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THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
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November 1, 1993

Docket No. 50-213
B14584

Re: License Condition 2.C.6

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Gentlemen:

Haddam Neck Plant
Integrated Safety Assessment Program

Connecticut Yankee Atomic Power Company (CYAPCO) is hereby submitting to the NRC Staff an updated report on the Haddam Neck Plant Integrated Safety Assessment Program (ISAP) in accordance with the license condition issued by the NRC Staff in License Amendment No. 150 to the Haddam Neck Plant license in a letter dated February 26, 1992.[1]

Since the last ISAP report was submitted to the NRC Staff, CYAPCO has performed reviews and updates of previous active ISAP topics. In those cases where there was a substantial change in scope, a full ISAP reevaluation was performed. Several new topics were added and evaluated if sufficient project scope was available. As a result, revised analytical ranking methodology (ARM) scores were defined and a new integrated implementation schedule (IIS) was developed. The revised IIS, provided in this report, was developed fully consistent with the program plan submitted to the NRC Staff in the December 23, 1991,[2] letter.

CYAPCO continues to pursue the closure of open IIS commitments. This submittal includes closure documentation for 23 topics. If the Staff concurs, the number of active ISAP topics would be reduced to 24.

Attachment 1 to this letter provides a list of all the ISAP topics, including both open topics and those topics considered closed by CYAPCO. Attachment 2 provides updates on those open, active ISAP topic reviews discussed previously. Attachment 3 describes new topics being added to the Haddam Neck Plant ISAP or existing topics which have recently been reevaluated in ISAP. Attachment 4 provides a summary table of the ISAP ARM scores and installation man-rem for each

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(1) J. F. Stolz letter to J. F. Opeka, "Issuance of Amendment (TAC Nos. M67774 and M67799)," dated February 26, 1992.

(2) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program," dated December 23, 1991.

project recently reevaluated. Attachment 5 provides the updated IIS, including both old and new topics. Attachment 6 provides a list and summary discussion for those topics being proposed for closure by CYAPCO.

CYAPCO respectfully requests that the NRC Staff review and respond back to CYAPCO within 60 days of receipt of this letter as to whether or not you concur with our positions outlined herein. We remain available to discuss the report with you at your convenience.

Please contact us if you have any questions.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

J. F. Opeka
Executive Vice President

Attachment 1--List of ISAP Topics
Attachment 2--Update on ISAP Topic Reviews
Attachment 3--Evaluation of New ISAP Topics or Reevaluation of Existing Topics
Attachment 4--ISAP ARM Summary Table
Attachment 5--Integrated Implementation Schedule
Attachment 6--Proposed Topics for Closure

cc: T. T. Martin, Region I Administrator
A. B. Wang, NRC Project Manager, Haddam Neck Plant
W. J. Raymond, Senior Resident Inspector, Haddam Neck Plant

Docket No. 50-213
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Attachment 1

Haddam Neck Plant

Integrated Safety Assessment Program

List of ISAP Topics

November 1993

Haddam Neck Plant
Integrated Safety Assessment Program
List of ISAP Topics

Topic Number	Closed[1]	Title
1.01	3-2-89	Switchgear Room Cooling Modifications
1.02		High/Low Pressure Valve Interlocks
1.03	11-1-93	Containment Penetration Evaluations
1.04		Seismic Qualification of Safety-Related Piping
1.05		Seismic Structural Modifications
1.06	11-1-93	Wind and Tornado Loadings/Tornado Missiles
1.07	3-2-89	Vital Bus Feed Realignment Modifications
1.08	3-2-89	Seismic Modifications to Reactor Coolant System
1.09	3-23-93	Design Codes, Design Criteria, and Load Combinations
1.10	9-28-90	Torque Switch Modifications
1.11	4-30-90	PAB Ventilation System Modifications
1.12	3-23-93	Control Room Habitability
1.13	3-2-89	Inadequate Core Cooling Instrumentation
1.14	9-28-90	Appendix R Modifications
1.15	3-2-89	FDSA Update
1.16	4-30-90	Anticipated Transients Without Scram (ATWS)
1.17	3-2-89	Replacement of Motor Operated Valves
1.18		Reactor Coolant Pump Seal Cooling Modifications
1.19		Control Room Design Review
1.20	3-2-89	Safety Parameter Display System
1.21		Regulatory Guide 1.97 Instrumentation
1.22	3-2-89	Emergency Response Facilities Information
1.23	4-30-90	Post-Accident Hydrogen Monitors
1.24	3-2-89	Technical Specification Surveillance for Hydraulic Snubbers
1.25	3-2-89	Technical Specification Surveillance for Mechanical Snubbers
1.26	3-2-89	Relief Valve and Safety Valve Testing
1.27	3-2-89	Compliance with 10CFR50.46
1.28	3-2-89	Reactor Coolant Pump Trip
1.29	3-2-89	Flooding Evaluation
1.30	8-4-92	Reactor Protection System Isolation
1.31	3-23-93	Pipe Breaks Outside Containment
1.32	3-2-89	Item 2.1, Equipment Classification and Vendor Interface Reactor Trip System Components)
1.33	3-2-89	Items 3.1.1 and 3.1.2, Post-Maintenance Testing Procedures
1.34	3-2-89	Item 3.1.3, Post-Maintenance Testing Technical Specification Changes

Topic Number	Closed[1]	Title
1.35	3-2-89	Item 4.1, Reactor Trip System Reliability (Vendor-Related Modifications
1.36	12-6-91	Item 2.2, Equipment Classification and Vendor Interface (Programs for all Safety-Related Components)
1.37	3-2-89	Items 3.2.1 and 3.2.2, Post-Maintenance Testing Procedures
1.38	3-2-89	Item 3.2.3, Post-Maintenance Testing Technical Specifications.
1.39	12-6-91	Items 4.2.3 and 4.2.4, Preventative Maintenance Procedures for Reactor Trip Breakers
1.40	4-30-90	Items 4.5.2 and 4.5.3, Reactor Trip System Testing
1.41	3-2-89	Item 4.5.1, Reactor Trip System Functional Testing
1.42	4-30-90	Reactor Coolant System Vents Technical Specifications
1.43	4-30-90	Technical Specifications from Generic Letter 83-37
1.44	3-2-89	Diesel Generator Reliability
1.45	3-2-89	Inservice Inspection Update to 1980 Code
1.46	3-2-89	Inservice Testing for Diesel Generator Auxiliaries
1.47	3-2-89	Reliability Engineering
1.48		Seismic Qualification of Equipment
1.49	3-2-89	Steam Generator Tube Integrity
1.50	3-2-89	Fracture Toughness in Supports
1.51	3-2-89	Systems Interactions
1.52	3-2-89	Reactor Vessel Pressure Transient Protection
1.53	3-2-89	Containment Emergency Sump Performance
1.54	3-28-91	Safety Implications of Control Systems
1.55	3-2-89	Radiation Protection Plans
1.56	3-2-89	Bolting Degradation
1.57	3-2-89	Flooding of Safety Equipment by Backflow
1.58	3-2-89	Steam Binding of Auxiliary Feedwater Pumps
1.59	3-2-89	Additional Low Temperature Over-Pressure Protection
1.60	3-2-89	RCS/RHR Suction Line Valve Interlock
1.61	3-2-89	Pressurized Thermal Shock
1.62	3-2-89	Feed-and-Bleed System Modifications
1.63	4-30-90	Hydrogen Control
1.64		System Dependencies on MCC-5
1.65	3-2-89	Steam Generator Tube Rupture Thermal-Hydraulic Analysis
1.66	3-2-89	Containment Integrated Leak Rate Test
1.100	4-30-90	Appendix J Modifications (P74-77)
1.101	4-30-90	Steam Generator Overfill Protection (Combined with Topic 1.54)
1.102		RCS Vent System Upgrade
1.103	12-6-91	Fire Barrier Penetration Seal Program Upgrade

Topic Number	Closed[1]	Title
1.104	11-1-93	Containment Isolation Valve Position Indication
1.105	12-6-91	NRC Bulletin 88-8, Piping Thermal Stress
1.106	4-30-90	Further Event V Analyses (Combined with Topic 1.02)
1.107	4-30-90	Charging Pump Importance
1.108	4-30-90	Review of Bayesian Updating
1.109	4-30-90	Refueling Cavity Seal Gate Closure
1.110	3-2-89	(Project Dropped)
1.111	12-6-91	Cable Vault Flooding
1.112	9-28-90	Fire Protection System Upgrades
1.113	3-23-93	Loss of Control Air Supply
1.114	3-23-93	Category 1 Piping Evaluation
1.115	8-4-92	Generic Letter 87-12, Loss of Residual Heat Removal (RHR), and Generic Letter 88-17, Loss of Decay Heat Removal
1.116	3-23-93	Station Blackout
1.117	4-30-90	CY Single Failure Modifications
1.118		Main Steam Safety Valve Capacity
1.119		MOV Testing, Generic Letter 89-10
1.120	8-4-92	Service Water, Generic Letter 89-13
1.121		Post Accident Sample System Enhancement Modifications
1.122	8-4-92	Auxiliary Feedwater (AFW) Modifications
1.124	11-1-93	Replace NG-SOV-470
1.125		Electric AFW Pump--Core Melt Frequency
2.01	4-30-90	Secondary Side Chemistry Monitoring
2.02	3-28-91	Demineralized Water Storage Tank Oxygen Reduction
2.03	11-1-93	Additional Atmospheric Steam Dump
2.04		Modernize Reactor Protection and Control Systems
2.05	3-2-89	Process Computer Replacement
2.06	3-2-89	Evaluation of RCS Loop Isolation Valves to Mitigate SGTR
2.07	3-2-89	Auxiliary Pressurizer Spray Nozzle
2.08	3-2-89	Loss of DC Power Study
2.09	3-2-89	RCP Vibration Monitoring System Upgrade
2.10	3-2-89	Administration Building Upgrades
2.11	3-2-89	Main Steam System Evaluation
2.12	3-2-89	Turbine Generator Trip Logic
2.13	9-28-90	Fire Detection System Upgrade
2.14	3-28-91	Radiation Monitoring System Upgrade
2.15	4-30-90	Long-Term Small Break LOCA and ECCS Modifications
2.16	4-30-90	Variable Overpower Trip Modifications
2.17	8-4-92	Zircaloy Clad Conversion
2.18	9-28-90	Nuclear Instrumentation Replacement
2.19	3-2-89	PCB Oil-Filled Transformers
2.100	4-30-90	Reactor Head Stud Tensioner

Topic Number	Closed[1]	Title
2.101	4-30-90	Spare Reactor Coolant Pump Motor Storage Facility
2.102	4-30-90	Radiological Assessment Equipment Procurement
2.103	3-28-91	Primary Auxiliary Building Monorails over LPSI Pumps
2.104	4-30-90	Service Water System Surge Analysis
2.105	9-28-90	Control Rod Drive Cooling Duct
2.106	11-1-93	Hotwell Sampling System
2.107		Secondary Makeup Water Inventory
2.108	4-30-90	Core Exit Thermocouple Modifications
2.109	11-1-93	DH-MOV-310 Replacement
2.110	12-6-91	Security Computer Replacement
2.111	3-28-91	ALARA Modifications
2.112	3-23-93	Permanent Shielding
2.113	11-1-93	Pressurizer Spray Valves
2.114	8-4-92	Auxiliary Feedwater Pump Turbine Overspeed Trip Protection
2.115	11-1-93	Site Facilities Modifications
2.116	8-4-92	EDG Fuel Oil Supply
2.117	3-28-91	Steam Generator ECT Inspection
2.118		Service Water Control Switch/Position Indication
2.119	8-4-92	Service Water Trip Valve/Waste Evaporation Steam Valve
2.120	3-28-91	Reactor and Pressurizer Head Vent Valve Replacement
2.121	3-28-91	Site Foundation Issue
2.122		Spent Fuel Storage Program
2.123	8-4-92	Flux Mapping System Replacement
2.124	8-4-92	Charging Pump Mini-Flow Valve Replacement
2.125	9-4-92	Service Water System Filters and Strainers
2.126		Service Water System Pump and Turbine Header Upgrade
2.127	8-4-92	Turbine Generator Hydrogen Dryer Replacement
2.128		Steam Generator Repair Analysis
2.129	11-1-93	High Pressure Turbine Replacement
2.130		Service Water Supply to Closed Cooling Water System
2.131	11-1-93	Charging Pump Operation Upon Loss of Semi-Vital Power
2.132	8-4-92	Emergency Diesel Generator Service Water Header Crosstie
2.133	11-1-93	345 kV Supervisory Control Equipment
2.134	12-6-91	Intake Structure Debris Boom Upgrade
2.135	11-1-93	Low Voltage Molded Case Circuit Breaker Replacement
2.136	11-1-93	Auxiliary Feedwater Supply Study--New Storage Tank
2.137	11-1-93	Hypochlorite System Upgrade
2.138	8-4-92	Radiation Information Tracking System Update
2.139	3-23-93	Reactor Coolant System Drain Cooler Replacement
2.140	8-4-92	Modify Pressurizer Level Sensing Lines
2.141	8-4-92	Electrical Separation Modifications

Topic Number	Closed[1]	Title
2.142	8-4-92	Adams Filter Bypass MOV Actuator Replacement
2.143	3-23-93	Auxiliary Feedwater--Direct Flowpath to Steam Generators
2.144	11-1-93	Primary Water Makeup Modifications
2.145		Installation of New Air Cooled Diesel Generator
2.146		Individual RPI Upgrade
2.148	11-1-93	Containment Isolation Valve Replacement
2.149	11-1-93	Spare Station Service Transformer
2.150	3-23-93	Spent Fuel Pool Cleanup
2.151		Simulator Upgrade--Phase 3
2.152	11-1-93	ADT System Evaluation
2.153	11-1-93	Reactor Vessel Level Indication System
2.154		Emergency Diesel Generation Ventilation
2.155	11-1-93	Removal of Abandoned Water Treatment Components (task not evaluated-canceled)
2.156	11-1-93	CY's Environmental DG Tank Berm(task not evaluated-canceled)
2.157	11-1-93	CY On-Site Radwaste Storage Area(task not evaluated-canceled)

(1) Date refers to the periodic ISAP/IIS submittal providing proposed justification for closure of topic.

Docket No. 50-213
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Attachment 2

Haddam Neck Plant
Integrated Safety Assessment Program
Update on ISAP Topic Reviews

November 1993

Haddam Neck Plant
Integrated Safety Assessment Program
Update on ISAP Topic Reviews

Topic 1.02--High/Low Pressure System Interface & Event V Analysis

This topic involves the addition of pressure interlock circuitry to the motor-operator valves (MOVs) used for the isolation of the Reactor Coolant System (RCS) from other systems that have lower design pressure ratings which evolved from the Systematic Evaluation Program (SEP). The objective is to prevent potential overpressurization of connected systems caused by the RCS pressure. A detailed description of this topic was provided in the March 28, 1991 ISAP update report.

This project has been deferred due to recent analyses which indicate that the delay in MOV opening because of the pressure interlock would affect Emergency Core Cooling Performance. CYAPCO has reevaluated this issue and has included a new evaluation in Attachment 3. The proposed modifications are scheduled for installation during the Cycle 18 refueling outage.

Topic 1.04--Seismic Qualification of Safety Related Piping

This topic addresses CYAPCO's program to demonstrate the seismic adequacy of the safety-related piping at the Haddam Neck Plant.

A detailed description of this topic was provided in the September 28, 1990 ISAP update report.

The planned seismic supports have been divided into several groups and may be evaluated individually. Service water supports in the Primary Auxiliary Building (PAB), main steam supports outside containment, and main feed supports outside containment require further engineering analysis. The entire issue of seismic qualification of piping is being reevaluated at the Haddam Neck Plant. This reevaluation centers around the degree of modifications necessary, if any, to demonstrate the seismic adequacy of the piping systems. A discussion on the proposed approach to address seismic adequacy was provided in CYAPCO's letter of July 9, 1993.[1] The results of this approach will be reported in a future ISAP/IIS report.

Topic 1.05--Seismic Structural Modifications

This topic encompasses CYAPCO's analysis of safety-related structures based on seismic piping loads developed as part of Topic 1.04. The only open issue remaining under this topic is qualification of the auxiliary feedwater building as affected by the attachment of new loads resulting from the seismic qualification of safety-related piping (Topic 1.04).

An updated ISAP evaluation was performed for this topic and reported in the April 30, 1990 report. The results revealed a moderate public safety benefit.

Additional discussion of this topic was provided in a letter dated September 30, 1991[2] as part of the response to SEP Topic III-6, Seismic Design Considerations. Included in the response were a listing of all the related open items understood by CYAPCO as needing resolution; and a detailed response for each open item and supporting information.

As part of our seismic reanalysis of the auxiliary feedwater (AFW) pumphouse (Terry turbine building), potential structural modifications may be identified. The results of this evaluation and a schedule for implementation, as appropriate will be documented in a future ISAP/IIS update report.

Topic 1.18--Reactor Coolant Pump Seal Cooling Modifications

Previous ISAP reports have detailed how this issue has been largely resolved for the Haddam Neck Plant. The only open issue remaining under this topic is Generic Issue 23. CYAPCO is awaiting NRC Staff action in this area.

Topic 1.19--Control Room Design Review

This topic encompasses the Control Room Design Review (CRDR) performed at the Haddam Neck Plant to meet the provisions of NUREG-0737, Supplement 1, as implemented by Generic Letter 82-33. The individual Human Engineering Discrepancies (HEDs) have been organized into individual work packages to facilitate resolution. These packages have been described in previous ISAP reports.

Implementation of all the individual groups of HEDs, as reported to the NRC Staff in previous ISAP reports, is scheduled in the IIS as follows:

- Group 1: EDG Controls--Cycle 17 refueling outage (R.O.) (Completed)
- Group 2: Main Control Board--Cycle 17 R.O. (Completed)
- Group 3: Containment Isolation Valve Position--Cycle 18 R.O.
- Group 4: HVAC Modifications--Cycle 16 R.O. (Completed)
- Group 5: Master Silence Switch--Cycle 16 R.O. (Completed)
- Group 6: Rewiring Turbine Drain Valve Switches--(not to be corrected)
- Group 7: Improved Communications in Masks--Cycle 17 R.O. (Completed)
- Group 8: Individual Main Steam Line Monitors (Canceled)
- Group 9: Main Control Board Railing--Cycle 16 R.O. (Completed)

- Group 10: Computer Displays--Cycle 17 R.O. (Completed)
- Group 11: Meter and Recorder Scales--Cycle 17 R.O.(Completed)
- Group 12: Eliminate Annunciator Nuisance Alarms--Cycle 17 R.O.(Completed)
- Group 13: Control Board Relabeling--Cycle 18 R.O.

Groups 1, 2, 7, 10, 11 and 12 were completed during the Cycle 17 Refueling Outage. The remaining 2 issues will be resolved during the next refueling outage. The modifications proposed for resolution of Group 3 HEDs are being reexamined to determined if any alternatives are available. Group 8 modifications have been canceled since there are alternate means available at Haddam Neck to identify a steam generator tube rupture. This cancellation is a result of a detailed analysis performed by CYAPCO which determined the modification was not justified.

In a letter dated March 13, 1991,[3] the NRC Staff provided a safety evaluation closing out this issue.

Topic 1.21--Regulatory Guide 1.97 Instrumentation

This topic addresses Regulatory Guide (RG) 1.97 which describes a method acceptable to the NRC for providing instrumentation to monitor plant variables and systems during and following an accident. On December 17, 1982, Generic Letter (GL) 82-33, was issued and subsequently published as Supplement 1 to NUREG-0737 requesting submittal of a report describing how plants meet the criteria of RG 1.97, and its application to a proposed emergency response facility.

Details regarding past correspondence between CYAPCO and the NRC Staff have been provided in previous ISAP update reports. More recently, in a letter dated April 13, 1992,[4] the NRC Staff requested that CYAPCO provide a status of the 12 remaining Regulatory Guide 1.97 instruments and provide technical justifications or acceptable alternatives for deviations from the Regulatory Guide.

In a letter dated July 6, 1992,[5] CYAPCO provided the NRC Staff with the information requested. Subsequent discussions have been held with the NRC Staff. An additional submittal will be made by CYAPCO in the near future to resolve the remaining Staff questions.

This topic will remain open until resolution on the remaining instruments have been reached.

Topic 1.48--Seismic Qualification of Equipment

This topic encompasses CYAPCO's plant-specific response to USI A-46, "Seismic Qualification of Equipment in Operating Plants." CYAPCO is addressing this issue in conjunction with the Seismic Qualification Utility Group (SQUG) and has reported details in previous ISAP reports.

In a letter dated May 22, 1992, the NRC Staff issued Supplement No. 1 to their Generic Letter No. 87-02. The letter provides their Supplemental Safety Evaluation Report on the SQUG Generic Implementation Procedure (GIP), Revision 2. In this letter, the Staff required a response to GL 87-02 within 120 days of the date of the letter. CYAPCO's September 21, 1992 letter provided the Haddam Neck response to Supplement 1 of Generic Letter 87-02. CYAPCO indicated that they intend to comply with the SQUG commitments set forth in Revision 2 of the GIP, including the clarifications, interpretations, and exceptions identified in SSER-2 in order to satisfy Generic Letter 87-02. In addition, CYAPCO stated that, at our option, CYAPCO may use any of the methods recommended by Section 4.2 of the GIP for defining in-structure response spectra for comparison to the SQUG Bounding Spectrum and the Generic Earthquake Ruggedness Spectra.

During the Cycle 17 refueling outage, CYAPCO completed all of the final walkdowns of the safe shutdown equipment list (SSEL). CYAPCO plans to submit the SSEL Report, the relay evaluation report, and the Seismic Evaluation Report, 180 days following the completion of the Cycle 17 refueling outage. As part of these reports, CYAPCO will define a proposed schedule for the complete resolution, future modification, and/or replacement of those equipment outliers which need to be resolved. The priority for action will be evaluated by using ISAP.

Topic 1.64 - System Dependencies on MCC-5 Electrical Separation Modifications

This ISAP topic was identified by the NRC Staff in the draft Integrated Safety Assessment Report (ISAR). The topic addresses a failure of MCC-5 as a contributor to the total core melt frequency in the Haddam Neck PSS. The Staff proposed that CYAPCO evaluate further design changes to help reduce overall core melt frequency. Additional details regarding this topic were provided in the September 28, 1990 ISAP update report.

Two efforts which are closely related to the study conducted under this ISAP topic are ISAP Topic 1.06, "Wind and Tornado Loadings/Tornado Missiles," and the Haddam Neck Risk Reduction Initiatives. All together, these efforts investigated the core melt frequency and risk reduction benefits of further design and procedural changes at Haddam Neck. Modifications to MCC-5, which were installed in Cycle 17, are repowering certain (some redundant) equipment from MCC-5 to MCC12-11 in the new switchgear building. This is being done as a result of the large contribution to risk that the loss of MCC-5 would cause the plant. A manual valve (RH-V-808A) planned for a replacement with a motor-operated valve

(MOV) has been deferred. The project is being reevaluated to determine the risk reduction/cost benefit.

A proposed technical specification change has been submitted via CYAPCO's letter of August 18, 1993,[6] which will allow testing of the Automatic Bus Transfer scheme in MODES 1, 2, 3, and 4.

Topic 1.102--RCS Vent System Upgrade

This project will be discussed in a future ISAP/IIS update report.

Topic 1.118--Main Steam Safety Valve Capacity

CYAPCO has identified several options which will resolve this issue. An engineering evaluation will consider each recommendation. Once the project assignment detailed review is complete, any forthcoming potential modifications will be reviewed within the ISAP process. This evaluation and associated information will be submitted in a future ISAP/IIS update report.

Topic 1.119--Safety-Related Motor Operated Valve Testing, Generic Letter 89-10

This topic addressed evaluation of potential modifications which may result from implementation of guidance as detailed in NRC Generic Letter (GL) 89-10, Safety Related Motor Operator Valve Testing and Surveillance, dated June 28, 1989. In a letter dated December 15, 1989,[7] CYAPCO responded to the GL discussing development of the MOV program and proposed schedule. The NRC conducted an inspection at the Haddam Neck Plant the week of October 5 through 9, 1992 on the MOV program.

Proposed modifications that result from CYAPCO's GL 89-10 valve testing program will be evaluated in ISAP. The results of these evaluations will be reported in a subsequent ISAP/IIS update report.

Topic 1.121--Post Accident Sample System Enhancement Modifications

This topic involves modifications to improve the Post Accident Sampling System Reactor Coolant Sample Module. Procedure and hardware changes are proposed to improve the ability to separate dissolved gas samples from the reactor coolant system and quantitatively analyze the sample for hydrogen and noble gases.

Once the detailed project review is complete, forthcoming modifications will be reviewed within the ISAP process. Currently, the following modifications are envisioned:

- Installation of a vacuum pump and vent line to the RCS PASS gas loop tubing to vent off the nitrogen purge gas prior to obtaining a dissolved gas sample.

- Installation of a pressure regulating valve upstream of the pH instrument to allow the instrument to be kept on-line at any RCS pressure without damaging the instrument.

- Replacement of the existing liquid loop temperature sensor with a direct immersion type.

- Installation of strainers in the RCS PASS inlet lines.

- Modification of the tubing configuration immediately upstream and downstream of the sample flow sensor to provide the required amount of straight, uninterrupted tubing upstream and downstream of the flow sensor resulting in more accurate flow measurements.

This topic has been tentatively scheduled for installation during Cycle 18. The results of the ISAP evaluation will be presented in the next ISAP report.

Topic 1.125--Electric AFW Pump--Core Melt Frequency

The project proposes to install a new electric driven auxiliary feedwater (AFW) pump to be used in addition to the two presently installed turbine driven AFW pumps.

The Haddam Neck Plant has two safety grade AFW pumps both of which are turbine driven. An additional AFW pump would provide diversity and additional redundancy. There are also benefits realized in addressing postulated high energy line breaks inside the Terry turbine building. CYAPCO committed to install the additional electric driven AFW pump during the Cycle 18 refueling outage in a letter dated December 24, 1991.[8] The task has been reevaluated. The results of the study are presented in Attachment 3. CYAPCO continues to plan installation of the electric AFW pump during the Cycle 18 refueling outage.

Topic 2.04--Modernize Reactor Protection and Control Systems

This topic addresses aging of instrumentation in the reactor protection and control systems. It includes projects originally included under Topic 1.30. CYAPCO's evaluation has yielded cost estimates and recommendations for a four-phased approach for implementing hardware/system replacements.

Phase IV is the remaining phase. Phase IV, ISAP topic 2.04.2, would upgrade the manual initiation and reset of containment isolation and main steam isolation. This task will be re-scheduled in a future IIS.

Topic 2.107--Secondary Makeup Water Inventory

The purpose of the topic was to study alternate methods of increasing the on-site inventory of seismically qualified secondary makeup water.

CYAPCO has placed this project on hold pending the completion of related issues (i.e., ISAP Topics 1.06 and 2.136) that will directly affect the approach CYAPCO will take to resolve the concerns associated with this topic.

Topic 2.118--Service Water Control Switches/Position Indication

The existing SW-MOV-1, 2, 3, 4 control logic automatically shuts these valves for certain events to shed nonessential Service Water (SW) loads. If any of these isolated loads are required to help mitigate the consequences of an event, an operator must be dispatched to either MCC-5 or the Primary Auxiliary Building (PAB) to open the appropriate valve.

The proposed project would provide additional control capabilities and position indication of these valves within the control room. The new switches would be functionally identical and in addition to the existing switches. Existing switches are located on MCC-5 (SW-MOV-1 & 2) and on the PAB wall (SW-MOV-3 & 4).

This topic was evaluated and reported in the September 28, 1990 ISAP update report. The installation of additional control capabilities within the control room for SW-MOV-1, 2, 3, & 4 would give operators the capability to restore SW on an as-needed basis during certain events. These MOVs can be operated from the "A" switchgear room (MOV 1 & 2) and the PAB (MOV 3 & 4) (or locally). This project received moderate public safety and personnel productivity benefits and thus resulted in a moderate overall ranking. The project is being reevaluated to determine if alternatives to modifications will resolve the related issues.

Topic 2.122--Spent Fuel Pool Storage Program

In the 1998 time frame, the Haddam Neck Plant will lose full core off-load capabilities. Therefore, to correct this situation, CYAPCO is considering a partial reracking of the spent fuel pool to allow storage capability until the end of life.

The project received a high overall ARM ranking based on its high economic performance evaluation. Also, the project is essential to accommodate continued future plant operation. The schedule will be discussed in a future ISAP/IIS report once future engineering studies are complete.

Topic 2.126--Service Water System Pump and Turbine Building Header Upgrade

The proposed modification involves enhancing service water flow to the secondary side components to: improve heat transfer capability during high river temperatures; protect the main turbine during plant trips; provide a back up source of water to the fire protection system; and reduce demand of the existing safety related service water pumps during normal plant operation. This would be accomplished via the installation of two non-QA pumps tied into the TB header downstream of SW-MOV 1&2. This would provide an additional source of service water flow to the TB auxiliary systems during turbine trips initiated by a SIAS provided a LNP was not experienced.

Currently, service water flow to the turbine building is automatically isolated during a loss of normal power (LNP) or Safety Injection Actuation Signal (SIAS) by the closing of SW-MOV-1&2. Service water cooling can be provided to the turbine lube oil coolers via the fire protection system by manually opening SW-MOV-30. Service water cooling can also be provided to the main exciter coolers via the well water supply line.

This project received a moderate overall ranking due to a high public safety benefit, negative personnel productivity score and substantial remaining project cost. A study to determine the most feasible approach to gaining the benefits, as described herein, has been scheduled in the IIS for completion in December 1993. The results and modifications identified from this study will be reported and scheduled in a future ISAP/IIS update report.

Topic 2.128--Steam Generator Repair Analysis

This topic involves engineering evaluation and potential modifications to repair degraded steam generator tubes. The steam generator tubes are currently experiencing primary water stress corrosion cracking (PWSCC). Repair methods, which will preserve the useful life of the steam generator tubes and return to service those tubes which have already been plugged due to PWSCC defects, are being evaluated. Potential repair methods include, but are not limited to: nickel plating of the tube inside diameter; hydraulic expansion of the tube within the tubesheet; sleeving of defective tubes; and roll expansion.

A project has been initiated to address the design acceptability and cost-effectiveness of repair options for the degraded steam generator tubes. Once the detailed review is complete, any forthcoming modifications will be reviewed within the ISAP process. This evaluation and associated information will be submitted in a future ISAP/IIS update report.

Topic 2.130--Closed Cooling Water System Modifications

The proposed modifications will perform piping modifications to the closed loop cooling system (CLCS). This change will allow series heat exchanger operation.

The CLCS, in part, provides cooling for the control air (CA) compressors, the SG feed pump oil coolers and the feedwater heater drain pumps. For a few months each year, the SW inlet temperature may increase, requiring the operators to isolate SW and initiate supplemental cooling flow from the well water (WW) system to cool the air compressors, the SG feed pump oil cooler and the feedwater heater drain pumps. The proposed modifications are designed to allow both service water and well water to be lined up during the summer months by allowing series operation of the heat exchanges. After the modification, CCW will flow through the service water cooled heat exchanger, then through the well water cooled heat exchanger. In the event of a loss of well water, service water will still be available to cool CCW.

This project received a low overall ranking due to small benefits in public safety and personnel productivity. However, the increased efficiency would allow operation of this system without the well water supplement in the summer months. Thus, the enhancement of the closed cooling water heat exchangers may increase the reliability of the CLCS. The proposed modifications available are being reevaluated, and are tentatively scheduled for Cycle 18 implementation.

Topic 2.145--Installation of New Air Cooled Diesel Generator

This project addresses the installation of a tornado protected air-cooled diesel generator to provide power to selected equipment. The new diesel generator (DG) would provide a diverse source of emergency AC power independent of service water.

For station blackout and certain fire, and tornado scenarios, the existing DGs are potentially unavailable. This unavailability has a significant impact upon the core melt frequency. An additional DG that is tornado protected, air cooled (i.e., independent of Service Water), and serving key components powered from the "B" switchgear room could have a significant effect upon core melt frequency reduction.

This project received the highest public safety benefit, zero attribute scores in economic performance and personnel safety and negative attribute score for personnel productivity. A study has been completed. An air-cooled diesel generator will be installed during the Cycle 19 Refueling Outage.

Topic 2.146--Individual RPI Upgrade

The existing Rod Position Indication system presently requires multiple recalibrations ouring start-up to obtain proper rod position indication during power operation. This is because in 1989, the Haddam Neck Plant changed over to a completely new set of revised technical specifications (RTS) based on Westinghouse Standard Technical Specification (STS) which are more limiting on RPI accuracy than the original custom technical specifications. Historically, rod positions were compared to rod insert limits (RIL) based on group position indication. The RTS were written for plants with digital rod position indication, which compare individual rod position indication to RIL. The Haddam Neck Plant's analog system was not designed to accommodate the newer RTS requirements.

This project received moderate economic performance, and personnel productivity and near zero public safety and personnel safety rankings.

Further studies are being conducted on how best to implement any proposed modifications. The results of this evaluation and associated information will be submitted in a future ISAP/(IIS) update report.

Topic 2.151--Simulator Upgrade--Phase 3

This proposed project proposes to replace the existing simulator process computers with state of the art computers. The existing computers are difficult to maintain and are being operated at capacity. Additionally, since the system is being operated at capacity newer and more complex training scenarios cannot be adequately simulated. The new process computers would eliminate the problems associated with the existing computers.

Studies are being conducted with regards to the type of equipment required to support system operation. The project received a high ARM score due to the calculated benefit from an economic performance standpoint. Continued excellent performance of the plant-specific simulator is considered a key contributor to continued safe and reliable plant operation. Modifications are scheduled for implementation during Cycle 18.

Topic 2.154--Emergency Diesel Generator Ventilation

A concern with smoke and hot gases caused by a fire in one cubicle of the emergency diesel generator backing up into the intake penthouse was identified. With the second diesel operating properly, pulling air from the same penthouse, smoke and hot gases could potentially enter the second cubicle and choke off the diesel. The effects of this would be the loss of redundant on-site emergency power, or at the very least the reduction of diesel capacity.

The diesel generator ventilation system is being modified to prevent back drafts from one diesel compartment to the other during a fire in one cubicle.

The proposed modifications to the EDG's ventilation supply will prevent smoke from going from one cubicle to the other, and provide winter protection. The hardware modifications were completed in September 1993. The project is in the final stages of acceptance testing and turnover.

References:

(1) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Verification of Seismic Adequacy of Piping," dated July 9, 1993.

(2) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Seismic Design Considerations, Wind and Tornado Loadings/-Tornado Missiles, New Switchgear Building," dated September 30, 1991.

(3) A. B. Wang letter to E. J. Mroczka, "Haddam Neck Plant, Safety Evaluation for Detailed Control Room Design Review (TAC No. 56128)," dated March 13, 1991.

(4) A. B. Wang letter to J. F. Opeka, "Haddam Neck Plant--Conformance to Regulatory Guide 1.97, Revision 2," dated April 13, 1992.

(5) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Conformance to Regulatory Guide 1.97, Revision 2," dated July 6, 1992.

(6) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Proposed Revision to Technical Specifications, Onsite Power Distribution," dated August 18, 1993.

(7) E. J. Mroczka letter to the U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Millstone Nuclear Power Station, Unit Nos. 1, 2, and 3, Generic Letter 89-10, Safety-Related Motor-Operated Valve Testing and Surveillances," dated December 15, 1989.

(8) J. F. Opeka to U.S. Nuclear Regulatory Commission, "Haddam Neck Plant, Proposed Modification to Auxiliary Feedwater System," dated December 24, 1991.

Docket No. 50-213
B14584

Attachment 3

Haddam Neck Plant

Evaluation of New ISAP Topics or
Reevaluation of Existing Topics

November 1993

Haddam Neck Plant
Evaluation of New ISAP Topics or
Reevaluation of Existing Topics

TOPIC 1.02 — EVENT V MODIFICATIONS

I. INTRODUCTION

This topic involves the addition of pressure interlock circuitry to the motor-operator valves (MOVs) used for the isolation of the Reactor Coolant System (RCS) from other systems that have lower design pressure ratings. The objective is to prevent potential overpressurization of connected systems caused by the RCS pressure. The existing plant configuration does provide a reasonable level of protection against overpressurization, but enhancements are recommended to consider Event V scenarios. The addition of the pressure sensor interlocks and RWST level analog computer point will enhance the current overpressurization protection system to adequately protect against Event V scenarios.

II. EVALUATION

A. Public Safety

This topic was reevaluated based upon a reduction in scope for this project. The remaining level of work is the installation of high/low pressure interlocks on the RCS core deluge isolation valves (SI-MOV-871A & B). The project results in a core melt frequency reduction benefit of $16,720.00 per year.

B. Economic Performance

Based on the already low probability of an over-pressurization, the impact of this project on plant availability and efficiency in terms of Equivalent Full Power Hours is negligible and for purposes of the evaluation is considered to be 0.0. Therefore the economic performance is estimated to be ($0/year).

C. Personnel Safety

No effect on safety is anticipated ($0/yr)

D. Personnel Productivity

Additional surveillance and testing may result in an additional two hours of testing per year. This cost is estimated to be $50/year.

III. CONCLUSION

The addition of the pressure interlock circuitry has a benefit in public safety. The Economic Performance, Personnel Safety and Personnel Productivity are essentially zero. Therefore, this task has received a medium ARM ranking. This task is scheduled for installation during the Cycle 18 refueling outage.

TOPIC 1.125 — AFW MODIFICATIONS

I. INTRODUCTION

CYAPCO has determined that certain postulated high energy line break (HELB) scenarios could render the existing turbine-driven AFW pumps and associated instrumentation inoperable. A main steam or feedwater line break inside the Terry turbine building would create a harsh environment due to the increased temperature in the building. CYAPCO has committed to the NRC Staff to incorporate this proposed modification which will mitigate the consequences of an HELB inside the Terry turbine building.

The proposed project will install an additional nonsafety-related auxiliary feedwater pump. This electric-driven pump would be powered by off-site or any emergency on-site diesel generator and would provide 100 percent of the design basis accident flow. The pump would be manually initiated from the control room. The electric pump would be used to feed the steam generators in the event a HELB occurs inside the Terry turbine Building that disables both steam-driven pumps coincident with a loss of normal off-site power.

Valves will be added to facilitate operation of the electric pump from the Control Room. One MOV will isolate the new pump suction from the DWST supply and a check valve will isolate the new pump discharge from the existing safety-related AFW piping inside the Terry Turbine Building.

II. EVALUATION

A. Public Safety

The benefit for the proposed project was reevaluated and calculated to be $7511/yr. The calculation was performed by adding a third AFW pump to the Haddam Neck Plant PRA model and then requantifying the CMF contribution from sequences in which a loss of AFW had occurred. The sequences were selected by reviewing the results for each initiating event sequence plant damage state and only requantifying those sequences which survived the truncation process. The reduction in CMF was calculated to be 4.75E-06/yr.

B. Economic Performance

The impact of plant availability or plant efficiency is assumed to be zero ($0/year).

C. Personnel Safety

Installation of major equipment poses a small safety risk based on demonstrated ability to handle this type of job. The long-term effect of the installation is to increase maintenance, surveillance and egress/ingress hazards.

The proposed topic will present a small personnel risk ($-60/year).

D. Personnel Productivity

A productivity decrease penalty for surveillance and preventative maintenance is incurred as a result of this modification ($-8000/yr)

III. CONCLUSION

This project was evaluated previously as reported in the Aguust 4, 1992, ISAP update report. As documented in this update, the project reevaluation has resulted in a significant decrease in overall ISAP ranking due to decrease in public safety and economic performance benefits and an increase in projected remaining cost. This task remains scheduled for implementation during the Cycle 18 refueling outage as committed to the NRC Staff.

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Attachment 4

Haddam Neck Plant
Integrated Safety Assessment Program

ARM Summary Table

November 1993

10/7/93

HADDAM NECK ARM RANKINGS

ISAP #	Title	PA #	Overall Rank	Public Safety	Economic Performance	Personnel Safety	Personnel Productivity	Remaining Project Cost	Total Value	Rank Value	Public Man-Rem	Occ B/A Man-Rem	Occ Inst Man-Rem	Net Man-Rem
2.151	SIMULATOR UPGRADE - PHASE 3	91-063	1	500	86,119,560	0	1,280	404,000	60,285,101	14922.05	0.00	0.00	0.00	0.00
2.122	SPENT FUEL STORAGE PROGRAM	88-020	2	0	66,673,842	0	0	8,000,000	46,671,689	583.40	0.00	0.00	-20.00	-20.00
2.154	EMER. DIESEL GENERATOR VENTILATIO	92-043	3	2,900	417,209	0	-200	60,000	296,025	493.38	7.00	0.00	0.00	7.00
2.145	INST. OF NEW AIR COOLED DIESEL GEN	91-014	4	481,780	0	0	-16,960	2,000,000	669,982	33.50	4576.00	0.00	0.00	4576.00
2.146	INDIVIDUAL RPI UPGRADE	89-054	5	0	117,972	120	32,000	600,000	100,341	16.72	0.00	0.00	-10.00	-10.00
1.02	HIGH/LOW PRESSURE VALVE INTERLOC	91-006	6	16,720	0	0	-50	300,000	23,548	7.85	171.00	0.00	0.00	171.00
1.64	SYSTEM DEPENDENCIES ON MCC-5	90-092	7	30,176	0	-400	-2,560	691,000	40,604	5.88	1.00	-6.00	-5.00	-10.00
2.118	SW CONTROL SWITCH POSITION INDICA	89-064	8	3,938	0	9	1,280	123,000	6,268	5.10	39.08	0.00	0.00	39.08
2.144	PRIMARY WATER MAKEUP MODIFICATIO	91-013	9	42,359	0	-840	-1,280	2,000,000	57,897	2.89	3.00	-13.00	-15.00	-25.00
2.04.1	MODERNIZE FEEDWATER CONTROL SY	90-013	10	6,035	128,713	180	6,464	3,575,000	102,405	2.86	0.00	0.00	0.00	0.00
2.126	SERVICE WATER PUMP AND TB HEADE	89-059	11	45,642	0	0	-2,560	2,204,000	62,947	2.86	350.00	0.00	0.00	350.00
2.152	CY ADT SYSTEM EVALUATION	89-052	12	0	0	1,200	200	100,000	1,718	1.72	0.00	9.80	-5.00	4.80
2.109	DH-MOV-310 REPLACEMENT	86-257	13	0	0	1,909	1,280	400,000	3,262	0.82	0.00	6.00	-10.00	-4.00
1.19.13	CONTROL RM. DESIGN REVIEW Gp 13	88-005	14	0	880	0	1,280	186,000	1,320	0.71	0.00	0.00	0.00	0.00
1.05	SEISMIC STRUCTURAL MODIFICATIONS	83-036	15	6,356	0	0	0	1,484,000	8,962	0.60	0.00	0.00	TBD	TBD
1.125	AUX. FEEDWATER MODIFICATIONS	91-009	16	7,511	0	-60	-8,000	2,200,000	6,110	0.28	-5.50	0.00	0.00	-5.50
2.130	SERVICE WATER SUPPLY-CLOSED COO	89-069	17	631	0	0	640	529,000	1,242	0.23	19.00	0.00	0.00	19.00
1.19.3	CONTROL ROOM DESIGN REVIEW Gp 3	88-005	18	2,620	0	-58	0	5,283,000	3,616	0.07	0.84	0.00	0.00	0.84
1.104	CONT. ISO. VALVE POS. INDICATION	-----	19	0	0	0	-1,280	1,000,000	-704	-0.07	0.00	0.00	TBD	TBD
1.21	REG GUIDE 1.97 INSTRUMENTATION	90-029	20	390	0	-1,047	-1,280	300,000	-1,557	-0.52	0.00	-1.60	-15.00	-16.60

TBD - To be determined

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Attachment 5

Haddam Neck Plant
Integrated Safety Assessment Program

Integrated Implementation Schedule

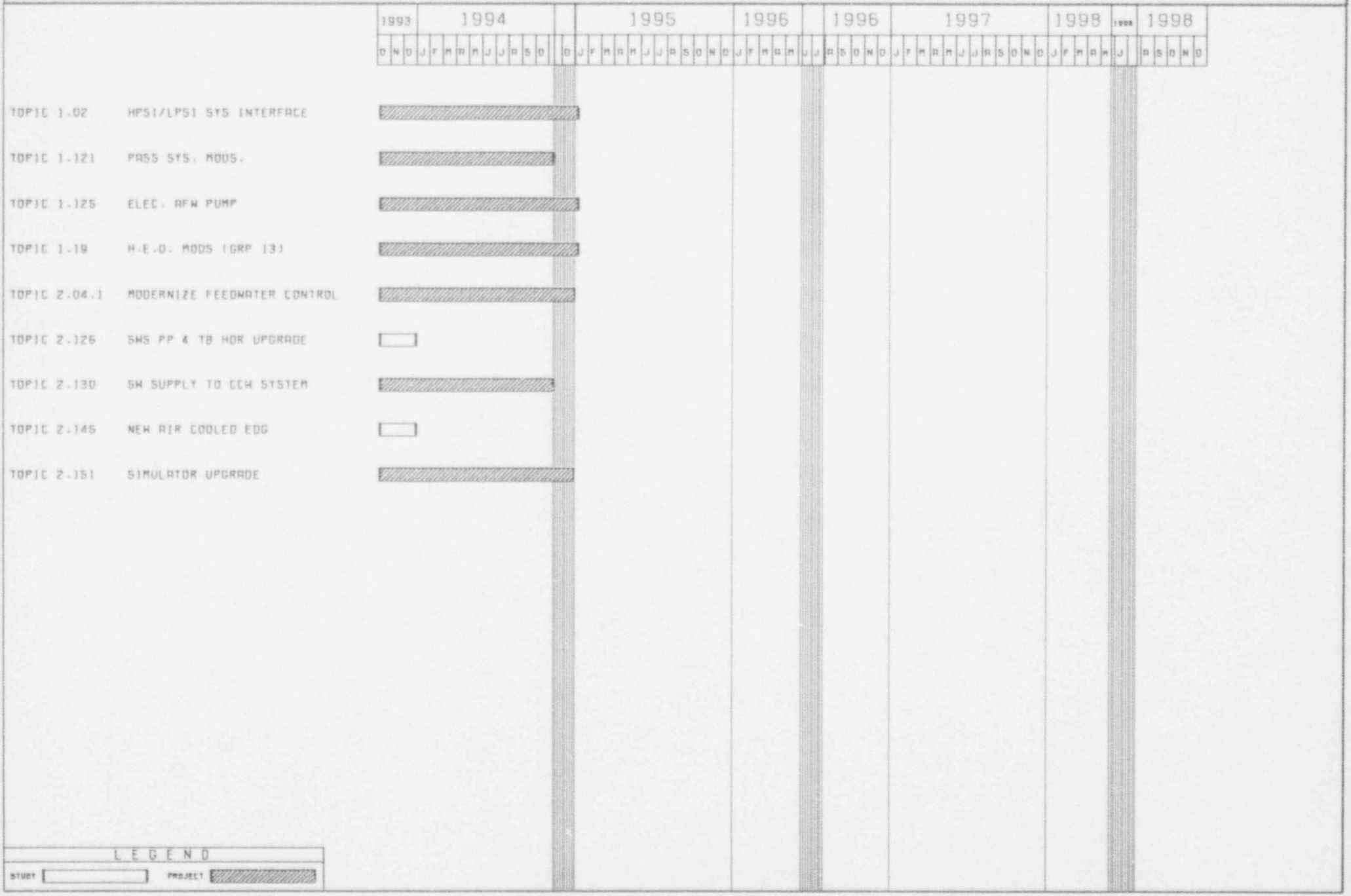
November 1993

CONN YANKEE ATOMIC POWER CO.

14 OCT 93

HADDAM NECK PLANT

INTEGRATED IMPLEMENTATION SCHEDULE



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Attachment 6

Haddam Neck Plant

Integrated Safety Assessment Program

Proposed Topics for Closure

November 1993

I. Topics Proposed for Closure--Awaiting NRC Staff Response

(Topics will remain in this category until a closeout letter is received from the NRC Staff.)

Topic 1.104--Containment Isolation Valve Position Indication

This project involves the replacement of 21 cables with environmentally qualified ones. This project was evaluated and received a low ISAP value as discussed in the March 2, 1989 ISAP/IIS update report. As such, no work has been scheduled. CYAPCO is continuing to evaluate this topic.

Based on the low benefit of this task and high cost associated with replacement, the task has been closed.

Topic 1.09--Design Codes, Design Criteria and Load Combinations

This topic addresses CYAPCO's review of safety-related structural elements at the Haddam Neck Plant against current codes and standards. CYAPCO had proposed to evaluate each potentially significant load combination to demonstrate that a more detailed analysis would identify only localized effects that would not adversely affect the integrity of the structure. If CYAPCO was unable to generically demonstrate this result, a sampling program would have been used to identify and evaluate specific locations and/or elements.

As a result of a detailed study, CYAPCO has determined that no modifications are required and this topic may be closed. A formal letter to the NRC Staff was transmitted on January 15, 1993 requesting closure of this task.

Topic 1.39--Items 4.2.3 and 4.2.4, Preventative Maintenance Procedures for Reactor Trip Breakers

This topic addresses CYAPCO's preventative maintenance and surveillance program to ensure reliable reactor trip breaker operation.

Based on previous information provided to the Staff, CYAPCO maintains that plant procedures currently in place constitute an acceptable ongoing testing program. Pending Staff review and approval of that information, CYAPCO considers this topic resolved.

II. Topics that are Closed

These topics are being closed out for one of the following reasons:

(1) a closeout letter has been received from the NRC Staff;

(2) all CYAPCO commitments recognized by the NRC Staff have been fulfilled; or

(3) This is a CYAPCO initiated project with no associated regulatory obligations;

Topic 1.03--Containment Penetration Evaluations

This project involves the modification of 14 containment penetration lines to permit air local leak rate testing (LLRT) in lieu of water leak rate testing. The penetration lines modified were P-11A through D, P-24A through D, P-29, P-30, P-34, P-61, P-68, and P-69.

Fourteen containment penetrations were modified during the Cycle 16 refueling outage. The modifications to the additional penetrations (identified and treated under ISAP Topic 1.03.2) were completed during the Cycle 17 refueling outage. CYAPCO has received a closeout letter on this topic and therefore we consider this topic closed.

Topic 1.06--Wind and Tornado Loadings/Tornado Missiles

This topic addresses the analysis and potential modification of structures and components vulnerable to the effects of tornado wind and missile loadings. Under this topic, CYAPCO is focusing on the tornado wind and missile effects on the switchgear and cable spreading structures, the auxiliary feedwater (AFW) system, the refueling water storage tank and the service water system. The analysis will also include wind and tornado loading/tornado missile effect on the diesel fuel oil vent piping.

In a letter dated August 30, 1989, CYAPCO provided the NRC Staff with the results of the TORMIS analysis. CYAPCO also submitted the Probabilistic Safety Study (PSS) of the effects of tornado winds and missiles on March 1, 1990. Several recommendations for further protecting AFW and providing emergency AC power independent of service water have been made by the Risk Reduction Task Force.

A description of the proposed modifications to address the wind and tornado loadings/tornado missiles issues at the Haddam Neck Plant was provided to the Staff on July 11, 1991. Related ISAP topics are 1.64, 1.125, 2.143, 2.144 and 2.145. CYAPCO has submitted additional information regarding the resolution of this issue via CYAPCO letters

dated June 30, 1993, August 23, 1993, and September 14, 1993. The remaining proposed modifications are the addition of a new electric auxiliary feedwater pump and installation of an air-cooled diesel generator which will be addressed under Topic 2.145. The NRC Staff safety evaluation accepting the proposed modification was provided by letter dated September 29, 1993. This topic is considered closed.

Topic 1.124--Replace NG-SOV-470

The project replaced the existing welded body to bonnet solenoid valve with a bolted body to bonnet solenoid valve.

Valve NG-SOV-470 failed its leak rate testing during the Cycle 15 refueling outage. Manual valve NG-V-473 was installed upstream of this containment isolation valve. This was done to ensure containment isolation capabilities per Appendix J. The manual valve is locked closed and was not intended to permanently take the place of the solenoid valve. (The NRC Staff, in License Amendment No. 138, specified that reliance on the manual valve could only be for Cycles 16 and 17.) Replacement of the old style solenoid valve with the new style valve results in the manual valve being locked open and operations being able to remotely add nitrogen to the pressurizer relief tank (PRT) during plant operations. Additionally, the new style solenoid valve would be easier to maintain thus increasing the likelihood of successful leak rate testing.

This modification was installed in the Cycle 17 refueling outage as committed to the NRC Staff. Therefore, this topic should be closed.

Topic 2.03--Additional Atmospheric Steam Dump

A steam generator tube rupture (SGTR) has one of the highest probabilities of occurrence among the significant PWR accident initiating events. An SGTR event requires a series of complex operator actions, where the operators are required to maintain adequate subcooling margins while cooling down and depressurizing the Reactor Coolant System (RCS) fast enough to prevent overfilling and pressurization of the secondary side of the faulted steam generator above the lowest code safety valve setpoint.

This project addresses increasing the remotely operated steam relief to atmosphere capacity and was undertaken as a result of a CYAPCO commitment to the NRC Staff described in a letter dated June 30, 1986.

CYAPCO has replaced one steam generator code safety valve on each of four steam generators with a safety relief valve with remote relief capability. The modifications were implemented during the Cycle 17 refueling outage. Currently, a technical specification change is with

the NRC which will provide controls on the automatic and remote functions.

Since the intended modifications to address this topic are complete, CYAPCO is closing this ISAP topic.

Topic 2.106--Hotwell Sampling System

This project involves the upgrade and redesign of the system designed to take samples from each of the condenser hotwells. The purpose of this system is to identify condenser tube leaks so that they may be isolated and plugged. Potential system improvements could include individual sample points for each hotwell that would provide a more representative sample and a composite sample pump unit that would include a built-in analyzer.

In an attempt to further evaluate this project, entry was made into the condenser hotwells during the Cycle 15 outage, to determine the scope of work required to provide the sample points. CYAPCO has determined that no modifications are required. Alternate sampling methods have been identified.

Topic 2.109--DH-MOV-310 Replacement

This project involves the replacement of valve DH-MOV-310. Valve DH-MOV-310 at Haddam Neck provides an interface between the high pressure RCS and the low pressure Chemical and Volume Control System.

The replacement of the valve will enable the plant to throttle flow with increased accuracy during low pressure operation. Moreover, it will provide a path to drain a depressurized and isolated RCS loop. The ARM ranking of this topic is relatively low. Reliability concerns have decreased as a result of maintenance improvements. Operating experience has been satisfactory over the last operating cycle. As a result, replacement if required, has been deferred and will be handled on a level of effort basis. This task is now closed.

Topic 2.113--Pressurizer Spray Valve Reliability Improvement

The intent of the proposed project is to prevent the uncontrolled depressurization of the Reactor Coolant System (RCS) due to a stuck open pressurizer spray valve. The modification involves placing a non-Category 1 three-way solenoid valve in the air supply line between the valve positioner and the air operator.

The project's major calculated ISAP benefits are due to public safety and economic performance. The pressurizer spray valves had comprehensive design and construction verification inspections performed

during the Cycle 16 refueling outage. The results of these inspections showed that the valves are not leaking. The recent performance of the valves has been good and it has been determined that no modifications are required.

Topic 2.115--Site Facilities Upgrade

This project involved the construction of new preengineered buildings to replace existing modular buildings. Due to the extensive cost of this project it has been canceled. Therefore, this topic is now closed.

Topic 2.129--High Pressure Turbine Replacement

This topic involves the proposed replacement and upgrade of the high pressure (HP) turbine internals. This includes the rotor, stationary blades and blade rings. The rationale behind the replacement of the high pressure turbine is that the current high pressure turbine may experience age-related problems. A new high pressure turbine will avoid these problems and in addition, may increase output by up to 8 MW.

An analysis of the feasibility of repairing the HP turbine versus replacement was conducted. The outcome of the research conducted on this task resulted in the decision to repair the turbine over a number of refueling outages. The following action plan was developed: 1) repair the rotor gland seal areas by field machining and installing new seal carriers in 1994; 2) install new side entry control stage blades and nozzle blocks in 1996; and 3) install new stainless steel blade rings in 1998. This ISAP topic is now closed.

Topic 2.131--Charging Pump Operation Upon Loss of Semivital Power

During the 1986 refueling outage, the (centrifugal) charging pump control logic was modified to automatically trip both charging pumps during a loss of semi-vital AC (SVAC) power or loss of motor control center MCC-5. The intent of this modification was to protect the charging pumps from potential damage which could be caused by a lo-lo level in the volume control tank (VCT).

As discussed in the December 6, 1991 ISAP update report, as a result of this low overall ranking and identification of higher priority work, this work had been deferred. CYAPCO has now decided to cancel this project due to low ISAP ranking. Therefore, this topic is now closed.

Topic 2.133--345 kV Supervisory Control Equipment

The proposed project is a one for one replacement of the existing obsolete 345 kV supervisory equipment with new state-of-the-art equipment.

In the late 1970s, the System Control and Data Acquisition equipment (SCADA) was installed and functionally replaced most of the Moore Supervisory Control System. Since the addition of the SCADA equipment, the Moore Supervisory Control System has been maintained primarily as a backup to the SCADA equipment.

Only a small portion of the existing Moore Supervisory Control System equipment is needed for the Haddam Neck Plant operations. The ability to monitor 345 kV Volt-amps reactive (VARs) and the ability to operate and monitor the 14B-3T-2 and 14B-4T-2 power circuit breakers are utilized. These circuit breakers are used to connect the main turbine generator output to the transmission grid once it is stepped up to 345 kV.

This project has a low project ranking based upon low public safety, economic performance and personnel safety scores. The need to replace this equipment has been reevaluated. Based on this reevaluation, CYAPCO has decided to cancel this project. Therefore, this topic is now closed.

Topic 2.135--Low Voltage Molded Case Circuit Breaker Replacement

This topic involves replacing many of the existing low voltage molded case circuit breakers installed as original plant equipment. These breakers are found in motor control centers (MCCs) and various electrical distribution panels and cabinets.

The modifications were scheduled in the IIS for implementation during the Cycle 16 and Cycle 17 outages. The Cycle 16 and 17 work has been completed. Therefore, this topic is now closed.

Topic 2.136--Auxiliary Feedwater Supply Study--New Condensate Storage Tank

This project addresses the concern that existing piping from the demineralized water storage tank (DWST) to the condenser hotwell is not seismically qualified. A seismic event could potentially cause pipe failure which would allow drainage of the only seismically qualified source of fluid for the Auxiliary Feedwater System. This concern is being addressed by the construction of a non-QA tank that will supply normal hotwell condensate makeup so that the existing non-QA, nonseismic condensate line can be removed from the existing QA DWST. The existing

QA DWST tank will then be used to provide only emergency cooling capacity to achieve hot standby.

This project has been implemented as scheduled in the IIS during the Cycle 17 refueling outage. This topic is now closed.

Topic 2.137--Hypochlorite System Upgrade

The original purpose of the sodium hypochlorite system was to prevent biofouling of the condenser tubes. The reliability of the existing system has degraded due to hypochlorite leaks and valve problems. This project proposes to upgrade the existing system and install new piping to provide direct injection of hypochlorite into the service water system. Also included is the installation of a new residual chlorine monitoring system.

This work has been completed and, as such, this topic is considered closed.

Topic 2.144--Primary Water Make-up Modifications

The proposed project would provide a fully tornado protected borated water supply to allow for RCP seal cooling and RCS makeup if needed following a tornado, and includes the installation of an additional positive displacement charging pump powered by Bus 11. A second metering pump would provide redundancy and reduce the core melt frequency due to internal events, fire, and tornados. The addition of a metering pump would reduce the dominant accident sequences involving a consequential small-break LOCA.

A study has been completed that has shown that this task is not cost effective. This task is now considered closed.

Topic 2.148--Containment Isolation Valve Replacement

This task includes changing four air-operated containment isolation valves (CIVs) from Contromatic ball valves having Tefzel or reinforced Teflon seats to valves with metal seats and more suitable seals. The valves proposed for replacement are CC-TV-917 and CC-TV-920, CCW to Neutron Shield Tank cooler via penetration P-60 and CH-TV-240 and CH-TV-241, RCS Seal Water Return via penetration P-7.

This project was implemented during the Cycle 17 refueling outage. Therefore, CYAPCO is closing this ISAP topic.

Topic 2.149--Spare Station Service Transformer

With the addition of the Seabrook Nuclear Station and power imported from Canada to the 115-kV distribution system in New England, the voltage operating ranges are now wider. This increase in operating voltage range impacts the Haddam Neck Plant station service voltage.

Voltage fluctuations on the 115-kV system result in station service 4.16-kV system fluctuations. Fluctuations outside of the acceptable fluctuation range will result either in overvoltage or undervoltage alarms.

This proposed project involves replacing both station service transformers with two automatic load tap changing (LTC) transformers. Automatic LTC transformers can maintain a constant output voltage when the input voltage is fluctuating with a $\pm$ 10 percent range.

This project was installed during the Cycle 17 outage. Therefore, CYAPCO is closing this ISAP topic.

Topic 2.152--Aerated Drains Tank (ADT) System Evaluation

Since 1987, Haddam Neck has used a mobile demineralizer service to improve radwaste water quality acceptable for release to the river. Although the system is necessary, a number of problems have affected the mobile system performance. These problems are:

1. High influent activity from a number of primary systems during plant startup/shutdown.

2. Particulate and organic fouling of the resin beds.

3. Due to the mobile demineralizer system location and the reluctance to use the spent resin pit (because of increased manrem exposure), resins are sluiced to a rented cask.

Based on these problems, a review of the system was conducted and a number of short- and long-term action items were recommended to help eliminate the above-mentioned problems. The short-term issues are being addressed by the unit and generally consist of procedural modifications, increased maintenance, and small physical modifications, such as oil drip pans under bearings to eliminate the infiltration of oil into the waste system.

The long-term items include: 1) adding a permanent sluice line from the mobile system to the spent resin system (to address problem 3), and 2) install a second aerated drains tank (ADT) filter in parallel to the existing filter, thus allowing continuous filtration of wastewater if

one filter should become clogged or inoperable (to address problems 1 and 2). A third recommendation is to install a recirculation line from the mobile demineralizer system to the aerated drains holdup tank (ADHUT). This would help to avoid contamination of the waste test tanks and ultimately decrease the radiation levels in the effluent to the river.

This topic received low overall ARM scores based on its marginal value in Public Safety, Economic Performance, and Personnel Productivity. Its positive attribute is associated with the marginal increase in personnel safety. This task has been closed based on its marginal benefit and high cost.

Topic 2.153--Reactor Vessel Level Indication System

The Inadequate Core Cooling (ICC) Monitoring System integrates the processing and display of data for the subcooled/superheat (SC/SH) monitor, core exit thermocouples (CETs) and heated junction thermocouple (HJTC) system for reactor coolant inventory tracking.

To date, six of sixteen sensor positions in the probes have failed. The Haddam Neck Plant Technical Specifications require that for a probe (or channel) to remain operable, it must not have more than one sensor failure in the reactor head area and three sensor failures in the plenum region. During the last cycle, both channels had the one allowable head failure, and Channel B had the three allowable plenum failures. The channels, therefore, could not accommodate additional failures and remain operable.

Replacement of these sensors occurred during the Cycle 17 outage. Therefore, CYAPCO is closing this ISAP topic.