UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

March 20, 1986

TO ALL REACTOR LICENSEES AND APPLICANTS

Gentlemen:

SUBJECT: TRANSMITTAL OF NUREG-1190 REGARDING THE SAN ONOFRE UNIT 1 LOSS OF POWER AND WATER HAMMER EVENT (GENERIC LETTER 86-07)

On November 21, 1985, while operating at 60% power, Southern California Edison Company's San Onofre Unit 1 Nuclear Power Plant experienced a loss of ac electrical power followed by a severe water hammer in the secondary system which caused a steam leak and damaged plant equipment. Shortly after the event, the NRC Executive Director for Operations directed that an NRC Team be sent to San Onofre, in conformance with the recently established Incident Investigation Program, to investigate the circumstances of this event. The NRC Team has now completed its investigation and has documented the factual information and their findings and conclusions associated with the event (see enclosed NUREG-1190, entitled "Loss of Power and Water Hammer Event at San Onofre Unit 1, on November 21, 1985").

In this report, the team has concluded that the event was significant because (a) all inplant ac power was lost for 4 minutes; (b) all steam generator feedwater was lost for 3 minutes; (c) a severe water hammer caused by check valve failures was experienced in the feedwater system which caused a leak, damaged plant equipment and challenged the integrity of the auxiliary feedwater system; (d) all indicated steam generator water levels dropped below scale; and (e) the reactor coolant system experienced an acceptable but unnecessary cooldown transient. In the team's view the most significant aspect of the event was that five safety-related feedwater system check valves degraded to the point of inoperability during a period of less than a year, without detection, and that their failure jeopardized the integrity of safety-related feedwater piping. The cause of the feedwater system check valve failures has been preliminarily identified by SCE as partial or complete separation of the check valve disc assemblies due to fluid flow conditions. Information submitted to the staff on this subject is currently under review.

You should review the information in the enclosed report for applicability to your facility. In addition, you should ensure that the information in NUREG-1190 is made available to your plant staff as part of your training program in connection with the Feedback of Operating Experience to Plant Staff (TMI Action Plan Item I.C.5).

IDHR 5
INFO OR

On February 4, 1986, the Executive Director for Operations (EDO) identified and assigned responsibility for generic and plant-specific actions resulting from the investigation of the San Onofre event. Some of the generic actions may be applicable to your facility. A copy of the EDO memorandum is included for your information.

This generic letter is provided for information only, and does not involve any reporting requirements. Therefore, no clearance from the Office of Management and Budget is required. The enclosed report is currently under NRC review. Any generic requirements stemming from the report will be transmitted at a later date following completion of the appropriate procedural steps.

Sincerely,

Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Enclosures: Computer Sheets (See Jacket)
1. NUREG-1190
2. EDO Memorandum of February 4, 1986
3. List of Generic Letters

STAFF ACTIONS RESULTING FROM THE INVESTIGATION

OF THE NOVEMBER 21 SONGS-1 EVENT

(Reference: NUREG-1190)

1. Item: Adequacy of feedwater check valves to perform safety function. (References: Commission briefing, Sections 6.2.4, 6.4, 6.7, and Principal Finding)

Action	Responsible Office	Category
Implement and coordinate the staff and industry actions necessary to assure the reliability of safety-related check valves. Other offices to assist as requested. Areas to be evaluated include: - licensee's engineering report on root cause analysis and proposed corrective actions - adequacy of check valve design for this application - adequacy of Inservice Testing (IST) Program and procedures to detect degraded and failed valves - adequacy of check valves (and related testing programs) in other systems such as RHR system	IE	Plant-specific Generic

2. Item: Completeness of resolved USI A-1, "Water Hammer". (References: Finding numbers 1, 2, 3, 8 and 9)

Action	Responsible Office	Category
Assess the need to re-evaluate USI A-1 to specifically address the potential for and prevention of condensation-induced water hammers in feedwater piping (assume the issue concerning check valve integrity will be resolved in item 1).	NRR	Generic

3. Item: Adequacy of San Onofre Unit 1 design.
(Commission briefing, Finding numbers 11 and 13)

Action	Responsible Office	Category
Implement and coordinate the staff's actions to re-evaluate the following San Onofre design features: - manual loading of the diesel generators following a loss of power event - manual actuation of steam line isolation valves and assurance of steam generator availability to remove decay heat - lack of steam generator blowdown status in control room - adequacy of the licensee's design change to eliminate spurious SI indication on loss of power	NRR	Plant-specific

4. Item: Adequacy of post-trip review.
(References: Sections 6.6 and 7.2.2.4 and Finding number 17)

Action	Responsible Office	Category
a. Evaluate NRC requirements for ensuring that sufficient event data are retrievable to accurately reconstruct the event following a loss of offsite power.	NRR	Generic
b. Evaluate the licensee's process for post-trip review and evaluation, including the thoroughness of review and oversight provided by the onsite and offsite nuclear safety review groups.	Region V	Plant-specific

5. Item: Adequacy of licensee's recordkeeping practices. (References: Section 6.5 and Finding number 20)

Action	Responsible Office	Category
Evaluate the adequacy of the licensee's maintenance records.	Region V	Plant-specific

6. Item: Adequacy of operator training and/or procedures. (References: Section 7 and Finding numbers 14, 15 and 16)

Action	Responsible Office	Category
Review the implementation of the training program regarding operator understanding and actions in the area of electrical systems, and invoking technical specification action statements.	Region V	Plant-specific

7. Item: Adequacy of emergency notifications and NRC response. (References: Section 7.3 and Finding number 22)

Action	Responsible Office	Category
a. Verify the adequacy of the licensee's procedures and training for reporting of events to NRC Operations Center.	Region V	Plant-specific
b. Evaluate the need for changes in NRC policy or guidance regarding: the use of the ENS line; the use of NRC personnel as ENS communicators; and possible approaches to improve the ability to determine the overall plant status.	IE	Generic

8. Item: Significance of backlog of license amendments. (Reference: Commission briefing)

Action	Responsible Office	Category
Evaluate whether a backlog of license amendments and technical specification changes contributed to delays in approving the licensee's IST program.	NRR	Plant-specific

List of Recently Issued Generic Letters

Generic Letter No.	Subject	Date of Issue	Issued To
86-06		To be Issued	
86-05		To be Issued	
86-04	Policy Statement on Engineering Expertise on Shift	02/13/86	All Power Reactor Licensees and Applicants for Power Reactor Licenses
86-03	Applications for License Amendments	02/10/86	All Power Reactor Licensees and OL Applicants
86-02	Technical Resolution of Generic Issue B-19 - Thermal Hydraulic Stability	01/23/86	All Licensees of Operating BWRs
86-01	Safety Concerns Associated with Pipe Breaks in the BWR Scram System	01/03/86	All BWR Applicants and Licensees
85-22	Potential for Loss of Post - LOCA Recirculation Capability Due to Insulation Debris Blockage	12/03/85	All Licensees of Operating Reactors, Applicants for OLs and Holders of CPs
85-21		Not Issued	
85-20	Resolution of Generic Issue 69: High Pressure Injection/ Make-up Nozzle Cracking in Babcock and Wilcox Plants	10/30/85	All Licensees with Babcock and Wilcox Operating Reactors