



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

July 9, 1985

Docket No. 50-213  
LS05-85 07-017

Mr. John F. Opeka, Senior Vice President  
Nuclear Engineering and Operations  
Connecticut Yankee Atomic Power Company  
Post Office Box 270  
Hartford, Connecticut 06141

Dear Mr. Opeka:

SUBJECT: CONTAINMENT PRESSURE AND WATER LEVEL MONITORS - TMI ACTION  
ITEMS II.F.1.4, AND II.F.1.5

Re: Haddam Neck Plant

By letters dated December 15, 1980, December 31, 1981, April 16, 1982, June 25, 1982 and June 25, 1985, you responded to questions regarding TMI Action Items II.F.1.4, and II.F.1.5. We have completed our review of your responses and find that for the exception of environmental qualification which is being reviewed under the Commission's environmental qualification efforts, the design of the containment pressure and water level monitors meets the requirements contained in NUREG-0737. We have enclosed a copy of our Safety Evaluation and conclude that all staff concerns on these topics have been resolved.

By letter dated November 17, 1983, Connecticut Yankee Atomic Power Company (CYAPCO) stated its position that the requirements of Item II.F.1.6 have been superseded by the implementation requirements of Regulatory Guide 1.97, Revision 2. CYAPCO also stated that the implementation requirements of both Regulatory Guide 1.97 and II.F.1.6 were included in a proposal to conduct an integrated evaluation of outstanding regulatory requirements. By letter dated July 5, 1985, CYAPCO reiterated its position that detailed plans of its hydrogen monitoring capability for Haddam Neck would not be available until after the integrated safety assessment evaluation has been completed.

We note that the staff is currently evaluating the proposed integrated safety assessment program for Haddam Neck. The staff's conclusions concerning the acceptability of placing the hydrogen

8507150172 850709  
PDR ADOCK 05000213  
P PDR

EX-02

SE01  
11

Mr. John F. Opeka

- 2 -

July 9, 1985

monitor capability into the integrated assessment program will be provided with its evaluation of the CYAPCO integrated safety assessment program. The staff will continue to follow the need for hydrogen monitoring capability as a plant-specific licensing issue.

By letter dated July 25, 1984, CYAPCO committed to providing technical specifications which are consistent with the guidance of Generic Letter 83-37 as part of its conversion to the Standard Technical Specifications. We conclude that it is very important to provide technical specifications to satisfy the requirements of the Generic Letter at the earliest possible date. Therefore please provide a submittal date for providing these technical specifications for the Haddam Neck Plant.

Sincerely,

**Original signed by:**

John A. Zwolinski, Chief  
Operating Reactors Branch No. 5  
Division of Licensing

Enclosure:  
Safety Evaluation

cc w/enclosure:  
See next page

DISTRIBUTION

Docket File  
ORB#5/Reading File  
FAkstulewicz  
CJamerson  
JZwolinski  
HThompson  
OELD  
EJordan  
BGrimes  
JPartlow  
ACRS (10)  
PKapo  
GHolahan  
CGrimes  
MBoyle

DL: ORB #5  
CJamerson  
7/8/85

DL: ORB #5 *JMA*  
FAkstulewicz:jb  
7/8/85

*Z*  
DL: ORB #5  
JZwolinski  
7/9/85

Mr. John F. Opeka  
Connecticut Yankee Atomic Power Company

Haddam Neck Plant

cc  
Gerald Garfield, Esquire  
Day, Perry & Howard  
Counselors at Law  
City Place  
Hartford, Connecticut 06103-3499

Kevin McCarthy, Director  
Radiation Control Unit  
Department of Environmental  
Protection  
State Office Building  
Hartford, Connecticut 06106

Superintendent  
Haddam Neck Plant  
RDF #1  
Post Office Box 127E  
East Hampton, Connecticut 06424

Edward J. Mroczka  
Vice President, Nuclear Operations  
Northeast Utilities Service Company  
Post Office Box 270  
Hartford, Connecticut 06141

Board of Selectmen  
Town Hall  
Haddam, Connecticut 06103

State of Connecticut  
Office of Policy and Management  
ATTN: Under Secretary Energy  
Division  
80 Washington Street  
Hartford, Connecticut 06106

Resident Inspector  
Haddam Neck Nuclear Power Station  
c/o U.S. NRC  
East Haddam Post Office  
East Haddam, Connecticut 06423

Regional Administrator  
Nuclear Regulatory Commission, Region I  
631 Park Avenue  
King of Prussia, Pennsylvania 19406



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

CONNECTICUT YANKEE ATOMIC POWER COMPANY

CONTAINMENT PRESSURE AND WATER LEVEL MONITORS

TMI ITEMS II.F.1.4 AND II.F.1.5

HADDAM NECK PLANT

DOCKET NO. 50-213

1.0 INTRODUCTION

By letter dated September 5, 1980 (Reference 1), the staff issued a summary listing of all the approved TMI Action Plan Requirements. In November 1980 the staff issued NUREG-0737, Clarification of TMI Action Plan Requirements (Reference 2), which specifies TMI Action Plan Items approved by the Commission for implementation. This Safety Evaluation (SE) addresses TMI Action Plan Items II.F.1.4 and II.F.1.5.

2.0 SCOPE OF REVIEW

This SE addresses all the requirements of II.F.1.4 and II.F.1.5 except the following:

(1) ENVIRONMENTAL QUALIFICATION OF EQUIPMENT

The scope of this review includes all the NUREG-0737 requirements except criteria requiring that the equipment be environmentally qualified (Appendix B of NUREG-0737 and Regulatory Guide 1.89). This issue will be reviewed separately under the scope of the Commission's environmental qualification program. In NUREG-0737, the requirements for each item are partly expressed in a list of clarifications. In this SE, Sections 3.2, 4.2 and 5.2 are verbatim copies of the clarifications in NUREG-0737, except that the clarification of the environmental qualification requirement has been omitted.

(2) IMPLEMENTATION SCHEDULE

The implementation schedule has been addressed by Confirmatory Orders, and is not included as part of this SE.

### 3.0 II.F.1.4: CONTAINMENT PRESSURE MONITOR SYSTEM (CPMS)

#### 3.1 NUREG-0737 CPMS POSITION

A continuous indication of containment pressure shall be provided in the control room of each operating reactor. Measurement and indication capability shall include three times the design pressure of the containment for concrete, four times the design pressure for steel, and -5 psig for all containments.

#### 3.2 NUREG-0737 CPMS CLARIFICATION

- (1) Omitted as explained in Section 2.0.
- (2) Measurement and indication capability shall extend to 5 psia (-10 psig) for subatmospheric containments.
- (3) Two or more instruments may be used to meet the range requirements. However, instruments that need to be switched from one scale to another scale to meet the range requirements are not acceptable.
- (4) Continuous display and recording of the containment pressure over the specified range in the control room is required.
- (5) The accuracy and response time specifications of the pressure monitor shall be provided and justified to be adequate for their intended function.

#### 3.3 SCOPE OF CPMS EVALUATION

The licensee has described the design for the CPMS in references 3 through 8. Our review of the licensee's submittals consists of the following: (1) checking for deviations from our requirements which are stated in Sections 3.1 and 3.2 above, (2) reviewing the adequacy of the accuracy specifications of the CPMS, and (3) reviewing the adequacy of the response time specifications of the CPMS. The figures quoted herein for accuracy are three standard deviations, which represents a 99.7% confidence level. All accuracy figures are quoted as a percentage of full scale. The figures quoted for response time are the 100% response values. For linear transfer functions the NRC staff is using the convention that the time for 100% response is four time constants.

### 3.4 EVALUATION OF CPMS ACCURACY AND TIME RESPONSE

The CPMS readout is on a recorder-indicator located in the control room. The CPMS has a system accuracy of 2.2% of full scale and a system response time of 0.9 seconds. These values, which are consistent with the present state of the art, will provide information over the intended range of the CPMS and is sufficiently accurate and useful to allow the plant operator to adequately assess pressure conditions within containment.

### 3.5 LICENSEE COMPLIANCE WITH NUREG-0737 CPMS REQUIREMENTS

After reviewing the licensee's submittals, the staff finds that the CPMS design meets all the requirements of Sections 3.1 and 3.2 above.

Both channels of the CPMS are identical in all essential details.

### 4.0 II.F.1.5: CONTAINMENT WATER LEVEL MONITOR SYSTEM (CWLMS)

#### 4.1 NUREG-0737 CWLMS POSITION

A continuous indication of containment water level shall be provided in the control room for all plants. A narrow-range instrument shall be provided for pressurized water reactors (PWRs) and cover the range from the bottom to the top of the containment sump. A wide-range instrument shall also be provided for PWRs and shall cover the range from the bottom of the containment to the elevation equivalent to 600,000 gallon capacity.

#### 4.2 NUREG-0737 CWLMS CLARIFICATION

- (1) Omitted as explained in Section 2.0.
- (2) The measurement capability of 600,000 gallons is based on recent plant designs. For older plants with smaller water capacities, licensees may propose deviations from this requirement based on the available water supply at their plant.
- (3) Narrow-range water level monitors are required for all sizes of sumps inside the containment.
- (4) For BWR pressure-suppression containments, the Emergency Core Cooling System (ECCS) suction line inlets may be used as a starting reference point for the wide-range water level monitors, instead of the bottom of the suppression pool.
- (5) The accuracy requirements of the water level monitors shall be provided and justified to be adequate for their intended function.



#### 4.3 SCOPE OF CWLMS EVALUATION

The licensee has described its design for the CWLMS in references 3 through 8. The staff's review of the licensee's submittals consists of the following: (1) checking for deviations from our requirements which are stated in Sections 4.1 and 4.2 above, and (2) reviewing the adequacy of the accuracy specifications for the CWLMS. The figures quoted herein for accuracy are three standard deviations, which represents a 99.7% confidence level. All accuracy figures are expressed as a percentage of full scale.

#### 4.4 EVALUATION OF CWLMS ACCURACY

The licensee has installed a narrow-range CWLMS in the sump and a wide-range CWLMS in containment. Both sump and containment CWLMS have readouts on indicators in the control room. The two redundant containment CWLMS channels are identical in all essential details. The sump CWLMS has a system accuracy of 2.2% of full scale and the containment CWLMS has a system accuracy of 2.3% of full scale. These values, which are consistent with the present state of the art, will provide information over the intended range of the CWLMS that is sufficiently accurate and useful to allow the plant operator to adequately assess water level conditions.

#### 4.5 LICENSEE COMPLIANCE WITH NUREG-0737 CWLMS REQUIREMENTS

After reviewing the licensee's submittals, the staff finds that the CWLMS design meets all the requirements of Sections 4.1. and 4.2 above, except the following: As stated in reference 3, the licensee does not plan to install a new qualified sump water level sensor. The reason is that the radiation level in the sump is about 25 R/hour and it would require 120 man hours to install a new sensor. The amount of human radiation exposure acquired during the installation of a new sensor is far in excess of the amount that could justify the benefits of having the new sensor. The staff has allowed an exception on this point, and the licensee will not be required to install a new sensor. As stated in Section 2.0(1) the final decision on this point will be made in the Commission's environmental qualification program.

#### 5.0 CONCLUSION

Within the scope of the review described in Section 2.0 of this SE, the staff concludes that the licensee has met all the requirements of NUREG-0737 for Items II.F.1.4 and II.F.1.5, and therefore, finds the design for these items acceptable.

## 7.0 ACKNOWLEDGMENT

Mr. Peter Kapo of the Containment Systems Branch, NRR prepared this Safety Evaluation.

## 8.0 REFERENCES

- (1) Letter from D. G. Eisenhut (NRC) to All Licensees of Operating Plants and Applicants for Operating Licenses and Holders of Construction Permits, dated September 5, 1980. Subject: Preliminary Clarification of TMI Action Plan Requirements.
- (2) NUREG-0737, "Clarification of TMI Action Plan Requirements," U. S. Nuclear Regulatory Commission, November 1980.
- (3) Letter from W. G. Counsil (NU) to Darrell G. Eisenhut (NRC) dated December 15, 1980. Subject: Brief system descriptions of the CPMS, CWLMS and CHMS.
- (4) Letter to W. G. Counsil (NU) to Darrell G. Eisenhut (NRC) dated December 31, 1980. Subject: Brief system descriptions of the CPMS, CWLMS and CHMS.
- (5) Letter from W. G. Counsil (NU) to Darrell G. Eisenhut (NRC) dated April 16, 1982. Subject: Licensee response to NUREG-0737.
- (6) Letter from E. L. Conner (NRC) to W. G. Counsil (NU) dated May 14, 1982. Subject: Transcript of phone conversation to gather information about the CPMS, CWLMS and CHMS.
- (7) Letter from W. G. Counsil (NU) to Robert A. Clark (NRC) dated June 25, 1982. Subject: Corrections to the phone transcript of Reference 6.
- (8) Letter from J. F. Opeka (NU) to John Zwolinski (NRC) dated July 5, 1985.

Dated: July 9, 1985.