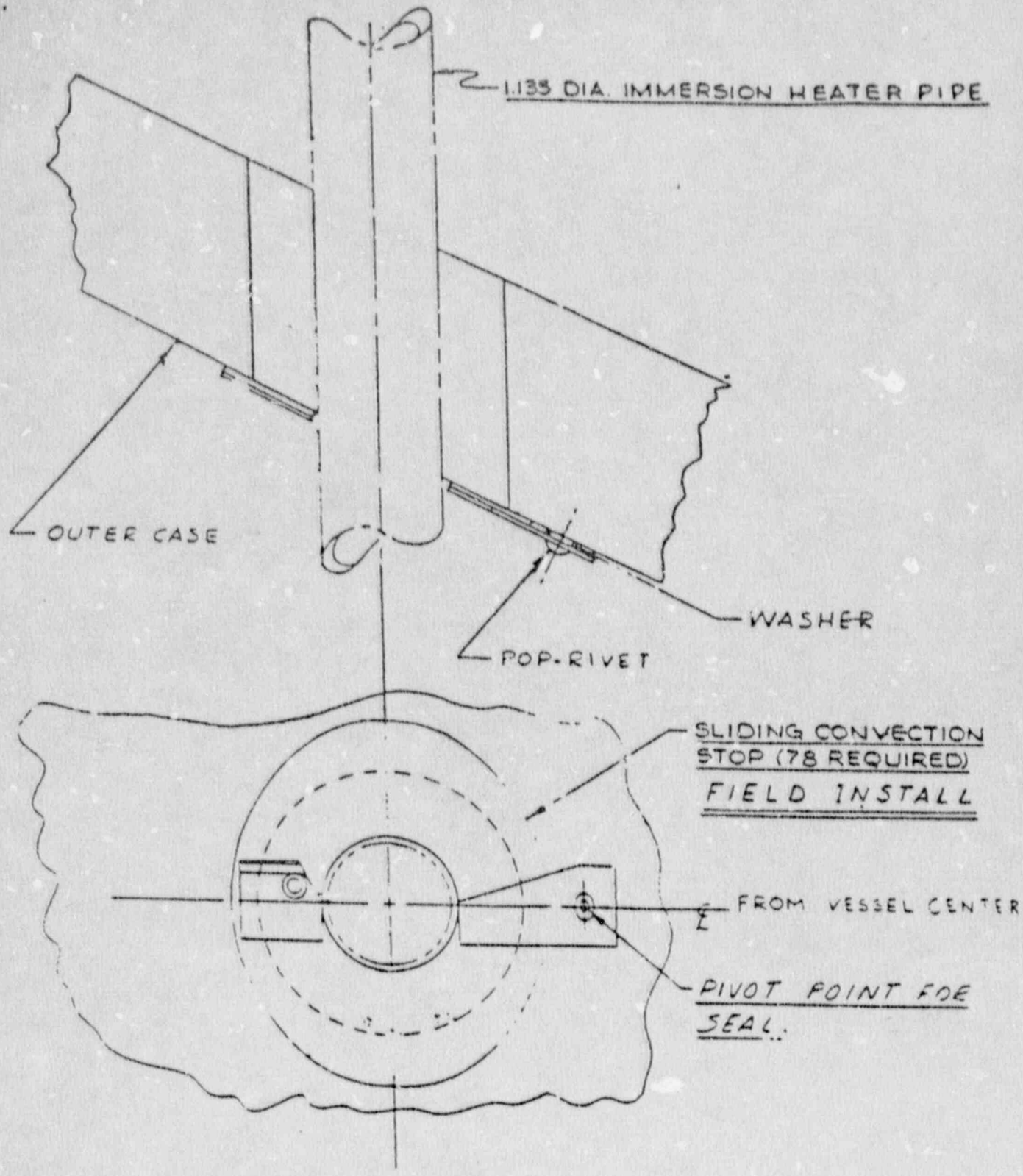
Bottom view of pressurizer with heater cable penetrations and surge nozzle, (not drawn to scale). Dimensions are close approximations.

ZION FIGURE B13

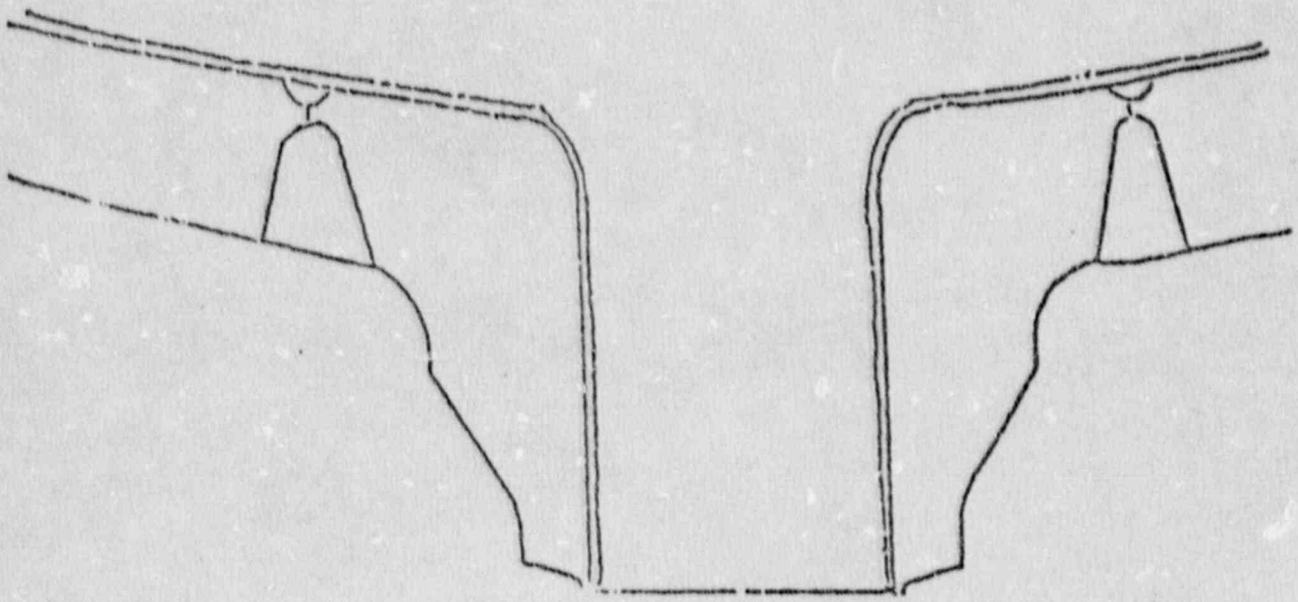


Side view of lower pressurizer head configuration with installed insulation and support skirt.

ZION FIGURE B14



Side and bottom views of a typical convection stop for a pressurizer heater.



Side view of the Unit 2 pressurizer surge nozzle and its geometry.

Zion Nuclear Station
Units 1 and 2

Pump Relief Request: #9

Affected Components:

Component EPN	Code Class	Function
RHR Pump A RH001	2	Remove Decay Heat
RHR Pump B RH002	2	Remove Decay Heat

ASME Section XI, 1980 Edition, Winter 1981 Addenda Test Requirements:
IWP-4120 requires the full range of each instrument shall be three times the reference value or less.

Request For Relief:
Zion Station is requesting relief from the requirement for each instrument to have full range of three times the reference value or less for all gauges listed on Attachment 1.

Basis For Relief:

By design there are 4 different modes of operation associated with the Residual Heat Removal System. These flowpaths vary considerably in terms of system flows and pressures. The Normal Cooldown Flowpath is utilized during controlled plant shutdown to remove decay heat from the Reactor Coolant System. Flows during this mode of operation vary from approximately 1000 gpm to 3000 gpm. Suction pressures can range from approximately 10 psi to 450 psi while discharge pressures vary from approximately 175 psi to 600 psi. The Injection Phase of Emergency Core Cooling is another mode of operation. It is initiated when a safety injection signal is received. During this phase of operation flows vary from approximately 200 gpm to 5000 gpm depending on the RCS pressure. Suction pressures range from approximately 10 psi to 30 psi while discharge pressures vary from approximately 120 psi to 220 psi. The third mode of operation is the Recirculation Phase of Emergency Core Cooling. Flows during this phase vary from approximately 2000 gpm to 5000 gpm. Suction pressure will be approximately 10 psi while discharge pressure can range from approximately 120 psi to 170 psi.

In addition to these three modes of operation, the RHR pumps may be run in a minimum flow condition where the only flow is via the pump recirculation piping. Flows during this mode range from approximately 200 gpm to 450 gpm. Suction pressures vary from approximately 10 psi to 30 psi while discharge pressures range from approximately 185 psi to 250 psi.

The RHR pumps may only be tested during normal cooldown and minimum flow recirculation modes.

Pumps Position #1 of Zion's IST Program, Revision 7, states in part "...that the manufacturer's pump performance curves consisting of multiple data points shall be used for reference values as allowed by IWP-3110 for all pumps included in the IST Pump Program except the diesel generator oil transfer pumps." As a result of this Position, pump performance is trended in accordance with the pump curves, thereby providing a range of reference values. Since no one specific reference value is used, gauges which cover the limits of the pump curves must be used. Therefore, the range limit of IWP-4120 may not be met for every test depending on test conditions.

The gauges installed in the RHR System were selected to provide accurate information in regard to all modes of designed system operating conditions, which are based on the manufacturer's pump curves. For example, Attachment 1 indicates the RHR System parameters, testing results and gauge information for the various modes of system operation.

The use of the limited scale factor ensures adequate readability during a test and provides for repeatability from test to test which are goals of the IST Program. The use of the currently installed gauges does not impede obtaining accurate and repeatable results. Although all of the installed gauges may not meet the full scale range requirements of three times the reference value or less for each specific test, the gauges provide appropriate and accurate information for all designed modes of operation, while also providing accurate and repeatable results for inservice testing. The gauges used meet all other ASME Section XI requirements.

Alternative Test:

None, current gauges are adequate.

ATTACHMENT 1

Test Results 1985 thru June 1989

FLOWPATH	OPERATING RANGE	TEST	GAUGE	RANGE	INCREMENTS
Normal Cooldown					
Flow	1000-3000 gpm	1260-2900 gpm	FIC-610/611	0-5000	250 gpm(mid) 500 gpm(end)
Suction	10-450 psi	12-430 psi	PI-601/602	0-600	5 psi
Discharge	175-600 psi	175-565 psi	PI-614/615	0-700	10 psi
Injection Phase					
Flow	200-5000 gpm	N/A	FIC-610/611	0-5000	250 gpm(mid) 500 gpm(end)
Suction	10-30 psi	N/A	PI-601/602	0-600	5 psi
Discharge	120-220 psi	N/A	PI-614/615	0-700	10 psi
Recirc Phase of ECCS					
Flow	2000-5000 gpm	N/A	FIC-610/611	0-5000	250 gpm(mid) 500 gpm(end)
Suction	10 psi	N/A	PI-601/602	0-600	5 psi
Discharge	120-170 psi	N/A	PI-614/615	0-700	10 psi
Mini-Flow Recirc.					
Flow	200-450 gpm	237-440 gpm	FIC-610A/611A	0-1500	20 gpm
Suction	10-30 psi	10-60 psi	PI-601/602	0-600	5 psi
Discharge	185-250 psi	185-250 psi	PI-614/615	0-700	10 psi

NOTE:

Pumps may only be tested during Normal Cooldown and Minimum Flow Recirculation.