



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

October 29, 1985

Docket No.: STN 50-470

Mr. A. E. Scherer, Director
Nuclear Licensing
Combustion Engineering, Inc.
1000 Prospect Hill Road
Windsor, Connecticut 06095

Dear Mr. Scherer:

SUBJECT: AUXILIARY PRESSURIZER SPRAY SYSTEM FOR CESSAR-F

On September 12, 1985, Arizona Nuclear Power Project (ANPP) conducted a loss-of-load test on Palo Verde Nuclear Generating Station Unit 1, the first plant incorporating a Combustion Engineering (CE) CESSAR-F nuclear steam supply system to become operational, from approximately 55% power. The plant did not perform as expected. The test resulted in an event involving loss of all offsite power to non-essential loads (including the reactor coolant pumps), turbine trip and reactor trip. During the recovery phase of the event, overcooling of the reactor coolant system (RCS) occurred to the extent that the emergency core cooling systems were automatically initiated, followed by the associated automatic initiation of containment isolation.

The following two sequences occurred during the event that caused the loss of all three charging pumps:

- (1) When the safety injection actuation signal (SIAS) occurred, power to certain suction valves for the charging pumps was lost since the motor control center for these valves was classified as non-essential and, accordingly was designed to be automatically shed from the safety related electric buses.
- (2) Because of a malfunction of the single water level instrument channel for the volume control tank (VCT), automatic control action was lost which would have transferred the suction of the charging pumps from the VCT to other water sources. Also, after the containment isolation signal was received, all makeup flow to VCT was isolated.

Due to the above sequences, the VCT emptied, the charging pumps became bound on VCT hydrogen cover gas and the pumps were tripped. This produced a potentially hazardous situation when, to re-establish charging pump flow, the lines from the pumps were vented to remove gas.

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Subsequent to the above event, we met with representatives of ANPP and CE on September 20 and October 8, 1985. In these two meetings, ANPP and CE provided indepth design information about the auxiliary pressurizer spray system (APS) and its supporting systems. As a result of these meetings, we became aware of a possible misunderstanding of the scope of the APS during our review of the CESSAR-80 design.

We are concerned about the APS system and its supporting systems for the following reasons:

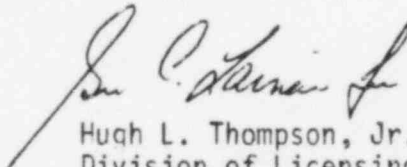
- (1) The natural circulation cooldown analysis submitted for CESSAR-F relies upon the APS and its supporting systems for reactor coolant system (RCS) depressurization during cooldown;
- (2) The APS and its supporting systems are relied upon in mitigating the steam generator tube rupture (SGTR) accident and possibly other accidents requiring depressurization of the RCS when the main pressurizer spray is not available; and
- (3) We relied heavily on the reliability of the APS and its supporting systems in our evaluation of the need for rapid depressurization capability for CE plants in NUREG-1044, "Evaluation of the Need for a Rapid Depressurization Capability for Combustion Engineering Plants."

As you know, we have a pending request from CE for an FDA amendment that is intended to close out confirmatory issues related to the SGTR and natural circulation cooldown events. In view of the above, we need additional information in order to complete our evaluation of that request. Specifically, we request that you:

- (1) Address need for a safety-grade APS and supporting systems (i.e., from its water source through the spray nozzles) considering the systems' functions as discussed above; and
- (2) Propose any changes in the CESSAR-F design and/or interface requirements as a result of the above.

Your response is needed before we can take any further action on your pending request for an FDA amendment.

Sincerely,



Hugh L. Thompson, Jr., Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: See next page

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Combustion Engineering, Inc.
(CESSAR)

Docket No. STN 50-470

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