MAINE YANKEE ATOMIC POWER COMPANY •

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January 30, 1981
2-CQ.1
JHG-81-50
FMY-81-11

Unites States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Darrell G. Eisenhut, Director
Division of Licensing

References: (a) License No. DPR-36 (Docket No. 50-309)
(b) USNRC Letter, D. G. Eisenhut to All Licensees of Operating Plants, dated October 31, 1980
(c) MYAPC Letter (WMY 80-162) to USNRC, dated December 15, 1980

Subject: Post TMI Requirements - Guidance for Evaluation and Development of Procedures for Transients and Accidents.

Dear Sir:

This letter describes the program to be undertaken by Maine Yankee to respond to "Guidance for Evaluation and Development of Procedures for Transients and Accidents", Item IC1 of NUREG 0737. The most recent revision to this guidance was transmitted to Maine Yankee via ref. (b), which also requested, pursuant to 10 CFR 50.54(f), information relating to Maine Yankee's commitment with respect to the implementation date associated with this task. Maine Yankee responded via ref. (c), in which a commitment was made to have revised procedures available and to have completed procedure implementation and personnel training by the first refueling outage after Jan. 1, 1982, and to submit a program description by Jan. 31, 1981.

Maine Yankee has already completed a major upgrade of the emergency operating procedures existing at the time of the TMI accident. This previous upgrade involved intensive investigation of small break LOCA phenomena, generation of small break LOCA guidelines for the CE Owner's Group by Combustion Engineering, approval of these guidelines by NRC, and implementation of the guidelines in Maine Yankee's procedures. In addition, for non LOCA transients and accidents, Maine Yankee participated in the CE Owner's Group review of transients and accidents, development of guidelines for transients, accidents, and inadequate core cooling, and factored the results of these efforts into emergency operating procedures. Procedure revision considered plant specific information and scenarios leading to core melt.

The emergency operating and casualty procedures now in effect were produced by a task team assembled to revise pre-TMI procedures both to

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incorporate all relevant new Tehcnical information and NRC staff guidance concerning operating strategies and plant response and to improve the effectiveness of procedures from a human factors point of view. The task team consisted of senior personnel drawn from the Maine Yankee operating organization and the Nuclear Services Division. Permanent members of this task team were the Maine Yankee Director of Operational Support (chair), the Maine Yankee Assistant Operations Department Head, the Nuclear Services Division Manager of PWR Transient and Accident Analysis, and a Nuclear Services Division Plant Engineering Department Principal Engineer. Additional technical expertise was drawn upon as needed. In the task team core alone was vested collectively nearly half a century of experience in design, analysis, and operation of nuclear power plants including Maine Yankee, other PWR's, a BWR, Navy nuclear propulsion plants, and large liquid metal cooled fast breeders.

The approach of upgrading procedures through a task team of highly qualified senior personnel will be maintained through the program described below.

Summary of Program

Maine Yankee will further upgrade its casualty and emergency operating procedures through a program consisting of two major tasks which will run essentially in parallel. Each task involves additional analysis and evaluation of the Maine Yankee plant specific design (NSSS and BOP) to better characterize plant response to abnormal conditions and formulation of improved strategies for use by the operator in controlling such conditions. Each task explicitly takes into account multiple failures and operator errors.

TASK 1

Task 1 involves upgrading Maine Yankee's existing casualty and emergency operating procedures by application of the critical safety functions[1] and safety function and protection sequence analysis[2] concepts.

Task 1 will thus result in more explicit consideration of primary and alternative methods of achieving, re-establishing, or maintaining critical safety functions within the context of existing casualty and emergency operating procedures.

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1 W. M. Guinn, Program Manager, W. R. Corcoran, N.J. Porter, J.F. Church, M.T. Cross, The Critical Safety Functions and Plant Operations, C-E Publication TIS-6743, Presented at International Conference on Current Nuclear Power Safety Issues, Sponsored by IAEA, October 20-24, 1980.

2 R. A. Fortney, J. T. Snedeker, J. E. Howard, W. W. Larson, Safety Function and Protection Sequence Analysis, Presented at American Nuclear Society Winter Meeting, November 11-16, 1973.

Task 2

Task 2 involves application of probabilistic risk assessment techniques to the Maine Yankee design to identify significant accident initiators and sequences.

This task will emphasize characterization of plant design and response by use of event tree and fault tree techniques rather than detailed sequence quantification or consequence calculation.

The results of Task 2 will be used to assure that significant credible events and sequences are covered in plant casualty and emergency procedures.

A consultant will likely be retained to assist in this task.

Schedule

Task 1 will be completed, and the results reflected in improved casualty and emergency operating procedures, by the end of the 1982 refueling outage.

Task 2 will be completed and the results reflected in further improvements to casualty and emergency procedures by the end of 1983.

Additional Information

The Maine Yankee Atomic Power Station utilizes a Combustion Engineering NSSS with several design features unique among CE plants. For example, the Maine Yankee design employs three loops, each with one U tube steam generator, one reactor coolant pump, one passive ECC accumulator, and two loop isolation valves in contrast to the usual 2 x 4 CE design. As another example, the Maine Yankee ECCS design utilizes high head high pressure safety injection pumps which can deliver flow to the reactor coolant system when the system is at and above normal operating pressure (2250 psia). Maine Yankee of course exhibits the usual uniqueness in BOP design and station layout.

Maine Yankee's inhouse analytical capability, and the usage of this capability, are also somewhat unique in that Maine Yankee performs essentially all necessary licensing, safety, and engineering analysis inhouse without NSSS vendor assistance.

Maine Yankee's unique NSSS design, together with the disparity between BOP design and layouts of CE, and indeed all nuclear plants, render more difficult the development of best estimates of plant behavior under abnormal conditions which apply to Maine Yankee as well as the other CE plants. Historically, Maine Yankee has had to very carefully review generic bounding analyses to assure applicability to Maine Yankee. The verification of applicability of best estimate generic analyses, in which large conservative margins to accomodate detailed differences in design are undesirable, appears to require even more effort than in the case of very conservative licensing analyses. This verification effort lags generic analysis, so it creates both an additional workload and a delay in application of the results, particularly if rework is found to be necessary.

Recognizing both the uniqueness of the Maine Yankee design and the available inhouse analytical capability, Maine Yankee will proceed directly to production of improved casualty and emergency operating procedures developed specifically for the Maine Yankee design. In this way, Maine Yankee will achieve several objectives:

- Improved procedures which consider multiple failures and operator errors will be available and implemented with a minimum of delay.
- The improved procedures will be based upon and derived directly from consideration of the Maine Yankee design, ie, they will be plant specific.
- Much of the work will be performed inhouse by personnel who are very familiar with the Maine Yankee design and the unit's operating history.
- All details relevant to the methods, assumptions, and results will be available for future reference.
- The end product will be the result of the combined efforts of the engineering and operations staffs, and will reflect the synergistic effects of such a multidisciplined approach.
- Maine Yankee personnel involved in the effort will be the primary beneficiaries of the knowledge to be gained by performance of the necessary work.
- Documentation of program output can be specified with application to training programs in mind.
- With respect to Task 2, Maine Yankee will obtain a plant specific characterization of the Maine Yankee design and experience in plant specific application of PRA techniques which will be applicable to future NREP and licensing work.

We trust the information contained herein is adequate; however, if further clarification is necessary, do not hesitate to contact us.

Very truly yours,

MAINE YANKEE ATOMIC POWER COMPANY

John H Garrity

John H. Garrity, Director
Nuclear Engineering & Licensing

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Enclosure