

From: Theresa Sutter <tsutter@scientech.com>
To: FOIA FOIA <FOIA@nrc.gov>
Date: Fri, Oct 28, 2005 11:42 AM
Subject: RE:

FOIA/PA REQUEST

Case No.: 2006-0017
Date Rec'd: 10-28-05
Specialist: Brown
Related Case: _____

Yes, I'm sorry, it is an FOIA Request.

-----Original Message-----

From: FOIA FOIA [mailto:FOIA@nrc.gov]
Sent: Friday, October 28, 2005 11:40 AM
To: tsutter@scientech.com
Subject: Re:

Is this a FOIA request? Does not state that it is.

>>> Theresa Sutter <tsutter@scientech.com> 10/28/05 11:13 AM >>>

I am requesting NRR's response to the attached memorandum. The response should be from J. A. Zwolinski to E. G. Greenman, dated November 18, 1991.

Thank you.

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

MAR 15 1980

JR/JC
- your action
- coordinate w/ Calv
CmH
4/2/9

MEMORANDUM FOR: Gary M. Holahan, Acting Director, Division of Reactor Projects III/IV/V and Special Projects, NRR

FROM: Edward G. Greenman, Director, Division of Reactor Projects, Region III

SUBJECT: REQUEST FOR TECHNICAL ASSISTANCE - CLARIFICATION OF ALTERNATE DECAY HEAT REMOVAL REQUIREMENTS - AIT #0128

Clinton Technical Specifications 3.4.9.1, 3.4.9.2, 3.9.11.1, and 3.9.11.2 require that two loops of residual heat removal (RHR) be OPERABLE for shutdown cooling in OPERATIONAL CONDITIONS 3, 4, and 5 except that only one train is required when the head is removed from the reactor and more than 23 feet of water is over the vessel flange. ACTION statements for the above Technical Specifications permit the licensee to utilize alternate methods capable of decay heat removal (DHR) for each required shutdown cooling mode loop of RHR that is not OPERABLE.

Technical Specifications require that the licensee demonstrate the operability of these alternate DHR methods within one hour and once per 24 hours thereafter. In addition, the ACTION statements require the licensee to establish reactor coolant circulation by an alternate method when no RHR or recirculation pumps are in operation. No time limits are specified for reliance on the ACTION statements for alternate DHR or alternate coolant recirculation. Several questions regarding Technical Specifications have been raised by the Clinton resident staff.

1. What are the requirements of "alternate methods of decay heat removal" with regard to the use of safety grade equipment, seismic qualifications, ability to withstand a loss of offsite power accident, margin of excess heat removal capability, etc.?
2. Does the alternate DHR method have to include the capability to transfer the heat all the way to an ultimate heat sink or just remove it from the core?
3. What is meant by "demonstrate the operability?" Would this be expected to include physically proving all components will operate by, for instance, actually opening safety relief valves (SRVs) and passing water through them when that is the method being used for alternate DHR? Current NRC philosophy seems to lean towards not putting water past the SRVs due to industry problems with foreign material contaminants interfering with their operation. Does the licensee have to actually measure heat removal capacity during each

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demonstration, just show that flow can be established through the system, or merely perform an analysis that shows that the decay heat rate is within the capacity of the alternate system? Can the licensee rely on previous demonstrations or generic evaluations (BWR Owners Group)?

4. No time limits are specified in the Technical Specification for dependance on alternate DHR methods. What time limits would be appropriate, or can the licensee utilize nonsafety grade methods for an unlimited time? Is it appropriate for the licensee to intentionally disable both loops of RHR at the same time and depend totally on nonsafety grade equipment for long term decay heat removal?
5. What are the requirements of "establishing reactor coolant circulation by an alternate method" with regard to flow rate, use of safety grade equipment, seismic qualification, ability to withstand a loss of offsite power accident, etc.? Would natural circulation be considered an acceptable method?
6. The Clinton Updated Safety Analysis Report (USAR) does not discuss alternate DHR methods except for use of SRVs to cool the reactor and RHR in the suppression pool cooling mode to transfer the heat to the ultimate heat sink. This accident analysis starts at 102% power and is terminated when cold shutdown is reached. The USAR does not analyze a loss of decay heat removal accident which occurs during cold shutdown conditions. Would the use of alternate DHR methods in cold shutdown constitute an Unreviewed Safety Question in accordance with 10 CFR 50.59?
7. Does 10 CFR 50, Appendix A, "General Design Criteria For Nuclear Power Plants," apply to alternate DHR and coolant circulation methods? For example, Criterion 34 states, in part, "A system to remove residual heat shall be provided...to assure that for onsite electrical power system operation (assuming offsite power is not available)...the system safety function can be accomplished, assuming a single failure."

Background Information:

Clinton has used several methods of alternate DHR in the past to meet the requirements of the Technical Specifications. Among the methods used have been circulation of the reactor refueling pool through the fuel pool cooling heat exchangers with the reactor head removed, circulation of reactor coolant through the reactor water cleanup system using the non-regenerative heat exchanger to remove heat, draining reactor coolant to the condenser through the main steam line drains while making up with water from other sources, draining reactor coolant through the SRVs with no method to remove the heat from the suppression pool but a calculation showing that the pool would not heat up excessively in the time that RHR was not available, and most recently, draining reactor coolant through the SRVs with suppression pool heat removal accomplished by circulating water through the spent fuel pool heat exchangers

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using the suppression pool cleanup pumps. In one case, the licensee depended on one such alternate DHR method for a 24 day period and depended on two alternate methods for 8 days of that time when both RHR loops were inoperable.

All of the above alternate DHR methods utilize nonsafety grade equipment for at least part of the DHR chain. None of the methods would be able to perform fully during a loss of offsite power accident. Clinton, as well as most other BWRs, routinely disables RHR loops for preventative and corrective maintenance and has no completely safety grade alternate DHR method available. In light of recent generic communication and TI inspection requirements regarding PWR loss of DHR incidents and long term decay heat removal capabilities, Region III is concerned about a BWR plant's ability to remove decay heat with RHR loops disabled during a loss of offsite power accident, seismic event, or other accident or failure. We believe that the Technical Specifications should be more prescriptive regarding acceptable methods of alternate DHR and coolant circulation and should contain time limits for operations with one or two RHR loops inoperable. Current Specifications would allow both loops of RHR to be inoperable for an unlimited period of time.

Regarding the issue of "demonstrating the operability" of the alternate systems, Clinton currently does a one-time test to verify flow rates and heat removal capability of the systems and then simply depends on a record review to meet the 1 hour and once per 24 hour demonstration requirements. They conduct an informal review of system status and tagout files to determine that the system would still work if called upon. This review is logged in the control room log. If the alternate system is being taken credit for but not physically being used to remove decay heat, they do not normally even keep it lined up in standby. In the case of using the fuel pool cooling system to cool the suppression pool, it took about seven hours to line up the systems to put it in operation. When using emergency core cooling system injection and SRVs as the alternate DHR system for the reactor, they do not do any kind of a test. However, there are existing periodic surveillance requirements for these individual systems. We do not know of any test done at Clinton to verify the heat removal capability of the SRVs when passing water.

Region III realizes that a completely safety grade alternate DHR system is not always possible. We would prefer that the Technical Specifications establish a reasonable time limit for inoperability of one of the required loops of RHR and not allow the intentional disabling of both loops of RHR. We request resolution of these issues before Clinton enters the next refueling outage in September 1990. These issues are also relevant to other BWRs so a generic response would appear to be appropriate. We have been told that the BWR Owners Group is in the process of preparing some kind of submittal concerning alternate DHR.

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Gary M. Holahan

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If you have any questions, please contact Richard Knop (FTS 388-5547) or Philip Brochman (217-935-9521).



Edward G. Greenman, Director
Division of Reactor Projects

cc: J. B. Hickman, NRR
P. G. Brochman, SRI-Clinton