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September 30, 1980

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

Subject: Zion Station Units 1 and 2
Additional Fire Protection Information
NRC Docket Nos. 50-295 and 50-304

References (a): March 24, 1980 letter from A. Schwencer to D. L. Peoples

(b): April 30, 1980 letter from D. L. Peoples to H. R. Denton

(c): May 28, 1980 letter from D. L. Peoples to H. R. Denton

Dear Mr. Denton:

In Reference (a), the NRC Staff requested Commonwealth Edison Company to provide additional information concerning the Zion Fire Protection Program. References (b) and (c) provided Commonwealth Edison's responses to the NRC Staff requests except for Parts 8(b) through 8(l) of Enclosure 5 of Reference (a) which were to be provided by September 30, 1980. In accordance with that commitment enclosed is Commonwealth Edison's response to Part 8 Items (b), (d), (f), (g), (h), (i), (j), (k), and (l) of Enclosure 5 of Reference (a). Item (c) and (e) require additional work and will be responded to by November 15, 1980.

Please address any questions that you might have concerning this matter to this office.

One (1) signed original and thirty-nine (39) copies of this letter and enclosure are provided for your use. Three (3) copies of the design drawings (Attachment 1) and explanations (Attachment 2) are also provided for your use.

Very truly yours,

W. F. Naughton

W. F. Naughton
Nuclear Licensing Administrator
Pressurized Water Reactors

Enclosure

cc: Resident Office - Zion
7114A



F

NRC Docket Nos. 50-295
50-304

ENCLOSURE

Response to Items in Enclosure 5 of the
March 24, 1980 letter from A. Schwencer to
D. L. Peoples

Question 8(b)

System design by drawings which show normal and alternate shutdown control and power circuits, location of components, and that wiring which is in the areas and the wiring which is out of the area that required the alternate system.

Response

Attachment 1 includes system design drawings which show the original locations of control and power cables and the new routing of certain of these cables which separates them in such a way that a fire in any fire area will not affect all shutdown equipment or cabling i.e., there will always be sufficient equipment unaffected by the fire to shutdown the plant. Also included as Attachment 2 is an explanation of the details shown on these drawings for your use in review of these drawings.

Question 8(d)

Demonstrate that wiring, including power sources for the control circuit and equipment operation for the alternate shutdown method, is independent of equipment wiring in the area to be avoided.

Response

The Zion 1/2 Fire Protection Safe Shutdown Analysis and the drawings submitted in response to question 8(b) demonstrate that wiring necessary for at least one method of safe shutdown is independent of any single plant fire area.

Question 8(f)

Demonstrate that licensee procedure(s) have been developed which describe the tasks to be performed to effect the shutdown method. A summary of these procedures should be reviewed by the staff.

Response

As modifications are completed and the changes to systems are tested, present procedures will be updated to include a description of these modifications and how they may be utilized, if needed.

Question 8(g)

Demonstrate that spare fuses are available for control circuits where these fuses may be required in supplying power to control circuits used for the shutdown method and may be blown by the effects of a cable spreading room fire. The spare fuses should be located convenient to the existing fuses. The shutdown procedure should inform the operator to check these fuses.

Response

All spare part inventories are located in the Station Storeroom. The shift engineer and Shift Foreman have ready access to all spare parts which come under the cognizance of the Operations Department including spare fuses.

Question 8(h)

Demonstrate that the manpower required to perform the shutdown functions using the procedures of (f) as well as to provide fire brigade members to fight the fire is available as required by the fire brigade technical specifications.

Response

There is sufficent manpower on all shifts such that if a shutdown is required for fire there are sufficient personnel to shut the plant down and man the fire brigade. Many secondary plant evolutions would be delayed during that shutdown to increase the availability of fire brigade members.

Question 8(i)

Demonstrate that adequate acceptance tests are performed. These should verify that: equipment operates from the local control station when the transfer or isolation switch is placed in the "local" position and that the equipment cannot be operated from the control room; and that equipment operates from the control room but cannot be operated at the local control station when the transfer or isolation switch is in the "remote" position.

Response

The CECo. Quality Assurance Program Procedures for fire protection cover the installation of plant modifications. The procedure for acceptance of a plant modification requires that adequate tests be performed.

Question 8(j)

Technical Specifications of surveillance requirements and limiting conditions for operation for that equipment not already covered by existing Tech Specs. For example, if new isolation and control switches are added to a service water system, the existing Tech Spec surveillance requirements on the service water system should add a statement similar to the following:

> "Every third pump test should also verify that the pump starts from the alternate shutdown station after moving all service water system isolation switches to the local control position."

Response

Technical Specifications should not address specific actions to be taken to carry out surveillance requirements. The best method for describing how a Technical Specification requirement is fulfilled is by Station Procedures. Station Procedues have the flexibility of being upgraded for the best methods of doing surveillance tesing in a timely manner. Tech Specs require substantial time for upgrading as improvements and methods of surveillance testing are found.

Question 8(k)

Demonstrate that the systems available are adequate to perform the necessary shutdown functions. The functions required should be based on previous analyses, if possible (e.g., in the FSAR), such a loss of normal a.c. power or shutdown on a Group I isolation (BWR). The equipment required for the alternate capability should be the same or equivalent to that relied on in the above analysis.

Response

The adequacy of the systems utilized to perform safe cold and hot shutdown of the reactor is demonstrated in the Zion 1 and 2 Safe Shutdown Analysis.

Question 8(1)

Demonstrate that repair procedures for cold shutdown systems are developed and material for repairs is maintained on site.

Response

The Zion Safe Shutdown Analysis for fire describes the means for taking the plant from hot shutdown to cold shutdown. The analysis does not rely on repairs and addition of materials, therefore, repair procedures are not necessary.

ATTACHMENT 2

ZION 1 & 2 POWER CABLE REROUTING

## 1.0 UNIT 1 POWER CABLES

### 1.1 Centrifugal Charging Pump 1A

Commitment: Hot Safe Shutdown Analysis, p. 3-5

Cable #10679

The power feed cable to Centrifugal Charging Pump 1A (located at column/row 23-24/K-L on elevation 579) currently runs in a cable tray from the pump cubicle to a riser located at 25/H, and runs up this riser in the Auxiliary Building to the Unit 1 Outer Cable Spreading Room at elevation 630. The cable then runs south in a tray along row J to a riser at 35/H, and then drops down to 4KV Bus 149 in the Division 19 Switchgear Room at elevation 617 in the Diesel Generator Building.

The rerouted power feed cable to Charging Pump 1A will follow the present routing in the riser at 25/H to elevation 617 in the Auxiliary Building. The cable will then run in conduit from the riser to the stairwell at 24-25/G-H, and up the stairwell to elevation 642 in the Auxiliary Building. The stairwell walls in the Cable Spreading Room area have a fire rating of 3 hours. The door from the outer Cable Spreading Room to the stairwell at 25/G is rated at 1-1/2 hours. At elevation 642, the cable will run in conduit from the stairwell south along the hallway, through the Auxiliary Electric Equipment Room, through the Rod Control Room, into the nonessential Switchgear Room, continue south in conduit along the Diesel Generator Building roof from column 34 to column 35. On the roof the conduit will be enclosed in an appropriate missile barrier. The cable will then run in conduit along the wall at column 35 down through the south end of the Unit 1 Outer Cable Spreading Room, and into the Division 19 Seitchgear Room at elevation 617. The conduit will be enclosed in a fire barrier as it passes through the south end of the Cable Spreading Room. Since the Safety Injection Pump power cables are also routed in this room.

### 1.2 Charging Pump 1A Auxiliary Lube Oil Pump

Commitment: Safe Hot Shutdown Analysis, p. 3-10

Cable #10879

The power feed cable to the Charging Pump 1A Auxiliary Lube Oil Pump presently runs west from the pump cubicle in a cable tray along row 23. At 23/M, the cable tray turns north and continues east and north to the riser area near the elevator at 20/N. The cable drops down in a riser to elevation 560 and runs to 480 V MCC 1393B

located at 20-21/N-P. The present routing of this cable is acceptable.

1.3 Charging Pump Unit 1A Unit Cooler

Commitment: Safe Hot Shutdown Analysis, p. 3-10

Cable #10077

The power feed cable to the Charging Pump 1A Unit Cooler presently runs north and east from the pump cubicle in a cable tray to a riser near 22/G. The cable runs down this riser to elevation 560, then runs in cable trays generally west to 480 V MCC 1393B near 20-21/N-P.

The rerouted power feed cable to the Charging Pump 1A Unit Cooler will follow a similar routing to that of the 1A Lube Oil Pump described above.

1.4 RHR Pump 1A

Commitment: Safe Cold Shutdown Analysis, p. A3-2

Cable #10505

The power feed cable to RJR Pump 1A (located at 22/L on elevation 542) currently runs in conduit east along the pipe tunnel from the south side of the pump cubicle to a cable tray near 21/H, then runs in the tray to a riser at 21/G. The cable runs up the riser to elevation 560; then runs in cable trays west, then south to a riser near 30/J. The cable runs up this riser through the Auxiliary Building to the Unit 1 Outer Cable Spreading Room at elevation 630. The cable then runs south in a tray along column row J to a riser at 35/H, then drops down to 4KV Bus 149 in the Division 19 Switchgear Room at elevation 617 in the Diesel Generator Building.

The rerouted power feed cable to RHR Pump 1A will run in conduit from the north side of the pump cubicle to the riser area located at 20/N near the elevator. The cable will run up the riser to elevation 579, then will run east and south in trays to the risers located near 25/H. From this point the cable will take the same path as the re-routed power cable to Charging Pump 1A (i.e., up to level 617, in conduit up the stairwell to level 642, south to column row 35, then down to the Division 19 Switchgear Room).

1.5 RHR Pump 1A Unit Cooler

Commitment: Safe Cold Shutdown Analysis, p. A3-2

Cable #10068

The power feed cable to the RHR Pump 1A Unit Cooler currently runs from the starter box on the north side of the pump cubicle in conduit west along the pipe tunnel to the riser area near the elevator at 20/N. The cable runs up the riser to elevation 560, then runs to 480 V MCC 1393B at 20-21/N-P.

The 1A starter box will be relocated to the ease, and the 1B starter box will be relocated to the west. The 1A Unit Cooler power feed conduit will be sprayed with fire-retardant coating. The 1B Unit Cooler power feed will be rerouted south through the 1B pump cubicle to provide maximum separation from the 1A feed.

1.6 Auxiliary Feedwater Pump Auxiliary Lube Oil Pumps

Commitment: Safe Hot Shutdown Analysis, p. 3-13

Cables #11074, #11078

The power feed cable to the Auxiliary Feedwater Pump 1B Auxiliary Lube Oil Pump currently runs from the pump (located at 23/G-H on level 579 in the Auxiliary Building) north in conduit to a cable tray along column 22. The cable runs east in this tray to a riser at 22/G, then runs down the riser to elevation 560. The cable runs south to 480 V MCC 1383B located at 23/G-H.

The power feed cable to the Auxiliary Feedwater Pump 1C Auxiliary Lube Oil Pump currently runs from the pump (located at 24/G-H on level 579 in the Auxiliary Building) north in conduit to a cable tray along column 22. The cable runs generally west in this tray to the riser area located near the elevator at 20/N. The cable runs down this riser to elevation 560, then runs to 480 V MCC 1393B at 20-21/N-P.

The rerouted power feed cable to the Auxiliary Feedwater Pump 1B Lube Oil Pump will run in conduit from the pump through a core drill in the floor at 23/G to elevation 560, and then to MCC 1383B.

The rerouted power feed cable to the Auxiliary Feedwater Pump 1C Lube Oil Pump will run west in conduit from the pump and north to the cable tray at 23/J, then continue as in the present routing described above. Neither of the rerouted cables will pass over the steam turbine driven Auxiliary Feedwater Pump 1A.

1.7 Diesel Generator Oil Transfer Pumps

Commitment: Safe Hot Shutdown Analysis, p. 3-5

Cable #10133, Cable #10134

The power feed cable to Diesel Generator Oil Transfer Pumps 1BE and 1BW are currently routed from the pumps (located at 34/H on elevation 567 in the Diesel Generator Building) to embedded conduits in the wall at row J. The cables run in the wall up to elevation 630, the Unit 1 Outer Cable Spreading Room. The cables run to a riser located at 35/H-J, down this riser to 480 V MCC 1391A in the Division 19 Switchgear Room at elevation 617.

The cables to Diesel Generator Oil Transfer Pumps 1BE and 1BW will be rerouted from the pump in conduit up through core drill holes in the floors at 592 feet and 617 feet directly into the Division 19 Switchgear Room.

1.8 125 V DC Feed to 4 KV Bus 149

Cable #10777, Cable #10779

The 125V DC main and reserve feeds to 4 KV Bus 149 are currently routed from the Division 19 Switchgear Room (elevation 617 in the Unit 1 Diesel Generator Building) up risers into the Outer Cable Spreading Room. The cables run north to column 29, then run in conduit up through the floor to DC distribution panel 112 at 29/K in the Auxiliary Electric Equipment Room.

The rerouted 125 V DC main and reserve feeds to 4 KV Bus 149 will run in conduit from DC distribution panel 112 through the Auxiliary Electric Equipment Room, Rod Control Room, and nonessential Switchgear Room. The cables will then be routed as described for the rerouted power cable to Charging Pump 1A, i.e., south to column 35, down through the south end of the Outer Cable Spreading Room (enclosed in a fire barrier) to the Division 19 Switchgear Room at elevation 617.

1.9 480 V MCC's 1391 and 1393A

The feed to 480 V MCC 1391 is currently routed from 480 V Bus 139 in the Division 19 Switchgear Room up to the Cable Spreading Room, then back to the MCC in the Switchgear Room. This routing met the minimum cable length requirements for proper voltage drop. The rerouted feed will remain in the Switchgear Room, encircling the room if necessary.

The feed to 480 V MCC 1393A is currently routed from the 480 V Bus 139 in the Division 19 Switchgear Room up to the Cable Spreading Room, then north to a riser at 30/J. The

cable runs down the riser to elevation 560, then runs north and west to the MCC at 22/L-M. The rerouted feed will run from Bus 139 up through a duct in the south end of the Cable Spreading Room. The cable will run north through the nonessential Switchgear Room, Rod Control Room, and Auxiliary Electric Equipment Room to the stairwell at 25/G-H. The cable will run down the stairwell to elevation 517, then west to a riser at 25/H. The cable will continue down the riser to elevation 579, then run north and west to a riser at 20/N. The cable will run down this riser to elevation 560, then run south and east to MCC 1393A.

## 2.0 UNIT 2 POWER CABLES

### 2.1 Centrifugal Charging Pump 2A

Commitment: Safe Hot Shutdown Analysis p. 3-7, 3-14, 3-17, and 3-20

Cable #20679

The power feed cable to Centrifugal Charging Pump 2A (located at 16-17/K-L on elevation 579) currently runs in a cable tray from the pump cubicle to a riser at 14/H. The cable runs up this riser through the Auxiliary Building to the Unit 2 Outer Cable Spreading Room at elevation 630. The cable then runs north in a tray along row J to a riser at 5/H, then drops down to 4 KV Bus 249 in the Division 29 Switchgear Room at elevation 617 in the Diesel Generator Building.

The rerouted power feed cable to Charging Pump 2A will run in conduit from the pump to the riser area near 19/N avoiding the riser area at 14/H where the Safety Injection Pump power cables are routed. The cable will run up the riser to elevation 617, then run in conduit east and north to the stairwell located at 15/G. The cable will run in conduit up through the stairwell to elevation 642 in the Auxiliary Building. The stairwell walls carry a fire rating of 2 hours on level 617 and 3 hours in the Cable Spreading Room. The doors to the stairwell are rated at 1-1/2 hours at elevation 642. The cable will run in conduit north through the Auxiliary Electric Equipment Room, through the Rod Control Room, into the nonessential Switchgear Room. From here the cable will continue north in conduit along the Diesel Generator Building roof from column 6 to column 5. The conduit will be enclosed in an appropriate missile barrier on the roof. The cable will then drop down in conduit along the wall at column 5 into the north end of the Unit 2 Outer Cable Spreading Room, and will continue down into the Division 29 Switchgear Room at elevation 617. The conduit will be enclosed in a fire barrier as it passes through the north end of the Cable Spreading Room, since the Safety Injection Pump power cables are also routed in this room.

### 2.2 Charging Pump 2A Auxiliary Lube Oil Pump

Commitment: Safe Hot Shutdown Analysis, p. 3-11

Cable #20879

The power feed cable to the Charging Pump 2A Auxiliary Lube Oil Pump presently runs from the pump cubicle north in a cable tray to a riser at 14/H. The cable drops down in the riser to elevation 560, and runs south in a cable tray to column 18. The cable turns west and runs in a tray to 480 V MCC 2393A, located at 18/L-M.

The rerouted power feed cable to the Charging Pump 2A Auxiliary Lube Oil Pump will run west from the pump cubicle in conduit along the wall from 17/K to 17/N, then run south to the riser area at 19/N. The cable will run down in the riser to elevation 560, then continue in conduit north and east to 480 V MCC 2393A at 18/L-M.

2.3 Charging Pump 2A Unit Cooler

Commitment: Safe Hot Shutdown Analysis, p. 3-11

Cable #20077

The power feed cable to the Charging Pump 2A Unit Cooler presently follows the same routing as described above for CP 2A Auxiliary Lube Oil Pump. The rerouted cable will run south from the starter cabinet outside the pump cubicle into the piping area at 17/K. The new conduit will be fire protected until it penetrates the wall at row 17. The cable will then run west along row 17 and continue to MCC 2393A as described above for the rerouted Libe Oil Pump cable.

2.4 RHR Pump 2A

Commitment: Safe Cold Shutdown Analysis, p. A3-2

Cable #20505

The power feed cable to RHR Pump 2A (located at 18/L on elevation 542) currently runs in conduit east along the pipe tunnel from the pump cubicle to a cable tray near 17/H, then runs in the tray to a riser at 14/H. The cable runs up this riser through the Auxiliary Building to the Unit 2 Outer Cable Spreading Room at elevation 630. The cable then runs north in a tray along row J to a riser at 5/H, then drops down to 4 KV Bus 249 in the Division 29 Switchgear Room at elevation 617 in the Diesel Generator Building.

The rerouted power feed cable to RHR Pump 2A will run in conduit from the south side of the pump cubicle to the riser area located at 19/N. The cable will run up riser to elevation 617, then run in conduit east and north to the stairwell located at 15/G. From this point the cable will run in conduit up the stairwell to level 642, north to column 5, then down to the Division 29 Switchgear Room as described for the rerouted power cable to Charging Pump 2A.

2.5 RHR Pump 2A Unit Cooler

Commitment: Safe Cold Shutdown Analysis, p. A3-2

Cable #20068

The power feed cable to the RHR Pump 2A Unit Cooler currently runs in conduit from the starter cabinet on the south side of the pump cubicle east to a cable tray near 19/H, then runs north to the riser area near 14/H. The cable runs up in the riser to elevation 560, then runs south and west in a cable tray to 480 V MCC 2393A at 18/L-M.

The rerouted power feed cable to the RHR Pump 2A Unit Cooler will run in conduit from the starter cabinet west to the riser area at 19/N, run up the riser to elevation 560, then continue west to 480 V MCC 2393B at 19/P.

The 2A starter cabiner will be relocated to the east, and the 2B starter cabinet will be relocated to the west. The 2A Unit Cooler power feed conduit will be sprayed with fire-retardant coating. The 2B Unit Cooler power feed will be rerouted north through the RHR 2B pump cubicle to provide maximum separation from the 2A feed.

2.6 Auxiliary Feedwater Pumps Lube Oil Pump

Commitment: Safe Hot Shutdown Analysis, p. 3-14

Cables #21074. #21078

The power feed cable to the Auxiliary Feedwater Pump 2B Auxiliary Lube Oil Pump (located at 17-18/G-H on elevation 579 in the Auxiliary Building currently runs south in conduit to a cable tray above the wall between Auxiliary Feedwater Pumps 2A and 2B. The cable runs west in this tray to row M, then runs south in a tray to 480 V MCC 2383B at 20-21/M. The power feed cable to the Auxiliary Feedwater Pump 2C Auxiliary Lube Oil Pump (located at 16-17/G-H on elevation 579 in the Auxiliary Building) currently runs south in conduit to a riser at 17-18/G. The cable runs down this riser to elevation 560, then runs west in a cable tray to 480 V MCC 2393A at 18/L-M.

The rerouted power feed cable to the Auxiliary Feedwater Pump 2B Lube Oil Pump will run west from the pump in conduit to the cable tray near 17/J, then continue in the tray as described above under the present routing.

The rerouted power feed cable to the Auxiliary Feedwater Pump 2C Lube Oil Pump will run north and west from the pump in conduit to a riser near 14/H. The cable will run down the riser to elevation 560, then will run south in a cable tray to column row 18. The cable will then run

west in a tray as described above under the present routing. Neither rerouted cable will pass over steam turbine driven Auxiliary Feedwater Pump 2A.

2.7 Diesel Generator Oil Transfer Pumps 2BE and 2BW

Cables #20133, #20134

The power feed cables to Diesel Generator Oil Transfer Pumps 2BE and 2BW are currently routed from the pumps (located at 6/H on elevation 567 in the Diesel Generator Building) to embedded conduits in the wall at row J. The cables run in the wall up to elevation 630, the Unit 2 Outer Cable Spreading Room. The cables run to a riser located at 5/H, and down in the riser to 480 V MCC 2391 in the Division 29 Switchgear Room at elevation 617.

The cables to Diesel Generator Oil Transfer Pumps 2BE and 2 BW will be rerouted from the pump in conduit up through core drilled holes in the floors at 592 feet and 617 feet directly into the Division 29 Switchgear Room.

2.8 125 V DC Feed to 4 KV Bus 249

Cables #20777, #20779

The 125 V DC main and reserve feeds to 4 KV Bus 249 are presently routed from the Division 29 Seitchgear Room (elevation 617 in the Unit 2 Diesel Generator Building) up risers into the Outer Cable Spreading Room. The cables run south to column 12, then run in conduit up through the floor to DC distribution panel 212 at column/row K/10 in the Auxiliary Electric Equipment Room.

The rerouted 125 V DC main and reserve feeds to 4 KV Bus 249 will run in conduit from DC Bus 212 north through the Auxiliary Electric Equipment Room, Rod Control Room, and nonessential Switchgear Room. The cables will be routed as described for the rerouted power cable to Charging Pump 2A, i.e., north to column 5, down through the north end of the Outer Cable Spreading Room (enclosed in a fire barrier) to the Division 29 Switchgear Room at elevation 617.

2.9 480 V MCC's 2391 and 2393A

The feed to 480 V MCC 2391 is currently routed from 480 V Bus 239 in the Division 29 Switchgear Room up to the Cable Spreading Room, then back to the MCC in the Switchgear Room. This routing met the minimum cable length requirements for proper voltage drop. The rerouted feed will remain in the Switchgear Room, encircling the room if necessary.

The feed to 480 V MCC 2393A is currently routed from 480 V Bus 239 in the Division 29 Switchgear Room up to the Cable Spreading Room, then south and west to a riser at 19/N. The cable runs down the riser to elevation 560, then runs to the MCC at 18/L-M. The rerouted feed will run from 480 V Bus 239 up through a duct in the north end of the Cable Spreading Room. The cable will run south through the nonessential Switchgear Room, Rod Control Room, and Auxiliary Electric Equipment Room to the stairwell at 15/G-H. The cable will run down the stairwell to elevation 617, then run south an west in conduit to the riser at 19/N. From this poin the cable will follow the present routing to MCC 2393A.

## 1.0 UNIT 1 INSTRUMENTATION

### 1.1 Steam Generator Pressure Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-3

Three channels of pressure instrumentation for each steam generator currently indicate in the Control Room. One channel for each steam generator also indicates at the Remote Shutdown Panels (1PI-514B, -524B, -534B, -544B). The signal cables for all channels run in proximity in several areas including the pipe tunnel, Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

The proposed steam generator pressure instrumentation for use in case of a postulated fire, will consist of local direct mechanical indicators. One indicator will be provided for each of the four main steam lines. The indicators will be located in the two isolation valve enclosures adjacent to the containment building. The "B" and "D" main steam lines are routed through the west enclosure, and the "A" and "C" lines through the east enclosure. The enclosures are physically separated by the containment building. Two means of access are provided to each enclosure: either from the pipe tunnel or from the outside via locked doors. Since the Turbine-driven Auxiliary Feedwater Pump 1A can be driven either

from the steam line "A" or "D", this pump and associated steam generator pressure indication will remain available in case of a postulated fire at either enclosure.

1.2 Steam Generator Level Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-3

Four channels of level instrumentation for each steam generator are currently provided in the Control Room. One level indicator for each steam generator is provided at the Remote Shutdown Panels (1LI-501A, -502A, -503A, -504A). The transmitters associated with each steam generator are widely separated from the transmitters associated with the other steam generators. The signal cables from each steam generator associated with a given division eventually are routed together to the penetration area. An extension of the present fire barrier at the penetration area will be constructed to assure that steam generator level indication will remain available in case of a postulated fire. When this modification is complete, a fire affecting cables approaching the penetration area from the north will not affect the cables approaching from the south, and vice versa. The minimum available steam generator level indication for a postulated fire inside containment will be two channels each for steam generators A and B, and one channel each for steam

generators C and D, assuming a fire in the north penetration area. This separation will be identical to that currently provided in the penetration vaults outside containment.

The signal cables for steam generator level indication currently run from the penetration vaults (separated as discussed above) to the Cable Spreading Room, Auxiliary Electric Equipment Room, and Control Room. The signal cables for this function which run to and from the Remote Shutdown Panels are also routed in these areas. A modification will be installed which involves tapping into the cables in the north penetration vault which carry steam generator level signals to the Remote Shutdown Panel (cable Nos. 16340, 16341, 16342, and 16343). New cables will be routed from the vault directly into the Purge Room at elevation 617 in the Auxiliary Building. A new panel will be provided in or near the Purge Room with a new power supply and isolation switches, wired such that the level indicators will operate in the present manner unless a postulated fire affects the indication. In that case, the isolation switches will be positioned such that the new power supply will drive the instrument loops, ensuring the availability of indication at the Remote Shutdown Panels independent of the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

1.3 Pressurizer Pressure Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-2

Four channels of pressurizer pressure instrumentation are currently provided. One channel (1PI-455B) indicates at the Remote Shutdown Panels. The signal cables for all four channels are routed in proximity i. several areas including the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

The proposed pressurizer pressure instrumentation for use in case of a postulated fire will consist of a local direct mechanical indicator. This indicator will be located at the Dead Weight Pressure Generator, PT-467B, at 21/P on the 560 elevation in the Auxiliary Building. This location is readily accessible for monitoring of the new instrumentation.

1.4 Pressurizer Level Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-2

Four channels of pressurizer level instrumentation are currently provided. Two channels (1LI-459, 1LI-460) indicate at the Remote Shutdown Panels. The transmitters associated with the four channels of pressurizer level instrumentation are located on racks RM-19, RM-21, RM-22,

and RM-23 between Columnes Z-1 and Z-4 outside of the missile barrier on the 568 level of the containment building. Racks RM-19 and RM-22 are in close proximity near the containment wall. Rack RM-21 is located 10 feet away at the missile barrier; the pressurizer relief tank separates RM-21 from RM-19 and RM-22. Rack RM-23 is located at Column Z-4, at least 25 feet from any of the other three racks.

Cable 15609 (channel 1LI-462) from Rack RM-21 is presently routed near Racks RM-19 and RM-22 (see accompanying sketch). This cable will be rerouted (dotted line on sketch) along the missile barrier behind the pressurizer relief tank to reduce the possibility that a postulated fire could affect more than two channels of pressurizer level signals. An extension of the fire barrier at the penetration area will be constructed to assure that pressurizer level indication will remain available in case of a postulated fire. Since two channels of pressurizer level signals approach the penetration area from the north and the other two channels approach from the south, the extended fire barrier will prevent the loss of more than two channels of pressurizer level signals. This separation will be identical to that currently provided in the penetration vaults outside containment.

The signal cables for pressurizer level indication currently run from the penetration vaults (separated as discussed above) to the Cable Spreading Room, Auxiliary Electric Equipment Room and Control Room. The signal cables for this function which run to the Remote Shutdown Panels are also routed in these areas. A modification will be installed which involves tapping into the cables (15570, 15589) in the penetration vaults which carry pressurizer level signals that indicate at the Remote Shutdown Panels. New Cables will be routed from the penetration vaults directly into the Purge Room at elevation 617 in the Auxiliary Building. A new panel will be provided in or near the Purge Room with a new power supply and isolation switches, wired such that the level indicators will operate in the present manner unless a postulated fire affects the indication. In that case, the isolation switches will be positioned such that the new power supply will drive the instrument loops, ensuring the availability of indication of the Remote Shutdown Panels independent of the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

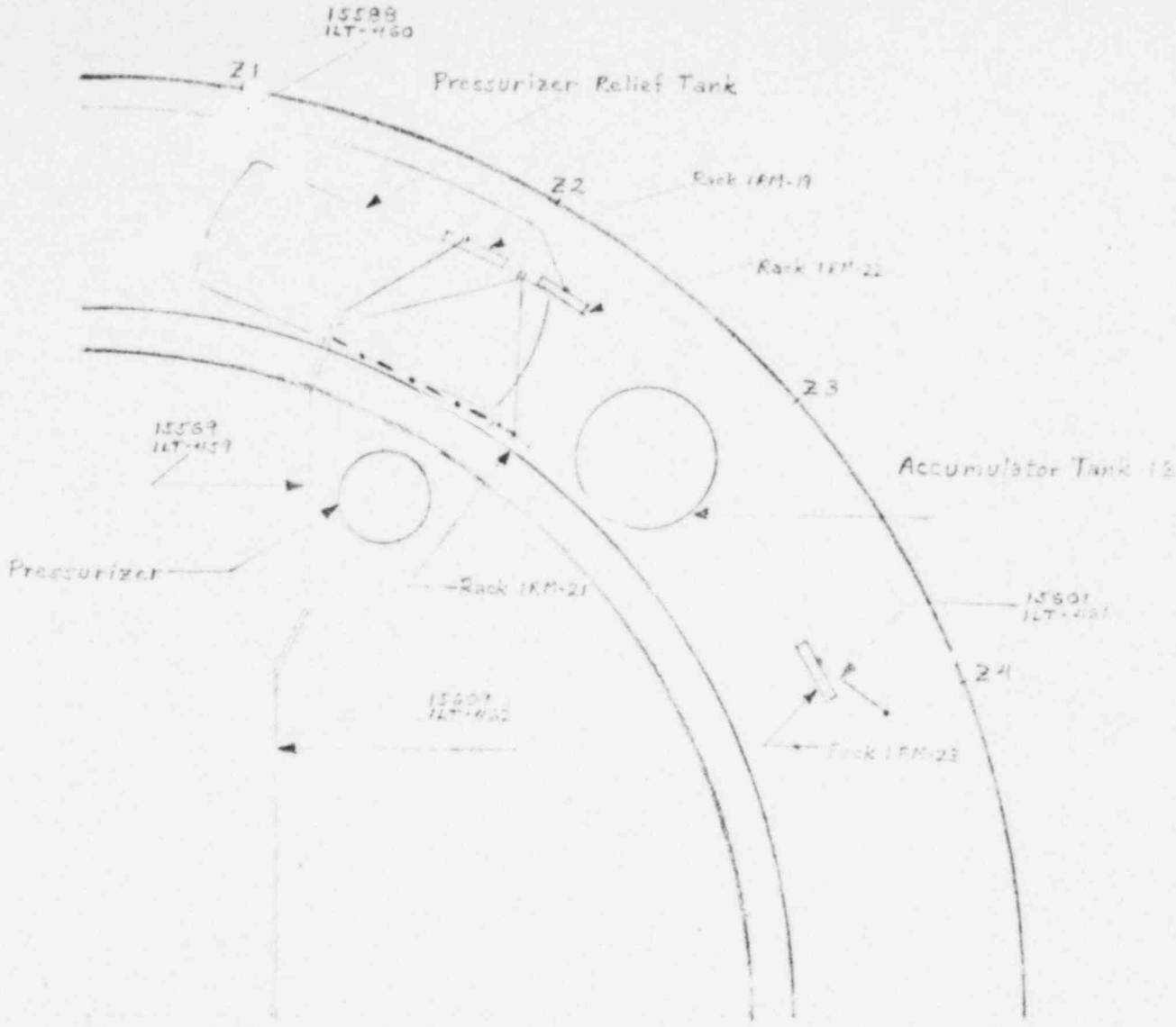
1.5 Reactor Coolant Temperature Instrumentation

Commitment: Safe Cold Shutdown Analysis, p. A3-7

One channel of hot leg wide-range temperature indication is provided for each of the four reactor coolant loops. The signal cables for all four channels (TE-413A, -423A,

-433A, -443A) are routed together to the same penetration, and continue together to the Cable Spreading Room, Auxiliary Electric Equipment Room, and Control Room.

Two new channels of wide-range temperature indication will be provided, one each for two of the four reactor coolant loops. The signal cables for these new channels will be routed to a different penetration such that the new fire barrier at the penetration area will separate the new cables from the existing ones. The new cables will then be routed from the penetration vault to the new instrument panels in or near the Purge Room. The new indicators at the local panel will be powered by a different division from that which powers the existing Control Room indicators.




NORTHWEST QUADRANT
UNIT 1 CONTAINMENT
ELEVATION 565'

## 2.0 UNIT 2 INSTRUMENTATION

### 2.1 Steam Generator Pressure Instrumentation

Commitment: Safe Hot Shutdown Analysis, p.2-3

Three channels of pressure instrumentation for each steam generator currently indicate in the Control Room. One channel for each steam generator also indicates at the Remote Shutdown Panels (2PI-514B, -524B, -534B, -544B). The signal cables for all channels run in proximity in several areas including the pipe tunnel, Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

The proposed steam generator pressure instrumentation for use in case of a postulated fire, will consist of local direct mechanical indicators. One indicator will be provided for each of the four main steam lines. The indicators will be located in the two isolation valve enclosures adjacent to the containment building. The "B" and "D" main steam lines are routed through the west enclosure, and the "A" and "C" lines through the east enclosure. The enclosures are physically separated by the containment building. Two means of access are provided to each enclosure: either from the pipe tunnel or from the outside via locked doors. Since the Turbine-driven Auxiliary Feedwater Pump 2A can be driven either

from the steam line "A" or "D", this pump and associated steam generator pressure indication will remain available in case of a postulated fire at either enclosure.

2.2 Steam Generator Level Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-3

Four channels of level instrumentation for each steam generator are currently provided in the Control Room. One level indicator for each steam generator is provided at the Remote Shutdown Panels (2LI-501A, -502A, -503A, -504A). The transmitters associated with each steam generator are widely separated from the transmitters associated with the other steam generators. The signal cables from each steam generator associated with a given division eventually are routed together to the penetration area. An extension of the present fire barrier at the penetration area will be constructed to assure that steam generator level indication will remain available in case of a postulated fire. When this modification is complete, a fire affecting cables approaching the penetration area from the north will not affect the cables approaching from the south, and vice versa. The minimum available steam generator level indication for a postulated fire inside containment will be two channels each for steam generators A and B, and one channel each for steam

generators C and D, assuming a fire in the south penetration area. This separation will be identical to that currently provided in the penetration vaults outside containment.

The signal cables for steam generator level indication currently run from the penetration vaults (separated as discussed above) to the Cable Spreading Room, Auxiliary Electric Equipment Room, and Control Room. The signal cables for this function which run to and from the Remote Shutdown Panels are also routed in these areas. A modification will be installed which involves tapping into the cables in the south penetration vault which carry steam generator level signals to the Remote Shutdown Panel (Cable Nos. 26340, 26341, 26342, and 26343). New cables will be routed from the vault directly into the Purge Room at elevation 617 in the Auxiliary Building. A new panel will be provided in or near the Purge Room with a new power supply and isolation switches, wired such that the level indicators will operate in the present manner unless a postulated fire affects the indication. In that case, the isolation switches will be positioned such that the new power supply will drive the instrument loops, ensuring the availability of indication at the Remote Shutdown Panels independent of the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

2.3 Pressurizer Pressure Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-2

Four channels of pressurizer pressure instrumentation are currently provided. One channel (2PI-455B) indicates at the Remote Shutdown Panels. The signal cables for all four channels are routed in proximity in several areas including the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

The proposed pressurizer pressure instrumentation for use in case of a postulated fire will consist of a local direct mechanical indicator. This indicator will be located at the Dead Weight Pressure Generator, PT-467B, at 21/P on the 560 elevation in the Auxiliary Building. This location is readily accessible for monitoring of the new instrumentation.

2.4 Pressurizer Level Instrumentation

Commitment: Safe Hot Shutdown Analysis, p. 2-2

Four channels of pressurizer level instrumentation are currently provided. Two channels (2LI-459, 2LI-460) indicate at the Remote Shutdown Panels. The transmitters associated with the four channels of pressurizer level instrumentation are located on racks RM-19, RM-21, RM-22,

and RM-23 between Columns Z-31 and Z-34 outside of the missile barrier on the 568 level of the containment building. Racks RM-10 and RM-22 are in close proximity near the containment wall. Rack RM-21 is located 10 feet away at the missile barrier; the pressurizer relief tank separated RM-21 from RM-19 and RM-22. Rack RM-23 is located at Column Z-31, at least 25 feet from any of the other three racks.

Cable 25609 (Channel 2LI-462) from Rack RM-21 is presently routed near Racks RM-19 and RM-22 . This cable will be rerouted along the missile barrier behind the pressurizer relief tank to reduce the possibility that a postulated fire could affect more than two channels of pressurizer level signals. An extension of the fire barrier at the penetration area will be constructed to assure that pressurizer level indication will remain available in case of a postulated fire. Since two channels or pressurizer level signals approach the penetration area from the north and the other two channels approach from the south, the extended fire barrier will prevent the loss of more than two channels of pressurizer level signals. This separation will be identical to that currently provided in the penetration vaults outside containment.

The signal cables for pressurizer level indication currently run from the penetration vaults (separated as discussed above) to the Cable Spreading Room, Auxiliary Electric Equipment Room and Control Room. The signal cables for this function which run to the Remote Shutdown Panels are also routed in these areas. A modification will be installed which involves tapping into the cables (25570, 25589) in the penetration vaults which carry pressurizer level signals that indicate at the Remote Shutdown Panels. New Cables will be routed from the penetration vaults directly into the Purge Room at elevation 617 in the Auxiliary Building. A new panel will be provided in or near the Purge Room with a new power supply and isolation switches, wired such that the level indicators will operate in the present manner unless a postulated fire affects the indication. In that case, the isolation switches will be positioned such that the new power supply will drive the instrument loops, ensuring the availability of indication of the Remote Shutdown Panels independent of the Cable Spreading Room, Control Room, and Auxiliary Electric Equipment Room.

2.5 Reactor Coolant Temperature Instrumentation

Commitment: Safe Cold Shutdown Analysis, p. A3-7

One channel of hot leg wide-range temperature indication is provided for each of the four reactor coolant loops. The signal cables for all four channels (TE-413A, -423A,

-433A, -443A) are routed together to the same penetration and continue together to the Cable Spreading Room, Auxiliary Electric Equipment Room, and Control Room.

Two new channels of wide-range temperature indication will be provided, one each for two of the four reactor coolant loops. The signal cables for these new channels will be routed to a different penetration such that the new fire barrier at the penetration area will separate the new cables from the existing ones. The new cables will then be routed from the penetration vault to the new instrument panels in or near the Purge Room. The new indicators at the local panel will be powered by a different division from that which powers the existing Control Room indicators.

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