CONNECTICUT YANKEE ATOMIC POWER COMPANY

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May 20, 1983

Docket No. 50-213
A02947
A03161

Mr. Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Haddam Neck Plant
Environmental Qualification of Electrical Equipment
May 20, 1983 Response to 10 CFR 50.49

The most recent NRC requirements on this issue of environmental qualification of electric equipment were promulgated as 10CFR 50.49, which became effective on February 22, 1983. Among its provisions is the requirement to provide a submittal on or before May 20, 1983, identifying the equipment to be qualified within the scope of the rule and the schedule for achieving full qualification. This document is being submitted to fulfill that requirement.

In addition, we are taking this opportunity to provide information on a number of other unresolved issues identified in previous correspondence. The large volume of correspondence on the docket on this issue, coupled with the complications introduced by NRC's use of a contractor to conduct technical reviews of our submittals, has made the task of documenting the current qualification status difficult. We are, therefore, attempting to include in this submittal sufficient information to resolve this general concern. This transmittal letter and certain of the attachments have been developed to provide a road map for this submittal and the referenced previous correspondence.

Reference (1) transmitted the second Safety Evaluation Report (SER) for Environmental Qualification of Safety-Related Electrical Equipment for the Haddam Neck Plant. Specific information requested pertaining to the thirty (30) day response was submitted via References (2) and (3). References (4) and (5) addressed the ninety (90) day response of Reference (1) to be submitted in accordance with Reference (6). The thirty (30) day and ninety (90) day submittal requirements of the SER are in some respects redundant with the requirements of the final rule. Nonetheless, in accordance with paragraph 10 CFR 50.49(g) of the Final Rule on Environmental Qualification of Electric Equipment Important to Safety, the following information is being supplied.

By way of an overview, we note that pursuant to 10 CFR 50.49(g), we have established a goal of final qualification of electric equipment important to

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safety by the end of the 1984 refueling outage, which is the second refueling outage after March 31, 1982. While in some instances this target is very ambitious, our current plans are focused on this date. Any future revisions to this schedule will be submitted in accordance with the provisions of 50.49(h).

Methods Used to Identify Equipment Pursuant to 10CFR50.49(b)(2)

Connecticut Yankee Atomic Power Company (CYAPCO) utilized the Division of Operating Reactors' (DOR) Guidelines as the original basis of the Equipment Environmental Qualification (EEQ) effort as ordered by the NRC. This description will explicitly define those steps taken to develop the lists of equipment which are addressed within the scope of our environmental qualification program. It is emphasized that the scope of our program was established long before the classifications of 50.49(b)(1), (b)(2), and (b)(3) equipment were ever documented. Hence, the equipment currently being qualified to address the intent of 50.49(b)(2) is interspersed within the equipment being qualified under 50.49(b)(1) and (b)(3). The following discussion describes how 50.49(b)(2) type equipment was captured during the initial stages of the program, and where pertinent segments of our efforts were submitted to and reviewed by the NRC.

- The first step in development of this program was to define the scope of systems important to safety. During a site audit on June 30 and July 1, 1980 the NRC auditors reviewed CYAPCO's Appendix A (to the DOR guidelines) equipment lists and agreement was reached regarding the systems and equipment to be addressed. It was agreed at the site audit by both parties (NRC & CYAPCO) that this would be the Appendix A list of safety-related equipment. At the end of the audit CYAPCO agreed to reissue the Appendix A response to reflect the results of the site visit. CYAPCO listed the plant unique systems which perform the safety functions listed in Appendix A to the DOR Guidelines (Reference (12)) as directed therein. Next, each system was further defined utilizing the corresponding Materials, Equipment and Parts List (MEPL), piping and instrument diagrams, single line diagrams, and the emergency operating procedures. From this intermediate list, the master listing of electrical components by system (Appendix I to Reference (13)) was developed. This was accomplished through the review of plant design drawings (elementary, control wiring and wiring diagrams, circuit and raceway schedules, etc). The master list included all equipment considered Category 1E, plus certain equipment identified in the emergency operating procedures, listed by system. It also included the location of the equipment by fire zone.

- The second major step was to define the harsh environmental zones, and their composite worst case environment both inside and outside containment. Again the DOR Guidelines were adhered to in development of the environmental profiles and other pertinent parameters.

- Step three combined the efforts of the previous two, and yielded a list of equipment subject to a harsh environment as defined in the DOR Guidelines. This list was further reduced based on the oper-

ability requirements of the equipment (i.e., it was not necessary to qualify all equipment for all accidents, but rather that equipment needed to mitigate the design basis accidents while simultaneously being subjected to a harsh environment).

A multi-discipline ad hoc committee was created and convened to review each piece of equipment which was not already fully qualified for the environment to which it could be exposed. This committee consisted of experienced operations, engineering, and licensing personnel. The operability requirements for each of these items were reviewed in detail to verify that the equipment which remained on the list was indeed required (per the DOR Guidelines). This list included those pieces of equipment which were not previously classified as Category 1E, but were determined to require environmental qualification due to the methodology developed to respond to the requirements of the DOR Guidelines. In retrospect, we recognize that some of the items remaining on our lists could have been called "(b)(2) type" equipment, had that term been established in 1980.

An example of how our process identified all necessary equipment is the Pressurizer Level Transmitters which can be found on the System Component Evaluation Work Sheet (SCEWS), B-1-1. In prior submittals this equipment has always been indicated for replacement with qualified equipment. As such it appears in the Materials, Equipment and Parts List (MEPL) and in this submittal even though it was not previously considered Category 1E.

We are confident that our approach, initiated approximately three years ago, has identified all equipment which, while not safety-related, could conceivably fail in such a manner that it could adversely affect a required safety function. Part of our confidence is a result of what we understand to be a somewhat unique approach to establishing the lists of equipment requiring qualification. As described above, we initially developed "master lists" which included all electrical components associated with the required safety systems. We required, of ourselves, a rationale to remove items from our original master lists. The fact that a given piece of equipment was not classified as Category 1E was not an acceptable rationale. Spurious operation of equipment, the potential for misleading plant operators, and other secondary effects were explicitly discussed and addressed. Throughout our verbal and written dialogue with the NRC and its contractor, the adequacy of the scope of our program has been addressed. Explicit NRC documentation to this effect includes References (1) and (11). The bottom line is that this issue was addressed satisfactorily at the outset of our program, and there is no information or reason to question the matter further, or to expend additional resources to generate more documentation to support our conclusion.

- Step four, therefore, defined the list of equipment required to operate during and after the design basis events. Each piece of equipment was then evaluated as to its qualification status.

> Where full qualification was not established, a plan and schedule to obtain full qualification including justifications for continued operation (JCOs) was provided to the NRC per the DOR Guidelines.

CYAPCO has concluded that the above discussion demonstrates that all of the equipment which is required to be included in the EEQ Program by 10CFR50.49 has indeed been included.

Based on the original design practices and reviews, equipment selection criteria, previous analysis conducted in response to the DOR Guidelines and other NRC Staff requests, we have concluded that any non-safety-related equipment whose failure would prohibit accomplishment of safety functions has been included within the scope of our environmental qualification program. If as a result of future activities, either internally generated or in response to other regulatory issues, it is determined that additional equipment should be included in this category, supplements to this submittal will be provided; and the corresponding electrical equipment will be environmentally qualified.

Interpretation of 10CFR 50.49(b)(3)

Review of this program was completed by NRC and a Safety Evaluation Report (SER) was issued May 29, 1981 (Reference (11)). Therein, CYAPCO was evaluated as to the completeness of the above described list. NRC required clarification of those pieces of equipment required for post accident display instrumentation. CYAPCO provided this list (Reference (10)) of safety related display instrumentation in response to the previous referenced SER. This list provided both those to be qualified, those qualified, and those not required to be operable in a harsh environment, and justifications for continued operation where appropriate.

However, based on the outcome of our assessments of other regulatory issues, new instrumentation may be installed or existing instrumentation may be upgraded. In these cases, future supplements to this response will be provided. Our position on this issue was provided by Reference (9), Attachment No. 2, page 5, "Regulatory Guide 1.97 Status", as follows:

> "...any new instrumentation required as a result of the above activities is not governed by the qualification schedule contained in 10 CFR 50.49."

Attachments (2) and (5) contain a List of Electric Equipment Important to Safety and their corresponding JCOs and SCEW Sheets, in accordance with paragraph 10CFR50.49(g). In addition, as specifically noted in Attachment (5), all remaining qualification activities are scheduled for completion during the Haddam Neck Plant 1984 refueling outage for existing plant instrumentation presently requiring qualification.

Preventative Maintenance Program

The Preventative Maintenance (PM) Program has been discussed in detail in past submittals. The following is excerpted from Reference (10).

The responsibility for Maintenance of Electrical, and Instrumentation and Control Equipment is split among three disciplines at CYAPCO, the Maintenance Department, Instrumentation and Control Department, and the Production Test Department. In addition, the Quality Control Department has the responsibility to ensure that periodic maintenance is performed on those pieces of equipment addressed in the Technical Specifications. In general, a lead discipline is assigned responsibility for a given equipment type. Support as required to perform maintenance of that device is requested of the remaining functional groups. Additionally, an In-Service Inspection (ISI) team retains the responsibility for maintenance of mechanical devices such as valves, pumps, and piping. The drivers (motors) for valves and pumps are not within the jurisdiction of ISI. In this case, the appropriate maintenance group would be called for assistance.

RESPONSIBILITIES

1. The CYAPCO Maintenance, and Instrumentation and Control Supervisors are responsible for ensuring that all electrical equipment assigned to their departments is maintained, calibrated, and tested for continued operation.

2. The Northeast Utilities Service Company (NUSCO) Production Test Field Supervisor is responsible for the maintenance, calibration, and testing for continued operation of all equipment assigned to the NUSCO Production Test Department.

3. In addition, the Haddam Neck Superintendent is responsible for resolving any discrepancies, and making appropriate assignments to ensure that the Plant electrical equipment is maintained, calibrated, and tested to ensure continued operation.

The following is a clarification of CYAPCO's position on the validity of trendable surveillance for equipment located in a harsh environment. This position endorses that advocated by the Atomic Industrial Forum (AIF) Subcommittee on Environmental Qualification, namely "Surveillance tests for harsh environment equipment performed in a mild environment cannot predict incipient failures at design conditions". In recognition of this limitation, the CYAPCO PM Program will include the trending of data for equipment only if the equipment falls into the categories indicated below.

1. Equipment which was analyzed to a 40-year Qualified Life.

2. Equipment which was not pre-aged before type testing but which was analyzed to a 40-year Qualified Life.

Data for trending may be taken for equipment which has an established 40-year Qualified Life by type testing for information only. This will not be part of the PM trending program, but will be part of the PM program for maintaining the equipment in accordance with manufacturer's recommendations. The reason for this is that harsh environment type testing alone, as summarized in the pertinent qualification documentation, substantiates the equipment's ability to survive the design basis event. Additionally, the Haddam Neck plant design for single active

failures addresses the potential random failure aspects of qualification. Trending data have little meaning in demonstrating operability of harsh environment equipment because the data are not obtained in the actual harsh environment. The PM program will demonstrate operability, which is the only concern of IEEE-323-1974 type tested equipment.

Presently trended data are being collected as discussed in the response (Reference (10)) to the May, 1981 Safety Evaluation Report (SER) as modified herein. However, a computerized PM network is being established such that third party reviewers may examine these data.

Attachments

Because of the volume of information being transmitted in this submittal, CYAPCO has adopted the following format of Attachments (including explanations) to facilitate the assimilation of this material.

Attachment 1: Chronology and References for Environmental Qualification of Electrical Equipment, Haddam Neck Plant.

Attachment 2: List of Electrical Equipment Important to Safety Requiring Qualification.

Attachment 3: Equipment Replaced.

Attachment 4: Index to SCEW Sheet Package.

Attachment 5: Justification for Continued Operation and System Component Evaluation Work Sheets for Electric Equipment Important to Safety.

Attachment 6: Qualification References.

Attachment 7: Qualification Documentation, Numbers 71-79, (Proprietary).

Explanations for each of these attachments are provided at the beginning of each section as needed.

It should be noted that the Qualification Documentation (71-79) of Attachment 7 is considered to be Proprietary, is marked accordingly, and should be withheld from public disclosure pursuant to 10CFR2.790. Due to the volume of paper involved and its proprietary nature, only one (1) copy of Attachment 7 is being provided directly to the Haddam Neck Project Manager for dissemination as appropriate. For the remainder of the copies, an index of the qualification documents is being provided as Attachment 6.

Conclusion

We trust the information supplied here satisfies the concerns of Reference (5) in accordance with the Final Rule on Environmental Qualification of Electrical

Equipment, 10 CFR 50.49. Further, since this submittal also constitutes our 90-day response to Reference (1), we are hopeful that it will serve to significantly reduce the number of instances where the NRC and Franklin Research Center (FRC) have not yet concurred with our qualification determinations and positions. Following NRC review of this submittal, we suggest that the Staff contact us to discuss and determine the optimum method of resolving the remaining issues.

Very truly yours,

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W. G. Counsil
Senior Vice President

C. Frederick Sears

By: C. F. Sears
Vice President Nuclear and
Environmental Engineering

References:

(1) D. M. Crutchfield letter to W. G. Counsil, dated December 13, 1982.

(2) W. G. Counsil letter to D. M. Crutchfield, dated January 21, 1983.

(3) W. G. Counsil letter to D. M. Crutchfield, dated March 11, 1983.

(4) W. G. Counsil letter to D. M. Crutchfield, dated March 18, 1983.

(5) D. M. Crutchfield letter to W. G. Counsil, dated April 4, 1983.

(6) Final Rule on Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants, 10 CFR 50.49, issued January 21, 1983 in 48FR2729.

(7) W. G. Counsil letter to D. M. Crutchfield, dated March 28, 1983.

(8) W. G. Counsil letter to R. A. Clark and D. M. Crutchfield, dated March 28, 1983.

(9) W. G. Counsil letter to D. G. Eisenhut, dated April 15, 1983.

(10) W. G. Counsil letter to D. G. Eisenhut, dated September 3, 1981.

(11) D. M. Crutchfield letter to W. G. Counsil, dated May 29, 1981.

(12) DOR Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors, February, 1980.

(13) W. G. Counsil letter to D. G. Eisenhut, dated October 31, 1980.

Docket No. 50-213

Environmental Qualification

of

Safety Related Electrical Equipment

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

May 28, 1982

Docket No. 50-213

Environmental Qualification

of

Safety Related Electrical Equipment

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

May 20, 1983

CONNECTICUT YANKEE ATOMIC POWER COMPANY

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In addition, we are taking this opportunity to provide information on a number of other unresolved issues identified in previous correspondence. The large volume of correspondence on the docket on this issue, coupled with the complications introduced by NRC's use of a contractor to conduct technical reviews of our submittals, has made the task of documenting the current qualification status difficult. We are, therefore, attempting to include in this submittal sufficient information to resolve this general concern. This transmittal letter and certain of the attachments have been developed to provide a road map for this submittal and the referenced previous correspondence.

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By way of an overview, we note that pursuant to 10 CFR 50.49(g), we have established a goal of final qualification of electric equipment important to

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safety by the end of the 1984 refueling outage, which is the second refueling outage after March 31, 1982. While in some instances this target is very ambitious, our current plans are focused on this date. Any future revisions to this schedule will be submitted in accordance with the provisions of 50.49(h).

Methods Used to Identify Equipment Pursuant to 10CFR50.49(b)(2)

Connecticut Yankee Atomic Power Company (CYAPCO) utilized the Division of Operating Reactors' (DOR) Guidelines as the original basis of the Equipment Environmental Qualification (EEQ) effort as ordered by the NRC. This description will explicitly define those steps taken to develop the lists of equipment which are addressed within the scope of our environmental qualification program. It is emphasized that the scope of our program was established long before the classifications of 50.49(b)(1), (b)(2), and (b)(3) equipment were ever documented. Hence, the equipment currently being qualified to address the intent of 50.49(b)(2) is interspersed within the equipment being qualified under 50.49(b)(1) and (b)(3). The following discussion describes how 50.49(b)(2) type equipment was captured during the initial stages of the program, and where pertinent segments of our efforts were submitted to and reviewed by the NRC.

- The first step in development of this program was to define the scope of systems important to safety. During a site audit on June 30 and July 1, 1980 the NRC auditors reviewed CYAPCO's Appendix A (to the DOR guidelines) equipment lists and agreement was reached regarding the systems and equipment to be addressed. It was agreed at the site audit by both parties (NRC & CYAPCO) that this would be the Appendix A list of safety-related equipment. At the end of the audit CYAPCO agreed to reissue the Appendix A response to reflect the results of the site visit. CYAPCO listed the plant unique systems which perform the safety functions listed in Appendix A to the DOR Guidelines (Reference (12)) as directed therein. Next, each system was further defined utilizing the corresponding Materials, Equipment and Parts List (MEPL), piping and instrument diagrams, single line diagrams, and the emergency operating procedures. From this intermediate list, the master listing of electrical components by system (Appendix I to Reference (13)) was developed. This was accomplished through the review of plant design drawings (elementary, control wiring and wiring diagrams, circuit and raceway schedules, etc). The master list included all equipment considered Category 1E, plus certain equipment identified in the emergency operating procedures, listed by system. It also included the location of the equipment by fire zone.

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CYAPCO has concluded that the above discussion demonstrates that all of the equipment which is required to be included in the EEQ Program by 10CFR50.49 has indeed been included.

Based on the original design practices and reviews, equipment selection criteria, previous analysis conducted in response to the DOR Guidelines and other NRC Staff requests, we have concluded that any non-safety-related equipment whose failure would prohibit accomplishment of safety functions has been included within the scope of our environmental qualification program. If as a result of future activities, either internally generated or in response to other regulatory issues, it is determined that additional equipment should be included in this category, supplements to this submittal will be provided; and the corresponding electrical equipment will be environmentally qualified.

Interpretation of 10CFR 50.49(b)(3)

Review of this program was completed by NRC and a Safety Evaluation Report (SER) was issued May 29, 1981 (Reference (11)). Therein, CYAPCO was evaluated as to the completeness of the above described list. NRC required clarification of those pieces of equipment required for post accident display instrumentation. CYAPCO provided this list (Reference (10)) of safety related display instrumentation in response to the previous referenced SER. This list provided both those to be qualified, those qualified, and those not required to be operable in a harsh environment, and justifications for continued operation where appropriate.

However, based on the outcome of our assessments of other regulatory issues, new instrumentation may be installed or existing instrumentation may be upgraded. In these cases, future supplements to this response will be provided. Our position on this issue was provided by Reference (9), Attachment No. 2, page 5, "Regulatory Guide 1.97 Status", as follows:

> "...any new instrumentation required as a result of the above activities is not governed by the qualification schedule contained in 10 CFR 50.49."

Attachments (2) and (5) contain a List of Electric Equipment Important to Safety and their corresponding JCOs and SCEW Sheets, in accordance with paragraph 10CFR50.49(g). In addition, as specifically noted in Attachment (5), all remaining qualification activities are scheduled for completion during the Haddam Neck Plant 1984 refueling outage for existing plant instrumentation presently requiring qualification.

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Attachments

Because of the volume of information being transmitted in this submittal, CYAPCO has adopted the following format of Attachments (including explanations) to facilitate the assimilation of this material.

Attachment 1:	Chronology and References for Environmental Qualification of Electrical Equipment, Haddam Neck Plant.
Attachment 2:	List of Electrical Equipment Important to Safety Requiring Qualification.
Attachment 3:	Equipment Replaced.
Attachment 4:	Index to SCEW Sheet Package.
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Attachment 7:	Qualification Documentation, Numbers 71-79, (Proprietary).

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Equipment, 10 CFR 50.49. Further, since this submittal also constitutes our 90-day response to Reference (1), we are hopeful that it will serve to significantly reduce the number of instances where the NRC and Franklin Research Center (FRC) have not yet concurred with our qualification determinations and positions. Following NRC review of this submittal, we suggest that the Staff contact us to discuss and determine the optimum method of resolving the remaining issues.

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CONNECTICUT YANKEE ATOMIC POWER COMPANY

W. G. Counsil
Senior Vice President

By: C. F. Sears
Vice President Nuclear and
Environmental Engineering

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(13) W. G. Counsil letter to D. G. Eisenhut, dated October 31, 1980.

Docket No. 50-213

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 1

Chronology and References

Environmental Qualification of Electrical Equipment

May 20, 1983

ENVIRONMENTAL QUALIFICATION OF ELECTRICAL EQUIPMENT

HADDAM NECK PLANT

CHRONOLOGY AND REFERENCES

(1) February 15, 1980 ..... D. L. Ziemann letter to W. G. Counsil requiring accelerated EEQ effort.

(2) February 21, 1980 ..... NRC/SEP Owners' Group meeting discussing details of accelerated effort.

(3) March 6, 1980 ..... D. L. Ziemann letter to W. G. Counsil discussing licensee submittal contents and schedules.

(4) March 11, 1980 ..... W. G. Counsil letter to D. L. Ziemann docketing relevant emergency operating procedures.

(5) March 12, 1980 ..... W. G. Counsil letter to D. L. Ziemann docketing requested P&ID's and equipment drawings.

(6) March 28, 1980 ..... D. L. Ziemann letter to W. G. Counsil clarifying submittal contents and schedules, and requesting data regarding containment parameters.

(7) April 29, 1980 ..... W. G. Counsil letter to D. L. Ziemann identifying plant systems requiring qualification documentation.

(8) May 1, 1980 ..... W. G. Counsil letter to D. M. Crutchfield providing information regarding containment parameters and qualification profiles.

(9) May 23, 1980 ..... Commission issues Memorandum and Order requiring SER's by February 1, 1981 and total compliance by June 30, 1982.

(10) June 2, 1980 ..... W. G. Counsil letter to D. M. Crutchfield providing available qualification information via SCEW sheets and qualification reference.

(11) June 30, 1980 ..... NRC and Franklin Research Center (FRC) July 1, 1980 conducted site audit.

(12) July 14, 1980 ..... W. G. Counsil letter to D. M. Crutchfield providing information requested by FRC during the site audit.

(13) July 14, 1980 ..... CYAPCO representatives attend Region I clarification meeting.

(14) July 18, 1980 ..... R. M. Kacich letter to FRC on the Haddam Neck Plant, providing them with an update of the June 2, 1980 submittal in the form of revised SCEW sheets.

(15) August 8, 1980 ..... W. G. Counsil letter to D. M. Crutchfield updating data regarding containment parameters and profiles.

(16) August 4, 1980 ..... R. M. Kacich letter to FRC on the Haddam Neck Plant, providing them with response to questions raised during the preparation of the Technical Evaluation Report.

(17) August 29, 1980 ..... D. M. Crutchfield letter to W. G. Counsil transmitting the Order for Modification of License requiring a response by November 1, 1980.

(18) September 9, 1980 ..... FRC issues draft interim Technical Evaluation Report.

(19) September 19, 1980 ..... D. G. Eisenhut letter to W. G. Counsil transmitting Revised Order for Modification of License.

(20) September 30, 1980 ..... NRC issues Supplement 2 to I&E Bulletin No. 79-10B.

(21) October 1, 1980 ..... D. G. Eisenhut letter to All Licensees of Operating Plant and Applicants for Operating Licenses and Holders of Construction Permits requesting pertinent information relative to environmental qualification testing.

(22) October 9, 1980 ..... W. G. Counsil letter to D. G. Eisenhut providing details on radiation service condition calculations and results.

(23) October 15, 1980 ..... W. G. Counsil letter to B. Flynn (Crane Teledyne Company) requesting expedited response regarding qualification documentation.

(24) October 20, 1980 ..... CYAPCO representative responds to request of NRC Project Manager to provide status of the response to the Order.

(25) October 24, 1980 ..... B. H. Grier letter to W. G. Counsil transmitting Supplement 3 to I&E Bulletin No. 79-01B.

(26) October 24, 1980 ..... D. M. Crutchfield letter to W. G. Counsil transmitting an immediately effective order regarding modifications to the license and Technical Specifications.

(27) October 31, 1980 ..... W. G. Counsil letter to D. G. Eisenhut providing information, SCEW sheets, and qualification references.

(28) November 26, 1981 ..... D. G. Eisenhut letter to W. G. Counsil, Generic Clarification of Documentation required associated with Central Qualification File.

(29) December 4, 1980 ..... W. G. Counsil letter to H. R. Denton requesting hearing on the Order issued by Reference (26).

(30) December 30, 1980 ..... W. G. Counsil letter to D. M. Crutchfield updating References (7) and (27) information.

(31) January 16, 1981 ..... D. G. Eisenhut letter to W. G. Counsil holding request for hearing in abeyance.

(32) January 19, 1981 ..... D. G. Eisenhut letter to All Licensees clarifying Bulletin 79-01B requirements.

(33) January 20, 1981 ..... W. G. Counsil letter to D. G. Eisenhut; schedules for Environmental Qualification testing.

(34) January 30, 1981 ..... W. G. Counsil letter to D. G. Eisenhut commenting on 30 day holding of hearing request.

(35) January 30, 1981 ..... W. G. Counsil letter to D. G. Eisenhut updating SCEWs and Master Listing of Electrical Components.

(36) February 4, 1981 ..... W. G. Counsil letter to D. M. Crutchfield updating October 31, 1980 submittal.

(37) February 13, 1981 ..... G. Lainas to W. G. Counsil transmitting the EER requiring a 10-day response.

(38) February 27, 1981 ..... W. G. Counsil to G. Lainas providing the 10-day response and highlighting major deficiencies with the content of the EER.

(39) March 10, 1981 ..... D. G. Eisenhut to all plants; Staff position that summary qualification reports not adequate.

(40) March 31, 1981 ..... D. M. Crutchfield to W. G. Counsil; SEP topics VI-2.D & VI-3, regarding mass/energy releases and containment profiles.

(41) April 1, 1981 ..... W. G. Counsil to D. M. Crutchfield regarding temperature and pressure for LOCA and MSLB - LOCA is limiting, 267°F and 39.3 psig.

(42) April 14, 1981 ..... B. H. Grier to W. G. Counsil transmitting Circular 81-06 - potential deficiency in Foxboro transmitters.

(43) April 27, 1981 ..... W. G. Counsil to D. M. Crutchfield; SEP Topics VI-2.D and VI-3, providing proprietary W information and response to question on containment response.

(44) May 27, 1981 ..... W. G. Counsil to D. M. Crutchfield; containment profiles, correction to previous submittal of parameter listing.

(45) May 29, 1981 ..... D. M. Crutchfield to W. G. Counsil transmitting the SER for review and 90 day response.

(46) June 1, 1981 ..... W. G. Counsil to D. G. Eisenhut; submittal of Material, Equipment and Parts List, which also serves as the Master Listing of Electrical Components.

(47) June 4, 1981 ..... W. G. Counsil to O. J. Hendrie requesting extension of June 30, 1982 deadline.

(48) June 12, 1981 ..... D. G. Eisenhut to W. G. Counsil

allowing 90 days for hearing request after issuance of SER.

(49) June 15, 1981 ..... W. G. Counsil to D. M. Crutchfield regarding SEP Topics VI-2.D and VI-3, also Westinghouse affidavit associated with modeling report and parameter list.

(50) June 22, 1981 ..... Industry petition for extension of deadline for compliance with CLI-80-21.

(51) June 26, 1981 ..... W. G. Counsil to D. G. Eisenhut, commenting on anticipated usefulness of July 7 - 10 meeting.

(52) June 23, 1981 ..... D. M. Crutchfield to W. G. Counsil, correcting administrative errors in the Reference (45) SER.

(53) June 29, 1981 ..... NRC response to industry petition postponing recommendation until July 31, 1981.

(54) July 16, 1981 ..... W. G. Counsil to H. R. Denton providing feedback on July 7 - 10 Environmental Qualification meeting.

(55) July 31, 1981 ..... Staff position to the Commission, recommending one year extension to June 30, 1982 deadline.

(56) August 14, 1981 ..... W. G. Counsil to D. G. Eisenhut documenting position on qualification of replacement parts.

(57) August 14, 1981 ..... D. G. Eisenhut letter to W. G. Counsil proposing additional delay on affirmation or withdrawal of pending hearing requests.

(58) August 20, 1981 ..... W. G. Counsil to D. G. Eisenhut accepting the Staff proposal of Reference (56) regarding hearing requests.

(59) August 26, 1981 ..... W. G. Counsil to D. G. Eisenhut discussing status of SER responses and providing overview of CYAPCO perspective on environmental qualification.

(60) September 3, 1981 ..... W. G. Counsil letter to D. G. Eisenhut submitting 90-day response to the Staff's SER.

(61) September 24, 1981 ..... I & E Information Notice 81-29 regarding adverse test results.

(62) September 30, 1981 ..... W. G. Counsil letter to D. G. Eisenhut supplying minor editorial changes to Ref. (60).

(63) January 11, 1982 ..... D. M. Crutchfield letter to W. G. Counsil requesting that additional information be provided to FRC.

(64) January 20, 1982 ..... Federal Register notice (47FR2876) on a proposed rule regarding Environmental Qualification of Electrical Equipment.

(65) January 26, 1982 ..... W. G. Counsil letter to D. M. Crutchfield, providing mass and energy release data.

(66) February 9, 1982 ..... W. G. Counsil letter to D. M. Crutchfield and R. A. Clark forwarding material requested in Reference (63).

(67) February 10, 1982 ..... W. G. Counsil letter to the Secretary of the Commission providing schedular comments on the proposed rule of Reference (64).

(68) February 22, 1982 ..... W. G. Counsil letter to V. L. Bissonnette (Crane Co.) requesting confirmation of orders for motor operators.

(69) February 22, 1982 ..... 47FR7782: Environmental Qualification of Electric Equipment for Nuclear Power Plants.

(70) February 25, 1982 ..... D. M. Crutchfield letter to W. G. Counsil requesting TMI Action Plan Information not included in Reference (63).

(71) March 4, 1982 ..... R. C. Haynes letter to all licensees transmitting Information Notice 82-03: "Environmental Tests of Electrical Terminal Blocks."

(72) March 22, 1982 ..... W. G. Counsil letter to Secretary of the Commission commenting on the proposed revision to Ref. Guide 1.89.

(73) June 30, 1982 ..... Federal Register Notice (28363) suspending the June 30 deadline for completion of Environmental Qualification of Safety Related Electrical Equipment by all operating nuclear power plants.

(74) July 15, 1982 ..... D. M. Crutchfield letter to W. G. Counsil agreeing with analysis of temperature and pressure for LOCA and MSLB-LOCA provided in Reference (41).

(75) July 23, 1982 ..... D. M. Crutchfield letter to W. G. Counsil agreeing with analysis of temperature and pressure for LOCA and MSLB-LOCA provided in Reference (41).

(76) September 16, 1982 ..... D. M. Crutchfield letter to W. G. Counsil, transmitting confirmation of final evaluation of SEP Topics VI-2.D and VI-3.

(77) September 21, 1982 ..... W. G. Counsil letter to D. M. Crutchfield accepting evaluations of SEP Topics VI-2.D and VI-3.

(78) December 13, 1982 ..... D. M. Crutchfield letter to W. G. Counsil transmitting SER/TER.

(79) December 21, 1982 ..... E. L. Jordan to all Licensees transmitting Information Notice 82-52.

(80) December 29, 1982 ..... W. G. Counsil letter to R. C. Haynes responding to I & E Bulletin 80-24.

(81) January, 1983..... Union of Concerned Scientists (Petitioners) vs NRC and the USA (Respondents), and NUGEQ (Intervenor), Brief for Respondents on Petition for

Review of Final Rule on Environmental Qualification of the NRC.

(82) January 3, 1983 ..... W. G. Counsil letter to D. M. Crutchfield transmitting information on environmental qualification requested to be submitted to Franklin Research Center.

(83) January 21, 1983 ..... W. G. Counsil to D. M. Crutchfield submitting 30-day response to Reference (78).

(84) January 21, 1983 ..... Federal Register, 48FR2729 issuing final rule on Environmental Qualification.

(85) February 18, 1983..... Union of Concerned Scientists (Petitioner) vs NRC, et. al. (Respondent), NUGEQ (Intervenor) Petition for Review of a Rule of the NRC, Brief for Intervenor, Nuclear Utility Group on Equipment Qualification.

(86) February 22, 1983 ..... W. G. Counsil letter to D. G. Eisenhut confirming date by which a determination must be made on a hearing request.

(87) March 7, 1983..... NUGEQ (Petitioner) vs NRC (Respondent), Petition for Review.

(88) March 11, 1983 ..... W. G. Counsil letter to D. M. Crutchfield clarifying the intended completion date of one component which was incorrectly reported in Reference (83).

(89) March 18, 1983 ..... W. G. Counsil letter to R. A. Clark and D. M. Crutchfield formally advising the Staff of NU's interpretation of the Final Rule on Environmental Qualification.

(90) March 24, 1983 ..... W. G. Counsil letter to D. G. Eisenhut conditionally withdrawing NU's request for a hearing.

(91) March 28, 1983 ..... W. G. Counsil letter to D. M. Crutchfield providing an update on dealings with the Crane Co. for procuring qualified motor operators for valves.

(92) March 28, 1983 ..... W. G. Counsil letter to R. A. Clark and D. M. Crutchfield reestablishing a submittal date for certain qualification information.

(93) April 4, 1983 ..... D. M. Crutchfield letter to W. G. Counsil providing clarification of the previously issued SER.

(94) April 15, 1983 ..... W. G. Counsil letter to D. G. Eisenhut submitting CYAPCO's response to items of Generic Letter 82-33 (Supplement 1 to NUREG-0737).

(95) May 18, 1983 ..... W. G. Counsil letter to R. A. Clark and D. M. Crutchfield, amending operating license DPR-61 incorporating revised Technical Specifications.

A. INTRODUCTION AND CHRONOLOGY

Connecticut Yankee Atomic Power Company (CYAPCO) was initially requested to address the issue of environmental qualification of electrical equipment for the Haddam Neck Plant by letter from V. Stello, Jr., to D. C. Switzer dated December 23, 1977. Responses to the request were provided during the subsequent several months and are summarized in NUREG-0458, Short-Term Safety Assessment on the Environmental Qualification of Safety-Related Electrical Equipment of SEP Operating Reactors. Relevant details of this phase of the qualification program were discussed in the forwarding letter to this report.

This issue of environmental qualification was re-escalated to high priority status upon issuance of the February 15, 1980 letter from D. L. Ziemann to W. G. Counsil (Reference (1)). The environmental qualification program has been the subject of frequent correspondence between our respective staffs and the NRC's consultant, Franklin Research Center (FRC). An indication of the magnitude of this task can be obtained by reviewing the attached chronology. It is important to recognize that CYAPCO resources have been strained significantly, not merely because of the amount of equipment requiring qualification documentation, but also because of the numerous changes and conflicts in NRC guidance documents on this subject. To support this position, the attached chronology is discussed to specify instances where such conflicts have arisen and to identify the applicability of these reference documents as of this writing.

In Reference (1), the Staff determined it necessary to increase the level of effort applied to the review of environmental qualification by the SEP licensees. It was identified that a meeting (Reference (2)) was to be held on this subject even though this letter was not received by CYAPCO until after the date of the meeting. At this time, the Staff issued the "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors". Although the requirements of this document are similar to those contained in NUREG-0588, the Staff explained that this document was generated specifically for operating reactors. Additional latitude and flexibility were being provided when compared to requirements for plants not yet licensed to operate or when compared to requirements for replacement equipment for operating plants. During the NRC meeting (Reference (2)), the SEP licensees expressed their position that until the issuance of Reference (1), it was their understanding that the NRC had satisfactorily resolved the issue for the SEP plants. Nonetheless, the Owners' Group committed to cooperate in the redirected program to the satisfaction of the NRC Staff.

By Reference (3), the Staff issued its first accelerated review schedule regarding the SEP plants. Reference (3) also identified the qualification program submittal content which at the time included the identification and justification of equipment

considered qualified by experience regarding "Areas Normally Maintained in Room Conditions". At this stage, CYAPCO opted to tabulate the equipment in the format of I&E Bulletin No. 79-01B. In partial response to Reference (3), CYAPCO docketed Reference (4) to facilitate Staff review of relevant emergency operating procedures. By Reference (5), CYAPCO docketed relevant piping and instrument drawings and equipment location drawings.

In Reference (6), the Staff provided some clarification of the guidelines enclosed in Reference (1) regarding containment environmental conditions and systems required for accident mitigation. At this stage, the Staff identified the schedule of Reference (3) to be "nominal submittal dates" and expressed the opinion that CYAPCO could easily provide the supplemental information on an expedited schedule. It is noted that References (3) and (6) were ultimately quoted in the Order and Modification of License (Reference (17)) as the documents to which a response must be provided by November 1, 1980.

In Reference (7), CYAPCO provided a partial response to References (1) and (6) be identifying which systems are utilized to perform the necessary functions of emergency reactor shutdown, containment isolation, reactor core cooling, containment and reactor heat removal, and prevention of significant releases of radioactive material to the environment. At this time, CYAPCO advised the Staff that it did not intend to distinguish qualified equipment from unqualified equipment in emergency operating procedures. Its preference to color-code or otherwise modify instrumentation on the main control boards remains in effect at this time. However, the plant-specific list of systems required to function to mitigate the effects of accidents which cause the harsh environment has undergone some refinement. Numerous discussions with the NRC Staff and its consultant, Franklin Research Center, as well as a more detailed evaluation of a necessity for a given component, has reduced the number of components requiring qualification. Applications of this refined concept are identified and justified in the Appendices to this report.

In Reference (8), CYAPCO provided a response to another segment of Reference (6) by transmitting sufficient plant data for the Staff to evaluate containment during accident conditions. The subject of containment profiles has been discussed extensively with cognizant members of the Staff. CYAPCO's plant-specific application of the data provided in Reference (8) is detailed in Section B of this report.

In Reference (9), the Commissioners issued the Memorandum and Order, and required the NRC Staff to issue Safety Evaluation Reports by February 1, 1981. It is CYAPCO's intention that the report will be the foundation for a favorable SER.

In Reference (10), CYAPCO docketed the first revision of the Master Listing of Electrical Components by System and the System Component Evaluation Work Sheets (SCEWS) available as of that date. The Master Listing has been replaced by Appendix I to this report; the SCEW Sheets have been revised and are provided as Appendix II to this report.

On June 30 and July 1, 1980 (Reference (11)), a site audit was conducted by Franklin Research Center. A number of significant changes to the program were identified during the conduct of the audit. Among these were:

a) Although the FRC position differed from existing NRC written requirements, they advised that equipment normally maintained at ambient conditions was no longer a part of the scope which had to be addressed by November 1, 1980. Unfortunately, significant manpower had been devoted to addressing this equipment between February 15, 1980 and the FRC audit dates.

b) FRC discussed the concept of the Technical Evaluation Report and the CYAPCO resources which would be required to support this activity. Some 21 previously docketed letters were provided to FRC during the audit to facilitate their review.

c) Although many man-hours had been spent to determine what constitutes the list of equipment which requires qualification, the changes in NRC requirements resulted in a significant percentage of the meeting being devoted to redeveloping this list. Although the list has been re-reviewed and evaluated subsequent to the conduct of the audit, it cannot be overemphasized that the failure to finalize the listing of what equipment requires qualification early in the program has resulted in significant expenditure of resources on areas which are no longer required with respect to the November 1, 1980 deadline.

d) Certain documentation provided to FRC during the audit has been updated or is being revised by this letter. Information regarding containment profiles was provided, but is superseded by the information given in Section B. Draft data on Submergence and Radiation Profiles has since been superseded by References (12) and (22), respectively.

In Reference (12), CYAPCO provided additional documentation regarding environmental profiles within the containment building. As noted previously, this section is superseded by Section B, although Section B generally confirms the correctness of the data provided in Reference (12). Reference (12) docketed the value for Submergence which continues to be the value identified on the

SCEW Sheets. CYAPCO also docketed the qualification reference documents utilized at that time. The applicability of these references is identified as appropriate on the SCEW Sheets.

During the Regional Meetings on this subject (Reference (13)), additional changes in the NRC requirements or new interpretations were provided. The Staff explained that there was no longer a need to address areas of the plant which remain at ambient conditions, despite the written requirements of References (3) and (6). The Staff also discussed the various qualification methods which are acceptable, and these included evaluation, analysis, and similarity considerations. Subsequent to the meeting, CYAPCO endeavored to restructure the program to respond to the new guidance.

The SCEW Sheets provided by Reference (14) are superseded by the contents of Appendix II to this report. CYAPCO updated the data regarding containment parameters and profiles originally provided by Reference (8) in Reference (15). By Reference (16), CYAPCO responded to specific questions raised by FRC during the preparation of the Technical Evaluation Report. It is noted that FRC requested CYAPCO to provide them with a copy of a letter issued by the NRC in March of this year on the subject of environmental qualification. Additional qualification reports, addressing the recently replaced electrical penetrations were provided. These reports remain applicable.

In Reference (17), the Staff issued the Order for Modification of License and required a response by November 1, 1980. Although eventually superseded by Reference (19), the principle purpose of this report is to respond to Reference (17).

In Reference (18), FRC issued the draft interim Technical Evaluation Report. CYAPCO has reviewed the contents of this report but is not preparing a direct response to it at this time due to lack of sufficient resources. Nonetheless, many of the open items are being addressed by the submittal of this document. The significance of Reference (19) has previously been discussed.

In Reference (20), the Staff clarified its position on a number of requirements and escalated the scope of the review effort significantly. CYAPCO's exceptions and positions with respect to the requirements of this document were discussed in the forwarding letter. CYAPCO reemphasizes that extreme difficulties are encountered when the NRC issues documents which revise the scope of a major effort which are required by order to be submitted merely one month from the issuance of Reference (20).

By Reference (21), the Staff requested pertinent information regarding environmental qualification tests to be conducted within the next two years. We are endeavoring to supply the

requested information, but did not receive this document until Tuesday, October 14, 1980. The current work load on individuals involved in environmental qualification will likely preclude a complete response by November 1, 1980, but CYAPCO intends to respond as soon as possible. No plans for qualification testing for CYAPCO have been identified as of this writing.

Updated information regarding the radiation service conditions for the Haddam Neck Plant was provided in Reference (22). This data remains applicable and is identified on the SCEW Sheets as appropriate. The disparity between the data supplied in Reference (22) and the requirements of Reference (20) was discussed in the forwarding letter.

CYAPCO has encountered numerous difficulties in obtaining some of the necessary qualification documentation. Several vendors are no longer in business supplying components for nuclear applications, others are no longer in existence, and still others express great reluctance in providing the requested data. Postulated reasons include difficulties in retrieval or commercial considerations. In attempting to deal with this dilemma, CYAPCO has resorted to letters such as Reference (23) to expedite receipt of the necessary information. Although such efforts have been helpful, they have not resolved a remaining difficulty in obtaining the required qualification documentation.

Reference (24) identifies a call between CYAPCO representatives and the NRC Project Manager for the Haddam Neck Plant regarding the status of the response to the Order. The questions posed were suggestive of potential for changes/relaxations in certain portions of NRC requirements. The responses provided by CYAPCO are intended to demonstrate its continued position that the purpose of this effort is to demonstrate the adequacy of the current qualification status of safety-related electrical equipment, which is possible even if certain provisions of the qualification requirements cannot be fulfilled by documentation.

By Reference (25), the Staff transmitted Supplement 3 to I&E Bulletin No. 79-01B. This document delayed the schedule for submittal of all qualification documentation regarding TMI Action Plan equipment until February 1, 1981. Similarly, the qualification information for equipment required to achieve and maintain a cold shutdown condition is not required until February 1, 1981. CYAPCO's position regarding these changes is described in the forwarding letter. Available information is being provided now and will be supplemented by February 1, 1981.

By Reference (26), CYAPCO received an immediately effective Order which modified the license and the Technical Specifications. June 30, 1982 has been established in the license as the date by which fully qualified safety-related electrical equipment must be installed. By December 1, 1980, CYAPCO must establish complete

and auditable records and maintain them at a central location. Steps have been and are being taken to comply with these requirements.

By Reference (27) CYAPCO provided information requested in Reference (19), consisting of qualification information for safety-related electrical equipment in accordance with the Commission's guidance in this matter. Where total qualification was not incorporated into this report, justification for continued operation until total conformance could be achieved was provided.

In Reference (28), D. G. Eisenhut addressed clarification of the October 24, 1980 Order to all Licensees. The provision of the Orders requiring centrally located records did not call for creation of any records, per se, but the existence of a system which contained a complete set of documentation on Environmental Qualification.

In Reference (29) CYAPCO requested that a hearing be held to determine the validity of NUREG-0588 requirements, specifically the requirement of meeting the June 30, 1982 deadline for qualification of all safety-related electrical equipment.

Reference (30) transmitted an update of the lists identifying plant systems requiring qualification documentation. This update was docketed only to accurately reflect the content of Reference (27).

In Reference (31) D. G. Eisenhut informed W. G. Counsil that the Commission intended to hold the Reference (29) hearing request in abeyance until 30 days after the issuance of the SERs for our facilities, thus providing the option of reviewing the SERs while still preserving our ability to seek a hearing. A response regarding the acceptability of this approach was requested by January 30, 1981.

Reference (32), from D. G. Eisenhut to all Licensees, provided information in response to licensee requests regarding certain requirements of Bulletin 79-01B, the Reference (9) memorandum, and the Reference (25) order.

In Reference (33), W. G. Counsil informed D. G. Eisenhut that there are no plans for environmental qualification testing.

Reference (34) forwarded W. G. Counsil's acceptance of D. G. Eisenhut's proposal to hold our hearing request in abeyance for 30 days following the issuance of the SER's for our facilities with the qualification that the 30 days be counted as after the receipt of the last SER.

Reference (35) updated the Reference (27) submittal, providing updated SCEW sheets, a revised index listing all safety-related electrical equipment, and additional or replacement pages for the Master Listing of Electrical Components.

In Reference (36) CYAPCO provided updated and corrected information regarding the pump section double ended break case of the mass and energy data provided in Reference (27). A reduction in the maximum allowable initial containment pressure was temporarily necessary to ensure conformance to the containment design pressure of 40.0 psig.

In Reference (37), G. Lainas transmitted the preliminary results of the Staff review of environmental qualification of safety-related electrical equipment at the Haddam Neck Plant. The Staff review resulted in the alleged identification of a number of potential deficiencies such that conformance to DOR guidelines could not be demonstrated. CYAPCO was required to respond within ten days, providing justification for continued operation in light of these alleged deficiencies.

Reference (38) provided the justification for continued operation requested in Reference (37). CYAPCO objected to conclusions drawn from a partial review in the absence of the SER, but supplied responses to concerns raised in Reference (37) to the extent possible. CYAPCO also suggested that a complete and accurate evaluation of these concerns should be made prior to the issuance of the SER or TER.

Reference (39) forwarded D. G. Eisenhut's letter to all Licensees, clarifying the NRC Staff requirements for a detailed explanation of test procedures and the results thereof. These detailed reports on Environmental Qualification of Class 1E Electrical Equipment would then be considered proprietary.

Reference (40) requested additional information to be submitted within 30 days on SEP Topics VI-2.D; Mass and Energy release for Postulated Pipe breaks inside containment, and VI-3; Containment Pressure and Heat Removal Capability. This information was necessary for the Staff's contractors, LLNL, to complete their work on these topics.

Reference (41) W. G. Counsil letter to D. M. Crutchfield, docketed information on the reanalysis of temperature and pressure for LOCA and MSLB using the same methodology and initial conditions described in Reference (36). By the docketing of this reanalysis, CYAPCO concluded that the existing Technical Specification limit of 3.0 psig was appropriate and the conclusions in Reference (27) remained valid.

Reference (42) (Circular 81-06) contained information on certain

Foxboro 10 to 50 milliampre transmitters. Licensees were advised of the improper use of Teflon insulation and an unsuitable capacitor in the amplifier section of these transmitters.

Reference (43) W. G. Counsil letter to D. M. Crutchfield, supplied the information on SEP topics VI-2.D and VI-3 requested in Reference (40). A Modeling Report and Parameter List was provided.

Reference (44) submitted corrected data for the calculation of containment profiles originally submitted via Reference (10). The identified discrepancies were not expected to impact the Staff's ongoing evaluation of containment response profiles, and the corrections were docketed simply to ensure the accuracy of data previously provided.

Reference (45) transmitted the Safety Evaluation Report (SER). The NRC Staff identified the information required, and the actions necessary to comply with Reference (26). CYAPCO was given the option of presenting alternatives to staff position, however, all information was requested to be provided within 90 days. CYAPCO has encountered difficulties in discerning the bases for the alleged deficiencies in many instances.

Reference (46) W. G. Counsil transmitted to D. G. Eisenhut a revised Master Listing of Electrical Components by System. This Listing is an update to information previously docketed via Reference (27), and thereby supersedes Appendix I of Reference (27) in its entirety.

In Reference (47), W. G. Counsil informed Dr. J. Hendrie of the substantial amounts of manpower and resources already expended on environmental qualifications, and that licensee evaluations found the NRC Staff requirements for a June 30, 1982 deadline for full compliance neither appropriate, realistic, nor attainable. CYAPCO requested relief from the June 30, 1982 deadline, in the form of extensions to a minimum of seventeen months after SER issuance. Other issues mentioned were equipment in mild environments, replacement parts, aging requirements, and containment profiles. This document was subsequently appended in Reference (54).

In Reference (48), D. G. Eisenhut informed W. G. Counsil of the Staff's decision to extend the 30-day abeyance period granted in Reference (31) to 90 days. Within 90 days of the issuance of the SER for the Haddam Neck Plant, CYAPCO was requested to inform the Staff of its intentions regarding the hearing request of Reference (29), and of the specific issues to be raised in that proceeding.

Reference (49) provided proprietary and non-proprietary versions

of the Modeling Report and Parameter List for the Haddam Neck Plant, together with an affidavit from W, the owner of the information supplied. Nineteen questions on SEP Topics VI-2.D and VI-3 posed in Reference (40) were thus addressed. This response simultaneously fulfilled related NRC requests originating from NRC's SEP Branch. A more thorough treatment of the evaluation of the containment profile issue at the Haddam Neck Plant was docketed by Reference (54), July 16, 1981.

In Reference (50), the law firm of Debevoise & Liberman filed a petition on behalf of 20 licensees seeking a thirteen month extension of the June 30, 1982 deadline established by CLI-80-21. The petition stated that few, if any, licensees could meet the deadline, and that the assumptions upon which CLI-80-21 was based have proven to be significantly understated in terms of the length of time needed for compliance.

Reference (51) informed the Staff that CYAPCO planned to have representatives present at the July 7-10, 1981 meeting on environmental qualification. Based upon speculation regarding the results of the meeting, CYAPCO also intended to propose dates for licensee-specific meetings on this subject.

Reference (52) advised CYAPCO of administrative changes to the Reference (45) SER. These changes were the result of Staff identified inconsistencies between the SER and the TER.

Reference (53) informed the 20 petitioning licensees that the NRC Staff intended to postpone its decision on the Reference (50) petition until after the Reference (51) meeting. The CYAPCO had no objection to this course of action.

Reference (54) provided feedback on the July 7-10, 1981 meeting on environmental qualification. CYAPCO and NNECO had a total of seven representatives in attendance at this meeting. While the meeting was of some benefit, additional dialogue on a plant-specific basis was determined to be necessary to resolve the numerous remaining questions. Specific comments on the meeting were provided as an attachment. General comments regarding resource expenditures, adequacy, and correctness of the SER discrepancies between the SER and the TER, mild environments, and the June 30, 1982 deadline were also provided.

In Reference (55), the NRC Staff responded to the Reference (50) petition, recommending a one-year extension of the deadline to the Commission. Other options were discussed, but a one year extension was recommended. Additional extensions of time could be authorized by the Director, Division of Licensing, on a case-by-case basis for good cause shown.

Reference (56) established a written position on qualification of replacement parts to the provisions of NUREG-0588. CYAPCO stated that "sound reasons" for use of equipment lacking full qualification existed in numerous instances, and that such reasons are documented in the central qualification file.

Reference (57) forwarded D. G. Eisenhut's letter to W. G. Counsil proposing an additional delay in the Reference (29) hearing request, to allow CYAPCO to consider all recent or imminent developments. The Staff expressed its intention to continue to pursue resolution of disputed technical issues.

In Reference (58), CYAPCO concurred with the Reference (57) proposal, agreeing to inform the Staff of CYAPCO's decision on the hearing request within 30 days of Commission disposition of the industry petition.

In Reference (59), CYAPCO provided an overview of the environmental qualification issue in light of recent developments. The preferred methods to achieve resolution of disputed technical issues were discussed.

In Reference (60) W. G. Counsil provided a detailed synopsis of progress achieved to date toward meeting Environmental Qualification requirements docketing a detailed response to the Safety Evaluation Report for the Haddam Neck Plant within the allocated 90 days; and demonstrating conclusively that continued operation of the Haddam Neck Plant is consistent with public health and safety considerations.

Reference (61) R. C. Haynes to All Licensees, transmitted I&E Information Notice 81-29, which reported adverse test results from testing of equipment, some of which was related to Environmental Qualification. The Staff does not require reporting of adverse test results, but pointed out that in some cases such results could be reportable under provisions of 10CFR50 or license requirements.

Reference (62) provided minor editorial changes to Reference (60).

In Reference (63), D. M. Crutchfield requested that additional information be forwarded to the NRC's contractor, Franklin Research Center, to facilitate the review of the CYAPCO 90-day response on Environmental Qualification.

Reference (64) consists of a Federal Register notice (47FR2876) on proposed rulemaking regarding Environmental Qualification. The proposed rule would clarify the Commission's requirements and codify methods of qualification currently contained in national standards, regulatory guides, and certain NRC publications.

In Reference (65), W. G. Counsil provided information on mass and energy release data previously requested. These data substantiated the validity of the assumption regarding credit for the anti-reverse rotation device in the broken loop. A typographical error in an April 1, 1981 letter from W. G. Counsil to D. M. Crutchfield was also corrected.

Reference (66) provided the material requested in Reference (63) to FRC, noting that much of the information is considered to be proprietary and also that much of it had been provided previously. Compliance with the intent and spirit of the Paperwork Reduction Act was also questioned.

W. G. Counsil submitted comments to the proposed rule on Environmental Qualification in Reference (67). Mr. Counsil supported Chairman Palladino's concept of a revised deadline, also contending that the second refueling outage commencing after March 31, 1982 constituted an achievable deadline. Commission action on the schedule, independent of the technical requirements of the rule, was recommended.

In Reference (68) W. G. Counsil informed V. L. Bissonnette of the Crane Co. that confirmation of orders for motor operators must be received immediately by CYAPCO to satisfy NRC requirements that progress be made in this are.

Reference (69) consists of a Federal Register Notice (47FR7782) on the proposed Revision 1 to Regulatory Guide 1.89, "Environmental Qualification of Electric Equipment for Nuclear Power Plants". The proposed Revision 1 would describe procedures that would be acceptable to the NRC Staff for complying with the proposed regulations in Reference (64).

In Reference (70), D. M. Crutchfield requested that additional information on TMI Action Plan items included in CYAPCO's EQ central file be sent to FRC to facilitate their review of CYAPCO's 90-day EQ submittal. This information includes identification of all TMI Action Plan equipment installed as of January 1, 1981, all equipment with implementation dates after January 1, 1981, and numerous other items, many of which were previously submitted to the NRC.

Reference (71), R. C. Haynes to All Licensees, transmitted I&E Information Notice 82-03 which reported results from tests conducted on electrical terminal blocks by Sandia Laboratories. The test results indicated that certain terminal blocks exhibited leakage currents when exposed to a chemical/steam environment. Although the Staff did not require action on this topic, it did note that licensees should assure that their preventative maintenance program considers the effect of maintenance activity in the cleanliness and integrity of electrical terminations and terminal

blocks.

Reference (72) submitted W. G. Counsil's comments on the Proposed Revision 1 to Regulatory Guide 1.89 (Reference (69)). Mr. Counsil noted that the proposed revision did not recognize the adequacy of previously submitted evaluations and documentations. Additionally, the revision would impose new costs and obligations on utilities without establishing a basis for these costs and obligations. The proposed revision has stated that "... no new costs or obligations ... (would be placed) on utilities".

Reference (73) consists of a Federal Register Notice (47FR28363) which suspends the previously imposed June 30, 1982, deadline for completion of Environmental Qualification. The rule in 47FR28363 is to remain in effect until the NRC supersedes 10CFR50.49 with the final Environmental Qualification rule.

Reference (74) transmitted the Staff's draft Safety Evaluation Report (SER) on SEP topics VI-2.D (Mass and Energy Release for Possible Pipe Break Inside Containment) and VI-3 (Containment Pressure and Heat Removal Capability). The SER concluded that containment pressure and temperature profiles (given in the SER) may be used in assessing the qualification of Class IE electrical equipment at CYAPCO.

Reference (75) transmitted the Staff's concurrence with a CYAPCO analysis documented in Reference (41). The analysis had predicted peak temperature and peak pressure in the containment based on new post-LOCA mass and energy release date.

Reference (76) documented a September 3, 1982, telephone conversation in which CYAPCO agreed with the SER analysis conclusions from Reference (74).

Reference (77) provided written agreement by CYAPCO with respect to the conclusions reached in the SER analysis of Reference (74).

Reference (78) transmitted FRC's TER for the Haddam Neck Plant and the NRC's associated SER. Several items required responses from CYAPCO on a 30 and/or 90 day schedule.

Reference (79) the Staff informed all licensees of the status and test results on the series of environmental qualification testing published in Information Notice 81-29.

In Reference (80) CYAPCO submitted an update on the qualification status of item II.F.1.5 and scheduling for submittal of test reports.

In Reference (81) Petitioner, Union of Concerned Scientists, challenges U.S. NRC's Final Rule on Environmental Qualification suspending the June 30, 1982 deadline by which operators of nuclear power plants were to show that certain safety-related electrical equipment would operate under adverse conditions, (47FR28363).

Reference (82) transmitted CYAPCO's final submittal of reference information to the Franklin Research Center for review of the 90-day response to a previous SER.

In Reference (83), W. G. Counsil provided the information requested in Reference (78), submitting surveillance and maintenance schedules and JCO's not previously submitted.

In Reference (84) the NRC issued the Final Rule on Environmental Qualification of safety related electrical equipment, codifying methods and criteria to meet the Commissions requirements in this area.

In Reference (85) NUGEQ (Intervenors) statement of support for NRC's position on interim rule on EEQ.

In Reference (86), W. G. Counsil re-affirmed CYAPCO's intention of making a determination on a hearing request by March 24, 1983.

In Reference (87), NUGEQ filed a peition to review the final rule on Environmental Qualification, 10CFR50.49.

Reference (88) clarified the replacement date of valve MOV-200, which had been stated incorrectly in Reference (83).

Via Reference (89) W. G. Counsil advised the NRC staff that CYAPCO interprets the Final Rule on Environmental Qualification of Electric Equipment Important to Safety for Nuclear Power Plants (Reference 84) as superseding the 90-day responses requested in Reference (78). Additionally, schedules for the completion of qualification of electric equipment will be submitted by May 20, 1983.

Reference (90) withdraws CYAPCO's request for a hearing, based on certain interpretations of the final rule.

In Reference (91), W. G. Counsil provided the staff with an update of communications with the Crane Co., in the on-going attempt to obtain complete qualification documentation for certain motor operators. Previous experience with the Crane Co. was described in some detail. This information was provided to the Commission to demonstrate our efforts to qualify the subject MOV's and to explicitly document the complications which arise as part of the qualification process.

Reference (92) deferred submittal of documentation of qualification information for several weeks due to a determination that the vendor-supplied information was incomplete.

In Reference (93), D. M. Crutchfield provided clarification to the requirements stated in the December 13, 1982 SER (Reference 78). CYAPCO was requested to review its January 21, 1983, and March 11, 1983, responses and notify the Staff of any changes within 30 days.

In Reference (94), CYAPCO provided responses to Supplement I to NUREG-0737, referred to as "basic requirements". Attachment Nos. 2 through 4 describe the current status of each of the five major areas (i.e., SPDS, CRDR, EOPs, Regulatory Guide 1.97, and ERFs) in Supplement I to NUREG-0737 for the Haddam Neck Plant, Millstone Unit No. 1, and Millstone Unit No. 2, respectively. Our interpretation of the implementation and qualification schedules of Supplement I to NUREG-0737 and 10CFR50.49 was provided.

In Reference (95), Revisions to the Technical Specifications were made to bring them into conformance with the Final Rule on Environmental Qualification, 10CFR50.49. The changes deleted the June 30, 1982 deadline date, and removed the requirement for a central qualification file.

Docket No. 50-213

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 2

List of Electrical Equipment Important to Safety

May 20, 1983

List of Electrical Equipment Important to Safety

Reference (3), previously submitted a list of Safety-Related Electric Equipment. Attachment 2 represents a complete list of Electric Equipment Important to Safety requiring qualification at the Haddam Neck Plant reflecting current status.

To facilitate the interpretation of this material, the following information is being supplied.

Column No.	Item	Description
1	SCEWS	System Component Evaluation Work Sheets - found in Attachment 5.
2	Temp Elem.	Temperature element
	VV Oper.	Valve operator
	PP Motor	Pump motor
	Limit Sw.	Limit switch
	Sol. Valve	Solenoid valve
	Elec. Pen.	Electrical penetration
	PWR & Cont. Cable	Power and Control Cable
	Inst. Cable	Instrument cable
	T.B.	Terminal block
	Splice & H.S. tube	Splice and heat shrink tube
	L.T.	Level transmitter
	P.T.	Pressure transmitter
	T.C.	Thermocouple
	FI & FT	Flow indicator and flow transmitter
3	Manufacturer	Self-explanatory
4	1982 TER No.	Corresponding Franklin Research Center (FRC) Technical Evaluation Report (TER) reference number
5	NRC Category	I.A - Equipment Qualified I.B - Equipment Qualification Pending Modification II.A - Equipment Qualification Not Established II.B - Equipment Not Qualified II.C - Equipment Satisfies All Requirements Except Qualified Life or Replacement Schedule Justified III.A - Equipment Exempt from Qualification III.B - Equipment Not in Scope of Review

Column No.	Item	Description
5 (cont.)	NRC Category	IV - Documentation Not Made Available
6	CYAPCO TER Assessment	CYAPCO's evaluation of FRC TER concerns
	Comments:	1. Refer to SER/TER Review Sheet for justification. 2. New equipment installed, refer to SCEW sheet. 3. Equipment replaced, refer to SER/TER Review Sheet for justification. 4. Equipment not evaluated in the 1982 TER/SER.

FACILITY: Connecticut Yankee
UNIT: Haddam Neck Plant
DOCKET: 50-213

EQUIPMENT ENVIRONMENTAL QUALIFICATION
QUALIFICATION STATUS OF EQUIPMENT COVERED
BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
A-1-7	Temp.Elem.	RFD Corp.	20	I.B	X			X	X	
A-1-9	Temp.Elem.	Lewis Engr.	20	I.B	X			X	X	
A-4-3	VV Oper.	Teledyne	2	I.B	X			X	X	
A-5-5	VV Oper.	Teledyne	5	III.B		X		X	X	
A-5-6	VV Oper	Teledyne	5	III.B		X		X	X	
A-5-7	VV Oper	Teledyne	5	III.B		X		X	X	
A-5-8	VV Oper	Teledyne	5	III.B		X		X	X	
A-5-9	VV Oper	Teledyne	4	I.B	X			X	X	
A-5-10	PP Motor	Westinghouse	18	III.B		X	X			1
A-6-3	VV Oper	Limitorque	10	I.A	X					
A-7-1	VV Oper	Teledyne	1	I.B	X			X	X	
A-7-2	Limit Sw.	Namco	16	I.A	X					
A-7-3	VV Oper	Teledyne	3	I.B	X			X	X	
A-7-4	Limit Sw.	Namco	16	I.A	X					
A-7-6	Sol.Valve	ASCO	12	I.B	X		X			3
A-7-7	Sol.Valve	Valcor	13	I.A	X					
A-7-8	Elec.Pen.	Conax	45	II.A		X				1

EQUIPMENT ENVIRONMENTAL QUALIFICATION

QUALIFICATION STATUS OF EQUIPMENT COVERED

BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
A-10-1	PWR & Cont. Cable	Kerite	38	I.A	X					
A-10-2	Inst. Cable	Brand-Rex	39	I.A	X					
A-10-3	Elec.Penet.	Conax	36	I.A	X					
A-10-4	T.B	Westinghouse	46	I.B	----------DELETED----------					
A-10-5	T.B.	Gen.Electric	47	I.B	----------DELETED----------					
A-10-32	Cable	Rockbestos	40	I.A	----------DELETED----------					
A-10-33	Splice & H.S. Tube	Raychem	49	I.A	X					
A-10-34	Connectors	Litton	50	I.A	X					
A-10-35	Cable	Samuel Moore	41	I.B	----------DELETED----------					
A-10-41	Cable	Samuel Moore	44	I.B	----------DELETED----------					
A-10-42	Cable	Samuel Moore	44	I.B	----------DELETED----------					
A-10-43	Cable	Collier	42	I.B	----------DELETED----------					
A-10-44	Cable	Collier	43	I.B	----------DELETED----------					
A-10-55	Coaxial Cable	Rockbestos	37	II.A		X	X			1

FACILITY: Connecticut Yankee
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EQUIPMENT ENVIRONMENTAL QUALIFICATION
QUALIFICATION STATUS OF EQUIPMENT COVERED
BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
A-10-56	Connector	Ideal	51	I.A	X					
A-10-57	T.B.	Marathon	48	I.B	----------DELETED----------					
A-10-58	T.B.	Weidmullen	None	-						2 & 4
A-10-59	Inst.Cable	Rockbestos	None	-						2 & 4
A-10-60	Connectors	Litton	None	-						2 & 4
A-10-61	Connectors	C-E	None	-						2 & 4

FACILITY: Connecticut Yankee
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EQUIPMENT ENVIRONMENTAL QUALIFICATION
QUALIFICATION STATUS OF EQUIPMENT COVERED
BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
B-1-1	L.T.	Foxboro	26	I.B	X			X	X	
B-2-2	P.T.	Foxboro	27	I.B	X			X	X	
B-3-9	T.C.	-------	21	II.A		X	X			1
B-4-1	L.T.	Hagan	24	I.B	X			X	X	
B-4-2	L.T.	Hagan	23	I.B	X			X	X	

FACILITY: Connecticut Yankee
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EQUIPMENT ENVIRONMENTAL QUALIFICATION
QUALIFICATION STATUS OF EQUIPMENT COVERED
BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
C-1-1	VV Operator	Teledyne	4	I.B	X			X	X	
C-1-6	VV Operator	Teledyne	4	I.B	X			X	X	
C-2-1	PP Motor	Westinghouse	17	II.A		X				1
C-2-2	----------Intentionally Left Blank----------									
C-2-3	PP Motor	Westinghouse	17	II.A		X				1
C-2-8	VV Operator	limitorque	6	II.A		X				1
C-3-1	VV Operator	Limitorque	7	II.A		X				1
C-3-2	VV Operator	Limitorque	8	I.B	X		X			3
C-3-3	Fan Motor	Westinghouse	19	II.A	X					1
C-3-4	Sol.Valve	ASCO	14	I.B	X		X			3
C-3-5	VV Operator	Limitorque	9	I.B	X		X			3
C-4-1	VV Operator	Limitorque	None	---						3 & 4
C-10-16	Rad.Monitor	Gen.Atomic	35	II.A		X				1

EQUIPMENT ENVIRONMENTAL QUALIFICATION
QUALIFICATION STATUS OF EQUIPMENT COVERED
BY RULE 10CFR50.49

SCEWS	Equipment Type	Manufacturer	1982 TER No.	NRC Category	NUSCO TER ASSESSMENT Agree	Disagree	Modification Complete	Modification Pending	JCO Provided	Comment
D-1-1	P.T.	Foxboro	28	I.B	X			X	X	
D-1-9	FI&FT	TEC*	29	I.B	X			X	X	
D-1-9	FI&FT	TEC*	30	I.B	X			X	X	
D-4-1	L.T.	Gem-Delaval	25	I.B		X				1

*TEC System to replace B&W

Docket No. 50-213

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 3

Equipment Replaced

May 20, 1983

Docket No. 50-213

Equipment Replaced

CYAPCO has replaced all the designated electrical equipment referred to as Generic Replacement Schedule No. 1 of Reference (2).

For your convenience, listed below by SCEW sheet number are the pieces of electrical equipment which have been replaced as of May 20, 1983.

SCEW SHEET No.	Equipment No.	Description
A-7-6	AOV-568	Solenoid valve
	AOV-570	Solenoid valve
A-10-4	MOV-298	Westinghouse terminal blocks
	MOV-567	Westinghouse terminal blocks
	LT-1301-2	Westinghouse terminal blocks
A-10-5	MOV-871A, B	General Electric terminal blocks
A-10-35	LT-1301-1-4	Samuel Moore cable #16 AWG
	LT-1302-1-4	Samuel Moore cable #16 AWG
A-10-41	TE-412 (A&B)	Samuel Moore cable #16 AWG
	TE-422 (A&B)	Samuel Moore cable #16 AWG
	TE-432 (A&B)	Samuel Moore cable #16 AWG
	TE-442 (A&B)	Samuel Moore cable #16 AWG
	TE-443	Samuel Moore cable #16 AWG
	TE-413	Samuel Moore cable #16 AWG
	TE-423	Samuel Moore cable #16 AWG
	TE-433	Samuel Moore cable #16 AWG
	TE-443	Samuel Moore cable #16 AWG
A-10-42	TE-411 (A&B)	Samuel Moore cable #16 AWG
	TE-421 (A&B)	Samuel Moore cable #16 AWG
	TE-431 (A&B)	Samuel Moore cable #16 AWG
	TE-441 (A&B)	Samuel Moore cable #16 AWG
A-10-43	MOV-298	Collier cable #12 AWG
	MOV-567	Collier cable #12 AWG
A-10-44	MOV-298	Collier cable #12 AWG
	MOV-567	Collier cable #12 AWG
A-10-55	IRMS-109	Coaxial cable
	IRMS-111	Coaxial cable
	IRMS-113	Coaxial cable
	IRMS-115	Coaxial cable
A-10-57	MOV-567	Marathon #1602 terminal blocks
	LT-1301s	Marathon #1602 terminal blocks
	LT-1302s	Marathon #1602 terminal blocks
	TE's	Marathon #1602 terminal blocks
	MOV-331s	Marathon #1602 terminal blocks
C-3-2	MOV-34	Limitorque
C-3-4	D-17-1-4	Solenoid damper valves
C-3-5	MOV-23	Limitorque
C-4-1	MOV-331	Limitorque

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Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 4

Index to SCEW Package

May 20, 1983

HADDAM NECK PLANT
DOCKET 50-213

INDEX

SYSTEM COMPONENT EVALUATION WORK SHEETS

C. ACCIDENT MITIGATING SYSTEMS (LOCA,MSLB,FWLB)

1.	Safety Injection (High & Low Pressure)	C-1
2.	Centrifugal Charging (Charging Pumps)	C-2
3.	Containment Vent Fans (Fan Coolers) & Filters	C-3
4.	Containment Isolation	C-4
5.	Feedwater Regulating Valves/MOV Back-ups	C-5
6.	Room Vent Coolers (SI,RHR,CCP,SWGR.,Diesels)	C-6
7.	H_2 Purge System	C-7
8.	Equipment Hatch Radiation Monitoring	C-8
9.	Control Room Ventilation	C-9
10.	Post Accident Sampling & Monitoring (Containment Gas and Particulate)	C-10

D. ACCIDENT MITIGATING INSTRUMENTS:

1.	Pressurizer Pressure	D-1
2.	Containment Pressure	D-2
3.	Steam Line Flow	D-3
4.	Containment Sump Level	D-4
5.	Other	D-5

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Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 5

Justifications for Continued Operation

and

System Component Evaluation Work Sheets

May 20, 1983

Docket No. 50-213

Connecticut Yankee Atomic Power Company
Haddam Neck Plant

Attachment 5

Generic Replacement Schedules

No. 1 This group of equipment has been replaced as referred to in past correspondence. Refer to References (2), (3), (8), and (10).

No. 2 In accordance with the Final Rule on Environmental Qualification, 10CFR50.49(g) we have established a goal of final qualification of electric equipment important to safety by the end of the 1984 refueling outage, which is the second refueling outage after March 31, 1982. Any future revisions to this schedule will be submitted in accordance with the provisions of 50.49(h).

May 20, 1983

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
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SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-1-7
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Reactor Protectio **Plant ID No.:** See NOTE 1 **Component:** Temperature Elements **Manufacture:** RDF Corporation **Model Number:** - **Function:** Senses temperature of RCS Loops **Accuracy:** ± 1% of Span **Service:** See Note 2 **Location:** Inside Containment loop areas	**Operating Time**	Variable		Variable			
	Temperature (^{o}F)	267		Ref. 35 & Addendum #1			
	Pressure (PSIA)	40 psig		Ref. 36			
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			
	Radiation	$9.4X10^{6}$ rads		Ref. 34			
	Aging	40 Yrs.		Plant Design Life			
Flood Level Elev: 4'-2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:
1. TE-413, 423, 433, & 443.
2. Transmits temperature T_{cold} of RCS Legs.

SUMMARY SHEET NO. A-1-7

SCEW SHEET NO. A-1-7
DATE: 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Temperature Elements (RTD's)
TE-412, 422, 432, 442

MANUFACTURER:

Lewis Engineering Company

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

The function of these temperature elements is to transmit the temperature of the RCS "Cold" leg and average temperature respectively via a resistance temperature detector (RTD). The failure of any one or more of these devices is an unlikely event. However, if one or more failures should occur, these devices are backed up by the In-Core Thermocouples and the Subcooled Margin Monitor.

Replacement of these devices will "ONLY" take place provided a better (qualified) RTD can be procured. Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified components. Refer to Generic Replacement Schedule 2.

In the event that the replacement schedule is subsequently modified, the staff will be notified of the revised schedule in subsequent correspondance.

SCEWS No. A-1-7

1982 TER No. 20

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C)

1. Corrected Plant ID numbers under Notes 1 & 2 on SCEW for information.

II) SER concerns: **I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER**

Response:

This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) **Proposed corrective action and schedule.**

Refer to corresponding equipment summary sheet.

V) **Justification for continued operation.**

__X__ **Reaffirmed**

_____ **Revised**

_____ **New**

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Reactor Protection **Plant ID No.:** See Note 1 **Component:** Temperature Element **Manufacture:** Lewis Engineering **Model Number:** - **Function:** Sense temperature of RCS Loops. **Accuracy:** ± 1% of span **Service:** See Note 2 **Location:** Inside containment loop areas	**Operating Time**	Variable		Variable			
	Temperature (^{O}F)	267		Ref. 35 & Addendum #1			
	Pressure (PSIA)	40 psig		Ref. 36			
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			
	Radiation	$9.4X10^{6}$ rads		Ref. 34			
	Aging	40 Yrs.		Plant Design Life			
Flood Level Elev: 4'-2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes: 1. TE-411, 421, 431, 441 (A&B for all) - T_{avg}.
TE-412, 422, 432, 442 (A&B for all) - ΔT
2. Transmits temperature T_{avg} & ΔT of RCS legs.

SUMMARY SHEET NO. A-1-9

SCEW SHEET NO. A-1-9
DATE: 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Temperature Elements (RTD's)
TE-413, 423, 433, 443, 411, 421, 431, 441

MANUFACTURER:

Lewis Engineering Company

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

The function of these temperature elements is to transmit the temperature of the RCS "Cold" leg and average temperature respectively via a resistance temperature detector (RTD). The failure of any one or more of these devices is an unlikely event. However, if one or more failures should occur, these devices are backed up by the In-Core Thermocouples and the Subcooled Margin Monitor.

Replacement of these devices will "ONLY" take place provided a better (qualified) RTD can be procured. Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified components. Refer to Generic Replacement Schedule 2.

In the event that the replacement schedule is subsequently modified, the staff will be notified of the revised schedule in subsequent correspondence.

SCEWS No. A-1-9

1982 TER No. 20

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C)

1. Corrected manufacturer to Lewis Engineering.
2. Corrected plant ID numbers under Note 1.
3. Indicated correct function under Note 2.

II) SER concerns: **I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER**

Response:

This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) **Proposed corrective action and schedule.**

Refer to corresponding equipment summary sheet.

V) **Justification for continued operation.**

__X__ **Reaffirmed**

_____ **Revised**

_____ **New**

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-4-3
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** RX Coolant System **Plant ID No.:** MOV-298 **Component:** Valve Operator **Manufacture:** Crane-Chapman Teledyne **Model Number:** T-4-5 **Function:** From Aux. Spray CVCS **Accuracy:** N/A **Service:** Controls flow to PRZR from the Aux. Spray CVCS **Location:** Containment at EL. 5'-6" Outer Annulus	Operating Time	Variable		Ref. 1 2(10.3), 4			
	Temperature (^{O}F)	267		Ref. 35 & Addedum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	4.3×10^{7} RADS		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

***Documentation References:**

See "List of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. A-4-3

SCEW SHEET NO. A-4-3

DATE: 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT: Auxiliary Pressurizer Spray MOV-298 (Motor Operator)

MANUFACTURER: Crane Teledyne

QUALIFICATION DISCREPANCY: Lack of full documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION: MOV 298 is the remote controlled motor operated valve between the charging header in the reactor containment building and the pressurizer spray header.

Normally the pressurizer spray which is used for pressure suppression of the pressurizer is supplied from the driving force of reactor coolant flow from either number three or number four loop. MOV 298 would be used to effect pressurizer spray only if neither of these loops had pumps in operation. Pressurizer pressure can also be reduced by use of the power operated relief valve on the pressurizer. The pressurizer is protected from over pressure by three code type safety valves.

The present operator for MOV 298 has design specifications that meet the accident conditions for most instances that the containment is likely to see.

Since there are other methods of reducing pressurizer pressure that could be used it is not vital to the operation of the plant that the MOV 298 be operable.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. A-4-3

1982 TER No. 2

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER

Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-5-5
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN RESIDUAL HEAT REMOVAL System Plant ID No.: MOV780 Component: Motor Operator Valve, Inboard Stop Manufacture: Crane Teledyne Model Number: T-10-20 Function: Operator for MOV780 Accuracy: NA Service: Open to permit RHR flow** Location: LOOP AREA OF CONTAINMENT	Operating Time	Variable Manual		Ref. 2(10.3), 4			
	Temperature (°F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4			See attached Summary Sheet
	Radiation	9.4×10^6 Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: **To allow cooldown of reactor coolant system to less than 200°F following a small LOCA

SUMMARY SHEET NO. A-5-5

SCEW SHEET NO. A-5-5
DATE: 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Residual Heat Removal System--Inboard Stop Valve
MOV-780 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

Normal functions of the Residual Heat Removal Loop are: (1) remove residual heat from the reactor core and reduce the temperature of the Reactor Coolant System during plant cooldown, (2) transfer water from the refueling canal back to the refueling water storage tank after a refueling operation. Additional functions of the Residual Heat Removal Loop after a loss of coolant accident are (1) provide water to the Core Cooling System (core deluge), (2) or alternatively providing water for the reactor containment spray system, and (3) cool and circulate spilled water from the reactor containment sump pump, through the residual heat exchangers and back to the Reactor Coolant System.

The residual Heat Removal Loop consists of two residual heat exchangers, two residual heat removal pumps and the associated piping, valves, and instrumentation necessary for operational control. During plant shutdown, reactor coolant flows from the Reactor Coolant System to the residual heat removal pumps, through the tube side of the residual heat exchangers and back to the Reactor Coolant System. The inlet line to the Residual Heat Removal Loop starts at the hot leg of Loop 1. The return line connects to the cold leg of Loop 2. Normally, heat loads are transferred by the residual heat exchangers to the Component Cooling Loop.

Remotely operated double valving is provided to isolate the residual heat removal system inlet and outlet piping from the reactor coolant system. An electrical interlock between the reactor coolant system loop 4 pressure channels and the first (inboard) set of valves prevents the valves from

being opened when reactor coolant system pressure exceeds residual heat removal system design pressure. Key control switches provide administrative control against misoperation of the second (outboard) set of valves. This motor operated valve is closed with the reactor at power and remains closed unless the RHR system is manually placed in operation.

Connecticut Yankee Atomic Power Company takes no credit for the automatic operation of this equipment from a Safety Injection Signal (SIS) and this equipment is not credited for operation in any safety-related analysis scenario.

The manufacturer of this motor operator has indicated that the MOV was designed to function in the containment environment shown on SCEW sheet A-5-5.

Due to the desirability of long-term operability of this equipment, and in conformance with existing license requirments it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. A-5-5

1982 TER No. 5

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: III.B Equipment not in the Scope of the Review, Pgs. 3-11 & 4-3 in TER

Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

X Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-5-6
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN RESIDUAL System: HEAT REMOVAL Plant ID No.: MOV781 Component: Motor Operator Valve, Outboard Stop Manufacture: Crane Teledyne Model Number: T-10-20 Function: Operator for MOV781 Accuracy: NA Service: Open to permit RHR flow** Location: Lower level, outer annulus of cntmt. Loop 1	Operating Time	Variable Manual		Ref. 2(10.3),4			
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4			See attached Summary Sheet
	Radiation	1.3 X 10^{7} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

**To allow cooldown of reactor coolant system to less than 200^{o}F following a small LOCA

SUMMARY SHEET NO. A-5-6

SCEW SHEET NO. A-5-6

DATE: 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Residual Heat Removal System--Outboard Stop Valve
MOV-781 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

Normal functions of the Residual Heat Removal Loop are: (1) remote residual heat from the reactor core and reduce the temperature of the Reactor Coolant System during plant cooldown, (2) transfer water from the refueling canal back to the refueling water storage tank after a refueling operation. Additional functions of the Residual Heat Removal Loop after a loss of coolant accident are (1) provide water to the Core Cooling System (core deluge), (2) or alternatively providing water for the reactor containment spray system, and (3) cool and circulate spilled water from the reactor containment sump pump through the residual heat exchangers and back to the Reactor Coolant System.

The residual Heat Removal Loop consists of two residual heat exchangers, two residual heat removal pumps and the associated piping, valves, and instrumentation necessary for operational control. During plant shutdown, reactor coolant flows from the Reactor Coolant System to the residual heat removal pumps through the tube side of the residual heat exchangers and back to the Reactor Coolant System. The inlet line to the Residual Heat Removal Loop starts at the hot leg of Loop 1. The return line connects to the cold leg of Loop 2. Normally, heat loads are transferred by the residual heat exchangers to the Component Cooling Loop.

Remotely operated double valving is provided to isolate the residual heat removal system inlet and outlet piping from the reactor coolant system. An electrical interlock between the reactor coolant system loop 4 pressure channels and the first (inboard) set of valves prevents the valves from

being opened when reactor coolant system pressure exceeds residual heat removal system design pressure. Key control switches provide administrative control against misoperation of the second (outboard) set of valves. This motor operated valve is closed with the reactor at power and remains closed unless the RHR system is manually placed in operation.

Connecticut Yankee Atomic Power Company takes no credit for the automatic operation of this equipment from a Safety Injection Signal (SIS) and this equipment is not credited for operation in any safety-related analysis scenario.

The manufacturer of the motor operator has indicated that the MOV was designed to function in the containment environment shown on SCEW sheet A-5-6.

Due to the desirability of long-term operability of this equipment, and in conformance with existing license requirements it will be replaced with fully qualified devices, Refer to Generic Replacement Schedule 2.

SCEWS No. A-5-6

1982 TER No. 5

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: III.B Equipment not in the Scope of the Review, Pgs. 3-11 & 4-3 in TER.

Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

X Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN RESIDUAL **System:** HEAT REMOVAL **Plant ID No.:** MOV803 **Component:** Motor Operator Valve, Outboard Stop **Manufacture:** Crane Teledyne **Model Number:** T-10-20 **Function:** Operator for MOV803 **Accuracy:** NA **Service:** Open to permit RHR flow** **Location:** Lower level, outer annulus of cntmt. --Loop 2	**Operating Time**	Variable Manual		Ref. 2(10.3),4			
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	1.3 X 10^{7} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

**To allow cooldown of reactor coolant system to less than 220^{o}F following a small LOCA

SUMMARY SHEET NO. A-5-7

SCEW SHEET NO. A-5-7

DATE 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Residual Heat Removal System--Outboard Stop Valve
MOV-803 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

Normal functions of the Residual Heat Removal Loop are: (1) remove residual heat from the reactor core and reduce the temperature of the Reactor Coolant System during plant cooldown, (2) transfer water from the refueling canal back to the refueling water storage tank after a refueling operation. Additional functions of the Residual Heat Removal Loop after a loss of coolant accident are (1) provide water to the Core Cooling System (core deluge), (2) or alternatively providing water for the reactor containment spray system, and (3) cool and circulate spilled water from the reactor containment sump pump through the residual heat exchangers and back to the Reactor Coolant System.

The residual Heat Removal Loop consists of two residual heat exchangers, two residual heat removal pumps and the associated piping, valves and instrumentation necessary for operational control. During plant shutdown, reactor coolant flows from the Reactor Coolant System to the residual heat removal pumps, through the tube side of the residual heat exchangers and back to the Reactor Coolant System. The inlet line to the Residual Heat Removal Loop starts at the hot leg of Loop 1. The return line connects to the cold leg of Loop 2. Normally, heat loads are transferred by the residual heat exchangers to the Component Cooling Loop.

Remotely operated double valving is provided to isolate the residual heat removal system inlet and outlet piping from the reactor coolant system. An electrical interlock between the reactor coolant system loop 4 pressure channels and the first (inboard) set of valves prevents the valves from being opened when

reactor coolant system pressure exceeds residual heat removal system design pressure. Key control switches provide administrative control against mis-operation of the second (outboard) set of valves. This motor operated valve is closed with the reactor at power and remains closed unless the RHR system is manually placed in operation.

Connecticut Yankee Atomic Power Company takes no credit for the automatic operation of this equipment from a Safety Injection Signal (SIS) and this equipment is not credited for operation in any safety-related analysis scenario.

The manufacturer of the motor operator has indicated that the MOV was designed to function in the containment environment shown on SCEW sheet A-5-7.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. A-5-7

1982 TER No. 5

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: III.B Equipment not in the Scope of the Review, Pgs. 3-11 & 4-3 in TER.

Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

X Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-5-8
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN RESIDUAL **System:** HEAT REMOVAL **Plant ID No.:** MOV804 **Component:** Motor Operator Valve, Inboard Stop **Manufacture:** Crane Teledyne **Model Number:** T-10-20 **Function:** Operator for MOV804 **Accuracy:** N/A **Service:** Open to permit RHR flow** **Location:** Loop Area of Containment	Operating Time	Variable Manual		Ref. 2(10.3), 4			
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4			See attached Summary Sheet
	Radiation	9.4 X 10^{6} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

**To allow cooldown of reactor coolant system to less than 200^{o}F following a small LOCA

SUMMARY SHEET NO. A-5-8

SCEW SHEET NO. A-5-8

EQUIPMENT ENVIRONMENTAL QUALIFICATION DATE 8/31/81

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Residual Heat Removal System—Inboard Stop Valve
MOV-804 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

Normal functions of the Residual Heat Removal Loop are: (1) remove residual heat from the reactor core and reduce the temperature of the Reactor Coolant System during plant cooldown, (2) transfer water from the refueling canal back to the refueling water storage tank after a refueling operation. Additional functions of the Residual Heat Removal Loop after a loss of coolant accident are (1) provide water to the Core Cooling System (core deluge), (2) or alternatively providing water for the reactor containment spray system, and (3) cool and circulate spilled water from the reactor containment sump pump through the residual heat exchangers and back to the Reactor Coolant System.

The residual Heat Removal Loop consists of two residual heat exchangers, two residual heat removal pumps and the associated piping, valves, and instrumentation necessary for operational control. During plant shutdown, reactor coolant flows from the Reactor Coolant System to the residual heat removal pumps, through the tube side of the residual heat exchangers and back to the Reactor Coolant System. The inlet line to the Residual Heat Removal Loop starts at the hot leg of Loop 1. The return line connects to the cold leg of Loop 2. Normally, heat loads are transferred by the residual heat exchangers to the Component Cooling Loop.

Remotely operated double valving is provided to isolate the residual heat removal system inlet and outlet piping from the reactor coolant system. An electrical interlock between the reactor coolant system loop 4 pressure channels and the first (inboard) set of valves prevents the valves from

being opened when reactor coolant system pressure exceeds residual heat removal system design pressure. Key control switches provide administrative control against misoperation of the second (outboard) set of valves. This motor operated valve is closed with the reactor at power and remains closed unless the RHR is manually placed in operation.

Connecticut Yankee Atomic Power Company takes no credit for the automatic operation of this equipment from a Safety Injection Signal (SIS) and this equipment is not credited for operation in any safety-related analysis scenario.

The manufacturer of the motor operator has indicated that the MOV was designed to function in the containment environment shown on SCEW sheet A-5-8.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. A-5-8

1982 TER No. 5

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: III.B Equipment not in the Scope of the Review, Pgs. 3-11 & 4-3 in TER.
Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.
Response:
Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN System: Letdown Plant ID No.: MOV200 Component: Motor Operator Valve Manufacture: Crane Teledyne Model Number: T-4-10 Function: Operator for MOV200 Accuracy: NA Service: Containment Isolation of Letdown Line Location: Loop Area of Containment 17'6"	Operating Time	Within 30 sec. Automatic		Ref. 1 2(10.3), 4			
	Temperature (°F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4			See attached Summary Sheet
	Radiation	9.4×10^6 Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. A-5-9

SCEW SHEET NO. A-5-9

DATE. 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Containment Isolation Valve-Letdown
MOV 200 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

MOV 200 is an isolation valve for the reactor coolant letdown system and it is also part of the containment isolation scheme. It is highlyprobable that this valve would perform its intended function since it receives its signal to close within 10 seconds after an accident condition has been established.

In the unlikely event of a failure, there are three AOV's (202, 203, 204) which will be actuated to perform the intended isolation function of MOV 200.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 1.

SCEWS No. A-5-9

1982 TER No. 4

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.

Response:

This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

The Generic Replacement Schedule indicated was incorrect and changed to indicate the proper information.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-5-10
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Residual Heat Removal System: Plant ID No.: P-14-1A & 1B Component: Pump Motor Manufacture: Westinghouse Spec. E-675254 Data Sheet: 1025 Model Number: AUDP 29N8905 Function: Drives Residual Heat Removal Pump Accuracy: NA Service: Provides Coolant Flow thru Residual Heat Exchangers to Lower Core Temp. Location: PAB-A-14, A-15 Respectively	Operating Time	Various	Various	-	Ref. 46 & 70		
	Temperature (°F)	NA					
	Pressure (PSIA)	NA					
	Relative Humidity(%)	NA					
	Chemical Spray	NA					
	Radiation	8.7×10^6 Rads	2×10^8 Rads	Ref. 31	Ref. 46 & 70	Type Test & Analysis	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 46 & 70	Type Test & Analysis	
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: The only harsh parameter is the radiation environment. Reference 46 describes the results of a much more demanding test of a similar motor with the same insulation system, bearings and lubricant. They strongly suggest that this motor will perform satisfactorily in this environment.

SCEWS No. A-5-10

1982 TER No. 18

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

1) None
2) Equipment is fully qualified for its intended function.

II) **SER concerns:** III.B equipment not in the scope of review. Pgs. 3-11 and 4-3 in TER.

Response:

Equipment is fully qualified for its intended function.

III) **TER concerns:** Same as II above.

Response:

Same as II above

IV) **Proposed corrective action and schedule.**

None

V) **Justification for continued operation.** N/A

_____ **Reaffirmed**

_____ **Revised**

_____ **New**

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe shutdown **System:** service water **Plant ID No.:** MOV-1 & 2 (12") **Component:** Valve operator **Manufacture:** Henry Pratt Valve/Limitorque Oper. **Model Number:** SMB-000 (S/N 35878A & 311482A) **Function:** Diverts service water to car fans & diesel generators **Accuracy:** NA **Service:** Service water isolation to turbine bldg. **Location:** Turbine-ground floor (out of containment)	**Operating Time**	Less than 1 minute	Less than 1 minute	Less than 1 minute	Less than 1 minute		
	Temperature (^{o}F)	See Note 1	250	see note 1	*B0003 pg5-sec 2.5 pg10 profile	sequential testing	
	Pressure (PSIA)	See Note 1	25 psig	see note 1	*B0003 pg5-sec 2.5 pg10 profile	sequential testing	
	Relative Humidity(%)	100%	100%	Ref. 2 Sec. 3.1	*B0003 pg5 sec 2.5.2	sequential testing	
	Chemical Spray	none	none	none	none	----	
	Radiation	35 rads	2 x 10^{7} rads	ref 31	*B0003 pg2 sec 2.3	sequential testing	
	Aging		165^{o}F/0 psig for 200 hrs.		*B0003 pg7 sec 4.1.4	sequential testing	
Flood Level Elev: **Above Flood Level:** Yes No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

*Limitorque report #B0003-for audit in our files.

Notes: 1) See attached.

NOTE 1—FOR SCEWS #A-6-3

The limiting environment of the turbine building can be assumed to be less than 220°F/2 psig and would be caused by a High Energy Line Break (HELB).

The design pressure rating of the turbine building will not allow the ambient pressure to exceed 2 psig. Therefore, the environment within the turbine building will not exceed the qualified test parameters of the equipment. The environmental transient (220°F/2 psig) would last less than one (1) hour as the steam line break would be isolated by equipment not subjected to this harsh environment.

From the above, it can be concluded that MOV's 1 and 2 are qualified and will perform their safety functions.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-7-1
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Pressurizer PORV'S **Plant ID No.:** MOV 567 **Component:** Valve Operator **Manufacture:** Crane Teledyne **Model Number:** ST-4-5 **Function:** Dumps Over Pressure to PRZR Relief Tank **Accuracy:** N/A **Service:** To facilitate safe shutdown **Location:** Top of PRZR	**Operating Time**	Variable Manual		Ref. 1, 2(10.3),4			
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4			See attached Summary Sheet
	Radiation	9.4 X 10^{6} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4'2" **Above Flood Level:** Yes ✓ No	**Submergence**						

***Documentation References:**

See "List of References" behind this section of worksheets

Notes:

SUMMARY SHEET NO. A-7-1

SCEW SHEET NO. A-7-1

EQUIPMENT ENVIRONMENTAL QUALIFICATION Ref. Date 8/31/81

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Pressurizer PORV Isolation Valve
MOV 567 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

This valve is normally closed and is used primarily as an isolation MOV for AOV 568. Evaluating this valve in a single failure mode requires that AOV 568 first be failed in an open mode or MOV 569 and/or 570 be failed in a closed mode.

This results in double failure mode for which an analysis is not required. Should it fail closed, MOV 569 would be open and AOV 570 would relieve the system overpressure.

In the unlikely event that an AOV of one train and the MOV of the other train should fail closed, the three code safeties would provide the system with overpressurization relief.

It is clear that MOV 567 by itself serves no accident mitigating function and is not included in any accident analyses.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. A-7-1

1982 TER No. 1

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER
Response:
This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.
Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

___X___ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-7-2
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown **Plant ID No.:** A0V568 **Component:** Indicating Limit Switches **Manufacture:** NAMCO **Model Number:** EA-18031302 **Function:** Trips to turn indicating light on and off **Accuracy:** N/A **Service:** Control room indication of valve status, open and close **Location:** Top of pressurizer	Operating Time	continuous	continuous	-	-	Sequential testing	
	Temperature (°F)	267	340	Ref. 35& Addendum 31 #1	Ref. 37	Simultaneous testing	
	Pressure (PSIA)	40 PSIG	70 PSIG	Ref. 36	Ref. 37	Simultaneous testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 37	Simultaneous testing	
	Chemical Spray	2640 ppm Boron	3000 ppm boron	Ref. 2 sec. 3.6.4	Ref. 45	Simultaneous testing	
	Radiation	1.1×10^7 Rads	2×10^8 Rads	Ref. 31	Ref. 37	Sequential testing	
	Aging	40 yrs.	40 yrs. **	Plant Design Life	Ref. 52 Sec. 5 Table 6-1	Sequential testing	
Flood Level Elev: 4'2" **Above Flood Level:** Yes ✓ No	Submergence						

*Documentation References:

See "List of References" behind this section of worksheets.

**Except gasket which should be replaced every two years.

Notes:

"Open" and "Close" switches were both replaced during the 1980 outage with qualified switches and connected to qualified cable by qualified Conax connectors N-11001-32

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown System: Pressurizer PORVS Plant ID No.: MOV-569 Component: Valve Operator Manufacture: Crane Teledyne Model Number: T-4-5 Function: Dumps over-pressure to PRZR relief tank Accuracy: Service: To facilitate safe shutdown Location: Top of PRZR	Operating Time	Variable Manual		Ref. 1, 2(10.3),4			
	Temperature (^{o}F)	267		Ref. 35 & Addendum #1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	9.4 X 10^{6} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4'2" Above Flood Level: Yes ✓ No	Submergence						

*Documentation References:

See "List of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. A-7-3

SCEW SHEET NO. A-7-3

EQUIPMENT ENVIRONMENTAL QUALIFICATION Rev. Date 8/31/81

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Pressurizer PORV Isolation Valve
MOV 569 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

This valve is normally closed and is used primarily as an isolation MOV for AOV 570. Evaluating this valve in a single failure mode requires that AOV 570 first be failed in an open mode or MOV 567 and/or 568 be failed in a closed mode.

This results in failure mode for which an analysis is not required. Should it fail closed, MOV 567 would be open and AOV 568 would relieve the system overpressure.

Ir the unlikely event that an AOV of one train and the MOV of the other train should fail closed, the three code safeties would provide the system with overpressurization relief.

It is clear that MOV 569 by itself serves no accident mitigating function and is not included in any accident analyses.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SUMMARY SHEET NO. A-7-3

SCEW SHEET NO. A-7-3

EQUIPMENT ENVIRONMENTAL QUALIFICATION Rev. Date 8/31/81

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Pressurizer PORV Isolation Valve
MOV 569 (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

This valve is normally closed and is used primarily as an isolation MOV for AOV 570. Evaluating this valve in a single failure mode requires that AOV 570 first be failed in an open mode or MOV 567 and/or 568 be failed in a closed mode.

This results in failure mode for which an analysis is not required. Should it fail closed, MOV 567 would be open and AOV 568 would relieve the system overpressure.

In the unlikely event that an AOV of one train and the MOV of the other train should fail closed, the three code safeties would provide the system with overpressurization relief.

It is clear that MOV 569 by itself serves no accident mitigating function and is not included in any accident analyses.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-7-4
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Pressurizer PORVS Plant ID No.: AOV570 Component: Indicating limit switch Manufacture: NAMCO Model Number: EA-18031302 Function: Trips to turn on indicating light Accuracy: N/A Service: Control room indication of valve status Open & Close Location: Top of pressurizer	Operating Time	continuous	continuous	-	-	Sequential testing	
	Temperature (°F)	267	340	Ref. 35 & Addendum 1	Ref. 37	Simultaneous testing	
	Pressure (PSIA)	40 PSIG	70 psig	Ref. 36	Ref. 37	Simultaenous testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 37	Simultaneous testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 sec. 3.6.4	Ref. 45	Simultaneous testing	
	Radiation	1.1×10^7 Rads	2×10^8 Rads	Ref. 31	Ref. 37	Sequential testing	
	Aging	40 yrs.	40 yrs. **	Plant Design Life	Ref. 52 Sec. 5 Table 6-1	Sequential testing	
Flood Level Elev: 4'2" Above Flood Level: Yes ✓ No	Submergence						

*Documentation References:

See "List of References" behind this section of worksheets.

**Except gasket which should be replaced every two years

Notes: 1) Open limit switch installed

2) Both switches are connected to qualified cable by qualified Conax connectors N-11001-32.

SCEWS No. A-7-3

1982 TER No. 3

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER
Response:
This equipment will be replaced with a fully qualified device.

III) TER concerns: Same as II above.
Response:
Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

SCEWS No. A-7-4

1982 TER No. 16

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

1. SCEW Sheet revised to indicate Limit Switch installed for Open Position Indication.

2. Add Notes 1 & 2.

II) SER concerns: I.A. Equipment Qualified

Response: N/A

III) TER concerns: N/A

Response: N/A

IV) Proposed corrective action and schedule.

N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Pressurizer PORVs **Plant ID No.:** AOV-570 & 568 **Component:** Solenoid Pilot Valve **Manufacture:** ASCO **Model Number:** NP8316A74E S/N 4769452 & 4769451 **Function:** Actuates Valves 568 & 570 **Accuracy:** N/A **Service:** Dump Over-Pressure to PRZR Relief Tank **Location:** Top of Pressurizer	**Operating Time**	Variable	Note 1	Variable	Note 1	Sequential Testing	
	Temperature (^{O}F)	267	346	Ref. 35 & Addendum 1	Ref. 72 Sec. 4.7	Sequential Testing	
	Pressure (PSIA)	40 psig	110	Ref. 36	Ref. 72 Sec. 4.7	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 72 Sec. 4.7	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 72 Sec. 4.7	Sequential Testing	
	Radiation	$9.4X10^{6}$ Rads	$2X10^{8}$ Rads	Ref. 34	Ref. 72 Sec. 4.6	Sequential Testing	
	Aging	40 Yrs.	Note 2	Plant Design Life	Ref. 73 Pgs. C-5 E C-8	Sequential Testing	
Flood Level Elev: 4'-2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

1. Operating is not specified, however, the qualification testing indicates the devices will perform their safety function.
2. EPDM Elastomeric Components qualified for "8" years @140°F and coils qualified for "40" years.

SCEWS No. A-7-6

1982 TER No. 12

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

Equipment has been replaced with a fully qualified device. SCEW sheet has been revised in its entirety.

II) SER concerns: I.B. Equipment qualification pending modification

Response:

See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-7-7
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Reactor Coolant **Plant ID No.:** SOV 596A-D (press) SOV 552A-D **Component:** Solenoid Vlv. **Manufacture:** Valcor **Model Number:** V526-60423A **Function:** Reactor Head & pressurizer venting **Accuracy:** N/A **Service:** RCS venting Vlvs **Location:** Containment	Operating Time	continuous	continuous	NUREG0578 Item 2.1.9	Ref. 38	Sequential Test	
	Temperature (^{o}F)	267	346	Ref. 35& Addendum 1	Ref. 38 Appendix IV	Simultaneous Test	
	Pressure (PSIA)	40 psig	113 psig	Ref. 36	Ref. 38 Appendix IV	Simultaneous Test	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 38 Appendix IV	Simultaneous Test	
	Chemical Spray	2640 ppm Boron	2200ppm Boron w/ .064M NAOH	Ref. 2 Sec. 3.6.4	Ref. 38 Appendix IV	Simultaneous Test	
	Radiation	*	2 X 10^{8}R	Ref. 31	Ref. 38 Appendix III	Sequential Test	
	Aging	40 yrs.	40 yrs.	plant design life	Ref. 38 Appendix I & III	Sequential Test	
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

* SOV 596 A-D (pressurizer venting) - 1.1 X 10^{7} Rads
SOV 552 A-D (reactor venting) - 9.6 X 10^{6} Rads

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-7-8
Rev.
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown **Plant ID No.:** NA **Component:** Electric Conductor Seal Assemblies **Manufacture:** Conax **Model Number:** N-11001-32 & 33 **Function:** Termination of 568 & 570 Limits Switches **Accuracy:** NA **Service:** **Location:** Top of Pressurizer	Operating Time	Variable	Variable	____	Ref. 65	Simultaneous Testing	
	Temperature (^{o}F)	267	340	Ref. 35 & Addendum 1	Ref. 65	Simutlaneous Testing	
	Pressure (PSIA)	40	60	Ref.6	Ref. 65	Simutlaneous Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec 3.1	Ref.65	Simutlaneous Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref 2 Sec. 3.6.4	Ref. 65	Simutlaneous Testing	
	Radiation	1.1×10^{7} RADS	1.5×10^{8} RADS	Ref. 31	Ref 65	Simutlaneous Testing	
	Aging	40 yrs.	Arrhenius Aging 40 yrs.	Plant Design Life	Ref 65 & 66	Test & Analysis	
Flood Level Elev: 4'2" **Above Flood Level:** Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: These Electric Conductor Seal Assemblies represents a qualified method of terminating the NAMCO Indicating Limit Switches used on AOV's-568 & 570.

SCEWS No. A-7-8

1982 TER No. 45

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet.

None

II) SER concerns: II.A Equip. Qualification not established, Pgs. 3-10 & 4-3 of TER.
Response:

See attached sheet for response.

III) TER concerns: Qualification not established.
Response:

See attached sheet for response.

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation. Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

SCEW No. A-7-8
1982 TER No. 45
Date: 1/20/83

II) Response:

CYAPCO presented information on the SCEW sheet indicating the device is fully qualified for a harsh environment.

CYAPCO has noted that FRC apparently did not read in its entirety the referenced qualification documentation. The referenced documentation consists of 1) Certificate of Conformance, 2) Qualification Report IPS-409 and, 3) Material Test Report. All of these reports combined substantiate full environmental qualification.

CYAPCO again reiterates that this device is qualified for its intended use.

III) Response:

CYAPCO responses to FRC's comments:

1) FRC apparently did not fully read in its entirety reference 65 submitted by CYAPCO. The referenced document is divided into several sections.

   CYAPCO notes that the report's sections are broken down as follows:

   A) IPS-412 Standard Instructions for Packaging, Shipping & Storage of Electric Conductor Seal Assemblies. (CYAPCO acknowledges that two (2) IPS-412 were sent inadvertently to FRC).

   B) IPS-412 Installation Manual for Electric Conductor Seal Assemblies with Pipe Thread Equipment Interface.

   C) Certificate of Conformance to IPS-409 Qualification and part numbers N-11001-32 and N-11001-33.

   D) IPS-409 Qualification Report for Conductor Modules.

   E) IPS-411 Standard Procedure for Production Test & Final Inspection of Electric Conductor Seal Assemblies.

   F) Conax drawings for Electric Conductor Seal Assembly for series N-11001.

After proper review by FRC of the submitted reference report, CYAPCO is confident that FRC will concur that the equipment is fully qualified.

III) Response (continued)

2) FRC did not make a definitive statement concerning submitted reference 66 which is Conax Test Report IPS-325 "Design Qualification Material Test Report for Materials Used in Conax Electrical Penetration Assemblies and Electric Conductor Seal Assemblies".

CYAPCO states a review of the supplied report will demonstrate qualificaton of material used for Electric Conductor Seal Assemblies.

3) FRC states that the proprietary report referenced is for Millstone Unit 1.

CYAPCO states that the referenced documentation does not indicate or refer to Millstone Unit 1. However, even if the submitted qualification report was for Millstone Unit 1 it would be CYAPCO's responsibility to determine the report's applicability to Connecticut Yankee Atomic Power Company's environmental parameters.

4) FRC states CYAPCO should obtain the proper qualification report for the equipment.

CYAPCO states that the proper reports were obtained from the manufacturer (vendor) and submitted which demonstrated qualification. Qualification has been demonstrated through the vendor's part numbers (N-11001-32 & N-11001-33) which are indicated on the SCEW sheet and Certificate of Conformance. The Certificate of Conformance establishes a link between the part numbers and test report (IPS-409). Further review of the test report indicates that the test parameters more than envelop CYAPCO containment environmental parameters.

CYAPCO again reiterates its statement that the device is qualified for its intended use and that proper qualification has been demonstrated by type test. Also, the devices installed have been demonstrated to be similar to the units tested.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN EMERGENCY System: POWER AC & DC Plant ID No.: Component: Insulated Electric Cable Manufacture: Kerite Model Number: N/A Function: Pwr., control Accuracy: N/A Service: Class 1E equip. Location: Containment	Operating Time	Various			F-C4020-1 Ref. 61	Simultaneous Test	
	Temperature (°F)	267	346	Ref. 35 & Addendum 1	F-C4020-1 Ref. 61	Simultaneous Test	
	Pressure (PSIA)	40 psig	113 psig	Ref. 36	F-C4020-1 Ref. 61	Simultaneous Test	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	F-C4020-1 Ref. 61	Simultaneous Test	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 45	F-C4020-1 Ref. 61	Simultaneous Test	
	Radiation	$1.6X10^7$ Rads	$2 X 10^8$ Rads	Ref. 31	F-C4020-1 Ref. 61	Simultaneous Test	
	Aging	40 yrs. & LOCA	Arrhenius Air Oven 40 yrs.	Plant Design Life	F-C4020-1 Ref. 61	Simultaneous Test	
Flood Level Elev: 4'-2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Franklin Institute Research Laboratories Report #F-C4020-1 and F-C4020-2

Notes:
1. Motor Operated Valves: 23, 25-29, 34, 200, 292B & C, 298, 311-314, 331, 567, 569, 780, 781, 803, 804, 861A-D & 871A & B
2. C.A.R. Fans: F-17 (1-4), Solenoid Operated Valves: 552A-D, 568, 570 & 596 A-D
3. Cable procured to Specification listed under Reference 53.

SCEWS No. A-10-1

1982 TER No. 38

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

1. Added the MOV's 298, 331, 567 and 569 to the list under Note 1 indicating new cabling to these devices which is qualified.
2. Changed the SCEW sheet revision level to C.

II) SER concerns: I.A. Equipment Qualified

Response: See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

SCEWS No. A-10-1

1982 TER No. 38

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

1. Added the MOV's 298, 331, 567 and 569 to the list under Note 1 indicating new cabling to these devices which is qualified.
2. Changed the SCEW sheet revision level to C.

II) SER concerns: I.A. Equipment Qualified

Response: See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-2
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN EMERGENCY System: POWER AC & DC Plant ID No.: Component: Insulated Electrical Cable Manufacture: Brand Rex Model Number: N/A Function: Instrumentation Accuracy: N/A Service: Class 1E Equip. Location: Containment	Operating Time	Continuous	Continuous		Ref. 55	Sequential Testing	
	Temperature (°F)	267	346	Ref. 35 & Addendum 1	Ref. 55	Sequential Testing	
	Pressure (PSIA)	40 psig	128 psig	Ref. 36	Ref. 55	Sequential Testing	
	Relative Humidity(%)	100	100		Ref. 55	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 45	Ref. 55	Sequential Testing	
	Radiation	1.6×10^7 Rads	2×10^8 Rads	Ref. 31	Ref. 55	Sequential Testing	
	Aging	40 yrs.	Arrhenius Air Oven 40 yrs.	Plant Design Life	Ref. 55	Air Oven	
Flood Level Elev: 4'-2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List of References" behind this section of work sheets.

Franklin Institute Research Laboratories F-C4113 dated May 1975.

IEEE 323-1974
IEEE 383-1974

Notes:

New qualified cable installed during the July 1980 refueling outage and connected to the following equipment:

Transmitters: PT's 401(1-3), 403 and 404.
LT's 401 (1-3).
FT 416A and B
LT 1810A & B

Cable procured to Specification listed under Reference 54.

SCEWS No. A-10-2

1982 TER No. 39

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

1) Add "B" device under FT 416. It was overlooked on previous submittals

2) Add LT 1810A & B cable to the list.

II) SER concerns: I.A. Equipment Qualified

Response: N/A

III) TER concerns: N/A

Response: N/A

IV) Proposed corrective action and schedule.

N/A

V) Justification for continued operation.

N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-3
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN EMERGENCY System: POWER AC & DC Plant ID No.: All Component: Electrical Penetration Manufacture: Conax Model Number: Function: To bring Pwr., Control & Instr. into containment Accuracy: NA Service: Location: Containment	Operating Time	Continuous	Continuous	-	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Temperature (^{O}F)	267	342	Ref. 35 & Addendum 1	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Pressure (PSIA)	40 psig	128	Ref. 36	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Chemical Spray	2,640 ppm Boron	3,000 ppm Boron	Ref. 45	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Radiation	1.6 X 10^{7} Rads	2 X 10^{8} Rads	Ref. 31	IPS-434-1,2,3 Ref. 63	Test & Analysis	
	Aging	40 yrs.	Arrhenius Air Oven 40 yrs.	Plant Design Life	IPS-434-1,2,3 Ref. 63	Test & Analysis	
Flood Level Elev: 4'-2" Above Flood Level: Yes x No	Submergence	#	#	#	#	#	

*Documentation References:

IEEE-323, 1974
IEEE-317, 1976

Notes:

New penetrations installed above design basis submergence levels.

Electrical Penetration procured to Specification listed under Reference 62.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Emergency System: Power AC & DC Plant ID No.: Varied Component: Terminal Blocks Manufacture: Westinghouse Electric Model Number: Style 805-432 Function: To make cable terminations Accuracy: NA Service: Provide electrical connections - various circuits Location: Lower level, outer annulus of cntmt.	Operating Time	292&C 30 Sec 567-Variable	24 hrs.	Ref. 1 Variable	F-C4911-1 Pg. 5-1	Simultaneous Test	
	Temperature (°F)	267	286	Ref. 35 & Addendum 1	Ref. 2 28,	ultaneous t	
	Pressure (PSIA)	40 PSIG	40 PSIG	Ref. 36	47	Simultaneous Test	
	Relative Humidity(%)	100	100	.1	Ref. 26, 27, 28, 29, 47	Simultaneous Test	
	Chemical Spray	2640 ppm Boron	2 Bor	45	Ref. 26, 27, 28, 29, 47	Simultaneous Test	
	Radiation	1.3×10^7 Rads	5×10^6 Rads	Ref. 31	Ref. 26, 27, 28, 29, 47	Analysis and Test	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 28, 47	Sequential Test	
Flood Level Elev: 4'2" Above Flood Level: Yes X No	Submergence						

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*Documentation References:

See "List Of References" behind this section of worksheets.
FRC Report #F-C4911-1, January 1978

Notes: W Model 805432 TB's are used in the following safety related circuits: MOV-298, MOV-567, LT 1301-2. All other circuits use the CONAX method of termination.

SCEWS No. A-10-4

1982 TER No. 46

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

1. SCEW sheet has been deleted. Westinghouse TB's have been replaced at electrical penetration.
2. Replaced with Raychem heat shrink tubing and in-line butt splices. Refer to SCEW sheet A-10-33 for qualification.

II) SER concerns: I.B. Equipment qualification pending modification

Response: See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-5
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
SAFE SHUTDOWN EMERGENCY **System:** POWER AC & DC **Plant ID No.:** VARIED **Component:** TERMINAL BLOCKS **Manufacture:** GENERAL ELECTRIC **Model Number:** EB-25 **Function:** TO MAKE CABLE TERMINATIONS **Accuracy:** NA **Service:** PROVIDE ELECTRICAL CONNECTIONS-VARIOUS CIRCUIT **Location:** Charging Floor Containment	Operating Time	30 Sec. Automatic	132 hrs.	Ref. 1	F-C4911-2 Pg. 5-1	Simultaneous Test	
	Temperature (^{O}F)	267	286	Ref. 35 & Addendum 1	Ref. 28, and 29	Simultaneous Test	
	Pressure (PSIA)	40 PSIG	40 PSIG	Ref.	28,	Simultaneous Test	
	Relative Humidity(%)	100	10[illegible]	5.1	Ref. 28, and 29	Simultaneous Test	
	Chemical Spray	2640 pp[illegible] Bor[illegible]	[illegible]n	Ref. 45	Ref. 28, and 29	Simultaneous Test	
	Radiation	1.1 Rads	$5x10^{6}$ R	Ref. 1,2	Ref. 29, 47	Simultaneous Test	
	Aging	40 yrs.	40 yrs	Plant Design Life	Ref. 38, 47	Sequenti[illegible] Test	
Flood Level Elev: 4'-2" **Above Flood Level:** Yes X No	Submergence						

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*Documentation References:

See "List of References" behind this section of work sheets.

FRC Report #F-C4911-2, May 1978

Notes: TB's ar[illegible]eel boxes on the Charging Floor Level of [illegible] containment.
TB's are used in circuits 871A & B (Core Deluge)

SCEWS No. A-10-5

1982 TER No. 47

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

1. SCEW sheet has been deleted. TB's removed from circuit.
2. Qualified cable installed; refer to SCEW sheet A-10-1.
3. Qualified cable connectors installed; refer to new SCEW sheet A-10-60.

II) SER concerns: I.B Equipment Qualification Pending Modification

Response:

See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Emgr. **System:** Power **Plant ID No.:** See Note 1 **Component:** Insulated Electrical cable **Manufacture:** Rockbestos **Model Number:** Firewall SR **Function:** Power and Cntl. **Accuracy:** N/A **Service:** see Note 1 **Location:** Containment	**Operating Time**	Various	Continuous		Ref. 33 Pg. 4	Sequential Test	
	Temperature (^{o}F)	267	340	Ref. 35 & Addendum 1	Ref. 33 Pg.	Sequential Test	
	Pressure (PSIA)	40 psig	104 PSIG	Ref	33 . 7	Sequential Test	
	Relative Humidity(%)	100	100	.. 3.1	Ref. 33 Pg. 7	Sequential Test	
	Chemical Spray	2640 Boron	ppm on	Ref. 45	Ref. 33 Pg. 7	Sequential Test	
	Radiation	1.6 X 10^{7} Rads	2 X 10^{8} Rads	Ref. 31	Ref. 33 Pg. 2 & 8	Sequential Test	
	Aging	40 yrs.	Arrhenius Air oven 40 yrs	Plant Design Life	Ref. 33 Pg. 5 & 6	Sequential Test	
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

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*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: This new cab. installed during the July 1980 refueling outage.

1) This cable is used for the control of MOV 871A & B and SOV's 596 A-D.

2) Cable procured to Specification listed under Reference 32.

SCEWS No. A-10-32

1982 TER No. 40

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted. These cables have been replaced due to circuit modifications during the February/March 1983 outage.
2. Refer to SCEW sheet A-10-1 for cable qualification.

II) SER concerns: I.A. Equipmnet qualified

Response:

See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-33
Rev. B
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe shutdown emergency **System:** power **Plant ID No.:** various **Component:** Raychem Sleeve Splice **Manufacture:** Raychem Corp **Model Number:** Type WCSF-N **Function:** Splice **Accuracy:** N/A **Service:** see list at bottom of page for connected components **Location:** Containment	**Operating Time**	Various	Continuous	SP-GEE-40	IPS-434-1, 2 & 3 Ref. 63	Test & Analysis	
	Temperature (^{O}F)	267	342	Ref. 35 & Addendum 1	IPS-434-1, 2 & 3	Test & Analysis	
	Pressure (PSIA)	40 psig	128	Ref. 36	IPS-434-1, 2 & 3 Ref. 36	Test & Analysis	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	IPS-434-1, 2 & 3 Ref. 63	Test & Analysis	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.1	IPS-434-1, 2 & 3 Ref. 63	Test & Analysis	
	Radiation	1.6 X 10^{7}	2 X 10^{8}	Ref. 31	IPS-434-1, 2 & 3 Ref. 63	Test & Analysis	
	Aging	40 yrs.	Arrhenius Air Oven 40 yrs	Plant Design Life	IPS-434-1, 2 & 3 Ref. 63	Test & Analysis	
Flood Level Elev: 4' 2" **Above Flood Level:** Yes x No	**Submergence**	Note 1	Note 1	Note 1	Note 1	Note 1	

***Documentation References:**

SP-GEE-40
IEEE-323 1974
IEEE-317 1976
IPS-434-1, 2 & 3

Notes:

1) Installed above present and future flood levels.
2) See attached

NOTE: 2) WCSF-N Heat Shrink Sleeving used at the Electrical Penetration in the following circuits:

MOV's

861A-D	331	780
871A & B	23	781
292 B & C	34	803
200	25-29	804
313-314	567 & 569	290
298		

AOV's

568 & 570

SOV's

596A-D	552A-D
D-17-1,2,3&4	

PT's

401-1,2,&3	403 & 404

LT's

401-1,2,&3	1301-1,2,3&4	1302-1,2,3&4
	1810 A&B	

FT's

416A & B

TE's

413, 423	411, 421, 431, 441 (A & B for all)
433, 443	412, 422, 432, 442 (A & B for all)

R

1801-1&2

SCEWS No. A-10-33

1982 TER No. 38

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

1) Revised Note 2 to indicate devices which were terminated using WCSF-N sleeving

II) SER concerns: I.A. Equipment qualified

Response: N/A

III) TER concerns: N/A

Response: N/A

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Reactor Coolant Plant ID No.: SOV 596 A-D SOV 552 A-D Component: Electrical connector Manufacturer: Litton Model Number: CIR 06VI-20-15S - plug CIR 02VI-20-15P - receptacle Function: Electrical connection Accuracy: N/A Service: RCS venting solenoid valves Location: Containment	Operating Time	continuous	continuous	NUREG 0578 Item 2.1.9	Ref. 39		
	Temperature (°F)	267	340	Ref. 35 & Addendum 1	Ref. 39 Fig. 1 pg. 3-4	Simultaneous Test	
	Pressure (PSIA)	40 psig	105 psig	Ref. 36	Ref. 39 Fig. 1 pg. 3-4	Simultaneous Test	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 39 Fig. 1 pg. 3-4	Simultaneous	
	Chemical Spray	2640 ppm boron	3000 ppm boron	Ref.45	Ref. 39 Appendix B para. 5.6	Simultaenous Test	
	Radiation	*	2 X 10^8 R	Ref. 31	Ref. 39 Appendix B	Sequential Test	
	Aging	40 yrs.	40 yrs.	Plant design life	Ref. 39 Appendix B para 5.1, 5.2	Sequential Test	
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

* SOV 596 A-D (pressurizer venting) - 1.1 X 10^7 Rads
SOV 552 A-D (reactor venting) - 9.6 X 10^6 Rads

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-35
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Emergency Power **Plant ID No.:** Various **Component:** Cable ngg twisted pair No. 16 **Manufacture:** Samuel Moore & Co. **Model Number:** **Function:** Conductors for Instrumentation **Accuracy:** N/A **Service:** Provides inst. wiring for devices in "Notes" **Location:** Containment	Operating Time						
	Temperature (^{o}F)	267	221	Ref. 35 & Addendum 1	Ref. 48		See attached Summary Sheet
	Pressure (PSIA)	40 PSIG	NA	Ref. [illegible]			See attached Summary Sheet
	Relative Humidity(%)	100	N[illegible]	[illegible] 3.1	Ref. 48		See attached Summary Sheet
	Chemical Spray	264[illegible] Boric		Ref. 2 Sec. 3.6.4	Ref. 48		See attached Summary Sheet
	Radiation	9.6 X 10^{6} Rads	5 X 10^{6} Rads	Ref. 31	Ref. 48		See attached Summary Sheet
	Aging	40 yrs.	NA	Plant Design Life	Ref. 48		See [illegible]
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

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*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: The above [illegible]e is used for the following equipment

Transmitter - LT-1301-1, 2, 3, 4
LT-1302-1, 2, 3, 4

SCEWS No. A-10-35

1982 TER No. 41

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted, PE/PVC cables have been removed from the circuit.
2. New qualified cable installed; refer to SCEW sheet A-10-59.

II) SER concerns: I.E. Equipment qualification pending modification

Response:

See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Emergency Power **Plant ID No.:** Various	Operating Time						
Component: Cable nsf 3/C No. 16	Temperature (°F)	267	221	Ref. 35 & Addendum 1	Ref. 48		See attached Summary Sheet
Manufacture: Samuel Moore & Co.	Pressure (PSIA)	40 PSIG	NA	Ref. DELETED	.. 48		See attached Summary Sheet
Model Number:	Relative Humidity(%)	100		.. 3.1	Ref. 48		See attached Summary Sheet
Function: Conductors for Instrumentation Use	Chemical Spray	2640 Boron	DELETED	Ref. 2 Sec. 3.6.4	Ref. 48		See attached Summary Sheet
Accuracy: N/A	Radiation	9.6×10^6 Rads	5×10^6 Rads	Ref. 31	Ref. 48		See attached Summary Sheet
Service: Provides Instrument wiring for devices in "Notes"	Aging	40 yrs.	NA	Plant Design Life	Ref. 48		See attached Summary Sheet
Location: Containment							
Flood Level Elev: 4' 2: **Above Flood Level:** Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: Cable listed above is used on the following equipment:

Temp. Elements: TE-412(A&B), 422(A&B), 432 (A&B) 442 (A&B), 443(A&B), 413, 423, 433

SCEWS No. A-10-41

1982 TER No. 44

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted, PE/PVC cables have been removed from the circuit.
2. New qualified cable installed; refer to SCEW sheet A-10-59.

II) SER concerns: I.B. Equipment qualification pending modification

Response: See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-42
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Emergency Power **Plant ID No.:** Various **Component:** Cable nsj 4/C No. 16 . **Manufacture:** Samuel Moore & Co. **Model Number:** NA **Function:** Conductors for Instrumentation use **Accuracy:** N/A **Service:** Provides Instrument wiring for devices in "Notes" **Location:**	Operating Time						
	Temperature (°F)	267	221	Ref. 35 & Addendum 1	Ref. 48		See attached Summary Sheet
	Pressure (PSIA)	40 PSIG	NA	Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100	NA		Ref. 48		See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		..f. 2 Sec. 3.6.4	Ref. 48		See attached Summary Sheet
	Radiation	9.6 X 10^6 Rads	5 X 10^6 Rads	Ref. 31	Ref. 48		See attached Summary Sheet
	Aging	40 yrs.	NA	Plant Design Life	Ref. 48		See atta... Summa... Sh...
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

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*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: Cables listed ...sed on the following equipment:
Temp. Elements: TE... , 421 A & B, 431 A & B, 441 A & B

SCEWS No. A-10-42

1982 TER No. 44

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted; PE/PVC cables have been removed from circuit.
2. New qualified cable installed, refer to SCEW sheet A-10-59

II) SER concerns: I.B. Equipment qualification pending modification.

Response: See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Emergency Power **Plant ID No.:** Various **Component:** Cable nna triplexed No. 12 **Manufacture:** Collier **Model Number:** NA **Function:** Power to MOV'S **Accuracy:** N/A **Service:** Power to MOV'S **Location:** Containment	Operating Time						
	Temperature (°F)	267	260	Ref. 35 & Addendum 1	Ref. 49,50		See attached Summary Sheet
	Pressure (PSIA)	40 PSIG	NA	Ref. 36	50		See attached Summary Sheet
	Relative Humidity(%)	100	100	.1	Ref. 49, 50		See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		ef. 2 Sec. 3.6.4	Ref. 49, 50		See attached Summary Sheet
	Radiation	9.6 X Rads	5 X 10^7 (I) 5 X 10^6 (J) Rads	Ref. 31	Ref. 49, 50		See attached Summary Sheet
	Aging	40 yrs.	NA	Plant Design Life	Ref. 49,50		See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	Submergence						

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*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: Cable listed ... ed on the following equipment:
MOV's - 2...

SCEWS No. A-10-43

1982 TER No. 42

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted. PE/PVC cables have been removed from the circuit.
2. New qualified cable installed. Refer to SCEW sheet A-10-1.

II) SER concerns: I.B. Equipment qualification pending modification.

Response:

See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: [illegible]
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-44
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown System: Emergency Power Plant ID No.: Various Component: Cable nhd 7/C No.-12 Manufacture: Collier Model Number: NA Function: Conductors for control and instrument use Accuracy: NA Service: Provides control/instrument wiring for devices in Location: "Notes" Containment	Operating Time						
	Temperature (°F)	267	260	Ref. 35 & Addendum 1	Ref. 49,50		See attached Summary Sheet
	Pressure (PSIA)	40 PSIG	NA	Ref. 36	Ref. 49,50		See attached Summary Sheet
	Relative Humidity(%)	100	100	Ref. 2 Sec 3.6.4	Ref. 49,50		See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec 3.6.4	Ref. 49,50		See attached Summary Sheet
	Radiation	9.6×10^6 Rads	5×10^7 (I) 5×10^6 (J) Rads	Ref. 31	Ref. 49,50		See attached Summary Sheet
	Aging	40 yrs	NA	Plant Design	Ref. 49,50		See attached Summary Sheet
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

DELETED

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*Documentation References:

See "List Of References" behind [illegible] of worksheets.

Notes: Cable listed above is used for the following equipment:

MOV's - 298 & 367

SCEWS No. A-10-44

1982 TER No. 43

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted; PE/PVC cables have been removed from the circuit.
2. New qualified cable installed, refer to SCEW sheet A-10-1.

II) SER concerns: I.B. Equipment qualification pending modification.

Response: See I above

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-55
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Emergency Power **Plant ID No.:** 1RMS 109 & 111, 1RMS 113 & 115 **Component:** Coaxial **Manufacture:** Rockbestos Company **Model Number:** RSS-6-104 Second Generation (1081) **Function:** Coax Cable **Accuracy:** N/A **Service:** See Notes 1,2 & 3 **Location:** Containment	**Operating Time**	Various	Continuous		Ref. 41 A&B	Sequential Testing	
	Temperature (^{o}F)	267	340	Ref. 35 & Addendum 1	Ref. 41 A&B	Sequential Testing	
	Pressure (PSIA)	40	104	Ref. 36	Ref. 41 A&B	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2	Ref. 41 A&B	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 41 A&B	Sequential Testing	
	Radiation	1.1×10^{7} Rads	2×10^{8} Rads	Ref. 31	Ref. 41 A&B	Sequential Testing	
	Aging	40 years	Arrhenius Air Oven 40 years	Plant Design Life	Ref. 41 A&B	Sequential Testing	
Flood Level Elev: 4'2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Reference 40 is SP-GEE-34, Rev. 0, 1/8/79, used for cable procurement.

Notes:

1. These cables are used in the circuit for R1801-1&2, (SCEW sheet C-10-16).
2. The Coax Connectors (P/N N-44079-03) and Raychem WCSF-N Tubing are qualifed under the CONAX IPS Reports, (SCEWS A-10-3 and A-10-33).
3. Second generation (#1081) coaxial cable installed during February/March 1983 refueling outage.

SCEWS No. A-10-55

1982 TER No. 37

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C)

1. Changed Notes on SCEW sheet.
2. SCEW sheet now indicates qualified cable second generation (#1081).

CYAPCO considers these cables fully qualified.

II) **SER concerns:** II.A Equipment qualification not established;
Pgs. 3-10 & 4-3 of TER.

Response:

Equipment (cables) have been replaced with fully qualified units.

III) **TER concerns:** Same as II above.

Response:

Same as II above.

IV) **Proposed corrective action and schedule.**

None

V) **Justification for continued operation.** N/A

_____ **Reaffirmed**

_____ **Revised**

_____ **New**

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-56
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Plant ID No.: NA Component: Set Screw Connectors Manufacture: Ideal Model Number: Cat. No. 30-210 Function: Splice Assemblies Accuracy: Not Required Service: Interface between Cable & Penetration Location: Containment Penetration Area - In-Board	Operating Time	Various	Continuous		Ref. 44 Page 21 Sec. 5.1	Analysis	
	Temperature (^{o}F)	267	286	Ref. 35 & Addendum 1	Ref. 43 Pg. 1-9	Test	
	Pressure (PSIA)	40	40	Ref. 36	Ref. 43 Pg. 1-9	Test	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 43 Sec 4.4.2	Test	
	Chemical Spray	2640 ppm Boron	2640 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 43 Table 3	Test	
	Radiation	1.6×10^{7} Rads	2.4×10^{7} Rads	Ref. 31 Table 1	Ref. 44 Pg. 21 Sec. 5	Analysis	
	Aging	40 yrs.	Arrhenius	Plant Design Life	Ref. 44 Sec. 5	Analysis	
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Ref. 43 - FRC Report F-C4911-3, May 1979

Notes:

These Ideal "Set Screw Connectors" are used in conjunction with the Raychem "Heat Shrink Tubing" at the new electrical penetrations.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Emergency System: Power Plant ID No.: NA Component: Terminal Blocks Manufacture: Marathon Model Number: 6012 Function: To make cable terminations Accuracy: NA Service: Provide electrical connections - various circuits Location: Lower level - outer annulus of cntmt.	Operating Time	See Note **	5 hrs. & 12 hrs.	See Note **	F-C4911-1 Pg. 5-1	Simultaneous Test	
	Temperature (°F)	267	286	Ref. 35 & Addendum 1	F-C4911-1 Pg. 3-9	Simultaneous	
	Pressure (PSIA)	40 PSIG	40 PSIG	Ref. 36	F-C49[illegible] Pg. [illegible]	[illegible]aneous [illegible]t	
	Relative Humidity(%)	100	100	Ref. [illegible]	[illegible]-1 Pg. 3-8	Simultaneous Test	
	Chemical Spray	2640 ppm Boron	[illegible]	[illegible] 3.6.4	NA*	NA*	
	Radiation	1.3×10^7 Rads	NA*	Ref. 31	NA*	NA*	
	Aging	Arrhenius air oven	NA*	NA*	NA*	NA*	
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

DELETED

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*Documentation References:

See "List Of References" behind this section of worksheets.

FRC Report #F-C4911-1, January 1978

Notes: *No[illegible]

Marath[illegible] .2 TB's are used in the following safety relat[illegible]. MOV 567, MOV 331, LT 1301-1,2,3,4, TE-41[illegible]433;
TE-411, [illegible]2, 421, 422, 431, 432, 441, 442, 443 (A&B - all)
**LT 1301-1,2,3,4 Operating time is 2.5 seconds automatic
MOV 331 - Normally closed after reactor start-up and after pressure is reached. Additionally, it does not perform any accident mitigating func
TE's are backed-up with In-Core thermocouples and subcooled margin monitor.

SCEWS No. A-10-57

1982 TER No. 48

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)

1. SCEW sheet has been deleted. All Marathon TB's have been removed from the circuits at the electrical penetrations and have been replaced with Raychem Heat Shrink Tubing and In-Line Butt Splice.
2. Refer to SCEW sheet A-10-33 for qualification.

II) SER concerns: I.E Equipment qualification pending modification.

Response: See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-58
Rev. 0
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Emergency Power **Plant ID No.:** N/A **Component:** Terminal Blocks **Manufacture:** Weidmuller **Model Number:** SAK6N (See Note 1) **Function:** To make cable terminations **Accuracy:** N/A **Service:** Provide electrical connections - various circuits **Location:** Lower Level loop areas	**Operating Time**	continuous	continuous	-	Ref. 74 Sec. 5.5.1 & 5.5.2	Sequential Testing	
	Temperature (^{O}F)	267	427	Ref. 35 & Addendum #1	Ref. 74 Sec. 5.5.1 & 5.5.2	Sequential Testing	
	Pressure (PSIA)	40 psig	110 psig	Ref. 36	Ref. 74 Sec. 5.5.1 & 5.5.2	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 74 Sec. 5.1.1 & 5.2.2	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 74 Sec. 4.6.2	Sequential Testing	
	Radiation	$1.1X10^{7}$ Rads	$2X10^{8}$ Rads	Ref. 31	Ref. 74 Sec. 5.3	Sequential Testing	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 75		
Flood Level Elev: 4'-2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

1. The TB's are installed in the same configuration as test and in a NEMA 4 box.
2. These TB's are part of circuits listed on SCEW Sheets A-1-7 and A-1-9 under Notes 1.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-59
Rev. 0
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Emergency Power **Plant ID No.:** Various **Component:** Instrument Cable - 4/C - #16, Shd. **Manufacture:** Rockbestos **Model Number:** Firewall SR (Silicone Rubber) **Function:** Instrumentation **Accuracy:** N/A **Service:** See Note 1 **Location:** Containment	**Operating Time**	various	Continuous	-	Ref. 33 Page 4	Sequential Testing	
	Temperature (^{o}F)	267	340	Ref. 35 & Addendum #1	Ref. 33 Pg. 7	Sequential Testing	
	Pressure (PSIA)	40 psig	104 psig	Ref. 36	Ref. 33 Pg. 7	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 33 Pg. 7	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 45	Ref. 33 Pg. 7	Sequential Testing	
	Radiation	$1.6X10^{7}$ rads	$2X10^{8}$ rads	Ref. 31	Ref. 33 Pg. 2 & 8	Sequential Testing	
	Aging	40 yrs.	Arrhenius Air Oven 40 Yrs.	Plant Design Life	Ref. 33 Pg. 5 & 6	Sequential Testingh	
Flood Level Elev: **Above Flood Level:** Yes No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:
1. This cable is used in circuits listed on SCEW sheets A-1-7 & A-1-9 under Note 1.
2. Cables are terminated using Raychem heat shrink tubing and butt splices at electrical penetrations; Refer to SCEW Sheet A-10-33 for qualification.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Emergency **System:** Power AC & DC **Plant ID No.:** 871 A & B Connectors* **Component:** Connectors **Manufacture:** Litton **Model Number:** CIR Stainless Steel **Function:** Power & Control **Accuracy:** N/A **Service:** For control on MOV's 871 A & B. **Location:** Containment	**Operating Time**	Continuous	Continuous	Continuous	Note 1	Sequential Testing	
	Temperature (^{o}F)	267	382 / (MSLB)/340 (LOCA)	Ref. 35 & Addendum #1	Note 1	Sequential Testing	
	Pressure (PSIA)	40 psig	105 psig	Ref. 36	Note 1	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Note 1	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.6.4	Note 1	Sequential Testing	
	Radiation	$6.7X10^{7}$ Rads	$1.5X10^{8}$ Rads	Ref. 34	Note 1	Sequential Testing	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Note 1	Sequential Testing	
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

*Connectors procured under Specification SP-EE-113, Rev. 1, dated 5/25/82 (Ref. 78)

NOTES:
1. The Connector/Cable System has been installed. NUSCO personnel have witnessed portions of the qualification testing and is awaiting receipt of the qualification test report.
2. Cables used as part of the system have been qualified under SCEW Sheet A-10-1.
3. The Connector/Cable System have installed flexible conduit from the backshell of the first connector off the valve to the first disconnect point above the reactor vessel/valve location.

SUMMARY SHEET NO. A-10-60

SCEW SHEET NO. A-10-60

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Low Pressure Safety Injection System Valves MOV-871 A & B (Connectors)

MANUFACTURER:

Litton

QUALIFICATION DISCREPANCY:

Qualification testing completed. CYAPCO is awaiting Qualification Test Report

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

The Safety Injection System delivers borated water to the Reactor Coolant System in the unlikely event of a loss-of-coolant accident.

Principal components of the Core Cooling System are four safety injection pumps located in the primary auxiliary building. These pumps take suction from the refueling water storage tank located adjacent to the primary auxiliary building. The high pressure pumps discharge into the cold leg piping of each reactor coolant loop and the low pressure pumps discharge into the RHR piping and to the core through the core deluge valves (871A & B).

Operation of the emergency core cooling system is initiated automatically by an actuation signal generated as a result of two out of three low pressurizer pressure signals. These signals are backed up by a high containment pressure signal which will also initiate emergency core cooling. The emergency core cooling signal starts all pumps and actuates all valves to inject borated water into the core within one minute from the start of a postulated LOCA. The system may also be actuated manually from the main control room.

The Low Pressure Safety Injection System is also backed up by the two (2) charging pumps also located in the primary auxiliary building which have a completely independent flow path.

CYAPCO has installed the connector/cable system as qualified due to the witnessing of the qualification testing.

SCEWS No. A-10-60

1982 TER No. None

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. 0 5/20/83)

New SCEW Sheet

II) SER concerns: N/A

Response:

N/A

III) TER concerns: N/A

Response:

N/A

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation.

_____ Reaffirmed

_____ Revised

__X__ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page A-10-61
Rev. 0
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Emergency **System:** Power AC & DC **Plant ID No.:** Incore Thermocouple Sys. **Component:** Connectors (see Note 1 & 2) **Manufacture:** Combustion Engr. (C-E) [Litton] **Model Number:** CIR Stainless Steel **Function:** Instrumentation **Accuracy:** N/A **Service:** Completes circuit to provide input to C-E subcooled margin mon. **Location:** Containment	**Operating Time**	continuous		continuous			See Note 3
	Temperature (^{o}F)	267		Ref. 35 & Addendum #1			See Note 3
	Pressure (PSIA)	40 psig		Ref. 36			See Note 3
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See Note 3
	Chemical Spray	2640 ppm B ron		Ref. 2 Sec. 3.6.4			See Note 3
	Radiation	$6.7X10^{7}$ Rads		Ref. 34			See Note 3
	Aging	40 yrs.		Plant Design Life			See Note 3
Flood Level Elev: 4' 2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

NOTES:
1. Connectors are attached Mineral Insulated (MI) cables, both are stainless steel hermetically sealed via welding process.
2. The MI cable is terminated at the Conax Electrical Penetration.
3. Connector/MI cable system has been environmentally qualified by C-E. NUSCO is awaiting receipt of the qualification test report.

SUMMARY SHEET NO. A-10-61

SCEW SHEET NO. A-10-61

EQUIPMENT ENVIRONMENTAL QUALIFICATION Date: 5/20/83

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Incore Thermocouples Connector/MI Cable System

MANUFACTURER:

C-E (supplier)

QUALIFICATION DISCREPANCY:

Qualification testing completed CYAPCO is awaiting qualification test report.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

These devices (presently five incore thermocouples) are used as part of the input to the Subcooled Margin Monitor which is not accident mitigating but could be used for post accident monitoring.

The new system (installed during the January/February refueling outage) consist of Mineral Insulated (MI) cable and Stainless Steel glass insert connector. The entire unit (MI Cable & Connector) are hermetically sealed. All the components are inorganic and not subject to degradation as organic material.

CYAPCO has been informed by the manufacturer (C-E) that the test units have passed a IEEE-323-1974 qualification program, qualification test report to follow.

CYAPCO considers these devices qualified for their intended function and is only supplying this Justification for Continued Operation (JCO) as formality until the qualification report is received, reviewed and forwarded to the NRC.

SCEWS No. A-10-61

1982 TER No. None

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. 0, 5/20/83)

New SCEW Sheet

II) SER concerns: N/A

Response: N/A

III) TER concerns: N/A

Response: N/A

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation.

_____ Reaffirmed

_____ Revised

__X__ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page B-1-1
Rev. A
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Instrument **System:** Pressurizer Level **Plant ID No.:** LT401-1, 2,3 **Component:** Liquid Level Transmitter **Manufacture:** Foxboro **Model Number:** 61 3HM-HSI **Function:** Transmit liquid level signal from pressurizer **Accuracy:** ±.5% of span **Service:** Accident Monitoring and Post Accident Monitoring **Location:** Lower level, outer annulus of cntmt.	**Operating Time**	Within 2.5 sec. automatic		Ref. 1			
	Temperature (°F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	Enclosed not exposed		NA			See attached Summary Sheet
	Radiation	9.4×10^6 Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. B-1-1

SCEW SHEET NO. B-1-1

EQUIPMENT ENVIRONMENTAL QUALIFICATION Rev. Date 8/31/81

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT: Pressurizer Level Transmitter LT 401-1, 2, 3

MANUFACTURER: Foxboro

QUALIFICATION DISCREPANCY: These components are discrepant because they lack documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION: The pressurizer level transmitters perform no safety function. That is, they provide no input to a logic matrix that is used to actuate any of the engineered safety features like the ECCS. CYAPCo has determined that the signal from these transmitters is desirable for post accident monitoring but not necessary.

These transmitters will have performed and completed their intended safety function within 2.5 seconds (Reference 1) from the start of an accident. Based on engineering judgement, CYAPCO concludes that these transmitters would perform satisfactorily before environmental peaks would be attained.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. B-1-1

1982 TER No. 26

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. A)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.
Response:

This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.
Response:
Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page B-2-1
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown **System:** Instruments **Plant ID No.:** PT 403, 404 **Component:** Pressure Transmitter **Manufacture:** Foxboro **Model Number:** NE11GH-H1M2-B-E **Function:** Transmits Pressure from LOOP4 Hot Leg **Accuracy:** ±.65% of Span **Service:** Transmits Signal to PIC 403 & PI 404 Respectively **Location:** 31'0" Reactor Containment	**Operating Time**	Continuous					
	Temperature (°F)	267	318	Ref. 35 &	Ref. 58 Fig. 2	Sequential Testing	
	Pressure (PSIA)	40 PSIG	90 PSIG	Ref. 36	Ref. 58 Fig. 2	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 59 (F-C 3635)	Sequential Testing	
	Chemical Spray	2640 ppm Boron	2640 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 59 (F-C 3635)	Sequential Testing	
	Radiation	9.4×10^6 Rads	7.6×10^7 Rads	Ref. 34	Ref. 56 Sec. 3 Ref. 57 Sec. 3	Sequential Testing	
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4'2" **Above Flood Level:** Yes ✓ No	**Submergence**						

***Documentation References:**

See "List of References" behind this section of worksheets.
For additional information see References 56, 57 & 60

Notes:

These devices provide the pressure inputs to the Combustion Engineering Subcooled Margin Monitor. They are qualified to the requirements of IEEE 323/344-1971 and so certified to NU.

SUMMARY SHEET NO. B-2-1

SCHW SHEET NO. B-2-1
Rev. Date 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT: Pressure Transmitters PT 403 & 404

MANUFACTURER: Foxboro

QUALIFICATION DISCREPANCY: Locks documented qualification concerning time/temperature aging.

FUNCTION:

PT 403 & 404 provides signal input for post accident monitoring, subcooling margin monitor. The post accident subcooling margin monitor, will alarm a pressure input failure which indicates to the operator that this system should not be used for a post accident monitoring function. This equipment preforms no safety related function.

Although time/temperature aging test data is unavailable, it is highly unlikely that this equipment will fail. These components were installed during the unit's 1980 refueling outage.

Utilities owners group in conjunction with Wyle Laboratory are presently testing Rosemount and Foxboro pressure transmitters and differential pressure transmitters to IEE-323-1974 and IEE-344-1975 standards. Upon successful completion of the test program the equipment will be replaced with fully qualified models.

Due to the desirability of long term operability of this equipment and in conformance with eixsting license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. B-2-1

1982 TER No. 27

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.

Response:

This equipment will be replaced with fully qualified devices for long term operability.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page B-3-9
Rev. A
Date 5/20/83

EQUIPMENT DESCRIPTION SAFE SHUTDOWN	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: RCS Temperature **Plant ID No.:** **Component:** Incore Thermocouples **Manufacture:** **Model Number:** **Function:** Measures Core Temperature at Various Location. **Accuracy:** ± 1.0°F at 500°F **Service:** Provides Temperature input to the C-E Subcooled Margin Monitor **Location:** Reactor Press. Vessel Containment	**Operating Time**	Continuous	Note 1	Ref. 2	Note 1	Note 3	
	Temperature (°F)	40-700	Note 1		Note 1	Note 3	
	Pressure (PSIA)	2500	Note 1		Note 1	Note 3	
	Relative Humidity(%)	In Reactor Coolant	Note 1	Ref. 2	Note 1	Note 3	
	Chemical Spray	In Reactor Coolant	Note 1	Ref. 2	Note 1	Note 3	
	Radiation	10^9 R @ Junction	Note 1		Note 1	Note 3	
	Aging	Arrhenius Air Oven	Note 1	DOR Guidelines	Note 1	Note 3	
Flood Level Elev: **Above Flood Level:** Yes No	**Submergance**						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

1. These are the thermocouples for use as temperature inputs to our solution to the TMI 2.1.3b "Detection of Inadequate Cooling They are used in conjunction with a qualified Combustion Engineering Subcooled Margin Monitor. B-2-1 covers the pressure input devices to the Subcooled Margin Monitor.
2. These components are connected to the computer, where a PROGRAM is used to ascertain which device is indicating high core temperature and which one is out of range.
3. Qualification Analysis attached.

SCEWS No. B-3-9

Date: 5/20/83

QUALIFICATION ANALYSIS

The Incore Thermocouple System is used for Reactor Coolant System (RCS) temperature monitoring.

The incore thermocouples' material constituents are: 1) Stainless steel outer sheath, 2) Magnesium Oxide insulation, and 3) Chromel/Alumel thermocouple. A review of the material constituents reveal that they are all inorganic. Being that the materials are inorganic they do not degrade in a similar manner as organic materials.

A closer examination of each material reveals the following:

1. Stainless steel used as the outer sheath of the incore thermocouple unit is of similar material as that used in lining the reactor vessel and, therefore, both are subjected to the same environment (normal and accident).

2. Magnesium Oxide insulation used has a very high melting point of 2800°C (5072°F); it is insoluble in water and it is inert (as it is found in nature - a rock).

3. Chromel/Alumel thermocouple is a metallic conductor with an upper end temperature monitoring range of 2300°F within standard limits of error.

Upon review of the above the material constituents were chosen, by design, for their unique ability to withstand the environmental parameters that they could be subjected to during a hypothetical accident.

In conclusion, this simple analysis indicates that the Incore Thermocouples are qualified by design for the environments (normal and accident) in which they are required to perform.

SCEWS No. B-3-9

1982 TER No. 21

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A, dated 5/20/83)

1. Notes have been numbered on SCEW Sheet.
2. Note three (3) has been added.
3. Qualification analysis attached to SCEW Sheet.

II) SER concerns: II.A Equipment qualification not established, Pgs. 3-10 and 4-3 of TER.

Response: CYAPCO has performed a qualification analysis.

III) TER concerns: Qualification could be done by analysis.

Response: See response II above

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Safe Shutdown Instrument **Plant ID No.:** LT 1301-1 1301-2, 1301-3, 1301-4 **Component:** Level Transmitter (Narrow Range) **Manufacture:** Hagan **Model Number:** PMD 477315 **Function:** Transmits Steam Generator Level Signal to Indicators **Accuracy:** ± 1% of Full Scale **Service:** Initiates Aux. Feed Water Flow **Location:** Containment LT 1301-1, 4-26'6" LT 1301-2, 3-22'0"	**Operating Time**						
	Temperature (°F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	9.6×10^6 Rads		Ref. 31			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4'2" **Above Flood Level:** Yes ✓ No	**Submergence**						

***Documentation References:**

See "List of References" behind this section of work sheets.

Notes:

SUMMARY SHEET NO. B-4-1

SCEW SHEET NO. B-4-1

DATE 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT: Steam Generator Level Transmitters (narrow range)
LT-1301-1, 2, 3, 4.

MANUFACTURER:

Hagan

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

These transmitters are part of a steam flow, feedwater flow, mismatch scheme. When the level in the steam generator drops (as indicated by these transmitters) in conjunction with a steam flow, feedwater mismatch, reactor trip will occur.

These transmitters will have performed and completed their intended safety function within a fraction of a second prior to determining that a low level exists in the steam generator. Based on engineering judgment, CYAPCO concludes that these transmitters would perform satisfactorily since environmental peaks would not have been attained before the transmitters could execute their function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. B-4-1

1982 TER No. 24

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.
Response:
This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.
Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

X Reaffirmed

_____ Revised

_____ New

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown Instrument **System:** Steam Gen. Level **Plant ID No.:** LT-1302-1, 1302-2, 1302-3, 1302-4 **Component:** Level Transmitter (wide range) **Manufacture:** Hagan Controls Division - Westinghouse **Model Number:** Powermag 292D-15 **Function:** Transmits Steam Generator Level signal to cntls/indicator **Accuracy:** ± 1% of full scale **Service:** Part of stm. flow feed flow mismatch, together with S/G low level causing reac. trip. **Location:** Containment Outer Annulus	**Operating Time**						
	Temperature (°F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	1.3×10^7 Rads		Ref. 31			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. B-4-2

B-4-2

SCEW SHEET NO. _____

Rev. Date 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT: Steam Generator Level Transmitters (wide range)
LT1302-1, 2, 3, 4

MANUFACTURER: Hagar

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

These level transmitters are used to measure the water level of each individual steam generator. When any two out of four transmitters indicate low steam generator levels with lighted annunciators, manual initiation of auxiliary feedwater begins. A second feature is a 69% water level interlock. Upon 69% level of any steam generator, the feedwater regulating valve for that generator will close.

These transmitters are not credited in the facility description and safety analysis report.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. B-4-2

1982 TER No. 23

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A)
None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.
Response:

This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.
Response:
Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Safety Inj. **Plant ID No.:** MOV871A, MOV871B **Component:** Motor Operator Valve **Manufacture:** Crane Teledyne **Model Number:** T-4-30 **Function:** Operator for MOV871A and B **Accuracy:** NA **Service:** Open to permit safety injection flow directly into the core **Location:** during long term cooling. Reactor Cavity of Cntmt.	**Operating Time**	Within 30 sec. automatic		Ref. 1 2(10.3),4			See attached Summary Sheet
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PISG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	9.4 X 10^{6} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. C-1-1

SCEW SHEET NO. C-1-1
REV. DATE 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Low Pressure Safety Injection System
Valves MOV-871A and 871B (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of full documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

The Safety Injection System delivers borated water to the Reactor Coolant System in the unlikely event of a loss-of-coolant accident.

Principal components of the Core Cooling System are four safety injection pumps located in the primary auxiliary building. These pumps take suction from the refueling water storage tank located adjacent to the primary auxiliary building. The high pressure pumps discharge into the cold leg piping of each reactor coolant loop and the low pressure pumps discharged into the RHR piping and to the core through the core deluge valves.

Operation of the emergency core cooling system is initiated automatically by an actuation signal generated as a result of two out of three low pressurizer pressure signals. These signals are backed up by a high containment pressure signal which will also initiate emergency core cooling. The emergency core cooling signal starts all pumps and actuates all valves to inject borated water into the core within one minute from the start of a postulated LOCA. The system may also be actuated manually from the main control room.
The manufacturer of these motor operators has indicated that this equipment was designed to function in the containment environment shown on SCEW sheet C-1-1.

We have a high degree of confidence that MOV's 871A and 871B will achieve their safety position in the first ten (10) seconds of the accident and before environmental peaks occur.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. C-1-1

1982 TER No. 4

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.

Response:
This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Safe Shutdown High Press. System: Safety Inj. Plant ID No.: MOV861A-D Component: Motor Operator Valve Manufacture: Crane Teledyne Model Number: T-4-15 Function: Operators for MOV861A, 861B, 861C, 861D Accuracy: NA Service: Safety Injection flow to primary loops Location: Middle level, outer annulus-containment	Operating Time	within 30 sec. automatic		Ref. 1, 2(10.3),4			See attached Summary Sheet
	Temperature (^{o}F)	267		Ref. 35 & Addendum 1			See attached Summary Sheet
	Pressure (PSIA)	40 PSIG		Ref. 36			See attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1			See attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4			See attached Summary Sheet
	Radiation	9.4×10^{6} Rads		Ref. 34			See attached Summary Sheet
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. C-1-6

SCEW SHEET NO. C-1-6

REV. DATE 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

High Pressure Safety Injection System
Valves MOV-861A-D (Motor Operator)

MANUFACTURER:

Crane Teledyne

QUALIFICATION DISCREPANCY:

Lack of full documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION
FOR CONTINUED OPERATION:

The Safety Injection System delivers borated water to the Reactor Coolant System in the unlikely event of a loss-of-coolant accident.

Principal components of the Core Cooling System are four safety injection pumps located in the primary auxiliary building. These pumps take suction from the refueling water storage tank located adjacent to the primary auxiliary building. The high pressure pumps discharge into the cold leg piping of each reactor coolant loop and the low pressure pumps discharged into the RHR piping and to the core through the core deluge valves.

Operation of the emergency core cooling system is initiated automatically by an actuation signal generated as a result of two out of three low pressurizer pressure signals. These signals are backed up by a high containment pressure signal which will also initiate emergency core cooling. The emergency core cooling signal starts all pumps and actuates all valves to inject borated water into the core within one minute from the start of a postulated LOCA. The system may also be actuated manually from the main control room.
The manufacturer of these motor operators has indicated that this equipment was designed to function in the containment environment shown on SCEW Sheet C-1-6.

We have a high degree of confidence that MOV's 861A-D will achieve their safety position in the first ten (10) seconds of the accident and before environmental peaks occur.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. C-1-6

1982 TER No. 4

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

II) SER concerns: I.B. Equipment qualification pending modification.

Response: This equipment will be replaced with fully qualified devices.

III) TER concerns: Same as II above

Response:

Same as II above

IV) Proposed corrective action and schedule.

Refer to corresponding equipment summary sheet.

V) Justification for continued operation.

X Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page C-2-1
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating **System:** Charging **Plant ID No.:** P-18-1A **Component:** Pump Motor **Manufacture:** Westinghouse Spec. E-675252 Data Sheet: 1024 **Model Number:** S.O.29N7167 8C4217G01 **Function:** Drives Charging Pump **Accuracy:** NA **Service:** Supplies Emergency Core Cooling Water **Location:** PAB, A-4	**Operating Time**	Various	Various	-	Ref. 46 & 70		
	Temperature (°F)	NA					
	Pressure (PSIA)	NA					
	Relative Humidity(%)	NA					
	Chemical Spray	NA					
	Radiation	3.7×10^6 Rads	2×10^8 Rads	Ref. 31	Ref. 46 & 70	Type Test & Analysis	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 46 & 70	Type Test & Analysis	
Flood Level Elev: **Above Flood Level:** Yes No	**Submergence**						

*Documentation References:

See "List Of References" behind this section of worksheets.

Notes: The only harsh environmental parameter is that of radiation. Reference 46 describes the satisfactory results of a much more demanding test of a similar motor with the same insulating system and bearings. These results strongly suggest that this motor will perform satisfactorily in this environment.

SCEWS No. C-2-1

1982 TER No. 17

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: II.A Equipment Qual. not established, Pgs. 3-10 & 4-3 of TER
Response:

See attached response.

III) TER concerns: Same as II above
Response:

See attached response.

IV) Proposed corrective action and schedule.

Refer to previously supplied SER/TER response dated 8/31/81, Items II & III.

V) Justification for continued operation. Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

SCEWS No C-2-1

1983 TER No. 17

Date: 1-20-83

II) Response:

CYAPCO presented information on the SCEW sheet indicating the device functions only in a radiation environment.

In addition, the referenced qualification documentation indicates that identical insulation systems are qualified for use both inside and outside of containment.

CYAPCO again states that the device is qualified for its intended use.

III) Response:

FRC did not thoroughly review and understand the referenced qualification documentation.

CYAPCO has established similarity between the motor units tested in the reference documents and the motor unit installed. Similarity was achieved by a motor data sheet supplied by the motor manufacturer during shipment. The data sheet indicates that the supplied motor has a Thermalastic Epoxy insulation system Class B rated, the same type that was tested by the manufacturer.

The motor lead terminations were performed in accordance with the manufacturers recommended practices.

Plant surveillance and preventive maintenance program will, on a prescribed time basis, perform manufacturers recommended inspections and replacement of the lubricant and bearing system.

Manufacturer's motor data sheet is available for audit in CYAPCO's files.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating **System:** Charging **Plant ID No.:** P-18-1B **Component:** Pump Motor **Manufacture:** Westinghouse Spec. E-675252 Data Sheet: 1024 **Model Number:** S.O.29N7167 8C4217G01 **Function:** Drives Charging Pump **Accuracy:** NA **Service:** Supplies Emergency Core Cooling Water to RCS **Location:** PAB, A-3	**Operating Time**	Various	Various	-	Ref. 40 & 70		
	Temperature (^{o}F)	NA					
	Pressure (PSIA)	NA					
	Relative Humidity(%)	NA					
	Chemical Spray	NA					
	Radiation	8.7×10^{6} Rads	2×10^{8} Rads	Ref. 31	Ref. 46 & 70	Type Test & Analysis	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 46 & 70	Type Test & Analysis	
Flood Level Elev: **Above Flood Level:** Yes No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes: The only harsh environmental parameter is that of radiation. Reference 46 describes the satisfactory results of a much more demanding test of a similar motor with the same insulating system and bearings. Those results strongly suggest that this motor will perform satisfactorily in this environment.

SCEWS No. C-2-3

1982 TER No. 17

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: II.A Equipment Qual. not established, Pgs. 3-10 & 4-3 of TER
Response:

See attached response.

III) TER concerns: Same as II above
Response:

See attached response.

IV) **Proposed corrective action and schedule.**

Refer to previously supplied SER/TER response dated 8/31/81, Items II & III.

V) **Justification for continued operation.** Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

SCEWS No. C-2-3

1982 TER No. 17

Date: 1-20-83

II) **Response:**

CYAPCO presented information on the SCEW sheet indicating the device functions only in a radiation environment.

In addition, the referenced qualification documentation indicates that identical insulation systems are qualified for use both inside and outside of containment.

CYAPCO again states that the device is qualified for its intended use.

III) **Response:**

FRC did not thoroughly review and understand the referenced qualification documentation.

CYAPCO has established similarity between the motor units tested in the reference documents and the motor unit installed. Similarity was achieved by a motor data sheet supplied by the motor manufacturer during shipment. The data sheet indicates that the supplied motor has a Thermalastic Epoxy insulation system Class B rated, the same type that was tested by the manufacturer.

The motor lead terminations were performed in accordance with the manufacturer's recommended practices.

Plant surveillance and preventive maintenance program will, on a prescribed time basis, perform manufacturers recommended inspections and replacement of the lubricant and bearing system.

Manufacturer motor data sheet is available for audit in CYAPCO's files.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Centrifugal Charge **Plant ID No.:** MOV292B & MOV292C **Component:** Motor Operator Valves **Manufacture:** Limitorque **Model Number:** SMB-0 **Function:** Operators for valves MOV292B & 292C **Accuracy:** NA **Service:** Provides charging flow for core cooling & recirculation flow during long term cooling. **Location:** Lower level, Loop Area	**Operating Time**	Within 30 sec. automatic	continuous	Within 30 sec. automatic	*600456 Pg. 18 Sec. 4.4.5	Sequential Testing	
	Temperature (°F)	267	300	Ref. 35 & Addendum 1	*600456 Pg. 13 Sec 4.4.1	Sequential Testing	
	Pressure (PSIA)	40 PSIG	70 PSIG	Ref. 36	*600456 Pg. 13 Sec 4.4.1	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	*600456 Pg. 18 Sec 4.4.3	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec 3.6.4	*600456 Pg. 17 Sec 4.4.2	Sequential Testing	
	Radiation	9.4 X 10^7 Rads	2.04 X 10^8 Rads	Ref. 31	*600456 Pg. 12 Sec 4.3	Sequential Testing	
	Aging	40 yrs.	Arrhenius air oven	Plant Design Life	*600456 Pg.3 Sec. 3.1.1 & Sec 3.1.2	Sequential Testing	
Flood Level Elev: 4' 2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

*Limitorque Report #600456 - for Audit in our files.

SCEWS No. C-2-8

1982 TER No. 6

Date: 1-20-83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. B)

None

II) SER concerns: II.A Equipment Qualification not established, Pgs. 3-10 & 4-3 of TER.

Response:

See attached response.

III) TER concerns: Qualification not established.

Response:

See attached response.

IV) Proposed corrective action and schedule.

Refer to attached SER/TER review sheet #1A, dated 8/31/81 Item IV.

V) Justification for continued operation. Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

SCEW No. C-2-8
1982 TER No. 6
Date 1/20/83

II) Response:

CYAPCO has presented information on the SCEW sheet and has submitted documentation from the manufacturer indicating qualification.

CYAPCO considers these devices fully qualified.

III) Response:

CYAPCO has resolved all identified TER concerns by submitting or identifying the appropriate qualification documentation.

Proper review by FRC of both the qualification documentation report and the SCEW sheet will adequately demonstrate similarity. The SCEW sheet identifies an installed model number of SMB-0 in which the documentation verifies a test unit model number SMB-0.

In addition, CYAPCO has a letter, in its files for audit, from the vendor stating:

"Our records indicate that our Qualification Report 600 456 can be applied to the actuators supplied on the following order numbers".

Limitorque O/N	Actuator S/N	Plant I.D.
3A3122-C	258174-77	MOV-292B & C

Similarity is established by CYAPCO Purchase Order Number 539327, dated September 3, 1980.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Cntm. Vent Fans **Plant ID No.:** MOV 25-29 **Component:** Operator Valves **Manufacture:** Limitorque **Model Number:** SMB-0 **Function:** Operators for MOV's 25-29 **Accuracy:** N/A **Service:** Backup Fire Protection for Charcoal Filters **Location:** Lower leverl outer annulus of containment	**Operating Time**	Variable	Variable	Variable	Ref. 76	Sequential Testing	
	Temperature (^{O}F)	267	328	Ref. 35 & Add. #1	Ref. 76	Sequential Testing	
	Pressure (PSIA)	40 psig	90 psig	Ref. 36	Ref. 76	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 76	Sequential Testing	
	Chemical Spray	2640 ppm Boron	2640 ppm Boron	Ref. 2 Sec 3.6.4	Ref. 76	Sequential Testing	
	Radiation	1.3×10^{7} Rads	2.04×10^{8} Rads	Ref. 31	Ref. 77	Sequential Testing	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 76	Sequential Testing	
Flood Level Elev: 4' 2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

SCEWS No. C-3-1

1982 TER No. D

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. D)

1. Note one (1) removed.
2. Letter from Limitorque indicating motors are qualified.
3. These pieces of equipment are considered fully qualified.

II) SER concerns: II.A Qualification not established, Pgs. 3-10 & 4-3 of TER.

Response: See attached response.

III) TER concerns:

Response:

See attached response

IV) Proposed corrective action and schedule.

Not Applicable

V) Justification for continued operation.

Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

II) Response:

CYAPCO has presented information on the SCEW Sheet and has submitted documentation from the manufacturer indicating qualification of valve actuator and motor for each unit.

CYAPCO considers the MOV units fully qualified.

III) Response:

CYAPCO responses to FRC's comments:

1) Documented evidence of qualification adequacy - Deficient.

CYAPCO has presented and still presents information on the SCEW sheet which indicates qualification. Test report were only indicated because NRC/FRC stated FRC test report only had to be listed and not sent.

2) Adequate similarity between equipment and test specimen established - Deficient.

CYAPCO has established the similarity link between equipment installed and test specimen. This has been done by Northeast Utilities Service Company (NUSCO) purchase orders #820366 and #539327. The purchase orders listed plant I.D. number, operator serial number and original operator order number. From this, the manufacturer (Limitorque) sent three letters establishing similarity and qualification. These letters are dated October 9 and 10, 1980; and April 18, 1983. This information is in our files for audit and will not submitted. CYAPCO is responsible for establishing similarity and has done so with the manufacturer.

3) Aging degradation evaluated adequately - Deficient.

Aging has been adequately justified and indicated on the SCEW Sheet. The devices are qualified for forty years with proper preventive maintenance as recommended by the manufacturer.

4) Qualified life or replacement schedule established (if required) - Deficient.

Qualified life has been established of forty years. There is no replacement schedule.

5) Criteria regarding radiation satisfied - Deficient.

Radiation requirements specified on SCEW Sheet and devices are qualified to 2E + 8 value.

6) Equipment qualification not established - Deficient.

Equipment is considered fully qualified by CYAPCO. No further comments.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page C-3-2
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Cntmt. Vent Fans **Plant ID No.:** MOV-34 **Component:** Valve Operator **Manufacture:** Limitorque **Model Number:** SMB-00 S/N 344267 **Function:** Operates MOV-34 **Accuracy:** N/A **Service:** Open to reduce fission product concentration & cntmt. Pres. following a LOCA **Location:** Lower level outer annulus of containment.	**Operating Time**	Within 30 Sec. Automatic	Continuous	Within 30 Sec. Automatic	*Ref. 71 Pg. 18 Sec. 4.4.5	Sequential Testing	
	Temperature (°F)	267	300	Ref. 35 Addendum 1	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Pressure (PSIA)	40 psig	70 psig	Ref. 36	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	*Ref. 71 Pg. 18 Sec. 4.4.3	Sequential Testing	
	Chemical Spray	2640 ppm	3000 ppm	Ref. 2 Sec. 3.6.4	*Ref. 71 Pg. 17 Sec. 4.4.2	Sequential Testing	
	Radiation	9.4×10^6	2×10^8	Ref. 31	*Ref. 71 Pg. 12 Sec. 4.3	Sequential Testing	
	Aging	40 Yrs.	Arrhenius Air Oven	Plant Design Life	*Ref. 71 Pg. 3 Sec. 3.1.1 & Sec 3.1.2	Sequential Testing	
Flood Level Elev: 4'2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes: *Reference 71 is Limitorque Qualification Report 600456, Dated 12/9/75

SCEWS No. C-3-2

1982 TER No. 8

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

Equipment has been replaced with a fully qualified device.
SCEW sheet has been revised in its entireity.

II) SER concerns: I.B. Equipment qualification pending modification.

Response: See I above.

III) TER concerns: NA

Response:

IV) Proposed corrective action and schedule. NA

V) Justification for continued operation. NA

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
ACCIDENT MITIGATING SYS. **System:** CTMT. VENT FANS **Plant ID No.:** F-17-1,2,3,4 **Component:** Fan Motor **Manufacture:** Westinghouse Electric (See ## Below) **Model Number:** Type CSP Frame: 684-5S **Function:** Drive Fans F-17-1,2,3,4 **Accuracy:** NA **Service:** To Effect a pid Depressurization (continued)** **Location:** Middle level, outer annulus of containment	**Operating Time**	continuous	continuous	Ref. 2 Sec. 3.6.2	Ref. 19,20, 46 & 67	Analysis & Test	
	Temperature (^{O}F)	267	320	Ref. 35 & Addendum 1	Ref. 19,20, 46 & 67	Analysis & Test	
	Pressure (PSIA)	40 PSIG	80 psig	Ref. 36	Ref. 19,20, 46 & 67	Analysis & Test	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 19,20, 46 & 67	Analysis & Test	
	Chemical Spray	2640 ppm Boron	3,000 ppm Boron	Ref. 2 Sec 3.6.4	Ref. 19,20, 46 & 67	Analysis & Test	
	Radiation	4.2×10^{7} Rads	2×10^{8} R	Ref. 31	Ref. 19,20, & 46	Analysis & Test	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 46	Analysis & Test	
Flood Level Elev: 4'-2" **Above Flood Level:** **Yes** x **No**	**Submergence**						

***Documentation References:**

See "List of References" behind this section of worksheets.

Refer to References 68 & 69 for Nameplate Data.

Notes:

**Of the containment and to provide for iodine filtration as fission products are released from the core.

QUALIFICATION ANALYSIS

The containment air recirculation system is used for depressurization and heat removal during a loss of coolant accident.

The fan motors are equipped with water resistant insulation and a closed circuit cooling arrangement. The cooling system is vented to the containment atmosphere so that no significant pressure differential exists between the motor cavity and the containment. The vent is so arranged that any moisture entering the motor will pass over the cooling coils and be condensed before it reaches the motor windings. We have a high degree of confidence with this arrangement, coupled with water resistant insulation and periodic tests, insures reliable operation of the fans even under incident conditions.

A comparison of technical information between references 46 (previously submitted), 68 and 69 shows similarity of tested units and installed units.

The comparison shows that the tested and installed motors are;

1. CSP type motors (Life-Line Type)

2. Insulation class is Thermal Epoxy class F.

3. Voltage difference between 460 V (Tested motor) and 440 V (Installed motor) are judge insignificant.

4. Motor load characteristics show no significant differences.

5. Motor horsepower ratings 300 HP (Tested motor) and 250 HP (Installed motor) are judged not significant.

It is concluded from the previously stated references and the above comparison that the motor tested and those installed are similar in design and duty function. Duty function is containment air recirculation during normal plant operation and accident condition.

Also, the newly submitted reference 67 (W, WCAP 9003) states on page 17 of the report, that the motor heat exchanger pressure equalizing valve was permitted to remain open thus allowing the steam environment into the heat exchanger and motor cavity. This confirms the unique ability of the motor insulation system to tolerate an adverse environment and still operate.

CYAPCO has reviewed Westinghouse's proposed qualification modifications which are:

1. Plug present heat exchanger drain hole.

2. Close piping system for condensate drain.

3. Install two (2) new pressure relief check valves.

Engineering review of the proposed modifications have indicated the following drawbacks:

1. If either valve sticks open after the accident, the containment atmosphere will be introduced into the heat exchanger box and motor cavity.

   This is no problem in itself due to the motor's insulation system ability to tolerate an adverse environment as noted in reference 67.

2. If either check valve fails to open when containment pressure goes up/down during the accident, the heat exchanger box could collapse or explode because of the pressure differential thus rendering the C.A.R. Fan Motor unit inoperable.

3. If the closed piping system for condensate drain is connected to a installed loop seal, a pressure surge in the containment could blow the loop seal back into the heat exchanger box and motor cavity.

Therefore, it is CYAPCo's conclusion that the proposed Westinghouse modifications not be done and that the CAR Fan Motor Units are qualified by test and analysis for the accident environment. No further action is planned.

SCEWS No. C-3-3

1982 TER No. 19

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C, dated 1/20/83)

No new changes.

II) **SER concerns:** II.A Equipment Qualification not established
Pgs. 3-8 & 4-3 of TER.

Response:

See attached for response.

III) **TER concerns:** Qualification not established.

Response: See attached for response.

IV) **Proposed corrective action and schedule.**

Motor is in normal plant surveillance and preventive maintenance program for Category 1E equipment.

V) **Justification for continued operation.** Not applicable.

_____ Reaffirmed

_____ Revised

_____ New

SCEWS No. C-3-3

1982 TER No. 19

Date: 5/20/83

II. Response:

CYAPCO has presented information on the SCEW sheet and has submitted documentation from the manufacturer indicating qualification. In addition, CYAPCO performed and submitted a written qualification analysis comparing the installed units to the tested unit. In order to demonstrate further qualification by similarity, CYAPCO has contacted the manufacturer of the motor for assistance.

CYAPCO still considers these devices (motors) fully qualified for a harsh environment.

III. Response:

CYAPCO's response to the FRC TER concerns as follows:

1. Motor manufacturer has been contacted in order to obtain qualification on motor terminations.

2. Plant surveillance and preventive maintenance programs will, on a prescribed periodic basis, perform manufacturer's recommended inspections and replacement of lubricant and bearing system.

3. Space heater is <u>not</u> a motor qualification requirement.

4. Grease and bearings (for motors) are replaced as recommended by the manufacturer. Historically, manufacturer's aging requirements and replacement cycles are very conservative.

5. CYAPCO has revised the SCEW sheet radiation specified column. The new value accounts for Beta emitter plate out.

CYAPCO again reiterates that this device is qualified for its intended use.

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Accident Mitigating Cntmt. Vent Filter **Plant ID No.:** D-17-1,2,3,& 4 **Component:** Solenoid Operator **Manufacture:** ASCO **Model Number:** NP8320A187EMS **Function:** Redirects CAR Fan Intake Dampers **Accuracy:** N/A **Service:** See Below (**) **Location:** In Cntmt. (C.A.R.) Fans	**Operating Time**	Variable	Note 1	Variable	Note 1	Sequential Testing	
	Temperature (°F)	267	346	Ref. 35 & Addendum 1	Ref. 72 Sec. 4.7	Sequential Testing	
	Pressure (PSIA)	40 psig	110	Ref. 36	Ref. 72 Sec. 4.7	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 72 Sec. 4.7	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec. 3.6.4	Ref. 72 Sec. 4.7	Sequential Testing	
	Radiation	$4.2X10^7$ Rads	$2X10^8$ Rads	Ref. 34	Ref. 72 Sec. 4.6	Sequential Testing	
	Aging	40 Yrs.	Note 2	Plant Design Life	Ref. 73 Pgs. C-5 E C-8	Sequential Testing	
Flood Level Elev: 4' 2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

(**) Closes normal CAR Fan Intake Dampers, Opens Iodine Filtration damper upon 5 psig containment pressure alarm.

Notes:

1. Operating is not specified, however, the qualification testing indicates the devices will perform their safety function.
2. EPDM Elastomeric Components qualified for "8" years @140°F and coils qualified for "40" years.

SCEWS No. C-3-4

1982 TER No. 14

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

Equipment has been replaced with a fully qualified device. SCEW sheet has been revised in its entirety.

II) SER concerns: I.B. Equipment qualification pending modification.

Response: See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page C-3-5
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Cntmt. Vent Fans **Plant ID No.:** MOV-23 **Component:** Valve Operator **Manufacture:** Limitorque **Model Number:** SMB-00 S/N 344266 **Function:** Operates MOV-23 **Accuracy:** N/A **Service:** Open to reduce fission product concentration & cntmt. pres. following a LOCA **Location:** Lower level outer Annulus of cntmt.	**Operating Time**	Within 30 Sec. Automatic	Continuous	Within 30 Sec. Automatic	*Ref. 71 Pg. 18 Sec. 4.4.5	Sequential Testing	
	Temperature (^{o}F)	267	300	Ref. 35 Addendum 1	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Pressure (PSIA)	40 psig	70 psig	Ref. 36	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	*Ref. 71 Pg. 18 Sec. 4.4.3	Sequential Testing	
	Chemical Spray	2640 ppm	3000 ppm	Ref. 2 Sec. 3.6.4	*Ref. 71 Pg. 17 Sec. 4.4.2	Sequential Testing	
	Radiation	9.4×10^{6}	2×10^{8}	Ref. 31	*Ref. 71 Pg. 12 Sec. 4.3	Sequential Testing	
	Aging	40 Yrs.	Arrhenius Air Oven	Plant Design Life	*Ref. 71 Pg. 3 Sec. 3.1.1 & Sec 3.1.2	Sequential Testing	
Flood Level Elev: 4'2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes: *Reference 71 is Limitorque Qualification Report 600456, Dated 12/9/75

SCEWS No. C-3-5

1982 TER No. 9

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

Equipment has been replaced with a fully qualified device.
SCEW sheet has been revised in its entirety.

II) SER concerns: I. B. Equipment qualificaton pending modification.

Response: See I above.

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page C-4-1
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating Sys. **System:** Cntmt. Vent Fans **Plant ID No.:** MOV-331 **Component:** Valve Operator **Manufacture:** Limitorque **Model Number:** SMB-000 S/N 343922 **Function:** Operates 3/4" Water Line **Accuracy:** N/A **Service:** Reactor Coolant Pump Seal Bypass **Location:** Containment R-4	**Operating Time**	Within 30 Sec. Automatic	Continuous	Within 30 Sec. Automatic	*Ref. 71 Pg. 18 Sec. 4.4.5	Sequential Testing	
	Temperature (^{o}F)	267	300	Ref. 35 Addendum 1	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Pressure (PSIA)	40 psig	70 psig	Ref. 36	*Ref. 71 Pg. 13 Sec. 4.4.1	Sequential Testing	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	*Ref. 71 Pg. 18 Sec. 4.4.3	Sequential Testing	
	Chemical Spray	2640 ppm	3000 ppm	Ref. 2 Sec. 3.6.4	*Ref. 71 Pg. 17 Sec. 4.4.2	Sequential Testing	
	Radiation	9.4×10^{6}	2×10^{8}	Ref. 31	*Ref. 71 Pg. 12 Sec. 4.3	Sequential Testing	
	Aging	40 Yrs.	Arrhenius Air Oven	Plant Design Life	*Ref. 71 Pg. 3 Sec. 3.1.1 & Sec 3.1.2	Sequential Testing	
Flood Level Elev: 4'2" **Above Flood Level:** Yes X No	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes: *Reference 71 is Limitorque Qualification Report 600456, Dated 12/9/75

SCEWS No. C-4-1

1982 TER No. None

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. C)

Equipment has been replaced with a fully qualified device. SCEW sheet has been revised in its entirety.

II) SER concerns: N/A

Response:

III) TER concerns: N/A

Response:

IV) Proposed corrective action and schedule. N/A

V) Justification for continued operation. N/A

_____ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident mitigating syst. System: Plant ID No. R1801-1 & 2	Operating Time	Continuous	Continuous	-	Ref. 64	Simultaneous Test	
Component: Ctmt. High Range Rad Monitor (*Detector Assembly)	Temperature (°F)	267	355	Ref. 35 & Addendum 1	Ref. 64	Simultaneous Test	
Manufacture: General Atomic	Pressure (PSIA)	40 psig	70 psig	Ref. 36	Ref. 64	Simultaneous Test	
Model Number: *RD-23 (detector)	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 64	Simultaneous Test	
Function: Measure ctmt. High Radiation	Chemical Spray	2640 ppm boron	3000 ppm boron	Ref. 2 Sec. 3.6.4	Ref. 64	Simultaneous Test	
Accuracy:							
Service: Post Accident Monitoring	Radiation	1.1×10^7 rads	2.0×10^8 rads	Ref. 31	Ref. 64 (see Note 2)	Test and Analysis	
Location: Charging Floor Ctmt.	Aging	40 yrs.	10 yrs. (See Note 1)	Plant Design Life	Ref. 64	Test and Analysis	
Flood Level Elev: 4' 2" Above Flood Level: Yes X No	Submergence	NA	NA	NA	NA	NA	

*Documentation References:

See "List Of References" behind this section of worksheets.

*RD-23 Detector Assm. - In Containment
RP-2C Readout Module } - Plant Control Room
RP-23 Power Supply }

Notes:

1) Detector Assm (RD-23) is Inorganic, not subject to aging and radiation degradation. However, Aluminum Electrolytic capacitors in RP-2C are replaced every 10 yrs.
2) This radiation value is limited to only the cable and heat shrink splice tubing.

SCEWS No. C-10-16

1982 TER No. 35

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet. (Rev. A, dated 8/31/81)

II) SER concerns: II.A Equipment qualification not established.

Response:

CYAPCO considers these devices fully qualified.

III) TER concerns: Same as II above.

Response: See attached response.

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation. Not applicable

_____ Reaffirmed

_____ Revised

_____ New

III) Response:

CYAPCO responses to FRC's comments:

1. The Detector Assembly (RD-23) is identical to the test specimen. The connector/cable interface is an Amphenol 83-816-1000 HN connector and RSS-6-104 (1081) coaxial cable with WCSF-N Raychem tubing. The termination was made in accordance to General Atomic procedure as outlined in the test report and shown on page 12 of said report.

   The cable has been requalified by the Rockbestos Company and is indicated on SCEW Sheet A-10-55. Thermal aging of this cable has been addressed, (see SCEWS A-10-55).

   The connectors are all metal except for the insulator and gasket materials which are teflon. However, the entire connector cable assembly is covered with Raychem tubing as stated earlier. Therefore, aging and radiation is not considered to be significant due to the small quantities of teflon. The Raychem material has been qualified by type test.

   Testing was performed on the connector/cable and Raychem tubing which is method four (4) page 11 of General Atomic Test Report.

2. The Detector Assembly (RD-23) is inorganic, refer to Table 3-1 Page 6 of General Atomic Test Report. The cable is not qualified by the manufacturer as second generation coaxial cable. The connector is all metal and the teflon material is used only in a static condition not subjected to any movement.

3. See response one above for connector aging justification.

CYAPCO has established the similarity link between equipment installed and test specimen. These pieces of equipment are considered fully qualified by CYAPCO.

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page D-1-I
Rev. B
Date 8/31/81

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REF*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Accident Mitigating Instruments **Plant ID No.:** PT401-1,2,3 **Component:** Pressure Transmitter **Manufacture:** Foxboro **Model Number:** 611GM-DSI **Function:** Transmit Pressure Signal **Accuracy:** ± .5% of Span **Service:** To Initiate Safety Injection **Location:** Lower Level, Outer Annulus of Containment	**Operating Time**	1 year		Developed by NRC after TMI		Analysis of Tests	
	Temperature (^{o}F)	267	294	Ref. 35 & Addendum 1	Ref. 22,23, 24	Analysis of Tests	
	Pressure (PSIA)	40 PSIG	60 psig	Ref. 36	Ref. 22,23, 24	Analysis of Tests	
	Relative Humidity(%)	100	100	Ref. 2 Sec. 3.1	Ref. 22,23, 24	Analysis of Tests	
	Chemical Spray	Enclosed not exposed		Ref. 2 Sec. 3.6.4		Analysis of Tests	
	Radiation	1.3 X 10^{7} Rads	1 X 10^{6}R	Ref. 31	Ref. 22,23, 24	Analysis of Tests	
	Aging	40 yrs.		Plant Design Life			See attached Summary Sheet
Flood Level Elev: 4' 2" **Above Flood Level:** Yes ✓ No	**Submergence**						

***Documentation References:**

See "List of References" Behind This Section of Worksheets.

Notes:

SUMMARY SHEET NO. D-1-1

SCEW SHEET NO. D-1-1

REV. DATE 8/31/81

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Pressurizer Pressure Transmitter
PT 401-1, 2, 3

MANUFACTURER:

Foxboro

QUALIFICATION DISCREPANCY:

Lack of documented qualification test data.

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

Pressurizer pressure transmitters are used to provide a reactor trip due to a high pressurizer pressure condition. When low pressurizer pressure occurs, these transmitters provide initiation signals for various engineered safety features such as the ECCS and containment isolation. The location of the component precludes the possibility of the rapid admission of fluid to the transmitter internals during a LOCA. In conjunction with the two out of three logic used to initiate safety injection and the short time to operate, there is an acceptably low probability that these transmitters would not perform their intended function.

Due to the desirability of long term operability of this equipment and in conformance with existing license requirements, they will be replaced with fully qualified devices. Refer to Generic Replacement Schedule 2.

SCEWS No. D-1-1

1982 TER No. 28

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. B)

None

II) SER concerns: **I.B Equipment Qual. Pending Modification; Pgs. 3-8 & 4-3 of TER.**

Response:

This equipment will be replaced with fully qualified devices for long term operability.

III) TER concerns: Same as II above.

Response:

Same as II above.

IV) **Proposed corrective action and schedule.**

Refer to corresponding equipment summary sheet.

V) **Justification for continued operation.**

__X__ Reaffirmed

_____ Revised

_____ New

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page D-1-9
Rev. C
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
Accident Mitigating **System:** Pressurizer **Plant ID No.:** FI 416A&B, FT 416 A&B **Component:** Acoustic Monitor Accelerometor & Preamp **Manufacture:** Sensor-Endevco Preamp-Unholts-Dickie **Model Number:** Sensor-2273AM20 Preamp-22CA-2TR **Function:** Monitor steam flow **Accuracy:** **Service:** Verify the opening & closing of the PORV's **Location:** Containment	**Operating Time**	Continuous	Continuous	Post TMI Requirement		Simultaneous Test	See Attached Summary Sheet
	Temperature (^{O}F)	267		Ref. 35 & Addendum1		Simultaneous Test	See Attached Summary Sheet
	Pressure (PSIA)	40 psig		Ref. 36		Simultaneous Test	See Attached Summary Sheet
	Relative Humidity(%)	100		Ref. 2 Sec. 3.1		Simultaneous Test	See Attached Summary Sheet
	Chemical Spray	2640 ppm Boron		Ref. 2 Sec. 3.6.4		Simultaneous Test	See Attached Summary Sheet
	Radiation	1.1 X 10^{7} Rads		Ref. 31		Sequential Test	See Attached Summary Sheet
	Aging	40 yrs.		Plant Design Life		Sequential Test	See Attached Summary Sheet
Flood Level Elev: 4'2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

SUMMARY SHEET NO. D-1-9

SCEW SHEET NO. D-1-9

Rev. 3: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

DISCREPANT EQUIPMENT SUMMARY

CONNECTICUT YANKEE

EQUIPMENT:

Acoustic Monitor FI-416A & B, FT-416A & B Accelerometer and Preamp

MANUFACTURER:

Endevco & Unholtz/Dickie (Babcock & Wilcox)

QUALIFICATION DISCREPANCY:

Lacks qualification test data at the present time.
(To be replaced with Technology for Energy Corporation).

SAFETY FUNCTION AND JUSTIFICATION FOR CONTINUED OPERATION:

This equipment has been procured on a risk release basis pending completion of vendor qualification testing. To date Babcock & Wilcox (B&W) has gone through several qualification efforts without success. In light of all the various difficulties the B & W testing have encountered, CYAPCO has decided to install the Technology for Energy Corporation (TEC) Acoustic Valve-Position Indicator System.

The basic design of the systems are identical except for the Charge Amplifier and associated housing. Therefore, CYAPCO has a high degree of confidence that the present system would perform its safety related function in an accident scenario. The reason being that the actual test profile is much more severe than the plant's design accident profile. There is significant margin between profiles.

The equipment modification and/or change outs will be performed during the 1984 refueling outage. The qualification documentation references will be identified at that time and submitted to the NRC for review if required.

The qualified life for this equipment will be determined in accordance with IEEE 323-1974 guidelines.

The present equipment was installed as part of the TMI Action Plan under Item 2.1.3a and is required to be operational by 1/1/81.

SCEWS No. D-1-9

1982 TER No. 29

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C dated 5/20/83)

1. Deleted environmental qualification and documentation qualification reference column information.

II) **SER concerns:** I.B. Equipment qualification pending modification.

Response: Refer to IV below

III) **TER concerns:** Same as II above.

Response:

Refer to IV below.

IV) **Proposed corrective action and schedule.**

Refer to corresponding equipment summary sheet Rev. 3 dated 5/20/83.

V) **Justification for continued operation.**

__X__ **Reaffirmed**

_____ **Revised**

_____ **New**

SCEWS No. D-1-9

1982 TER No. 30

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. C dated 5/20/83)

1. Deleted environmental qualification and documentation qualification reference column information.

II) **SER concerns:** I.B. Equipment qualification pending modification.

Response: Refer to IV below

III) **TER concerns:** Same as II above.

Response:

Refer to IV below.

IV) **Proposed corrective action and schedule.**

Refer to corresponding equipment summary sheet Rev. 3 dated 5/20/83.

V) **Justification for continued operation.**

__X__ **Reaffirmed**

_____ **Revised**

_____ **New**

Facility: CONNECTICUT YANKEE
Unit: Haddam Neck Plant
Docket: 50-213

SYSTEM COMPONENT EVALUATION WORK SHEET

Page D-4-1
Rev. 0
Date 5/20/83

EQUIPMENT DESCRIPTION	ENVIRONMENT			DOCUMENTATION REP*		QUAL. METHOD	OUTSTANDING ITEMS
	Parameter	Spec.	Qual.	Spec.	Qual.		
System: Accident Mitigating System Inst. Trans. **Plant ID No.:** LT 1810 A&B **Component:** Level Transmitter **Manufacture:** Gems-Delaval **Model Number:** XM-54852 **Function:** Detect CNTM Flood Level **Accuracy:** ±5% Span **Service:** *See Below **Location:** Containment	**Operating Time**	Continuous	Continuous	----	Ref. 79	Sequential Testing	
	Temperature (^{o}F)	267	381	Ref. 35 & Addendum #1	Ref. 79 Sec XII	Sequential Testing	
	Pressure (PSIA)	40 psig	60 psig	Ref. 36	Ref 79 Sec. XII	Sequential Testing	
	Relative Humidity(%)	100	100	Ref 2 Sec. 3.1	Ref 79 Sec. VII & XII	Sequential Testing	
	Chemical Spray	2640 ppm Boron	3000 ppm Boron	Ref. 2 Sec 3.6.4	Ref. 79 Sec VI & XII	Sequential Testing	
	Radiation	9.6×10^{6} Rads	2×10^{8} Rads	Ref. 31	Ref. 79 Sec. II	Sequential Testing	
	Aging	40 yrs.	40 yrs.	Plant Design Life	Ref. 79 Sec IV & XIV	Sequential Testing	
Flood Level Elev: 4'2" **Above Flood Level:** **Yes** X **No**	**Submergence**						

***Documentation References:**

See "List Of References" behind this section of worksheets.

Notes:

* Signal is transmitted to LIC 1810 A&B (Receiver RE 36562) located in Control Room

SCEWS No. D-4-1

1982 TER No. 25

Date: 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) **Summary of new information on SCEW sheet.** (Rev. D, 5/20/83)

SCEW sheet completely revised to indicate equipment now qualified.

II) **SER concerns:** I.B Equipment Qualification Pending Modification

Response: Pgs. 3-8 & 4-3 of TER.

Not applicable

III) **TER concerns:** Same as II above.

Response:

Not applicable

IV) **Proposed corrective action and schedule.**

Not Applicable

V) **Justification for continued operation.** Not Applicable.

_____ **Reaffirmed**

_____ **Revised**

_____ **New**

Prepared By J. S. Nicosia Date 5/20/83

Reviewed By W. H. Becker Date 5/20/83

EQUIPMENT ENVIRONMENTAL QUALIFICATION

____Millstone Unit 1 ____Millstone Unit 2 X Connecticut Yankee

CATEGORY 1 EQUIPMENT CHECKLIST

EQUIPMENT I.D.: MOV-508, 522, 535 & 578

FUNCTION: Loop Fill Valves (from Fill Header to each loop)

LOCATION: Containment

This equipment is subject to a harsh environment caused by incidents checked below:

X LOCA

X MSLB Inside Ctmt.

____ MSLB Outside Ctmt.

X HELB Inside Ctmt.

____ HELB Outside Ctmt.

Ia) Will failure of this equipment prevent satisfactory accomplishment of safety functions defined in 10CFR50.49 paragraph b (1)i, ii, iii.

____Yes X No

I) Is this equipment required to mitigate the consequences of the incident(s) checked above?

Ia) See above ____Yes X No

II) Is this equipment required to bring the plant to cold shutdown following an incident(s) checked above?

____Yes X No

III) Is this equipment specified in the emergency operating procedures for use after an incident(s) checked above?

____Yes X No

IV) Is this equipment required to perform a post accident monitoring/function following an incident(s) checked above?

____Yes X No

V) If answer is YES for any of the above, equipment is to be environmentally qualified

See SCEWS No. Not Applicable

VI) If answer is NO to all the above, provide justification below.

See attached for response to Loop Fill Valves

SCEWS No. Loop Fill Valves

1982 TER No. 1

Date: 1-20-83

EQUIPMENT ENVIRONMENTAL QUALIFICATION
SER/TER REVIEW

Connecticut Yankee

Docket No. 50-213

I) Summary of new information on SCEW sheet.

No SCEW sheet supplied.

II) SER concerns: I.B Equipment Qual. Pending Modification, Pgs. 3-8 & 4-3 of TER.
Response:

See attached sheet for response.

III) TER concerns: Same as II above.
Response:

See attached sheet for response.

IV) Proposed corrective action and schedule.

None

V) Justification for continued operation. Not Applicable

_____ Reaffirmed

_____ Revised

_____ New

SCE&S No. Loop Fill Valves

1982 TER No. 1

Date: 1-20-83

II) Response:

The item which has been addressed in the Franklin Research Center (FRC) Technical Evaluation Report (TER) does not require environmental qualification. This judgement has been made by CYAPCO based on the following criteria:

(1) the equipment performs no accident mitigating function,

(2) achieving safe shutdown does not require the use of or signal output from this equipment,

(3) the equipment is not addressed in any one of the CYAPCO emergency operating procedures, and

(4) the equipment is not required for post accident monitoring.

III) Response:

Adequate justification has been presented by CYAPCO to indicate why the loop fill valves need not be qualified.

Nonetheless, previous submittals have stated CYAPCO's position for the qualification of the Pressurizer PORV Isolation Valves. CYAPCO again reiterates its statement that;

"Due to the desirability of long term operability of this equipment and in conformance with existing license requirements it will be replaced with fully qualified devices."

VI) Response:

The loop fill valve system is used to supply borated water off the discharge of each charging pump and the metering pump. The fill header discharges through a flow meter, indicated on the Main Control Board (MCB), through two control valves. One of the control valves is air operated from the MCB for fine control. The other control valve is in parallel with the Air Operated Valve (AOV) and is a motor operated valve to be used when a greater demand is needed of the fill system than the AOV can handle. The fill system discharges to a header in the containment which supplies each loop fill Motor Operated Valve (MOV).

These valves are closed during normal plant operation and are generally used as a maintenance tool during shutdown.

These valves are manually operated and receive no Safety Injection Signal (SIS), therefore, they serve no accident mitigating function.

In addition, the loop fill system is not part of the normal and accident plant charging system. The regular charging system which is used for normal power operation and for accident operation is backed-up by High Pressure Safety Injection (HPSI) and Low Pressure Safety Injection (LPSI) Systems which are both capable of delivering ample water to the reactor core by design.

Docket No. 50-213

Connecticut Yankee Atomic Power Company

Haddam Neck Plant

Attachment 6

List of Qualification References

May 20, 1983

List of Qualification References

Attachment 6 contains a List of Qualification References used in the qualification effort for the Haddam Neck Plant. References 1-70 (inclusive) have been provided previously in Reference (10). References 71-79 are attached for your information in Attachment 7.

Facility: Connecticut Yankee
Unit: Haddam Neck Plant
Docket: 50-213

Attachment: November 1, 1980

List of References

For "System Component Evaluation Work Sheets"

1. Letter of 3/6/78 from CYAPCO, D. C. Switzer, to NRC, V. Stello, Jr. plus supplement #1 of July, 1978.
2. Haddam Neck Plant, "Facility Description and Safety Analysis".
3. Crane R & D Laboratory Report E.L. 7828-2, S.O. 952075 dated October 20, 1969.
4. Letter of 12/29/78 from CYAPCO, W. G. Counsil, to NRC, D. L. Ziemann, "Attachment - Haddam Neck Plant, Systematic Evaluation Program, Electrical Equipment Environment Qualification" dated December, 1978.
5. NUSCO Evaluation (GEE-78-387) dated 7/28/78.
6. NUSCO Evaluation (GEE-78-396) dated 7/28/78.
7. Crane Company letter of 2/1/78.
8. Crane Company letter of 2/2/78.
9. NUSCO Evaluation (GEE-78-382) dated 7/21/78.
10. NUSCO Evaluation (GEE-78-384) dated 7/20/78.
11. NUSCO Evaluation (GEE-79-449) dated 7/30/79.
12. NUSCO Evaluation (GEE-79-10) dated 1/4/79.
13. NUSCO Evaluation (GEE-78-383) dated 7/20/78.
14. Franklin Institute Report F-C2232-01 of November 1968.
15. Limitorque letter of 1/31/78.
16. Limitorque Test Report #600198 dated 1/2/69.

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List of References

For "System Component Evaluation Work Sheets"

17. Franklin Institute Report F-C3441 dated September 1972

18. NUSCO Evaluation (GEE-78-411) dated 8/3/78.

19. Westinghouse Electric letter CY-W-78-518 dated 4/5/78 (with Attachments 1, 2 and 3 plus the Enclosure titled "CYW Containment Fan Cooler Motors Qualification").

20. NUSCO Evaluation (GEE-78-388) dated 7/28/78.

21. Stone & Webster - Report No. 4 dated 9/6/78. (Section A).

22. Amendment 47 to San Onofre FSAR - pages 6A-32, 33, and 6B-17, 18 and 19.

23. NUSCO Evaluation (GEE-79-29) dated 1/11/79.

24. NUSCO Evaluation (GEE-79-340) dated 5/31/79.

25. CYAPCO - Plant Design Change Request No. 270 dated 1/28/78.

26. CYAPCO letter of 2/2/78, Switzer to NRC, A Schwencer.

27. CYAPCO letter of 2/10/78, Switzer to NRC, A. Schwencer.

28. NUSCO Evaluation (GEE-78-127) dated 3/27/78.

29. CYAPCO letter of 3/29/78, Switzer to NRC, Ziemann.

30. NUSCO Evaluation (GEE-79-150) dated 3/9/79.

31. NUSCO internal letter (NEE-80-RA-439) dated 8/12/80.

32. NUSCO Specification 970 dated April 30, 1975, plus Addendum of February 17, 1978.

33. Rockbestos Qualification of "Firewall SR" Class 1E Electrical Cable - dated March 2, 1978. (proprietary)

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List of References

For "System Component Evaluation Work Sheets"

34. NUSCO internal letter (NEE-80-RA-527) dated 9/23/80.

35. Containment Temperature Profile (See Item B1, Haddam Neck Submittal) & Addendum #1

36. Containment Pressure Profile (See Item B1, Haddam Neck Submittal)

37. NAMCO Test Report of September 5, 1978. (Proprietary)

38. Valcor Engineering Qualification Test - QR 52600-515. (Proprietary)

39. "Qualification Test Report for Litton Connector and Receptacle" as performed by Litton Precision Products International. QR-5402-1

40. NESCO Specification for QA Category 1 Coax and Triax Cable for Nuclear Power Stations, SP-CEE-34, Rev. 0, 1/8/79.

41. (Rockbestos-Qualification of "Firewall III" Coax Construction Cable dated January 18, 1978-Proprietary)-Deleted

41a. Rockbestos-Qualification of Second Generation Solid Dielectric Coaxial Construction, Report #2806 dated April 23, 1982-Proprietary

41b. Rockbestos-Qualification of "Firewall III" Coaxial Constructions, Revision 1 dated March 15, 1979-Proprietary

41c. (Future Rockbestos 100 Day Report)

42. Automatic Switch Company letter of September 29, 1980 from T. R. Hays to Woodrow C. Saccoccio (NUSCO).

43. Franklin Research Center Report No. F-C4911-3 dated May 1979. (Proprietary)

44. Wyle Laboratory Report No. 17436-1 dated 10/8/80. (Proprietary)

45. NUSCO interoffice memo of 7/24/80 from J. P. Donohue to R. J. DeRosa-"MP-2 Environmental Qualification"

46. Westinghouse - WCAP 7829, April 1972.

47. Franklin Research Center Report No. F-C4911-2 W and G.E. TB's (March 1978).

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List of References

For "System Component Evaluation Work Sheets"

48. Samuel Moore & Company - Performance Capabilities LO-255 (Proprietary)

49. Collyer Insulated Wire Company, Inc. Collyer Technical Report No. 67-2. (Proprietary)

50. Collyer Insulated Wire Company, Inc., Description: PE Insulated/PVC Jacketed 1KV Control Cable LO-193/LO-279. (Proprietary)

51. Northeast Utilities internal letter GEE-80-617 of 9/2/80 from J. S. Nicosia to W. H. Becker - "CY Ambient Temperature Condtions".

52. Wyle Labs. Report No. 17436-3 of 10/23/80.

53. NUSCO Specification, SP-GEE-44, Rev. 2, 7/31/78.

54. NUSCO Specification, SP-GEE-20, Rev. 0, 1/25/80.

55. Brand - Rex Company, Technical Attachment to SP-GEE-20. (Proprietary)

56. The Foxboro Company Test Report No. T3-1068 (Radiation) (Proprietary)

57. The Foxboro Company Test Report No. T3-1097 (Radiation) (Proprietary)

58. The Foxboro Company Test Report No. Q9-6005. Maximum Credible Accident (MCA). (Proprietary)

59. The Foxboro Company Test Report No. T3-1013. Maximum Credible Accident (MCA). (Proprietary)

60. The Foxboro Company Test Report No. T3-1013 (Supplement) Maximum Credible Accident (MCA). (Proprietary)

61. Letter of October 27, 1980 from Kerite Company, S.S. Nelmes to NUSCO, L.D. Davison-Supplemental Qualification Data (Proprietary)

62. NUSCO Specification, SP-GEE-40, Rev. 2, 6/27/80

63. Conax Corporation, Design Qualification Report for Penetration Assemblies IPS-434-1, 2 & 3 (Proprietary) sent to FRC for review in August 1980.

64. General Atomic Company, Test Report E-254-960, Rev. 1, dated 5/1/81, Qualification of Analog High Range Radiation Monitor-in NUSCO file for audit.

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List Of References

For "System Component Evaluation Work Sheets"

50. Collyer Insulated Wire Company, Inc., Description: PE Insulated/PVC Jacketed 1KV Control Cable LO-193/LO-279. (proprietary)

51. Northeast Utilities internal letter GEE-80-617 of 9/2/80 from J. S. Nicosia to W. H. Becker - "CY Ambient Temperature Conditions".

52. Wyle Labs. Report No. 17436-3 of 10/23/80.

53. NUSCO Specification, SP-GEE-44, Rev. 2, 7/31/78.

54. NUSCO Specification, SP-GEE-20, Rev. 0, 1/25/80.

55. Brand - Rex Company, Technical Attachment to SP-GEE-20. (proprietary)

56. The Foxboro Company Test Report No. T3-1068 (Radiation) (proprietary)

57. The Foxboro Company Test Report No. T3-1097 (Radiation) (proprietary)

58. The Foxboro Company Test Report No. Q9-6005. Maximum Credible Accident (MCA). (proprietary)

59. The Foxboro Company Test Report No. T3-1013. Maximum Credible Accident (MCA). (proprietary)

60. The Foxboro Company Test Report No. T3-1013 (Supplement) Maximum Credible Accident (MCA). (proprietary)

61. Letter of October 27, 1980 From Kerite Company, S.S. Nelmes to NUSCO, L.D. Davison- Supplemental Qualification Data (proprietary)

62. NUSCo Specification, SP-GEE-40, Rev. 2, 6/27/80

63. Conax Corporation, Design Qualification Report for Penetration Assemblies IPS-434-1, 2 &3 (Proprietary) sent to FRC for review in August 1980.

64. General Atomic Company, Test Report E-254-960, Rev 1, Dated 5/1/81, Qualification of Analog High Range Radiation Monitor-in NUSCo file for audit.

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List of References (con't)

65. Conax Corporation, Electric Conductor Seal Assemblies, IPS-412.

66. Conax Corporation, Design Qualification Material Test Report, IPS-325, Rev. C, dated 11/2/79.

67. Westinghouse - WCAP 9003, January 1969

68. Westinghouse letter dated January 17, 1967 on Containment Fan Motors F-17-1, 2, 3, & 4 to Stone & Webster Engineering Corporation.

69. C.A.R. Fan Motor Nameplate Data.

70. Westinghouse - WCAP 8754, June 1976, Environmental Qualification of Class 1E Motors for Nuclear Out-Of-Containment Use.

71. Limitorque - Qualification Report #600456, dated 12/9/75

72. ASCO - Qualification Report #AQS21678/TR - Rev. A, July 1979

73. ASCO - Qualification Report #AQR-67368/Rev. 0, March 2, 1982

74. Weidmuller - Qualification Report F-C5205-3, October 1979

75. Weidmuller - Aging Letter, June 10, 1980

76. Limitorque Report #600198 dated 2/2/79

77. Limitorque Report #600376A dated 2/23/79

78. NUSCO Connector Specification SP-EE-113, Rev. 1 dated 5/26/82

79. Wyle Qualification Report #45700-2, Dated 12/14/82.

5/20/83