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 RECIP. NAME RECIPIENT AFFILIATION
 MATTSON, R. J. Division of Systems Integration (post 811005)

SUBJECT: Responds to NRC 820401 ltr re cost of inadequate core cooling instrumentation. Provides installation & plant-specific NSSS cost info.

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April 27, 1982

K. P. BASKIN
MANAGER OF NUCLEAR ENGINEERING,
SAFETY, AND LICENSING

TELEPHONE
(213) 572-1401

Director, Office of Nuclear Reactor Regulation
Attention: Dr. R. J. Mattson, Director
Division of Systems Integration
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



This letter is provided in response to your April 1, 1982 letter concerning the cost of Inadequate Core Cooling (ICC) instrumentation.

Your letter requested that the Combustion Engineering (CE) Owner's Group provide summary cost information for each of four instrumentation functions under six different design options. In lieu of a summary table, the following submittals have or will be transmitted to you in order to provide the requested information on a timely basis. First, CE has provided the NRC with cost information for CE-supplied ICC instrumentation by letter dated April 20, 1982. Second, several other Owners Group members will provide directly to the NRC installation cost information for ICC instrumentation. Finally, this letter provides installation and plant specific NSSS cost information for San Onofre Units 2 and 3.

Enclosure 1 provides the total installation (Architect-Engineer) costs for both San Onofre Units 2 and 3. Although CE's letter of April 20, 1982 provided the base generic equipment costs for ICC instrumentation, there are numerous Nuclear Steam Supply System (NSSS) cost elements for specific applications which are not included in CE's estimates. Examples of additional costs include NSSS-related backfit expenditures, mineral insulated cabling, environmentally-qualified connectors and flanges, penetrations, etc. Enclosure 2 provides the total equipment (NSSS) costs associated with ICC for NRC Design Option 1 for both San Onofre Units 2 and 3. In order to obtain the total costs incurred in implementing NRC Design Option 1 on San Onofre Units 2 and 3, it is necessary to add column 1 of Enclosure 1 to the costs in Enclosure 2. The resulting grand total is 20.1 million dollars. The single unit costs for ICC can be obtained by taking about 60% of this two unit cost.

Boo!
s
11/1

8205030286

Mr. Frank Miraglia

-2-

April 27, 1982

Southern California Edison Co. (SCE) shares the NRC's concerns with regard to the cost-benefit aspects of ICC and is grateful for the opportunity to provide the above information. Given industry and regulatory uncertainty regarding the need for ICC information, it is difficult to justify the level of cost associated with Option 1. Notwithstanding this concern, SCE is not prepared at this time to identify recommended design criteria. Thus, in order to provide a timely response to your request, SCE is providing Enclosure 1 without Option 6 (Recommended Design) cost information.

I hope the above information will be of benefit to you. If you have further questions concerning this matter, please contact me.

Very truly yours,

A handwritten signature in cursive script, appearing to read "VP Bushman".

Enclosures

ENCLOSURE 1

INSTALLATION COSTS FOR ICC INSTRUMENTATION SAN ONOFRE NUCLEAR GENERATION STATION, UNITS 2&3

Cost of Design Options (\$1,000,000/2 Unit Project)

Instrumentation	(Note 1) 1	(Note 2) 2	(Note 3) 3	(Note 4) 4	(Note 5) 5	6
Core Exit Thermocouples	4.8	4.0	1.0	3.1	4.7	--
Subcooling Margin Monitor	0.5	0.4	0.2	0.3	0.5	--
Inventory Trending with RCS Pumps Off	4.6	3.9	2.4	3.0	4.6	--
Inventory Trending with RCS Pumps On (Same system as pumps off)	--	--	--	--	--	--

NOTES:

1. Original design is a system provided by CE and uses Heated Junction Thermocouples (HJTC) for the reactor vessel level monitoring system. CE is also providing an upgraded CET system using mineral insulated (MI) cable and an upgraded subcooled margin monitor (SMM) with superheat capability. Costs provided above are for installation of the upgraded system in millions of dollars. The data from this system are displayed on the Critical Function Monitor (CFM) computer with new software provided for ICC integrated color graphics display.
2. With seismic requirements deleted, mounting requirements are reduced and installation costs are less. An estimate was made that 15% could be saved in installation costs across the board.
3. With environmental requirements deleted much of the cost of CET upgrade is eliminated since mineral insulated cable is no longer required. Hookup is still required to the CFM computer and the display software is still required. The HJTC is less costly to install because organic cable can be used in place of MI cable. About two thirds of the cost of the upgrade is saved.
4. With the single failure criteria deleted only half the CET would need to be upgraded and only one HJTC string installed. The SMM would need only one channel of data. About one third the cost of the upgrade would be saved.
5. Little can be saved by not hooking up to 1E power. It was estimated that \$100K could be saved in the installation of the ICC system.

ENCLOSURE 2

Design Option 1 Nuclear Steam Supply System Costs for San Onofre Units 2&3

Cost of Design Option (\$1,000,000/2 Unit Project)

<u>Instrumentation</u>	<u>Cost</u>
Core Exit Thermocouples	2.4
Subcooling Margin Monitor	.2
Inventory Trending	2.6
Integrated Process and Display	5.0