



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

Attachment 1

MAR 11 1982

50-309

MEMORANDUM FOR: Thomas M. Novak, Assistant Director for  
Operating Reactors, DL

THRU: Robert A. Clark, Chief *[Signature]*  
Operating Reactors Branch #3, DL

FROM: Christian C. Nelson, Project Manager  
Operating Reactors Branch #3, DL

SUBJECT: JUSTIFICATION FOR CONTINUED OPERATION OF MAINE YANKEE  
DURING ONGOING EQUIPMENT QUALIFICATION REVIEW

SECY-81-603B identified Maine Yankee as one of 18 plants without sufficient documented justification for continued operation during the ongoing equipment qualification review. I notified the licensee, Maine Yankee Atomic Power Company, of this position and, on February 12, 1982, met with the licensee and Robert A. Clark on this subject. On February 25, 1982 the licensee submitted additional information supplementing his September 2, 1981 letter in the area of justifying continued operation.

The licensee's February 25, 1982 letter addresses each component identified by the staff (Franklin Research Center - reviewer) as lacking adequate documented justification for continued operation. Based on the information provided, the licensee concludes that continued operation is justified.

I have reviewed the licensee's submittal and determined that the justification for continued operation associated with each identified component falls within one or more of the following acceptable categories:

1. The component has been replaced with a qualified component and no longer requires a justification for continued operation.

Components:

- ELEC-8 Cables
- Solenoid Pilot Valves:
  - CVCS-2,3,5,6,7,8
  - CF-S-1,2
  - FP-1
  - HPSI-3,4
  - LPSI-3
  - PS-1,2,3,4
  - PV-1,2,3
  - AFW-3
  - CLMS-5
  - FW-2
  - KS-1,2
  - PCC-1,4
  - RC-C
  - MC-1

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2. Another system is capable of providing the required function of the system with unqualified equipment.

Components (affected system)/alternate system:

- RC-6,9 (RTDs)/In-core thermocouples.
  - PAM 6 (sump level for monitoring recirc operation)/HPSI discharge pressure and flow indication.
  - ELEC-13,16,17,19 (position indication of some containment isolation and ESF valves)/if long term operation required, valve position can be verified by flow, temperature and pressure indication.
  - LPSI-4 (RHR System)/AFW System.
  - PAM-1 (Hydrogen analyzer)/until PAM-1 qualified (April 1, 82) Maine Yankee will initiate purge based on conservative analysis if PAM-1 fails.
  - PAM-9,10 (safety and relief valve position indication)/operators trained to use other indications including quench tank parameters, block valve position, PORV solenoid position indication and containment response.
  - MS-3 (steam system pressure transmitters potentially affected by aux steam line rupture in valve house)/redundant instruments outside valve house.
  - CS-3 (containment spray pump discharge pressure)/pump motor amps and containment response can be used to monitor spray pump operation.
3. The plant can be safely shut down in the absence of the unqualified component.

Component - function:

- PAM-2 - containment radiation monitors to be fully qualified in March 82 - provide indication only.
  - PAM-8 - containment pressure monitors - located in less than severe environment, provide indication only.
4. The unqualified component will have performed its safety function prior to failure.

Component - Affected system:

- ELEC-7 - terminal blocks in circuits of solenoid operated valves which operate quickly after accident. For those valves which should remain energized shut there are redundant shut valves outside containment. It should be noted blocks are similar to blocks which have been qualified.

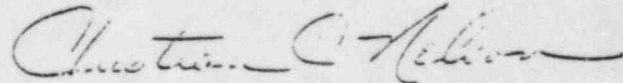
- ELEC-13,16,17,19 - position indications will not fail prior to initial valve response to accident. See category 2 for long term position indication.
- HPSI-9 - valve motors for HPSI pump discharge being replaced due to lack of documentation on radiation tolerance. Must operate one day however one year calculated dose less than one half tolerance of similar motors.

5. Other Justifications:

Component - Discussion:

- HPSI-8 - This pressure switch protects HPSI pump during normal operation by tripping on low suction pressure. This switch is bypassed by SIAS therefore failure during LOCA has no effect.
- RC-1, PAM-5, FW-1 - transmitters for which adequate qualification documentation exists.
- AFW-5 - Deleted - solenoid pilot valves not required for accident mitigation.

Based on my review, I conclude that sufficient justification for continued operation has been provided by the licensee.



Christian C. Nelson, Project Manager  
Operating Reactors Branch #3  
Division of Licensing

APPENDIX D - REVIEW OF LICENSEE'S RESPONSE TO NRC EEQ  
SER CONCERNING JUSTIFICATION FOR INTERIM OPERATION

## 1. BACKGROUND

The NRC Safety Evaluation Report (SER) concerning equipment environmental qualification (EEQ) states [9]:

"Subsection 4.2 identified deficiencies that must be resolved to establish the qualification of the equipment; the staff requires that the information lacking in this category be provided within 90 days of receipt of this SER. Within this period, the licensee should either provide documentation of the missing qualification information which demonstrates that such equipment meets the DOR guidelines or NUREG-0588 or commit to a corrective action (requalification, replacement, relocation, and so forth) consistent with the requirements to establish qualification by June 30, 1982. If the latter option is chosen, the licensee must provide justification for operation until such corrective action is complete."

On January 19, 1982, FRC representatives met with NRC Division of Licensing personnel at NRC offices to discuss the potential for FRC to assist the staff in the technical review of licensees' statements regarding justification for interim plant operation submitted in response to outstanding qualification deficiencies in the NRC EEQ SERs. The results of the meeting were as follows: (1) FRC was requested to proceed immediately with the technical review of licensees' justification for interim operation, (2) the format was established, and (3) the criteria for the review were established. These criteria are presented in Section 2 of this appendix.

On January 21, 1982, the NRC provided the following modification to Final Assignment 13 concerning this subject:

"The FRC review will consist of:

- o Review the licensee's justification of interim operation and provide FRC independent analysis which shows whether or not licensee provided technically sound rationale as a basis for justification for continued plant operation.



- o On January 27, 1982, FRC shall provide a list of those power reactors that have provided technically sound justification for continued operation. FRC shall also provide a list of those power reactors which have not provided technically sound justification for continued operation. In addition to the lists, FRC may provide any additional information which in FRC's judgment is necessary to support the conclusions regarding justification for continued operation."

On January 25, 1982, the NRC was provided with the completed review of the licensees' statements presented as a basis for justification for interim operation in response to the NRC EEQ SER.\* On February 5, 1982, at the NRC's request, the NRC was provided with actual examples of licensees' responses to the NRC EEQ SER that provide adequate rationale as a basis for justification for interim operation.\*\*

## 2. GENERAL DISCUSSION

In general, licensee-submitted justifications for interim operation are based on systems considerations, equipment operability evaluations, or failure-modes-and-effects analyses.

Systems considerations often involve the availability of backup equipment capable of performing the particular safety function of concern. The backup equipment is either environmentally qualified, unqualified but not exposed to a harsh environment at the same time as the primary equipment, or located so that it is unlikely that both the primary and backup equipment could be simultaneously exposed to a severe environment. In general, these systems discussions should consider (1) the possibility of a single-active failure

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\* C. J. Crane

Letter to R. A. Clark, NRC. Subject: Transmittal of FRC Review of Licensees' Responses to NRC EEQ SER Concerning Justification for Interim Operation  
FRC, 25-Jan-82

\*\* C. J. Crane

Letter to R. A. Clark, NRC. Subject: Transmittal of Actual Examples of Licensees' Responses to NRC EEQ SER Which Provide Adequate Rationale as a Basis for Justification of Interim Operation  
FRC, 5-Feb-82

disabling the backup equipment, (2) any major differences in the characteristics of the primary and backup equipment (unless it is obvious that the equipment is essentially identical), (3) the possibility of electrical failure of the primary equipment causing an adverse effect on other safety-related equipment or power supplies, and (4) in the case of display instrumentation, the possibility of an operator being misled by the failed primary equipment. Where equipment has not been demonstrated to be qualified, some justifications discuss administrative procedures or revised operating procedures in effect. Depending upon the specific equipment involved, each of the above considerations need not be discussed in every instance, but, in general, a complete systems discussion would consider the above points.

Where equipment qualification evaluations were used, licensees generally (1) received additional information from manufacturers, (2) applied engineering judgment, (3) performed material analysis, and/or (4) used partial test data in support of the original qualification documentation. Where these evaluations were performed, the licensees determined that, although full qualification was not documented, there was sufficient evidence to suggest that the equipment would perform its intended safety function, thereby justifying interim operation until qualified equipment is installed.

Some licensees provided detailed failure-modes-and-effects analyses of electrical circuitry to demonstrate that, under all identified failure modes, the safety function of the equipment could still be accomplished.

Other justifications involved a combination of qualification information and systems information. For example, if a licensee has qualification information (such as a generic test report or other partial qualification documentation) that tends to confirm the ability of the equipment to remain operable for a specified period of time, justification for interim operation often was based upon a discussion of the required safety function being performed prior to the potential failure. This type of discussion often applies to equipment which performs a short-term trip or isolation function in the early stages of an accident.

### 3. PLANT-SPECIFIC REVIEW

As a result of the review, this plant was evaluated and the results documented on the "Summary of Review of Licensee's 90-Day Response" form reproduced below:

"EQUIPMENT ENVIRONMENTAL QUALIFICATION (EEQ)  
Review of Licensees' Resolution of Outstanding Issues  
From NRC Equipment Environmental Qualification  
Safety Evaluation Reports

#### SUMMARY OF REVIEW OF LICENSEE 90-DAY RESPONSE

Utility: Maine Yankee Atomic Power Company  
Plant Name: Maine Yankee  
NRC Docket No. 50-309  
NRC TAC No. 42490  
NRC Contract No. NRC-03-79-118  
FEC Project No. C5257  
FRC Assignment No. 13  
FRC Task No. 491

#### References:

- a. D. W. Edwards  
Letter to R. A. Clark, NRC. Subject: Environmental Qualification  
of Safety-Related Electrical Equipment - Maine Yankee -  
Response to Safety Evaluation Report  
Maine Yankee Atomic Power Co., 02-Sep-81  
FMY 81-133
- b. Office of Nuclear Reactor Regulation  
Safety Evaluation Report for Maine Yankee  
Environmental Qualification of Safety-Related  
Electrical Equipment  
NRC, 01-June-81

The Licensee has submitted technical information in Reference a in response to the NRC SER [b] on environmental qualification. FRC has reviewed these documents [a, b].

In general, the Licensee's submittal did not adequately address justification for interim operation for deficient equipment items identified in the SER.

The Licensee's resolution of each equipment item identified in Appendices B and C of the SER was indicated by assigning one or more of the following 'notes for resolutions' to the specific items:

'NOTES FOR RESOLUTIONS'

1. Qualification documents associated with this piece of equipment have been evaluated and have been found to meet the intent of the applicable standards and is therefore qualified. (Refer to latest revision of 79-01B worksheet.)
2. Subsequent detailed review of the 90 day submittal resulted in deletion of this equipment from the worksheet list for one or more of the following reasons:
  - (1) Equipment does not perform essential safety functions in the harsh environment, and equipment failure in the harsh environment will not impact safety-related functions or mislead an operator.
  - (2a) Equipment performs its function before its exposure to the harsh environment, and the adequacy for the time margin provided is adequately justified, and
  - (2b) Subsequent failure of the equipment as a result of the harsh environment does not degrade other safety functions or mislead the operator.
  - (3) The safety-related function can be accomplished by some other designated equipment that has been adequately qualified and satisfies the single-failure criterion.
  - (4)\* Equipment will not be subjected to a harsh environment as a result of the postulated accident.
3. Due to advances in equipment design, this equipment is slated for replacement during the next available outage consistent with equipment delivery time requirements.



4. Additional documentation is being assembled and reviewed to correct deficiencies. It has been determined that additional documentation is available, can be assembled, and that the review will adequately establish qualification. Should it be established otherwise either on technical or economic grounds, equipment replacement program will be undertaken. NRC will be notified of the change along with the applicable schedule for replacement.
5. Equipment deleted from master list.
6. TMI Items, to be addressed by a supplement.
7. Qualification testing is currently being conducted on this piece of equipment by the manufacturer. Upon completion of testing, reports will be reviewed to provide adequate qualification documentation.'

Equipment items designated with several of these 'notes of resolution' (e.g., Nos. 3, 4, and 7) are not documented as environmentally qualified. Review of Reference a does not reveal justifications for interim operation for these items."

#### 4. SUBSEQUENT REVIEW

As a result of FRC's review of the Licensee's 90-day response, described in Section 3 above, a meeting was held between the NRC staff and certain Licensee personnel. Following the meeting, the Licensee submitted Reference 12, in which additional information justifying interim operation was submitted for each equipment item not documented as environmentally qualified.

#### Evaluation

An evaluation has been conducted of the information provided by the Licensee in Reference 12 regarding justification for interim operation. After reviewing the technical basis of the Licensee's justification for continued operation for each item, it is concluded that the Licensee has provided sufficient technical basis to support justification for interim operation.