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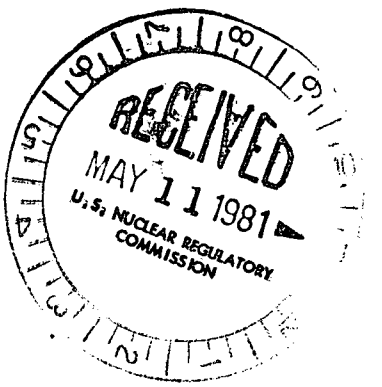
May 7, 1981




Director of Nuclear Reactor Regulation
Attention: D. M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: SEP Topic XV-16
San Onofre Nuclear Generating Station
Unit 1

Your letters of December 15, 1980, and March 19, 1981, requested information pertaining to SEP Topic XV-16, "Radiological Consequences of Failure of Small Lines Carrying Primary Coolant Outside Containment." The requested information is provided as an enclosure to this letter.

If you require additional information, please let us know.

Very truly yours,

Mr. D. Meaford for WCM

Enclosure

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REQUEST FOR ADDITIONAL INFORMATION
FOR SEP TOPIC XV-16
SAN ONOFRE UNIT 1

Lines carrying primary coolant outside containment are:

A. RCS Letdown
B. RCP Sealwater Return/Excess Letdown
C. Pressurizer Liquid/Steam Sample
D. RCS Loop B/C Sample
E. RHR Heat Exchanger Sample
F. Sump Pump Discharge
G. RCS Drain Tank Pump Discharge

In addition, the charging pump discharge and reactor coolant pump seal injection lines carry primary coolant outside containment. However, this water is normally processed through the demineralizers and the reactor coolant filter prior to entering the volume control tank. In addition, fission gases are removed from the water in the volume control tank. Therefore, this water is less radioactive than the primary coolant and these lines are not further addressed in this submittal.

For each of these lines information is provided on the following pages which addresses items 1 through 6 in the enclosures to the NRC letters dated December 15, 1980 and March 19, 1981. The responses to items 7 through 10 are applicable to all of the lines and are provided below.

7. The plant areas (where breaks might occur) which are served by ventilation systems utilizing charcoal filters.

   Responses

   There are no plant areas where breaks might occur which are served by charcoal filters.

8. Whether the filters identified in item 7, above, are used when the plant is at power.

   Response

   This item is not applicable.

9. Information concerning the charcoal filters, if used (e.g., thickness, etc.).

   Response

   This item is not applicable.

10. Are any of the plant areas where breaks might occur completely sealed (i.e., no ventilation)?

    Response

    There are no areas where breaks might occur which are completely sealed.

A. RCS Letdown

1. Containment Penetration: B-6
   P&ID: 568767

2. Line Size: 2", schedule 40S

3. Flow Rate: 180 gpm based on total flow through letdown orifices 397, 398 and 399.

4. Plant Location: The letdown lines traverse the penetration doghouse, pipe tunnel, and radwaste auxiliary building (to letdown demineralizers, RCS filter, volume control tank and charging pump suction)

5. Detection and Isolation Capabilities: A break in the RCS letdown line outside containment would cause flow to increase and pressure to drop. In addition, temperature would increase due to high flow. For some break locations, a high temperature (140°F) at TIC 1105 will cause an alarm and also automatically bypass the demineralizers at TCV-1105 diverting flow directly to the volume control tank. A break downstream of FIC-1104 will cause a high flow alarm at 110 gpm during the pressure blowdown. A break either upstream or downstream of the volume control tank can cause the tank level to decrease. Automatic makeup will initiate at 30% and a low level alarm from LC-1100D will annunciate at 22%. In addition, on low level in the volume control tank the charging pump suction will automatically switch over to the refueling water storage tank. Complete loss of suction to the charging pumps will result in pump cavitation and result in a loss of discharge pressure alarm from PT-1119A or 1119B.

   A break in the letdown line would cause pressurizer level and pressure to decrease. A low level alarm from LC-430C-X will initiate at -4% and a low pressure alarm from PC-431C-X will initiate at 2035 psig. A pressurizer low-low level of 10% will automatically isolate letdown control valve LCV-1112, located inside containment. This can also be accomplished by manual operation of the control room switch.

   In addition to automatic actions identified above specific portions of the letdown piping can be manually isolated by various valves in the system. Isolation of the letdown line can be accomplished by manually closing from the control room the containment isolation valves CV-525 and 526 and the letdown valves CV-202, 203 and 204.

6. Time Required to Isolate Break: The time required to isolate a break will depend on the size and location of the break. Since overall isolation of the letdown system requires manual action, an operator action time of 20 minutes is assumed.

B. RCP Sealwater Return/Excess Letdown

1. Containment Penetration: B-8
   P&ID: 568767

2. Line size: 3", schedule 10S

3. Flow Rate: 207 gpm based on sealwater return leakage of 2 gpm for each of the three reactor coolant pumps and a worst case excess letdown flow of 201 gpm assuming all valves are completely open. (Note: Normal excess letdown flow is 15 gpm.)

4. Plant Location: The RCP sealwater return/excess letdown line traverses the penetration doghouse, pipe tunnel and radwaste auxiliary building (to filter, sealwater heat exchanger and charging pump suction).

5. Detection and Isolation Capabilities: A break of the RCP seal water return/excess letdown line would cause flow to increase and pressure to drop. The following alarms would annunciate: RCP A, B or C No. 1 Seal Leakoff High Flow (4.5 gpm) and RCP Seal Leakoff Manifold Low Pressure (25 psig). The RCP Sealwater Return Isolation Valves CV-527 and 528 are manually closed from the control room. The excess letdown line is normally not in use.

6. Time Required to Isolate Break: Since isolation of the RCP seal-water return/excess letdown line requires manual action, an operator action time of 20 minutes is assumed.

C. Pressurizer Liquid/Steam Sample

1. Containment Penetration: B-12
   P&ID: 568770

2. Line Size: 3/8" tubing with .065" wall thickness

3. Flow Rate: 9.1 gpm based on a worst case of single phase liquid flow

4. Plant Location: The pressurizer liquid/steam sample line goes from the sphere penetration on the southeast side of containment into the ground and then underground to the sample room on the bottom floor of the control building. The line then goes either to the sample sink or back underground to the volume control tank in the radwaste auxiliary building. The sample sink drains are pumped through an underground line to the rad-chem lab drain tank located in the radwaste auxiliary building.

5. Detection and Isolation Capabilities: Use of the pressurizer liquid/steam sample lines is a controlled manual operation. The probability of an uncontrolled failure of this line is very remote due to the local control and short time period the system is in use. The sample line is flushed to the volume control tank prior to drawing a sample. The sample line isolation valves CV 951 and CV 953 located inside containment are isolated manually from the sample station. A break would be detected by local observation or a high radiation alarm or survey in the sample room. The sample line isolation valve CV-992, located in the sample room is automatically isolated on containment high pressure or safety injection and can be manually isolated.

6. Time Required to Isolate Break: Since there is an individual in the sample room whenever these lines are in use, a break outside containment should be detected almost immediately.

D. RCS Loop B/C Sample

1. Containment Penetration: B-12
   P&ID: 568770

2. Line Size: 3/8" tubing with .065" wall thickness

3. Flow Rate: 10.2 gpm based on a worse case of single phase liquid flow

4. Plant Location: The RCS loop B/C sample line traverses the same areas as the pressurizer liquid/steam sample line.

5. Detection and Isolation Capabilities: Use of the RCS loop B/C sample line is a controlled manual operation. The probability of an uncontrolled failure of this line is very remote due to the local control and short time period the system is in use. The sample line is flushed to the volume control tank prior to drawing a sample. The sample line isolation valves CV-955 and 956 located inside containment are isolated manually from the sample station. A break would be detected by local observation or a high radiation alarm or survey in the sample room. The sample line isolation valve CV-957, located in the sample room, is automatically isolated on containment high pressure or safety injection and can be manually isolated.

6. Time required to Isolate Break: Since there is an individual in the sample room whenever these lines are in use, a break outside containment should be detected almost immediately.

## E. RHR Heat Exchanger Sample

1. Containment Penetration: B-12
   P&ID: 568770

2. Line Size: 3/8" tubing with .065" wall thickness

3. Flow Rate: 2.4 gpm based on a worst case of single phase liquid flow

4. Plant Location: The RHR heat exchanger sample line traverses the same areas as the pressurizer liquid/steam sample line. This line also ties in with the RCS loop B/C sample line in the sample room just before isolation valve CV-957.

5. Detection and Isolation Capabilities: Use of the RHR heat exchanger sample line is a controlled manual operation. The probability of an uncontrolled failure of this line is very remote due to the local control and short time period the system is in use. The sample line is flushed to the volume control tank prior to drawing a sample. The sample isolation valve CV-962 located inside containment is isolated manually from the sample station. A break would be detected by local observation or a high radiation alarm or survey the sample room. The sample line isolation valve CV-957, located in the sample room, is automatically isolated on containment high pressure or safety injection and can be manually isolated.

6. Time Required to Isolate Break: Since there is an individual in the sample room whenever these lines are in use, a break outside containment should be detected almost immediately.

F. Sump Pump Discharge

1. Containment Penetration: A-8
   P&ID: 568772

2. Line Size: 1 1/2" schedule 10S

3. Flow Rate: 200 gpm based on runout flow of one sphere sump pump

4. Plant Location: The sump pump discharge line traverses the penetration doghouse, pipe tunnel and radwaste auxiliary building (to decontamination drain tank or through process filter to in-service holdup tank).

5. Detection and Isolation Capabilities: During normal operation the containment sump functions as a collection point in the sphere for component leakage. It also collects the discharge of the reactor cavity sump pump. The containment sump volume is 100 cubic feet. One sump pump starts on high level and the standby pump starts if level continues to rise. Both pumps are locked out on high-high level to prevent operating against a closed discharge valve in the event of containment isolation. Isolation valves CV-102 and 103 in the discharge line are normally open and close on containment high pressure or safety injection. A break in the discharge line is remote due to the low pressure in the line and the periodic use of the line.

6. Time Required to Isolate Break: The time required to isolate a break will depend on the size and location of the break. Since isolation requires manual action, complete discharge of the containment sump (100 cubic feet) is assumed.

## G. RCS Drain Tank Pump Discharge

1. Containment Penetration: B-10
   P&ID: 568772

2. Line Size: 2" schedule 10S

3. Flow Rate: 140 gpm based on runout flow of one RCS drain tank pump.

4. Plant Location: The RCS drain tank pump discharge line traverses the penetration doghouse, pipe tunnel and radwaste auxiliary building (to flash tank and in-service holdup tank)

5. Detection and Isolation capabilities: The RCS drain tank located in the containment acts as a collection point for radioactive drains and vents within the containment before discharge to the flash tank. The RCS drain tank volume is 100 cubic feet. One RCS drain tank pump starts at tank centerline level and the standby pump starts at 6" above the centerline. Containment isolation valves CV-104 and 105 are normally open and close on containment high pressure or safety injection. A break in the discharge line is remote due to the low pressure in the line and the periodic use of the line.

6. Time Required to Isolate Break: The time required to isolate a break will depend on the size and location of the break. Since isolation requires manual action, complete discharge of the RCS drain tank (100 cubic feet) is assumed.