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MIRAGLIA,F. Licensing Branch 3

SUBJECT: Documents info discussed in 811118 & 1203 meeting w/NRC re instrumentation for inadequate core cooling.Schedule for implementing final inadecuate core cooling sys dictated by delivery schedule & const complexities.

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TITLE: Response to NUREG -0737/NUREG-0660 TMI Action Plan Rqmts (OL's)

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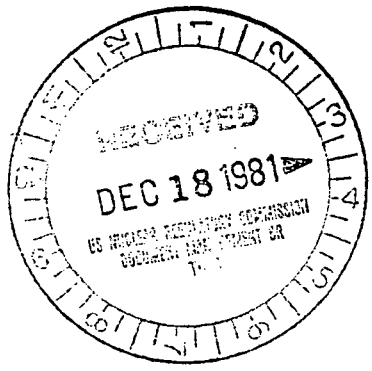
December 16, 1981



Director, Office of Nuclear Reactor Regulation
Attention: Mr. Frank Miraglia, Branch Chief
Licensing Branch No. 3
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
San Onofre Nuclear Generating Station
Units 2 and 3

In recent meetings with NRC management on November 18, 1981 and December 3, 1981 the subject of instrumentation for Inadequate Core Cooling (ICC) for San Onofre Units 2 and 3 was discussed. The purpose of this letter is to document the information discussed during the meetings and to reiterate SCE's position relative to ICC instrumentation.

It should be noted that San Onofre Unit 2 was the first Combustion Engineering plant to commit to the procurement of an ICC instrumentation system which will meet the requirements delineated in Item II.F.2 of NUREG-0737. Because of the complex construction interfaces and the long lead times associated with material delivery as identified on Enclosure 1 (Figure 8-1 which was most recently submitted to the NRC on September 22, 1981 as part of a revised response to Item II.F.2 of NUREG-0737 in Amendment No. 26 to the FSAR), the final ICC system which meets the requirements of NUREG-0737 will be implemented during the first refueling outage for San Onofre Unit 2, and prior to fuel load for San Onofre Unit 3 rather than the January 1, 1982 NRC requirement. SCE's letter of August 31, 1981 documented the material/equipment delivery schedule which was discussed in detail during a meeting with the NRC staff in Bethesda, Maryland on August 20, 1981. As a result of the final implementation schedule imposed by these material/equipment delivery schedules, operation of San Onofre Unit 2 for the first fuel cycle will utilize an interim ICC instrumentation system consisting of previously existing instruments augmented by the addition of a backup display supported by specific operating instructions (OIs) in conjunction with training for monitoring and detecting ICC with this interim system. The interim ICC system coupled with the OIs and training provides a high degree of confidence that ICC will be detected and mitigated. The configuration for the interim and final ICC instrumentation systems is depicted in Enclosure II.

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During the December 3, 1981 meeting, the capabilities of the existing core exit thermocouples (CETs) to function following a LOCA were discussed because the CETs provide one of the indications for identification of ICC. In response, SCE indicated that there is no formal documentation or test results to support an IEEE-323 level of qualification for a post-LOCA type environment for the existing CETs.

The portion of the existing CET system outside the reactor vessel to the containment penetration which consists of connectors, junction boxes, and cabling sections was tested for normal 40 year operation which included integrated leak rate test conditions. The individual test conditions for some of the variables (pressure, temperature effects on aging, and integrated radiation exposure) envelop the LOCA profiles for those variables during the first fuel cycle. However, system performance post-LOCA is expected to be sensitive to excessive moisture under pressure. Considering the testing that was performed on the CET components and the existing capability of the CETs in conjunction with other multiple and diverse information as it will be utilized in accordance with the OI for ICC, a high level of confidence is assured that the operators can successfully identify and mitigate ICC.

In the December 3, 1981 meeting, Mr. Mattson questioned the probable failure mode of the CET's. SCE has no additional information regarding specific CET failure modes. However, there are 56 CETs and other multiple and diverse indicators which can be used to detect ICC. As an example, for a loss of primary inventory event, the following multiple and diverse indicators are also considered:

RCS Subcooled Margin
Pressurizer Pressure
Steam Generator ΔP
Reactor Coolant Pump Motor Amps
RCS Temperature (hot and cold leg)
Core Exit Thermocouples
High Pressure Safety Injection Flow

The San Onofre Units 2 and 3 ICC OI (SO23-3-2.30, Determination of Adequate Core Cooling) requires that these indications be trended every 10 minutes. Comparison of the output of a given thermocouple with (1) its trend over time and (2) the output of other thermocouples at a given point in time would allow identification of a possibly degrading signal.

In summary, SCE has committed to implement a final ICC system which meets the requirements delineated in NUREG-0737. However, material/equipment delivery schedules and construction complexities dictate a schedule for San Onofre Unit 2 which extends implementation of the final ICC system to the first refueling outage, or the first unscheduled outage of sufficient duration following delivery of all necessary material/equipment, rather than the January 1, 1982 NRC requirement. In the interim, SCE considers that the

existing instrumentation, in conjunction with operator training and the operating instructions which rely upon diverse and redundant parameters for the detection of ICC, provides a high degree of confidence that ICC can be detected and mitigated.

If you have any questions or comments concerning this information, please contact me.

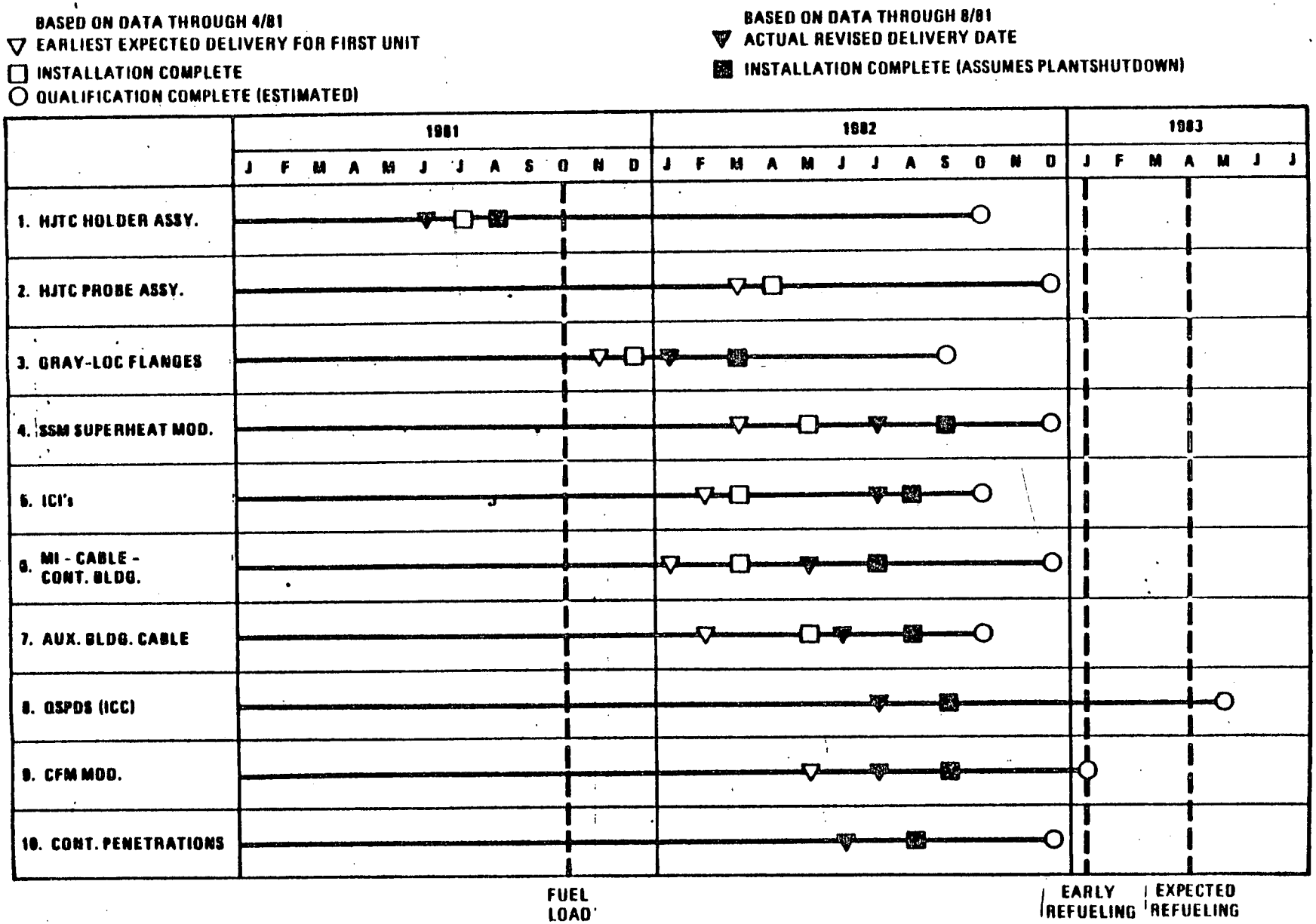
Very truly yours,

M. O. Medford for K. P. Baskin

Enclosures

cc: L. S. Rubenstein (Assistant Director for Reactor Systems
NRC, Bethesda, Maryland)

FIGURE 8-1 EARLIEST POSSIBLE ICC INSTALLATION SCHEDULE – SONGS 2



ENCLOSURE II

INTERIM AND FINAL ICC INSTRUMENTATION SYSTEMS

Interim	Final
(To be implemented by Fuel Load)	(To be implemented during the first refueling outage)
- Subcooled Margin Monitor (SMM)(1)	- SMM upgraded for superheat.
- Existing Core Exit Thermocouples (CET) including backup display (unqualified)(2)(3)	- Qualified CET's
- Critical Function Monitoring System (CFMS) with existing instrumentation	- CFMS modified to include ICC
	- Reactor Vessel Level Monitoring System (heated junction thermocouples)
	- Qualified Safety Parameter Display System (QSPDS)

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(1) The existing SMM is currently qualified for post-accident operation and will be modified during the first refueling outage to calculate and display superheat temperatures.

(2) The CET's were not part of the Environmental Qualification program and are not currently qualified for post-accident operation. The components integral to the qualification of the CETs (e.g., Mineral insulated cables, modified/qualified instrumentation flanges, modified/qualified connectors, modified/qualified Containment Penetrations) have been ordered and their delivery schedules are identified in Enclosure I, which indicates that the earliest schedule for delivery of all the necessary components is approximately June of 1982.

(3) CET's provide indication over a temperature range of approximately 60°F up to 1600°F. The CET's are capable of functioning up to about 2300°F with decreased accuracy. Readings above 1600°F are obtained manually using a digital voltmeter to read CET output voltage at the termination cabinet.