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Director, Nuclear Reactor Regulation
Att Mr Dennis M Crutchfield, Chief
Operating Reactors Branch No 5
US Nuclear Regulatory Commission
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 -
PALISADES PLANT - SEP TOPIC VII-3, SYSTEMS REQUIRED FOR
SAFE SHUTDOWN (EICS MATTERS)

By letter dated January 24, 1981, the NRC transmitted for comment a draft evaluation of the E & IC portion of SEP Topic VII-3. Consumers Power Company has completed a review of that document and provides the attached comments for your consideration.

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PALISADES PLANT
SEP TOPIC VII-3 (E & IC) REVIEW COMMENTS

1. Page 3, Switchyard, Second Paragraph: The acceptability of Palisades design was addressed in CPCo letter to the NRC dated February 9, 1981. That report concluded that with the present design, there is a high probability that: (1) specified acceptable fuel design limits and design conditions are not exceeded and; (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents. These safety functions are accomplished through the low probability of losing all three power sources combined with loss of control power procedures.

2. Page 5, Two Circuits, Third Paragraph: Although the Palisades d-c battery system is only designed to supply required shutdown loads with total loss of a-c power for 30 minutes, the aux. feed system using the turbine driven pump can be operated totally independent of d-c power for the 4-6 hours required to remove the disconnect links. This is because all necessary steam and feedwater valves either fail open or can be manually positioned using hand cranks. Thus, provided the operator takes action within 30 minutes to assure a secondary heat sink, specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary will not be exceeded. Therefore the intent of GDC 17 is met.

3. Page 6, Onsite Class 1E Power Systems: Figure 2 provides a simplified diagram of the Palisades on-site Class 1E power system. This simplified diagram does not reflect the modifications made to the d-c distribution system as part of the fire protection modification. These changes were shown in Figure 2 in CPCo letter of March 19, 1981.

4. Page 7, Second to Last Paragraph: The initial CPCo response to Appendix R requirements was provided in a letter to NRC dated March 19, 1981. Additional information was submitted by letter of May 19, 1981. The issue of cable separation is being addressed as part of the Fire Protection Modifications and therefore will not be addressed separately here.

5. Page 8, First Paragraph: Adequate heating for the room can be maintained by starting the diesel engine if the conventional method of heating fails. This issue, however, is being addressed under SEP Topic IX-5 and under the generic EEQ program. The correctness of the stated 10°C to 40°C temperature range has not been verified for this topic.

6. Page 8, Second Paragraph: This issue is addressed under SEP Topic IX-5 and the generic EEQ program. It will therefore not be addressed further here. The correctness of the stated 10°C to 40°C temperature range has not been verified for this topic.

7. Page 8, Third Paragraph: The first sentence states that the other vital support systems associated with each diesel generator include a load sequencer. There are actually two load sequencers for each division. One is called the DBA sequencer, the other is the Normal Shutdown sequencer.

8. Page 8, Second to Last Paragraph: Each diesel has a 600-gallon day tank in its bedplate and a 2700-gallon auxiliary day tank in each diesel room which feeds its respective bedplate day tank by gravity feed through the 600-gallon day tank level actuated solenoid valve. As reported in FSAR, Section 8.4.1.3 (page 8-20c), this provides 27.6 hours of diesel/generator run time. This is enough time to pump oil directly into the day tank from an oil tanker truck through the connection outside the diesel/generator rooms (in the event supply from the 30,000-gallon underground tank is not available). This paragraph should be deleted.

9. Page 9: See comment No 3.

10. Page 10, First Paragraph: Flow indication is not required.

11. Page 10, High Primary System Pressure Trip Signal: Present plant technical specifications specify a high pressure trip setpoint of 2255 psia.

12. Page 10, Last Paragraph: A Raceway is a passive device. Therefore, it is not proper to consider it as the required single failure.

13. Page 10, Last Paragraph: This paragraph makes the assumption that the single failure of one a-c power source will cause the failure of two high-pressure trip signals. Each of the four channels has its own a-c power source (four inverter/distribution panels) and therefore the loss of one of these sources will not cause the failure of two trip signals.

14. Page 11, First Paragraph: Fire protection is addressed in response to 10CFR50.48. The vertical cable tray spacing has not been verified for this topic.

15. Page 11, Third Paragraph: There is relay coil/contact isolation now. However, the isolation of the RPS from non-safety systems is being addressed by SEP Topic VII-1A, "Isolation of RPS from Non-Safety Systems, Including Qualification of Isolation Devices." Refer to that topic for this review.

16. Page 11, Last Paragraph: A recent modification to the block valves provided positive position indication at Panel C-02 in the control room. A corrected P&ID M-201 has not yet been issued to show this modification.

17. Page 12, Second Paragraph: Circuit separation is being addressed in response to 10CFR50.48. Cable tray spacing has not been verified for this topic.

18. Page 12, Pressurizer Heaters, Second Paragraph: Drawing E-254 shows that both the proportional and backup heaters have direct indication on Panel C-02 in the control room.

19. Page 12, Last Paragraph: A failure of non-safety grade control and instrument air will not disable the flow path from the boric acid tanks through the boric acid pumps. Motor-operated valve MO-2140 which is opened on SIS and is independent of instrument air provides the required flow path.

20. Page 13, Figure 3: A flow path from the boric acid pumps through motor-operated valve MO-2140 to the suction of the charging pumps should be shown.

21. Page 14, Paragraphs 3 and 4: These two paragraphs should be rewritten as follows: "The boric acid heat tracing and boric acid concentrated tank heaters are supplied from non-Class 1E power sources (480v motor control centers 7 and 8). The temperature of the boric acid in the lines is monitored by three redundant sensors, two indicators at local panels with alarms in the control room and the other indicator in the control room itself. The non-Class 1E power source and non-Class 1E heat tracing does not meet current licensing requirements."

The entire boric acid heat tracing system and tank heater controls were replaced in 1979. It was replaced with heat tracing from a different vendor but the system is still classified non-Class 1E. The three redundant temperature monitors more than adequately monitor the boric acid temperature during normal operations with ample opportunity to detect system power failures. It was determined that sufficient heat retention is available through the use of insulation to allow the entire inventory of boric acid to be injected into the PCS even if the heat tracing failed at the start of the injection. Therefore, it is not necessary to have the heat tracing or power supply classified Class 1E. The heat tracing and power supplies are redundant for the two boric acid supply lines. The heat tracing system is in compliance with GDC-4.

22. Page 14, Sixth Paragraph: Circuit separation is being addressed in response to 10CFR50.48. The cable tray spacing has not been verified for this topic.

23. Page 14, Pressure: This paragraph should be rewritten entirely as follows: "Primary coolant system pressure is measured in the pressurizer. There are eight pressure transmitters, PT-0102A, B, C, D, PT-0103, PT-0104 and PT-0105A, B.

The PT-0102 transmitters are the same transmitters used for high-pressure reactor trips that are described in Section 3.A(1) above. The transmitters have a range of 1500-2500 psi. Each transmitter is indicated in the control room and is provided power from a separate preferred a-c bus.

PT-0103 is used to monitor and record the pressurizer pressure in the control room and the remote safe shutdown Panel C-33. This transmitter has a range of 0-3000 psi. The power is provided from the instrument a-c Panel Y-01. This instrument is the preferred instrument for cold shutdown.

PT-0104 is used for overpressure protection interlocks for the suction line valves MO-3015, 3016 for shutdown cooling. This transmitter has a range of 0-600 psi. The transmitter is indicated and recorded in the control room and is provided power from a preferred a-c bus.

The PT-0105 transmitters are used for overpressure protection in connection with the pressurizer relief valves PRV-1042B and PRV-1043B, and supply the subcoded margin monitor. These transmitters have a range of 0-2500 psi. Each transmitter is indicated in the control room and is provided power from a separate preferred a-c bus."

24. Page 15, Second Paragraph: The temperature elements listed provide narrow range monitoring (515 to 615°F) to be used with PT-0102A, B, C and D for thermal margin tripping.

The hot legs are also monitored by TE-0111H and TE-0121H. The cold legs are also monitored by TE-0111A, B and TE-0121A, B. The temperature element outputs for the cold legs are indicated and recorded in the control room. These are wide range instruments (0-600°F); one of the two wide range instruments in each cold leg is required for cold shutdown.

25. Page 15, Pressurizer Level: Pressurizer level is also measured by LT-0103 (range is 0 to 260 in. of water = 0 to 100% level) which is indicated in the control room by LI-0103A and in the remote Panel C-33 by LI-0103B.

    Also, the range for LT-0102A, B, C, and D is 100.7" to 236".

26. Page 16, First Sentence: Two wide range level channels per steam generator are being installed.

27. Page 16, Boric Acid Tanks Level Indication: The tank level instrumentation is actually designated LT-0206 and LT-0208, LIA-0206A, B and LIA-0208A, B. Drawing E-90 shows that LIA-0206A and LIA-0208A are located on the wall in the boric acid room, so that they are accessible for operations remote from the control room.

    Whenever the reactor is critical, Technical Specifications require that sufficient boric acid be maintained in the tanks to bring the reactor to cold shutdown. In the event of an accident, boric acid is drawn from the tanks automatically. During a controlled shutdown several means are available to monitor boric acid injection including the routine samples of the PCS to verify boron concentration. In addition, the SIRW tank serves as a backup source of boron for shutdown. Thus, failure of the level instrumentation on the tanks will not prevent safe shutdown of the plant, and they should not be considered essential for this topic.

28. Page 16, Safety Injection and Refueling Water Storage Tank Level: Redundant level switches (LS-0323, 0327, 0329, and 0330) are provided to automatically initiate safety injection system switch-over to recirculation on low SIRW tank level. Loss of SIRW tank level indication will not prevent safe shutdown of the plant, and this indication should not be considered essential for this topic.

29. Page 16, Chemical and Volume Control System Pumps Flow: Although only one flow transmitter is provided on the charging pumps discharge line, the pressurizer level instrumentation provides the primary means of verifying PCS inventory. Loss of charging flow indication will not prevent safe shutdown of the plant, and this indication should not be considered essential under this topic.

30. Page 16, Service Water System: Circuit separation is being addressed in response to 10CFR50.48. Cable tray spacing has not been verified for this topic.

31. Page 17, Second Paragraph: In the event of loss of both onsite and offsite a-c, the operator is instructed to open the turbine driven aux. feed pump steam admission valves using the hand cranks that already exist on the valves. In addition, a modification relating to fire protection is planned in which nitrogen bottles will be installed on the air header supplying CV 0522B to assure at least two hours of valve operability from the control room. This modification is discussed in CPCo letter of March 19, 1981.

32. Page 17, Paragraph 4: This concern was addressed in Consumers Power Company's response to NUREG-0737 (page 79 of CPCo letter dated December 19, 1980).

33. Page 17, Last Paragraph: Redundant safety grade condensate tank level instrumentation will be installed during the 1981 refueling outage (see page 80 of CPCo letter dated December 19, 1980). Although such indication is not provided on the alternate shutdown panel, redundant pressure switches (three switches; 2 of 3 required for trip) are provided to trip the auxiliary feedwater pumps on low suction pressure, thus avoiding pump failure due to low or non-existent tank level. A backup water source (ultimate heat sink) is provided from Lake Michigan independent of tank level indication. It should be noted that failure of the tank level indication will not prevent safe shutdown of the plant.

34. Page 18, Figure 4: PCV-0521A and its two inch bypass valve in the steam supply line to the turbine driven aux. feed pump is not shown. The pressure switch which is shown closing XV-0521 also closes XV-0522B and trips the motor-driven aux. feed pump. Also, the pressure switch is connected to the aux. feed pump) suction line rather than the discharge line as shown.

    Note that the valves in the flow path are control valves designated CV-0521, CV-0522A, and CV-0522B. These are controlled by solenoid valves SV-0521, SV-0522A, and XV-0522B.

35. Page 19, First Paragraph: The primary means for monitoring secondary inventory is with steam generator level instruments. Failure of auxiliary feed flow indication will not prevent safe shutdown of the plant, and this indication should not be considered essential for this topic.

36. Page 19, Second Paragraph: Circuit separation is being addressed in response to 10CFR50.48. Cable tray spacing has not been verified for this topic.

37. Page 19, Shutdown Cooling System, Second Paragraph: Alternate modes of shutdown cooling are available. See page 20 of the staff's evaluation of Safe Shutdown Systems (October 1980 revision) transmitted by NRC letter of November 5, 1980

    Also, there are five flow transmitters in the shutdown cooling (LPSI) lines. FT-0306, 0307, 0309, 0311, and 0314. FT-0306 has a flow indicating controller in the control room and a hand indicating controller at C-33. The remainder of the transmitters have indicators in the control room and C-33. This meets the single failure criteria.

38. Page 19, Shutdown Cooling System, Third Paragraph: Circuit separation is being addressed in response to 10CFR50.48. Cable tray spacing has not been verified for this topic.

39. Page 20, Figure 5: The two valves between the shutdown heat exchangers are mislabeled. The valve closest to E-60A (now labeled CV-3213) should be labeled CV-3224. The valve closest to E-60B (now not labeled) should be labeled CV-3213.

40. Page 2, Figure 6: Several designations have been marked incorrectly. The valve marked CV-0910 should be CV-0940. The valve marked CV-0410 should be CV-0910. The valve marked CV-0945 should be CV-0948. The box marked RC pump coolers should show a heat exchanger marked Letdown Heat Exchanger E-58. In Note 2 at the bottom, LPSI P60A should say LPSI P67A.

41. Page 22, Third Paragraph: Circuit separation is being addressed in response to 10CFR50.48. Cable tray separation has not been verified for this topic.

42. Page 22, Fourth Paragraph: Loss of CCW pressure indication will not prevent safe shutdown of the plant. This indication should not be considered essential for this topic.

43. Page 22, Fifth Paragraph: Loss of CCW surge tank level indication will not prevent safe shutdown of the plant. This indication should not be considered essential for this topic.

44. Page 22, Last Paragraph: The reference requiring direct indication of cooling water flow in the control room is not given. GDC-44, "Cooling Water" and SRP 9.2.2 "Reactor Auxiliary Cooling Water Systems" do not specifically require or even imply this requirement. Therefore, the existing local and remote indications are considered to be adequate.

    Indication of cooling flow for the listed system is given below:

    1) Shutdown cooling heat exchanger - Flow to the heat exchanger can be determined by local flow indication, FI-0938.

    2) Charging pumps - Flow to the charging pumps can be determined by local flow indication, FI-0971, 0972, 0973.

    3) Engineered safeguards pumps - Flow to pumps P-67A, P-54A, and P-66A can be determined in the control room by an alarm from FS-0958. Flow can also be determined by local flow indication, FI-0958, 0955, and 0952, respectively. Flow to Pumps P-66C, P-66B, P-67B, P-54C and P-54B can be determined in the control room by an alarm from FS-0954. Flow can also be determined by local flow indication FI-0954, 0953, 0959, 0957, and 0956, respectively.

45. Page 23, Service Water System, Third Paragraph: Circuit separation is being addressed in response to 10CFR50.48. Cable tray separation has not been verified for this topic.

46. Page 24, Figure 7: The designation for all of the valves is SV which represents a Solenoid valve. Note that all of the valves in the flow stream are control valves (designation CV) which are supplied air through the solenoid valves. However, the numbers for the SV's and CV's are the same.

    In addition, there are some errors: XV-0885 should be designated CV-0876 and vice versa, SV-0807 should be CV-0869, XV-0843 should be CV-0867, and P7A should be P7C and vice versa.

47. Page 26, Offsite Power Source, Second Paragraph: See comment No 2.

48. Pages 27 and 28, Table 3.3: The only instrument indications which are needed for safe operator control of plant shutdown are one level channel per steam generator, one wide range pressurizer pressure channel, one wide range temperature channel for each PCS cold leg and one wide range channel of pressurizer pressure. Failure of the remaining instruments in the table would not in themselves prevent a safe plant shutdown. See the previous comments for the correct wide range instrument numbers for the above parameters.

49. Page 29, Onsite Class IE Power Sources, Second Paragraph: Circuit separation is being addressed in response to 10CFR50.48. By CPCo letters dated March 19, 1981 and May 19, 1981, design information was submitted on proposed alternate shutdown capability for those instances where separation does not comply with 10CFR50 Appendix R requirements. This information is currently under NRC review.

50. Page 29, Vital Support Systems: See comments 5 and 6.

51. Page 30, First Paragraph: See comment no. 8.

52. Page 30, Steam Generator Level Instrumentation, Second Paragraph: See comment no. 49.

53. Page 30, Condensate Storage Tank Level Indication: See comment no. 33.

54. Page 31, Auxiliary Feedwater Flow: See comment no. 35 and CPCo response to NUREG-0737 dated December 19, 1980.

55. Page 31, Component Cooling Water System: See comments 42 and 43.

56. Page 31, Pressurizer Level: There are 5 level transmitters in the containment. LT-0103 indicates on LI-0103B in the C-33 Panel.

57. Page 32, Pressurizer Pressure: The single pressurizer pressure instrument on C-33 is PT-0103 - the wide range (0-3000 psia) pressure instrument.

58. Page 32, Primary Coolant System Temperature: The temperature indication on C-33 is from one cold leg in each loop (not each hot leg).

59. Page 32, Third Paragraph: See comment no. 21.

60. Page 32, Fourth Paragraph: See comment no. 49. In addition, since this issue is being addressed elsewhere, the frequently stated staff value of one foot vertical air space or metal barrier separation between channels has not been verified for any of the cases discussed in this topic evaluation.

61. Page 32, Summary Section A: See comment no. 1.

62. Page 32, Summary Section B: See comment no. 49.

63. Page 32, Summary Section C: See comments 5, 6 and 21.

64. Page 32, Summary Section D: See comment no. 8.

65. Page 32, Summary Section E: See comment no. 49.

66. Page 32, Summary Section F: See comment no. 48.