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March 23, 1994

Docket No. 50-245
B14684
Re: Integrated Safety
Assessment Program

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

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
Update Report

In a letter dated June 18, 1993,[1] Northeast Nuclear Energy Company (NNECO) submitted to the NRC Staff an updated report on the Millstone Unit No. 1 Integrated Safety Assessment Program (ISAP).

Since the June 18, 1993, ISAP report was submitted to the NRC Staff, NNECO has performed in-depth reviews and updates of previous active ISAP topics. 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.

NNECO continues to take an aggressive approach to maximize the closure of open IIS commitments. This submittal represents closure documentation for 3 topics and 9 subtopics. There are now 28 active ISAP topics and 7 active subtopics.

Attachment 1 to this letter provides a list of all the ISAP topics including both open topics and those topics considered closed by NNECO. Attachment 2 provides an update on those open, active ISAP topic reviews discussed previously. Attachment 3 describes new topics being added to the Millstone Unit No. 1 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 project. 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 NNECO. In accordance with the Program Plan identified in Amendment No. 56[2] for Millstone Unit No. 1, it is respectfully requested that the NRC Staff review

(1) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Integrated Safety Assessment Program--Update Report," dated June 18,1993.

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

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and respond back to NNECO within 60 days of receipt of this letter as to whether or not you concur with our positions outlined herein.

We will remain available to discuss these issues with you at your convenience. Please contact us if you have any questions.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

J. F. Opeka

J. F. Opeka
Executive Vice President

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

cc: T. T. Martin, Region I Administrator
J. W. Andersen, NRC Acting Project Manager, Millstone Unit No. 1
P. D. Swetland, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3

Docket No. 50-245
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Attachment 1

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

List of ISAP Topics

March 1994

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
List of ISAP Topics

Topic Number[1]	NNECO Proposed Closure[2]	Title	NRC Closure Date[3]
1.01	9/29/89	Gas Turbine Generator Start Logic Modifications	12/30/92
1.02	5/31/91	Tornado Missile Protection	12/30/92
1.03	11/9/88	Containment Isolation--Appendix A Modifications	4/14/93
1.04	11/9/88	RWCU Pressure Interlock	12/30/92
1.05	11/9/88	Ventilation System Modifications	12/30/92
1.06		Seismic Qualification of Safety-Related Piping	
1.07		Control Room Design Review	
1.08	11/9/88	Safety Parameter Display System	12/30/92
1.09		Regulatory Guide 1.97 Instrumentation	
1.10	9/29/89	Emergency Response Facilities Instrumentation	12/30/92
1.11	11/9/88	Post Accident Hydrogen Monitor	12/30/92
1.12	11/9/88	Control Room Habitability	12/30/92
1.13	11/9/88	BWR Vessel Water Level Instrumentation	12/30/92
1.14		Appendix J Modifications	
1.15	11/9/88	FSAR Update	12/30/92
1.16	11/9/88	10CFR50, Appendix R	8/18/93
1.17	11/9/88	Replacement of Motor-Operated Valves	12/30/92
1.18	11/9/88	ATWS	12/30/92
1.19	10/22/92	Integrated Structural Analysis	12/30/92
1.20	11/9/88	MOV Interlocks	12/30/92
1.21	11/9/88	Fault Transfers	12/30/92
1.22	1/24/92	Electrical Isolation	12/30/92
1.23	11/30/90	Grid Separation Procedures/Degraded	4/14/93
1.25	11/30/90	Grid Voltage Procedures	4/14/93
1.24	11/9/88	Emergency Power	12/30/92
1.26	11/9/88	Equipment Classification/Vendor Interface (GL 83-28, Item 2.1)	12/30/92
1.27	11/9/88	Post-Maintenance Testing (GL 83-28, Items 3.1.1 and 3.1.2.)	12/30/92
1.28	11/9/88	Post-Maintenance Testing Technical Specification Changes (GL 83-28, Item 3.1.3)	12/30/92
1.29	11/9/88	Response to GL 81-34	12/30/92
1.30	11/9/88	Post-Trip Review Data and Information (GL 83-28, Item 1.2)	12/30/92

Topic Number[1]	NNECO Proposed Closure[2]	Title	NRC Closure Date[3]
1.31	5/31/91	Equipment Classification/Vendor Interface (GL 83-28, Item 2.2)	12/30/92
1.32	11/9/88	Post-Maintenance Test Procedures (GL 83-28, Items 3.2.1 and 3.2.2)	12/30/92
1.33	11/9/88	Post-Maintenance Testing Technical Specification Changes (GL 83-28, Item 3.2.3)	12/30/92
1.34	9/29/89	Reactor Trip System Testing (GL 83-28, Items 4.5.2 and 4.5.3)	12/30/92
1.35	11/9/88	Reactor Trip System Functional Testing (GL 83-28, Item 4.5.1)	12/30/92
1.36	10/22/92	Technical Specifications Covered by GL 83-36	12/30/92
1.37	11/9/88	Technical Specification Changes to address 10CFR50.72 and 10CFR50.73	12/30/92
1.38	11/9/88	Expand Quality Assurance List	12/30/92
1.39	11/9/88	Radiation Protection Plans	12/30/92
1.40	9/29/89	Bolting Degradation or Failure	8/18/93
1.41	11/9/88	Flooding of Compartments by Backflow	12/30/92
1.42	11/9/88	Main Steam Line Leakage Control System	12/30/92
1.43	3/23/94	Water Hammer	
1.44	11/9/88	Asymmetric Blowdown Loads on Reactor Systems	12/30/92
1.45	11/9/88	Systems Interactions	12/30/92
1.46	11/9/88	Determination of SRV Pool Dynamic Loads	12/30/92
1.47	9/29/89	Containment Emergency Sump Performance	12/30/92
1.48	9/29/89	Safety Factor for Penetration X-10A	12/30/92
1.49	11/9/88	Reactor Vessel Surveillance Program	12/30/92
1.50	9/29/89	Isolation Condenser Start-Up/Makeup Failures	12/30/92
1.51	9/29/89	Failure to Restore Main Condenser	12/30/92
1.52		SRV Failure - Setpoint Drift	
1.100	1/24/92	Fire Barrier Penetration Seal Program Upgrade	12/30/92
1.101		Fire Detection System Code Compliance	
1.102		Fire Suppression System Code Compliance	
1.103	9/29/89	Standby Gas Treatment System Redundancy	12/30/92
1.104		Pump Flow Rate Instrumentation	
1.105	9/29/89	Valves LP 15 A/B, 16 A/B, & CU 2/3	12/30/92
1.106		Station Blackout	
1.107	10/22/92	Drywell Spray Flow Indication	4/14/93
1.108	11/30/90	Torus Vacuum Breakers	
1.109	9/29/89	IGSCC Countermeasures	12/30/92
1.110	1/24/92	Vital Area Ventilation	12/30/92
1.111		Motor Operated Valve Testing, GL 89-10	

Topic Number[1]	NNECO Proposed Closure[2]	Title	NRC Closure Date[3]
1.112		Service Water System Evaluation, GL 89-13	
1.113		Hardened Wetwell Vent, GL 89-16	
1.114	10/22/92	Individual Plant Examinations, GL 88-20	4/14/93
1.115	11/30/90	Reactor Water Level Reference Leg Break, GL 89-11	4/14/93
1.116	1/24/92	Remote Wide-Range Yarways	12/30/92
1.117	6/18/93	Safety Parameter Display System Upgrade	8/18/93
1.118	3/23/94	Plant Heating Steam System	
1.119		Resolution of Unresolved Safety Issue A-46	
1.120		Purge and Vent Valve Auto-Closure	
1.121	6/18/93	Postaccident Hydrogen Monitor	9/7/93
1.122		Split Loss-of-Normal Power Logic	
1.123		LPCI/CS Pipe Temperature Modifications	
1.124		MSIV ASCO Solenoid Valve Replacement	
1.125		Turbine Building Secondary Closed Cooling Water Modifications	
1.126		BWR Stability	
1.127	6/18/93	Reactor Pressure Vessel Water Level Instrumentation	8/18/93
1.128		TSI Thermo-Lag Fire Barrier	
2.01	11/9/88	LPCI Remotely Operated Valves LP-50A and B	4/14/93
2.02	11/9/88	Drywell Humidity Instrumentation	4/14/93
2.03	11/9/88	Process Computer Replacement	12/30/92
2.04	11/9/88	High Steam Flow Setpoint Increase	12/30/92
2.05	9/29/89	Hydrogen Water Chemistry Study	12/30/92
2.06		Condenser Retube	
2.07	11/9/88	Sodium Hypochlorite System	12/30/92
2.08	10/22/92	Extraction Steam Piping	4/14/93
2.09	9/29/89	Upgrading of P&IDs	12/30/92
2.10	5/31/91	Drywell Ventilation Systems	12/30/92
2.11	9/29/89	Stud Tensioners	12/30/92
2.12	9/29/89	Reactor Vessel Head Stand Relocation	12/30/92
2.13	11/9/88	Turbine Water Induction Modifications	12/30/92
2.14	11/9/88	Evaluation and Implementation of NUREG-0577	12/30/92
2.15	4/30/90	Torque Switch Evaluations for MOVs	12/30/92
2.16	11/9/88	Reactor Protection Trip System	12/30/92
2.17	4/30/90	4.16-kV, 480-V, and 125 VDC Plant Distribution Protection Study	4/14/93
2.18	4/30/90	Spent Fuel Pool Storage Racks/Transportation Cask	12/30/92
2.19	11/9/88	DC System Review	12/30/92
2.20	11/9/88	RWCU System Isolation Setpoint Reduction	12/30/92
2.21	11/9/88	480-V Load Center Replacement of Oil-Filled Breakers	12/30/92

Topic Number[1]	NNECO Proposed Closure[2]	Title	NRC Closure Date[3]
2.22	11/9/88	'ontrol Rod Drive System Water Hammer Analysis	12/30/92
2.23	9/29/89	Instrument, Service, and Breathing Air Improvements	12/30/92
2.24	11/9/88	Off-Site Power Systems	4/14/93
2.25	11/9/88	Drywell Temperature Monitoring System	12/30/92
2.26	11/9/88	Reliability Equipment	12/30/92
2.27	11/9/88	Spare Recirculation Pump Motor	12/30/92
2.28	4/30/90	Long-Term Cooling Study	12/30/92
2.29	11/9/88	FWCI Assessment Study	12/30/92
2.30	10/22/92	MSIV Closure Test Frequency	12/30/92
2.31	11/9/88	LPCI Lube Oil Cooler Test Frequency	12/30/92
2.32	11/9/88	Primary Containment Pumpback System	12/30/92
2.33	9/29/89	RBCCW Leak Rate Testing	12/30/92
2.100	11/9/88	Emergency Gas Turbine Generator Reliability Study	12/30/92
2.101	9/29/89	Shutdown Cooling Discharge Valve Replacement	12/30/92
2.102	9/29/89	Main Transformer Replacement	12/30/92
2.103		Battery Charger Replacement	
2.104	11/30/90	Feedwater Nozzle Leakage Monitoring System	12/30/92
2.105	4/30/90	480-Volt Motor Soft Start	12/30/92
2.106	6/18/93	Diesel Air Start System Upgrade	8/18/93
2.107		Class 1E Generator Antimotoring Protection	
2.108		Generator Antimotoring Protection While Shutdown	
2.109	11/9/88	ECCS Keepfill System	12/30/92
2.110	11/9/88	Head Spray Line Removal	12/30/92
2.111	11/9/88	(Project Dropped)	N/A
2.112	9/29/89	Gas Turbine Governor Control System Replacement	12/30/92
2.113	9/29/89	Recirculation Pump Vibration Monitoring	12/30/92
2.114	11/30/90	RBCCW System Class Boundaries	12/30/92
2.115	1/24/92	Replacement of LPC-4A & B Valves	12/30/92
2.116		Replacement of CU-28 Motor Operator	
2.117	1/24/92	Environmental Qualification of IC Local Control Stations	12/30/92
2.118	5/31/91	Replacement of the Normal Station Service Transformer	12/30/92
2.119	4/30/90	(Topic Deleted)	N/A
2.120		Atmospheric Control System Containment Isolation Valves	
2.121	1/24/92	Feedwater Venturi Replacement	12/30/92
2.122	5/31/91	Reserve Station Service Transformer Transfer Trip Scheme Replacement	12/30/92

Topic Number[(1)]	NNECO Proposed Closure[(2)]	Title	NRC Closure Date[(3)]
2.123	6/18/93	Chemistry Laboratory HVAC System	8/18/93
2.124		Replacement of Motor Operator for IC-4	
2.125	10/22/92	LPCI Pump Motor Replacement	12/30/92
2.126		Emergency Service Water/Service Water Headers	
2.127		Replacement of LP-43A/B, LP-44A/B, and IC-10 Motor Operators	
2.128		Low Pressure A Turbine Rotor Replacement	
2.129		LPCI Check Valve Replacement	

(1) Topics prefixed by the number 1 indicate that these topics have been initiated as a result of an NRC Staff request. Topics prefixed by the number 2 indicate that these topics are NNECO initiatives.

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

(3) Date refers to the NRC Staff response document providing ISAP closure.

Docket No. 50-245
B14684

Attachment 2

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

Updates on Existing ISAP Topics

March 1994

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
Updates on Existing ISAP Topics

Topic 1.06--Seismic Qualification of Safety-Related Piping

This topic was addressed in detail in our previous ISAP submittals.

In a letter dated April 16, 1993,[1] NNECO discussed several issues which are believed to provide marginal benefit to safety yet involve significant resource expenditures. Within this submittal, this project was identified as being an area in which a significant cost savings could be realized without adversely affecting regulatory and safety objectives or reducing public health and safety protection. Additionally, developments in the area of seismic analytical techniques may provide further bases for resolution of this issue. As such, NNECO plans to postpone the remaining modifications until the above-mentioned developments have been further investigated. In the interim, engineering design work is expected to be completed which will update associated as-built drawings. Our intent is to resolve this issue within the time frame of the original schedule (i.e., Cycle 15). Relevant information will be reported in a future ISAP/IIS report.

Topic 1.07--Control Room Design Review

This topic involves resolution of a substantial number of Human Engineering Discrepancies (HEDs) as identified by the Control Room Design Review (CRDR). Our previous submittals described this topic in detail and provided a schedule for completion of the identified HEDs.

Non-ISAP HEDs (e.g., communication, training, administrative controls, etc.) are currently being addressed internally and tracked via this ISAP topic. Since the inception of the project, four additional HEDs have been added to the list, bringing the total number of non-ISAP HEDs to 51. To date, 26 have been completed, 20 are in progress, and 5 are scheduled for resolution no later than the Cycle 15 refueling outage. Since the June 18, 1993 ISAP Update Report, Topic 1.07.14 has been resolved by revising the emergency operating procedures (EOPs) to eliminate secondary containment differential pressure as an entry condition. The EOP changes were effective on July 31, 1993.

CRDR HED resolution is currently scheduled within ISAP for the Cycle 14 and Cycle 15 refueling outages. Several modifications are scheduled for completion during the Cycle 14 refueling outage. A reassessment of the method by which the remaining HEDs will be resolved will be conducted following the Cycle 14 refueling outage. The results of this reassessment will be included in a future ISAP report.

Topic 1.14.1--Appendix J Modifications (Reorientation of Valves)

The two penetrations for the torus spray lines currently do not meet local leak rate Appendix J requirements because leakage through the packing and body to bonnet flanges of motor-operated valves (MOVs) LP-14A and -14B cannot be tested during local leak rate testing (LLRT). The proposed modification involved turning MOVs LP-14A and -14B around so that the packing and body to bonnet flanges of the valves can be tested during LLRTs. This was previously discussed in our letter dated May 22, 1991.[2] NNECO will rotate atmospheric control valves AC-7 through AC-12 to ensure the actuator shaft seals are tested during the LLRT.

Due to the substantial cost involved relative to the overall benefit, NNECO is currently assessing our options regarding resolution of this topic for LP-14A and -14B. As such, rotation of the valves will not be accomplished during the Cycle 14 refueling outage.

Topic 1.14.2--Appendix J Modifications (Penetration X-15) (CIVs CU-28 and CU-29)

This topic was described in detail in our October 23, 1992, ISAP submittal. In summary, containment penetration X-15, which is the reactor water cleanup system penetration, is not currently tested as specified in 10CFR50, Appendix J. The present scope of the project consists of installing test connections downstream of CU-29 to permit Appendix J LLRT of the containment isolation valve (CIV).

This project received a very low overall ranking due to the small public safety benefit, zero personnel safety benefit, and negative personnel productivity benefit. However, due to the interface of this project with Inservice Testing requirements, NNECO is planning to install the necessary test connections during the Cycle 15 refueling outage.

Topic 1.14.3--Appendix J Modifications (Penetration X-20) (CIVs DW-64, 66, 67)

This topic was described in detail in our October 23, 1992, ISAP submittal. In summary, containment penetration X-20, is not currently tested as specified in 10CFR50, Appendix J. The evaluation considered the installation of testable blank flanges at penetration X-20.

This project received a very low overall ranking due to the small public safety benefit, negligible personnel safety benefit, and negative personnel productivity benefit. As such, the evaluated modification will not be completed. However, NNECO plans to cut and cap this penetration as a maintenance activity during the Cycle 14 refueling outage, thereby eliminating DW-64, 66, and 67 as CIVs, and the need for Appendix J testing.

Topic 1.14.4--Appendix J Modifications (Penetration X-21) (CIVs SA-344, 345)

This topic was described in detail in our October 23, 1992, ISAP submittal. In summary, containment penetration X-21, is not currently tested as specified in

10CFR50, Appendix J. The evaluation considered the installation of a testable blank flange in the service air line outside containment. This modification would eliminate SA-344 as a CIV.

This project received a very low overall ranking due to the small public safety benefit, negligible personnel safety benefit, and negative personnel productivity benefit. However, due to the interface of this project with Inservice Testing requirements, this modification has been scheduled in the IIS for completion during the Cycle 14 refueling outage.

Topic 1.52--SRV Failure - Setpoint Drift

As discussed in previous submittals, this topic addresses recommendations from the BWR Owners' Group (BWROG) regarding the issue of potential safety relief valve (SRV) failure. NNECO has determined that the most appropriate modification for Millstone Unit No. 1 is to replace three of the existing pilot discs with pilot discs alloyed with 0.3% platinum with the pilot disc tip catalyzed. Additionally, the SRV pilot stabilizer disc tips will also be catalytically coated. This portion of the project will be completed prior to startup from the Cycle 14 refueling outage. The remaining three discs will be replaced during the Cycle 15 refueling outage if deemed appropriate. This would be consistent with the recommendations of the BWROG to replace the discs in two phases in order to verify performance and effectiveness of the new discs.

Topic 1.101--Fire Detection System Code Compliance

This project involves certain modifications to the fire detection system to ensure compliance with the intent of the National Fire Protection Association (NFPA) code and their ability to function in accordance with their design purpose. Engineering evaluations on the identified NFPA code deviations have been completed, and all code compliance deviations have been dispositioned. Any modifications which will result in a significant change in the scope of the existing Project Assignment will be evaluated in a future ISAP report.

Topic 1.102--Fire Suppression System Code Compliance

This project involves certain modifications to the fire suppression system to ensure compliance with the intent of the NFPA code and their ability to function in accordance with their design purpose. Engineering evaluations on the identified NFPA code deviations have been completed, and all code compliance deviations have been dispositioned. Any modifications which will result in a significant change in the scope of the existing Project Assignment will be evaluated in a future ISAP report.

Topic 1.106--Station Blackout

This project was discussed in detail in previous ISAP update reports. The project includes:

- a modification to install a structure around the 14H bus to reduce the probability that the alternate AC source would be disabled coincident with the loss of off-site power due to the effects of weather-related events,

- an evaluation to determine whether the above ground cable tray between Millstone Unit Nos. 1 and 2 requires reinforcement, and

- necessary modifications to the control circuits within the control room. This would enable operators to energize the crosstie between Millstone Unit Nos. 1 and 2 without having to bypass protective relays and also provide additional assurance that the 1-hour time frame for accomplishing the crosstie is met.

This project received a low overall ranking due to the small public safety benefit and negligible economic performance, personnel safety, and productivity scores. However, the remaining project cost is relatively small, and this project will fulfill NNECO's commitment to implement modifications to resolve the station blackout issue. As such, the control circuit modifications remain scheduled for completion during Cycle 14. Modifications to install the structure around the 14H bus will be completed by the end of April, 1994.

<u>Topic 1.111--Motor Operated Valve Testing, Generic Letter 89-10</u>

This ISAP topic addresses Generic Letter (GL) 89-10, "Safety-Related Motor Operated Valve Testing and Surveillance," issued by the NRC Staff in a letter dated June 28, 1989.[3]

As scheduled previously, testing will be completed prior to startup from the Cycle 15 refueling outage. This is reflected in the IIS. This schedule may change if, while conducting the program, there is a substantial change in scope of work from that initially projected. Should the program reveal substantial modifications, an ARM evaluation will be performed. These resulting modifications will be scheduled according to their rank and reported in a future ISAP/IIS report.

<u>Topic 1.113--Hardened Wetwell Vent, Generic Letter 89-16</u>

The October 23, 1992, ISAP submittal indicated that installation of a hardened wetwell vent would be completed and testing would be performed during any outage of sufficient duration after February 1993, but not later than the Cycle 14 refueling outage. However, as was discussed during an April 22, 1993, meeting between NNECO and the Staff, an alternate design for the hardened wetwell vent is being pursued. This alternate design utilizes the nitrogen inerting system piping versus the containment venting system. The original schedule for installation was postponed until after the engineering and design was completed. The Staff concurred with this change in schedule, as documented in the Staff's meeting summary.[4] Installation of the hardened wetwell vent remains scheduled in the IIS for completion during the Cycle 14 refueling outage. It should also be noted that NNECO is combining improvements to the nitrogen inerting system with the hardened wetwell vent modifications, as the synergy between the combustible gas control issue and the hardened wetwell vent installation offers an opportunity for effective utilization of resources and resolves two outstanding regulatory issues. NNECO has determined that the combination of these two modifications does not require a formal ISAP reevaluation. The NRC accepted NNECO'S planned modifications to the nitrogen inerting system to resolve the combustible gas control issue in a letter dated August 20, 1993.[5]

Topic 1.119--Resolution of Unresolved Safety Issue A-46

This topic encompasses NNECO's plant-specific response to USI A-46, "Seismic Qualification of Equipment in Operating Plants." NNECO is addressing this issue in conjunction with the Seismic Qualification Utility Group, and has reported details in previous ISAP reports. NNECO submitted its response to Supplement 1 of Generic Letter 87-02 on September 21, 1992.[6] As stated therein, submittal of a safe shutdown equipment list report, a relay evaluation report, and a seismic evaluation report is currently scheduled for 180 days following the completion of the Cycle 15 refueling outage. Any recommended actions involving hardware modifications will be evaluated within the ISAP process. Modifications will be scheduled in the IIS depending on their ranking. Subsequent information will be reported in a future ISAP/IIS report.

Topic 1.120--Purge and Vent Valve Auto-Closure

As discussed in our previous ISAP submittals, the proposed change involves providing a new primary containment isolation input signal to the purge and vent system valves on high radiation. This project received a low ARM value and relative ranking based on a very small public safety benefit and negligible values in the remaining attributes. Due to our desire to resolve this regulatory issue, the project priority has been increased. Accordingly, NNECO remains committed to implement this modification during the Cycle 14 refueling outage.

Topic 1.122--Split Loss-of-Normal Power Logic

By letter dated December 28, 1993,[7] the NRC Staff accepted NNECO's proposed resolution of the long-standing issue of a split loss-of-normal power (LNP) logic design at Millstone Unit No. 1. NNECO plans to implement the modifications in the Cycle 15 refueling outage. The proposed project will modify the undervoltage detection logic so that, in the event one division of electrical power experiences an LNP, that division would automatically be transferred to its emergency power source, while the other safety division would continue to be powered by normal power. In addition, the LNP sensing for the S1 division will be relocated from 4160-volt bus 14E to bus 14C.

Topic 1.123--LPCI/CS Pipe Temperature Modifications

Postaccident analyses indicate that the torus water temperature could reach temperatures as high as 207°F following a design basis loss-of-coolant accident. An evaluation was performed to ensure that the low pressure coolant injection (LPCI) and core spray (CS) piping and components would remain operable under these postaccident conditions. Modifications may be required to restore the piping to within design code stress levels. An ISAP evaluation will be performed upon further definition of the project scope, and identification of any appropriate modifications.

Topic 1.124--MSIV ASCO Solenoid Valve Replacement

In September 1989, the NRC notified licensees of a potential common mode failure with ASCO dual-coil solenoid valves that could impact main steam isolation valve (MSIV) operability. An error in the calculation of the qualified life of the elastomer disc of the solenoid valve was identified. The original calculation employed temperatures acquired from single-coil heat up data which are lower than temperatures produced from dual-coil solenoid valves. The higher-than-anticipated temperature impacts the qualified service life of the elastomer disc. Degradation of the elastomer disc has the potential to affect proper operation of the solenoid valves and the MSIV. The predominate failures noted in the industry are the models utilized at Millstone Unit No. 1. The existing qualified life of the solenoid valves is July 1994.

The proposed project is to replace the solenoid valves thus maintaining their compliance with 10CFR50.49.

This project received the highest ranking based primarily on the economic performance attribute. Given its ranking and the need to maintain compliance with 10CFR50.49, this modification remains scheduled in the IIS for completion during the Cycle 14 refueling outage.

Topic 1.125--Turbine Building Secondary Closed Cooling Water Modifications

It has been concluded that the selected Turbine Building Secondary Closed Cooling Water (TBSCCW) system heat exchanger is operating at approximately twice the shell-side-design flow. Of concern is the potential failure of the heat exchanger tubes due to vibration caused by the flow in excess of design flow. This has been the normal system alignment for many years, and no indication of tube damage due to the high flow has been detected to date. In addition, special testing was conducted to evaluate the degree of tube vibration at various higher-than-design flows. No significant tube vibration was observed. An evaluation has concluded that the heat exchangers are presently operable, notwithstanding the high flow rate. However, NNECO plans to install four new valves in the TBSCCW heat exchanger discharge piping, and differential pressure instrumentation across the two valves on the TBSCCW side during the Cycle 14 refueling outage. This will eliminate the concern identified above, since parallel heat exchanger operation would be permitted. It is noted that the topic title has been changed to reflect the current scope of the project. Additionally, this project did not receive an ISAP evaluation due to timing of the decision to implement this project.

Topic 1.126--BWR Stability

Following the instability event at LaSalle Unit 2 in March 1988, the NRC Staff, in conjunction with the BWROG and General Electric, performed studies and analyses to develop long-term solutions for resolution of instability concerns. This topic was opened to address the potential hardware modifications that may be necessary.

Following issuance of the expected GL on this subject, NNECO will evaluate any appropriate hardware modifications within ISAP and schedule the modifications accordingly. At this time, NNECO is reviewing options to resolve stability concerns and will complete an ISAP evaluation once a determination has been made.

Topic 1.128--TSI Thermo-Lag Fire Barrier

This ISAP topic was opened to evaluate solutions to concerns which were identified in NRC Bulletin 92-01 regarding degraded fire protection properties and higher derating values associated with TSI Thermo-Lag fire wrap. This material was used at Millstone Unit No. 1 to provide fire protection for certain safe shutdown components in areas where physical separation was not feasible. Recent material qualification test data indicate that Thermo-Lag fire wrap material may not perform as well as the manufacturer indicates.

An ARM evaluation will be performed on any proposed modifications with significant scope, and appropriate modifications will be scheduled according to their rank and reported in a future ISAP/IIS report.

Topic 2.06--Condenser Retube

This topic was discussed in detail in our previous ISAP submittals. This topic addresses replacement of the existing 70/30 copper-nickel condenser tubes with titanium tubes and tube sheets of a highly corrosion-resistant material. This project also includes new anti-vibration stakes, a new Cathodic Protection System, and refurbishment of the water boxes.

This project received a moderate ARM value and relative ranking based mainly on the remaining project cost of approximately $25 million. Retubing remains scheduled in the IIS for the Cycle 14 refueling outage.

Topic 2.103--Battery Charger Replacement

This ISAP topic addresses the replacement of existing battery chargers with battery-eliminating type, self-regulating chargers so as to provide more reliable continuous DC power in the event of a loss of battery charger. The topic was discussed in our previous submittals. As reflected therein, the project received a moderate ranking. The project remains scheduled in the IIS for the Cycle 15 refueling outage.

Topic 2.107--Class 1E Generator Antimotoring Protection

This topic was addressed in previous submittals. This project received a high ARM value and ranking based largely on the relatively low remaining cost. The implementation of this project will avoid 2.05 hours of lost full power operation per year, and installation continues to be scheduled for the Cycle 15 refueling outage.

Topic 2.108--Generator Antimotoring Protection While Shutdown

This topic was addressed in previous submittals. This project received a high ARM value and relative ranking based upon its positive economic performance score and its relatively low remaining cost. It continues to be scheduled for implementation during the Cycle 15 refueling outage.

Topic 2.120--Atmospheric Control System Containment Isolation Valves

This topic addresses modifications to atmospheric control system CIVs to improve reliability and provide added assurance that the valves will pass their LLRT.

The modifications completed to date, as well as the contemplated modifications, were the subject of significant discussions in NNECO's corrective action plan.[8] The modifications do not require significant resources to complete. As such, an evaluation will not be performed in accordance with the ISAP process. These modifications remain scheduled for completion during the Cycle 14 refueling outage.

Topic 2.126--Emergency Service Water/Service Water Headers

The emergency service water (ESW) and service water (SW) pump discharge piping in the intake structure is experiencing external corrosion due to salt water exposure. The arrangement of the piping precludes visual inspection of a portion of the piping in some areas. Significant degradation of the piping would impact the operability of the ESW and SW systems. The proposed project is to redesign and replace the ESW and SW pump discharge headers in the intake structure from the pump nozzles to the strainer pit south wall. Additionally, a cross connect will be installed between the ESW trains and SW.

Due to the positive benefits in the areas of public safety, economic performance, and personnel productivity and the associated high ranking of this project, modifications remain scheduled in the IIS for completion during the Cycle 14 refueling outage.

Topic 2.127--Replacement of LP-43A/B, LP-44A/B, and IC-10 Motor Operators

The motor operators for valves LP-43A and -43B, LP-44A and -44B, and IC-10 are currently not fully environmentally qualified (EQ). As such, it had been assumed that these valves would not be operable following postulated high energy line breaks (HELBs) in the reactor building. The failure of these valves would preclude the use of some of the methods of mitigating the postulated HELBs. The proposed evaluation involves replacement of the motor operators for the valves with operators that are EQ. This potential modification could provide improvement in the area of HELB shutdown methods. However, the motor operators for LP-43A/B and -44 A/B were recently determined to be operable in the reactor building HELB environment with only a minor modification. This modification is scheduled for completion during the Cycle 14 refueling outage. Diagnostic testing on IC-10 is planned for a later date. As such, an ISAP evaluation has not been performed and no modifications are currently scheduled in the IIS. Any appropriate modifications will be evaluated following testing.

Topic 2.128--Low Pressure A Turbine Rotor Replacement

Keyway cracking in the A low pressure (LP) turbine rotor has progressed to the extent that inservice inspections of the rotor would have to be performed more frequently than every refueling outage. The risk of a turbine missile being generated due to a turbine disc rupture could not be adequately eliminated without a mid-cycle shutdown to inspect for cracking following the Cycle 14 refueling outage.

This project received a very high ARM ranking due to its positive benefit in the areas of economic performance, personnel safety, and personnel productivity. As such, this modification remains scheduled in the IIS for completion during the Cycle 14 refueling outage.

References

(1) J. F. Opeka letter to Dr. T. E. Murley, "Cost-Effective Resolution of Selected Operational and Safety Issues," dated April 16, 1993.

(2) E. J. Mroczka letter to U.S. Nuclear Regulatory Commission, "Appendix J--Reverse-Direction Testing," dated May 22, 1991.

(3) James G. Partlow letter to All Licensees of Operating Nuclear Power Plants and Holders of Construction Permits for Nuclear Power Plants, "Safety-Related Motor-Operated Valve Testing and Surveillance (Generic Letter 89-10)," dated June 28, 1989.

(4) J. W. Andersen letter to NNECO, "Summary of April 22, 1993, Meeting Regarding Proposed Modifications to the Combustible Gas Control System and Implementation of the Hardened Wetwell Vent," dated April 28, 1993.

(5) J. W. Andersen letter to J. F. Opeka, "Millstone Nuclear Power Station, Unit 1 — Generic Letter 84-09 -- Recombiner Requirements (TAC No. M65067)," dated August 20, 1993.

(6) J. F. Opeka letter to the U.S. Nuclear Regulatory Commission, "Plant-Specific Response to Supplement 1 of Generic Letter 87-02," dated September 21, 1992.

(7) J. W. Andersen letter to J. F. Opeka, "Withdrawal of Amendment Request and Safety Evaluation Related to Degraded Grid Voltage--Millstone Nuclear Power Station, Unit 1 (TAC No. M60207)," dated December 28, 1993.

(8) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "10CFRE50, Appendix J, Type A Testing -- Request for Exemption from Schedular Requirements," dated November 4, 1992.

Docket No. 50-245
B14684

Attachment 3

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

Evaluation of New ISAP Topics or
Reevaluation of Existing Topics

March 1994

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
Evaluation of New ISAP Topics or Reevaluation of Existing Topics

Topic 1.09.4--Regulatory Guide 1.97 Instrumentation—Type A Variables

I. Introduction

This topic has been described in previous ISAP submittals. This reevaluation reflects NNECO's final assessment of this issue and includes two Type A variables for which modifications are proposed to provide resolution of this issue. This position was formally transmitted to the NRC Staff on November 12, 1993.[1]

One variable previously under evaluation in this topic has been resolved. In a letter to the Staff on July 21, 1993,[2] NNECO provided justification for downgrading emergency service water to low pressure coolant injection (LPCI) differential pressure, variable A-10, to a Type D variable. The existing instrumentation meets the Category 2 design and qualification criteria for this variable, now identified as variable D-30.

The instrumentation for the two remaining Type A variables does not meet the provisions of Regulatory Guide (RG) 1.97. The two variables are LPCI flow (variable A-7) and core spray flow (variable A-8).

The proposed project consists of the following modifications to provide resolution of the RG 1.97 issue for these two variables:

- Changing the power supply for the LPCI injection flow transmitters and associated control room indicators for each of the LPCI loops to a source (120-volt Vital AC (VAC)) that is diverse from the power source for the two LPCI total flow transmitters (120-volt Instrument AC (IAC)).
- Changing the power supply for one of the core spray (CS) train's flow transmitter and control room indication to a diverse source (VAC).

By letter dated December 30, 1993,[3] the NRC Staff issued a safety evaluation concluding that NNECO's proposed modifications mentioned above are acceptable.

II. Evaluation

A. Public Safety

The repowering of the two LPCI injection flow transmitters by the VAC system would provide increased reliability of LPCI flow indication. With the failure of the IAC bus, the LPCI injection flow transmitters (one in each loop) will still be operable, since they will be powered by VAC. Likewise, with the failure of the VAC bus, the LPCI total flow transmitters (one in each loop) will still be operable, since they will be powered by IAC. However, since the probability of the IAC bus failing is so low, this change would not have a significant impact on the core melt frequency.

Existing flow transmitters FT-1461A and B measure the CS flow to each of the two injection loops. Since both of the flow transmitters are currently powered from the IAC system, the repowering of one of the transmitters from the 120-volt AC system would provide increased reliability of CS flow indication. However, even if it is assumed that the loss of the IAC system would result in the failure of both CS pumps, since the probability of the IAC bus failing is so low, this change would not have a significant impact on the core melt frequency. The common cause failure of both CS pumps to operate, which has a higher probability than the failure of the IAC system and is modelled in the Millstone Unit No. 1 Probabilistic Safety Study, does not have a significant impact on the core melt frequency (less than one-tenth of a percent).

The proposed modifications would result in increased availability of flow indication. The proposed modifications are such that a measurable reduction in the core melt frequency cannot be accurately calculated. However, after comparing this project with other ISAP topics, this project was assigned a public safety score of $750 per year.

B. Economic Performance

The proposed modifications will potentially increase the reliability of LPCI and CS instrumentation by providing separation of power supplies. The current instrumentation is considered fully functional and meets all operability requirements for an emergency core cooling system (ECCS). Since the ECCS does not function to support normal plant operation, there is no impact on the power conversion process. Additionally, the proposed modifications do not affect the maintainability of other equipment important to plant availability. The impact of this issue on economic performance is zero (0) hours per year.

C. Personnel Safety

This project will have no impact on personnel safety. These modifications consist of only instrumentation and cabling changes, and will be performed in the Millstone Unit No. 1 Control Room, which is a very low radiation environment. The radiation levels in the Control Room will remain unaffected by these proposed modifications, and any additional radiation exposure incurred as a result of these proposed modifications will be negligible. In addition, there is no net decrease in industrial safety as a result of the proposed instrumentation and cabling changes. As such, a personnel safety score of $0/year has been assigned.

D. Personnel Productivity

The proposed wiring changes will require scheme verification of the affected circuits in addition to the normal refueling outage loop and power supply calibrations and operability surveillances of all affected instruments. However, it is noted that this represents a one-time requirement, and there will be no additional surveillance requirements other than those already existing for the same instruments. Therefore, the overall net change in personnel productivity would be negligible. Therefore, this project received a personnel productivity score of $0/year.

III. Conclusion

This topic received a moderate ARM ranking due to the benefit in the area of public safety. Therefore, in an effort to resolve this long-standing issue, NNECO plans to implement the above modifications in the Cycle 14 and 15 refueling outages.

Topic 1.09.5--Regulatory Guide 1.97 Instrumentation — EQ CIV Position Indication

This topic has been opened to resolve the environmental qualification (EQ) issue for the position indication instrumentation for 22 primary containment isolation valves included in variable B-10 of RG 1.97.

In a letter dated October 6, 1993,[4] NNECO agreed to classify variable B-10 as Category 1 and transmitted the results of an extensive rereview of the design and qualification criteria as applied to the position indication for a total of 45 piping penetration valve sets. Although justifications for exception to selected criteria were provided for various penetrations and/or valve sets, NNECO committed to continue an evaluation of the need for EQ for the position indication of 22 specific valves under ISAP Topic 1.09.

The need for EQ position indication for the following valves will be addressed in a future ISAP evaluation:

TIP-BV-1, 2, 3 & 4
MS-5
AC-40
AC-41
CU-2A
SD-5
SD-4A & B
SD-1
SD-2A & B
SDV-1N&S
SDV-2N&S
SDV-3N&S
SDV-4N&S

Topic 1.104.1--Service Water Pump Flow Rate Instrumentation

I. Introduction

This topic was evaluated in a previous ISAP report and has been reevaluated due to a change in project scope.

The NRC has stated that enhanced flow monitoring instrumentation for the Service Water (SW) pumps is required to comply with the inservice testing (IST) requirements of 10CFR50.55a.

The proposed project consists of installing annubar flow sensing devices on the 16-inch SW supply header to the Turbine Building Secondary Closed Cooling Water (TBSCCW) heat exchangers, on the 24-inch SW supply header to the Reactor Building Closed Cooling Water (RBCCW) heat exchangers, and on the 6-inch SW supply header to the diesel generator room. Pressure and temperature local indication will also be provided on the TBSCCW and RBCCW supply headers.

II. Evaluation

A. Public Safety

The primary reason for this project is to comply with an NRC IST requirement by establishing a means to detect long-term degradation in SW pump performance by comparing individual pump flow capacity each refueling outage to previous baseline data. In order to accurately determine flow from a SW pump, the 3 other SW pumps would have to be secured, and flow to the TBSCCW heat exchangers isolated. Since this can only be accomplished with the turbine off line, the ability to accurately monitor individual pump flow and/or total SW flow during normal operating conditions will still not exist. As such, minimal benefit is credited for this project for accident mitigation.

This project will provide a benefit by enabling data collection of actual SW system flow in the portions of the system with the new instrumentation. The current dependency on conservative computer code analyses would be reduced, which would provide greater operational flexibility, such as permitting throttling of the non-essential SW loads. The ability to analytically and physically ensure adequate SW cooling to essential loads would be enhanced.

This project would also provide the operators with a more direct means of detecting RBCCW and TBSCCW heat exchanger plugging.

This project would not result in a direct quantifiable reduction in core melt frequency. However, due to the risk significance of the SW system, the proposed modifications would have a positive impact on public safety. A review of other ISAP topics was conducted to determine the appropriate public safety score. This project was assigned a public safety score of $2000 per year.

B. Economic Performance

The impact on plant availability is judged to be negligible and considered to be zero for this evaluation.

C. Personnel Safety

This project will impact personnel safety. While these modifications will be performed in low radiation areas, there will be additional requirements to perform additional preventative and corrective maintenance, as well as surveillances once installed. This will result in additional occupational exposure. There will be no affect on industrial safety as a result of the proposed addition of the annubar flow elements. A personnel safety score of -$1000/year has been assigned.

D. Personnel Productivity

The proposed modifications will require additional routine maintenance, calibration, testing and surveillances after the annubar flow elements are installed in the subject SW lines. Even though the frequency of heat exchanger cleaning is not expected to change, the net affect will be a minimal negative impact on personnel productivity. As such, this project received a personnel productivity score of -$3840/year.

III. Conclusion

This topic received a very low relative ranking due to the negative impact on personnel productivity and the high project cost. However, it is the NRC Staff's position that the lack of installed instrumentation is not adequate technical justification for not testing pumps to the ASME Code requirements. As such, this project is scheduled for completion during the Cycle 14 refueling outage.

Topic 1.112--Service Water System Evaluation, Generic Letter 89-13

I. Introduction

This topic addresses Generic Letter 89-13, "Service Water System Problems Affecting Safety-Related Equipment" which requested licensees to confirm that the SW system will perform its intended function in accordance with the licensing basis for the plant.

To assist in confirming the ability of the SW and emergency service water (ESW) systems to perform their intended functions, a thermal-hydraulic computer model of the systems is being developed. The model will be used to evaluate the SW and ESW systems in various alignments or conditions (e.g., pump degradation, heat exchanger or strainer blockage, and pipe breaks). During the Cycle 14 refueling outage, testing of the SW and ESW systems will be conducted to benchmark and refine the model.

Due to the limited instrumentation currently installed in the SW and ESW systems, new pressure gauges will be installed to obtain heat exchanger inlet and outlet pressures.

II. Evaluation

A. Public Safety

The thermal-hydraulic model being developed will enable the confirmation of the ability of the SW and ESW systems to perform their intended functions, as required by Generic Letter 89-13.

Due to current system flow balance requirements, throttling of the TBSCCW and RBCCW heat exchanger outlet valves is necessary to ensure adequate cooling water flow is provided to safety-related equipment. New differential pressure gauges would provide a means of more accurately throttling the valves.

The new pressure gauges would also allow more accurate monitoring of debris accumulation in the various closed cooling water heat exchangers, which would enable more timely operator actions to counteract heat exchanger fouling. This would be an improvement over existing means of detecting fouling, which include closed cooling water system temperature trending and visual inspection.

The development of an accurate thermal-hydraulic model of the SW and ESW systems, together with the installation of the new pressure gauges, would result in greater operational flexibility due to the likely easing of some of the current throttling restrictions. In addition, more accurate and timely operability determinations and other evaluations would be available.

The proposed modifications would provide increased assurance of the capabilities of the SW and ESW systems, but would not result in an easily quantifiable reduction in core melt frequency. A review of other ISAP topics was conducted to determine the appropriate public safety score. This project was assigned a public safety score of $2000 per year.

B. Economic Performance

It has been determined that one forced outage of power reduction per fuel cycle could result from service water system leaks. Based on historical information, it has been calculated that an increase in plant availability of 26.48 equivalent full power hours per calendar year could be expected, and accordingly, an economic performance score of $17,658 is assigned.

C. Personnel Safety

This project will have a negligible impact on personnel safety. While the differential pressure gauges will require periodic calibration, the overall impact of this activity to occupational exposure is expected to be minimal. There will be no affect on industrial safety as a result of the proposed addition of the pressure gauges, and this project received a personnel safety score of $0 per year.

D. Personnel Productivity

The proposed modifications will require additional plant testing and flow verification during the 1994 refueling outage and, therefore, there will be a negative impact on personnel productivity. As such, this project received a personnel productivity score of -$3840 per year.

III. Conclusion

This project received a moderate overall ranking due to positive public safety and economic performance attributes. Also, as discussed in previous submittals, the overall completion schedule for addressing

GL 89-13 is the Cycle 14 refueling outage. Therefore, this project is scheduled for completion during the Cycle 14 refueling outage.

Topic 2.116--Replacement of CU-28 Motor Operator

I. Introduction

This topic was previously evaluated as part of Topic 2.124, "Replacement of IC System Valves and CU-28." However, due to significant changes to the scope of the original project, it was determined that a reevaluation was appropriate.

This project proposes to replace the motor operator and associated cables on valve CU-28 with an environmentally qualified (per 10CFR50.49 requirements) motor operator and cables compatible with that operator. This will be done to ensure that during a Reactor Water Clean-Up (RWCU) line break upstream of valve CU-28, the motor operator on that valve is capable of operating in the harsh environment created. This will provide added assurance that penetration X-15 will isolate following a RWCU line break. Currently, only CU-29 (a check valve) is credited for isolation of breaks in the reactor building.

The scope of this project includes not only the removal of an existing motor operator and the installation of a new motor operator, but the design of new connections (yoke, etc.) and electrical connections to make the new operator compatible with the existing valve. The new electrical connections, circuit breaker, and thermal overload device will be changed with appropriately sized, seismically and environmentally qualified replacements.

II. Evaluation

A. Public Safety

The upgrade of the new operator to meet EQ requirements would have a small benefit for public safety. Valve CU-28, which is normally open, is designed to close to isolate postulated RWCU line breaks. If the break is outside the drywell, the operator would be exposed to the harsh environment. Check valve CU-29, which is inside the drywell, is designed to isolate backflow through the RWCU system following a postulated break in the RWCU piping outside the drywell.

The new operator would provide increased assurance that CU-28 would close following a RWCU line break. To estimate the benefit of replacing the operator, it was assumed that the existing valve would fail to close following a RWCU line break upstream of CU-28, and that the valve would close with certainty following implementation of this project. The benefit of this project with the above assumptions would be a decrease in the calculated core melt frequency of 2.7E-8/year, with an associated reduction in public risk of 0.08 man-rem per year. As such, this project was assigned a public safety score $220 per year.

B. Economic Performance

Since the only change will be the valves ability to operate during harsh environmental conditions, when the plant is presumably already in a shutdown condition, there is no direct or indirect impact on the power conversion process. Hence, there is no anticipated impact on plant availability. Implementation of the proposed changes are not expected to impact refueling outage length nor are they expected to affect the maintainability of equipment important to plant availability. As such, the impact on plant availability is judged to be negligible and considered to be zero for this evaluation.

C. Personnel Safety

This project will have a negligible impact on personnel safety. Due to the higher than average radiation levels near the RWCU Heat Exchanger Room, implementation of this project may require significant occupational dose. However, post-implementation, the extent of maintenance activities that will be required for this new motor operator is expected to remain unchanged. Therefore, there is no net change in occupational exposure. There will be no affect on industrial safety as a result of the proposed cable and motor operator replacement. Therefore, this project received a personnel safety score of $0 per year.

D. Personnel Productivity

The proposed modifications will require no additional plant testing nor new surveillance requirements after installation. As such, there will be no affect on personnel productivity, and a project score of $0 per year has been assigned.

III. Conclusion

This project received a low ARM ranking due to negligible benefits in the areas of economic performance, personnel safety, and personnel productivity. However, due to a positive public risk score, this project is scheduled in the IIS for completion during the Cycle 14 refueling outage.

Topic 2.124--Replacement of Motor-Operator for IC-4

I. Introduction

This project has been reevaluated due to significant changes from the original project scope.

This project involves replacing the motor operator and associated cables on valve IC-4 with an environmentally qualified (per 10CFR50.49) motor operator and cables compatible with that operator.

The scope of this project includes not only the removal of an existing motor operator and the installation of a new motor operator, but the design of new connections (yoke, etc.) and electrical connections to make the new operator compatible with the existing valve.

II. Evaluation

A. Public Safety

The upgrade of the new operator to meet EQ requirements would not have a significant benefit for public safety. Valve IC-4, which is normally open, is designed to close to isolate postulated isolation condenser (IC) line breaks. If the break is outside the drywell, the operator would not be exposed to the harsh environment. Due to the very low probability of a break in the short section of piping between IC-4 and the drywell penetration, the risk associated with the assumed inability of the valve to close in a harsh environment is negligible. In addition, IC-3, which is EQ, is normally closed. For these and other reasons, an exemption from 10CFR50.49 requirements for IC-4 has been granted.[5]

The new operator and yoke would provide increased assurance that IC-4 would close as designed following an IC line break. Numerous adjustments to the valve have been made to comply with technical requirements, including the concerns of Generic Letter 89-10, making it more difficult to ensure its reliability. To estimate the benefit of replacing the operator and the yoke, it was assumed that the existing valve would fail to close following an IC line break between IC-2 and IC-3, and that the valve would close with certainty following implementation of this project.

The proposed modifications would provide a reduction in core melt frequency of 1.2E-7 per year and a corresponding public risk reduction of 0.36 man-rem per year. This project was assigned a public safety score of $970 per year.

B. Economic Performance

Since the only change will be the valve's ability to operate during harsh environmental conditions, when the plant is already in a shutdown condition, there is no direct or indirect impact on the power conversion process. Hence, there is no anticipated impact on plant availability.

Implementation of the proposed changes are not expected to impact refueling outage length nor are they expected to affect the maintainability of equipment important to plant availability. Therefore, the impact on plant availability is judged to be negligible and considered to be zero for this evaluation.

C. Personnel Safety

This project will have a negligible impact on personnel safety. Due to the higher than average radiation levels in the upper drywell region where IC-4 is located, implementation of this project may require significant occupational dose. However, post-implementation, the extent of maintenance activities that will be required for this new motor operator is expected to be reduced. Therefore, there would be a positive net change in occupational exposure, and this project received a personnel safety score of $1,000 per year.

There will be no affect on industrial safety as a result of the proposed cable and motor operator replacement.

D. Personnel Productivity

The proposed modifications should result in significantly less maintenance being performed on this valve in subsequent outages than in historical outages. Therefore, there will be a positive affect on personnel productivity, and a personnel productivity score of $5120 per year.

III. Conclusion

This project received a low relative ranking in the ARM. This project is scheduled for completion during the Cycle 14 refueling outage due to its positive ratings in public safety, personnel safety, and personnel productivity.

Topic 2.129--LPCI Check Valve Replacement

I. Introduction

There are four LPCI check valves at Millstone Unit No. 1 which are vertically mounted and do not reseat properly. Following LPCI pump surveillance testing, leakage enters the torus through the four LPCI check valves from the downstream piping keep-fill maintained by the condensate transfer system. On the average, approximately 1,000 gallons must be pumped twice a week from the torus to the radwaste system. LPCI pumps are used to pump down the torus. The water pumped from the torus must go to radwaste and be subsequently processed. During this processing, manual valves must be opened to establish the flow path. Should a design basis accident occur when these valves are opened, water will be diverted from the torus to radwaste.

This project involves replacement of two of the four LPCI check valves (LP-3C and LP-3B) with check valves containing resilient seats. Since valve LP-3C and LP-3B will have resilient seats, they will seat properly (allow no leakage) with a minimal pressure differential in the containment cooling line. Proper seating of the check valves will stop leakage into the torus. Additionally, this modification will prevent unnecessary cycling of the LPCI pumps.

II. Evaluation

A. Public Safety

While the largest benefit of this project would be a reduction in the amount of water that has to be processed by the radwaste system, there would also be a small positive safety impact due to the decreased likelihood of LPCI flow diversion in the highly improbable event of an accident occurring while pumping down the torus.

If an accident were to occur while pumping down the torus, the operator stationed by the valves in the torus area would be instructed to isolate the valves. In almost all postulated accident scenarios, the operator would not be endangered by high radiation or other hazardous conditions in the brief time it would take to isolate the valves. The torus pumping evolution typically occurs a couple times per week and takes about 10 to 15 minutes, which means that the valves are open approximately 0.3 percent of the time. The probability that an accident occurs while the valves are open is very low. Even if the valves were not isolated during an accident scenario, the flow diversion would not significantly impact the LPCI function, since the drain line to radwaste is only a 3-inch pipe. Due to the large inventory of water in the torus, the loss of water to radwaste would not have a large impact on accident mitigation until several hours into the event.

To estimate the benefit of this project, it was assumed that the unavailability (due to loss of torus inventory) of the CS, LPCI injection, and torus cooling functions would be slightly reduced. The Millstone Unit No. 1 probabilistic risk assessment model was requantified after increasing the probability of failure of CS, LPCI injection, and torus cooling by the probability that the torus is being pumped down. The benefit of this project would be the impact of returning the failure probabilities to their previous values.

The proposed modifications would provide a reduction in core melt frequency of 2.4E-8 per year and a corresponding public risk reduction of 0.07 man-rem per year. This project was assigned a public safety score of $195 per year.

B. Economic Performance

Because no changes will be made to the direct power conversion process, the implementation of this project is not anticipated to have a direct or indirect affect on normal plant operations, outage length, or the maintainability of equipment important to plant availability.

The impact on plant availability is judged to be negligible and considered to be zero for this evaluation.

C. Personnel Safety

These valves are located in the Reactor Building North/East and South/West Corner Rooms. Because these valves do not reseat properly, the torus is required to be pumped down on the average of twice per week. Each time this is done, the operators receive additional occupational exposure. Replacement of these valves would result in a positive net change in occupational exposure. Therefore, this project was assigned a personnel safety score of $1,000 per year. There will be no affect on industrial safety as a result of the proposed check valve replacement.

D. Personnel Productivity

The proposed modifications should result in significantly less operational activities being performed to pump the torus on a regular basis. Therefore, there will be a positive affect on personnel productivity, and a score of $3,840 per year has been assigned.

III. Conclusion

This project scored low in the ARM rankings. This project is scheduled in the IIS for completion during the Cycle 14 refueling outage due to positive scores in public safety, personnel safety, and personnel productivity. It should be noted that at the onset of the Cycle 14 refueling outage, it was determined that all four LPCI check valves will be replaced. Due to the timing of the decision, an ISAP evaluation of the additional two check valves will not be performed.

References

(1) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Regulatory Guide 1.97, Revision 2 (TAC No. M51106)," dated November 12, 1993.

(2) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Regulatory Guide 1.97, Revision 2, (TAC No. M51106)," dated July 21, 1993.

(3) J. W. Andersen letter to J. F. Opeka, "Millstone Nuclear Power Station, Unit 1 — Conformance to Regulatory Guide 1.97, Revision 2 (TAC No. M51106)," dated December 30, 1993.

(4) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Regulatory Guide 1.97, Revision 2 (TAC No. M51106) - Primary Containment Isolation Valve Position Indication," dated October 6, 1993.

(5) D. M. Crutchfield letter to E. J. Mroczka, "Exemption - Valve Motor Operators," dated June 8, 1987.

Docket No. 50-245
B14684

Attachment 4

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

Summary Table of ISAP ARM Scores

March 1994

Report Date: 3/23/94

MILLSTONE UNIT NO. 1 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
1.124	MSIV ASCO SOLENOID VALVE REPLACEMENT	93-001	1	720	70,121,481	0	0	865,000	49,086,052	5674.69	4.86	0	0	4.86
2.128	LP-A TURBINE ROTOR REPLACEMENT	91-036	2	0	77,207,489	6,700	150,400	14,627,000	54,136,926	365.12	0	0	0	0
2.108	GEN. ANTIMOTORING PROTECTION WHILE SHUT DOWN	85-120	3	0	103,546	0	0	168,000	72,482	43.14	0	0	0	0
2.107	CLASS 1E GENERATOR ANTIMOTORING PROTECTION	85-019	4	0	29,897	0	0	50,000	20,928	41.86	0	0	0	0
1.07.16	CONTROL ROOM DESIGN REVIEW (pkg. 16)	81-047	5	6,100	700	0	2,400	40,000	10,411	26.03	116	0	0	116
2.126	ESW / SW HEADERS	92-078	6	1,800	1,273,248	0	1,280	5,800,000	894,234	15.42	10.8	0	0	10.8
1.07.17	CONTROL ROOM DESIGN REVIEW (pkg. 17)	81-047	7	0	700	0	0	10,000	490	4.90	0	0	0	0
1.07.12	CONTROL ROOM DESIGN REVIEW (pkg. 12)	81-047	8	2,250	700	0	0	100,000	3,663	3.66	40.4	0	0	40.4
1.07.8	CONTROL ROOM DESIGN REVIEW (pkg. 8)	81-047	9	0	700	0	2,400	50,000	1,810	3.62	0	0	0	0
1.07.3	CONTROL ROOM DESIGN REVIEW (pkg. 3)	81-047	10	850	700	0	0	50,000	1,689	3.38	15.4	0	0	16.4
1.07.7	CONTROL ROOM DESIGN REVIEW (pkg. 7)	81-047	11	0	0	0	2,400	50,000	1,320	2.64	0	0	0	0
2.06	CONDENSER RETUBE	81-105	12	31,900	562,902	70,000	80,000	25,000,000	576,810	2.31	579	10	-5	584
1.09.4	REG. GUIDE 1.97 - TYPE A VARIABLES	None	13	750	0	0	0	50,000	1,058	2.12	5.04	0	0	5.04
2.103	BATTERY CHARGER REPLACEMENT	88-029	14	7,600	0	0	0	587,000	10,716	1.83	149	0	0	149
1.112	SERVICE WATER SYSTEM EVALUATION, GL 89-13	90-073	15	2,000	17,658	0	-3,840	736,000	13,069	1.78	13.5	0	0	13.5
1.07.15	CONTROL ROOM DESIGN REVIEW (pkg. 15)	81-047	16	0	700	0	3,600	250,000	2,470	0.99	0	0	0	0
2.124	REPLACEMENT OF MOTOR OPERATOR FOR IC-4	89-088	17	970	0	1,000	5,120	629,000	5,524	0.88	6.48	18	-1.5	22.98
2.129	LPCI CHECK VALVE REPLACEMENT	93-029	18	195	0	1,000	3,840	802,000	3,727	0.46	1.26	18	0	19.26
1.106	STATION BLACKOUT	90-098	19	240	0	0	0	100,000	338	0.34	4.1	0	0	4.1
1.07.9	CONTROL ROOM DESIGN REVIEW (pkg. 9)	81-047	20	2,750	0	0	-3,600	1,000,000	1,898	0.19	53.6	-2	-40	11.6
1.07.6	CONTROL ROOM DESIGN REVIEW (pkg. 6)	81-047	21	330	700	0	1,200	1,000,000	1,615	0.16	6.7	0	0	6.7
1.07.2	CONTROL ROOM DESIGN REVIEW (pkg. 2)	81-047	22	100	700	0	1,200	1,200,000	1,291	0.11	2	0	0	2
1.120	PURGE AND VENT VALVE AUTO-CLOSURE	None	23	50	0	0	0	75,000	71	0.09	1	0	0	1
1.113	HARDENED WETWELL VENT, GL 89-16	90-097	24	2,000	0	0	-3,200	1,500,000	1,060	0.07	42	0	-1	41
2.116	REPLACEMENT OF CU-28 MOTOR OPERATOR	89-035	25	220	0	0	0	529,000	310	0.08	1.44	0	-1.5	-0.06
1.07.5	CONTROL ROOM DESIGN REVIEW (pkg. 5)	81-047	26	125	0	0	0	480,000	176	0.04	2.2	0	0	2.2
1.07.13	CONTROL ROOM DESIGN REVIEW (pkg. 13)	81-047	27	0	0	0	0	[illegible],000	0	0.00	0	0	0	0
1.07.1	CONTROL ROOM DESIGN REVIEW (pkg. 1)	81-047	28	0	0	0	0	22,000	0	0.00	0	0	0	0
1.07.4	CONTROL ROOM DESIGN REVIEW (pkg. 4)	81-047	29	0	0	0	0	50,000	0	0.00	0	0	0	0
1.14.2	APPENDIX J MODIFICATIONS TO PENETRATION X-15	None	30	120	0	0	-320	113,554	-7	-0.01	2.4	-1.08	-5.4	-4.08
1.14.4	APPENDIX J MODIFICATIONS TO PENETRATION X-21	None	31	36	0	0	-256	192,573	-90	-0.05	12.96	-0.96	-4.8	7.2
1.104.1	SW PUMP FLOW RATE INSTRUMENTATION	88-007	32	2,000	0	-1,000	-3,840	1,012,000	-632	-0.06	13.5	-18	0	-4.5
1.122	SPLIT LNP LOGIC	80-135	33	1,300	0	0	-5,120	300,000	-983	-0.33	0	0	0	0
1.07.11	CONTROL ROOM DESIGN REVIEW (pkg. 11)	81-047	34	270	0	0	-1,200	25,000	-279	-1.12	5.2	0	0	5.2

Docket No. 50-245
B14684

Attachment 5

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

Integrated Implementation Schedule

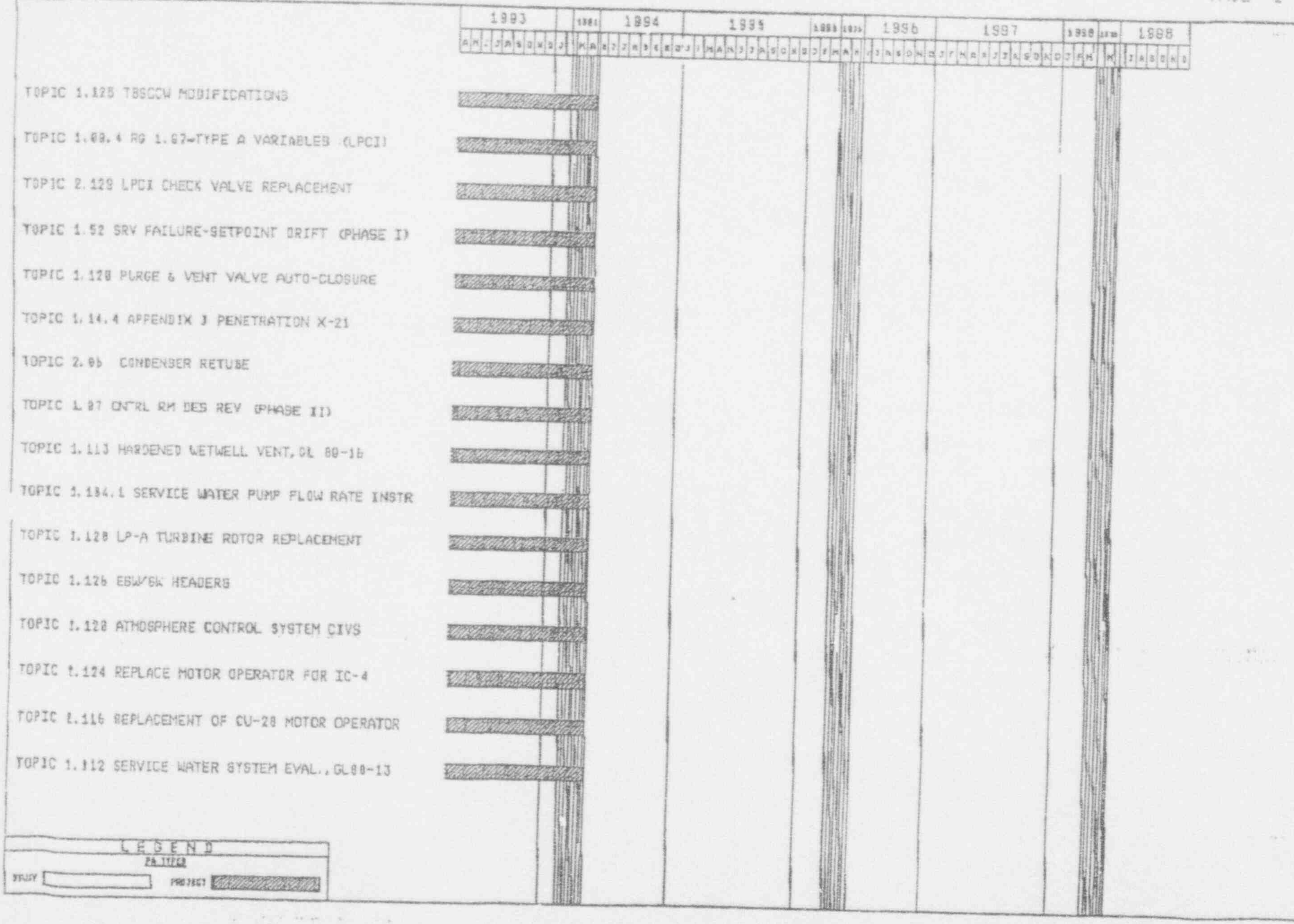
March 1994

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE UNIT NO. 1

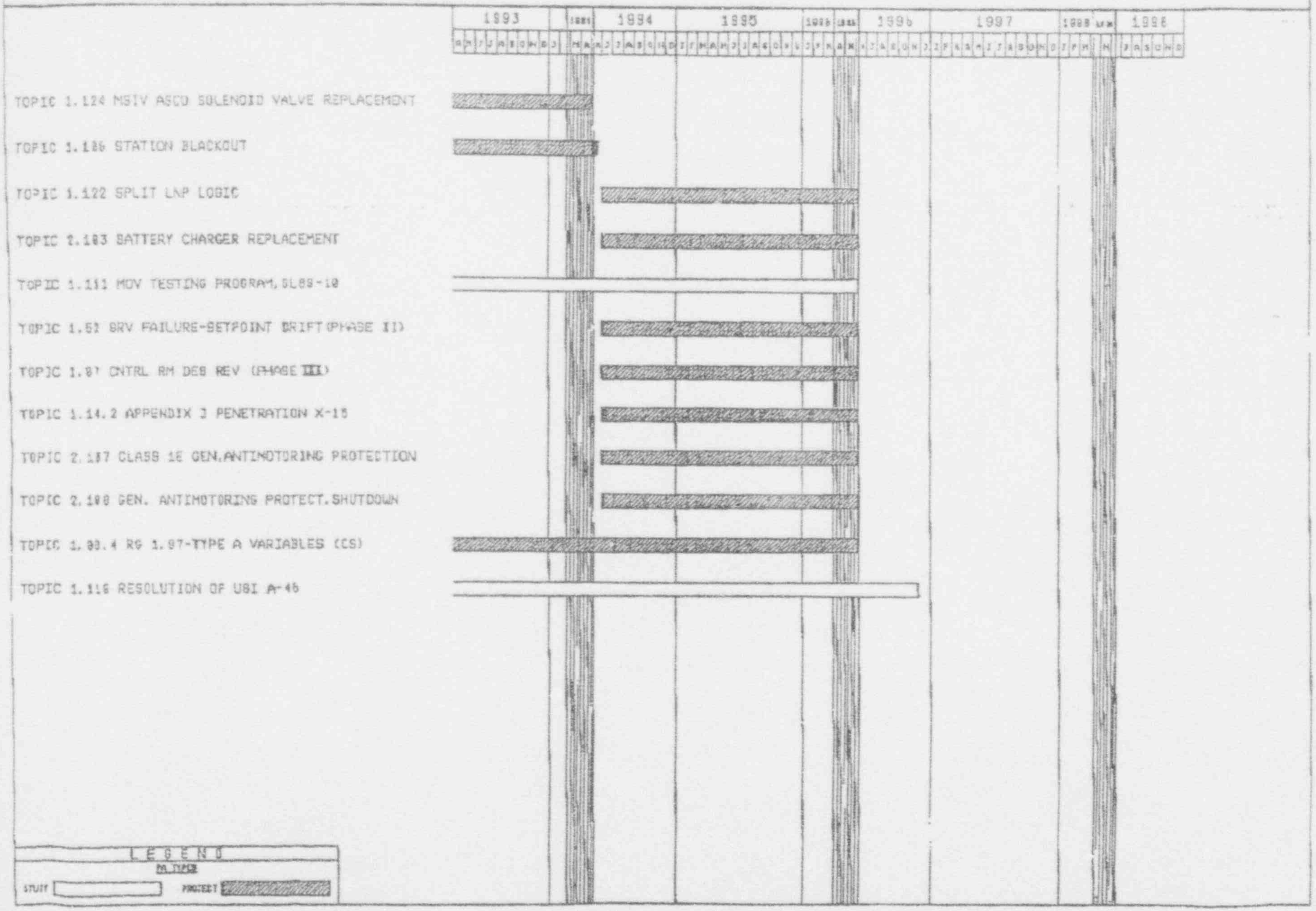
SORT BY EARLY FINISH

INTEGRATED IMPLEMENTATION SCHEDULE MARCH 1994



NORTHEAST NUCLEAR ENERGY COMPANY
MILLSTONE UNIT NO. 1
INTEGRATED IMPLEMENTATION SCHEDULE MARCH 1994

SORT BY EARLY FINISH



Docket No. 50-245
B14684

Attachment 6

Millstone Nuclear Power Station, Unit No. 1

Integrated Safety Assessment Program

Topics Proposed for Closure

March 1994

Millstone Nuclear Power Station, Unit No. 1
Integrated Safety Assessment Program
Topics Proposed for Closure

Topics Proposed for Closure--Awaiting NRC Staff Response

Topic 1.09-1--Main Feedwater Flow

As discussed in our November 30, 1990, ISAP submittal, it was unclear whether the current main feedwater flow indication met the guidelines of Regulatory Guide (RG) 1.97. Specifically, the environmental qualification of the instrumentation was in question. Subsequent review indicated that the equipment was environmentally qualified. As such, the replacement of the instrumentation is not needed and would not provide any benefit. Therefore, any proposed modifications would not provide a measurable improvement in public safety. Accordingly, NNECO considers this subtopic closed.

Topic 1.09.2--Cooling Water Flow to Engineered Safety Feature (ESF) Components

As discussed in our November 30, 1990, ISAP submittal, it was unclear whether the current ESF system components flow indication met the guidelines of RG 1.97. Specifically, the environmental qualification of the emergency service water system flow instrumentation was in question. Subsequent review indicated that the equipment was environmentally qualified. As such, the replacement of the instrumentation is not needed, and would not provide any benefit. Therefore, the proposed modifications would not provide a measurable improvement in public safety. Accordingly, NNECO considers this subtopic closed.

Topic 1.09.3--Neutron Monitoring

Environmentally and seismically qualified neutron monitoring instrumentation was not available when the system was originally installed or at the time of the original evaluation submitted in 1986. This subtopic consisted of an evaluation to determine the benefit of replacing the existing equipment with qualified equipment which meets RG 1.97, as requested by the NRC Staff in a letter dated February 13, 1990.[1]

This project received a low overall ranking due to the small public safety benefit and very high project cost. Although the NRC Staff requested (in the February 13, 1990 letter), the inclusion of installation of qualified neutron flux monitoring instrumentation into the IIS, there were no modifications scheduled.

In addition, NNECO believed that Millstone Unit No. 1's neutron monitoring instrumentation was acceptably enveloped by the criterion specified in the Staff's SER, dated April 1, 1993. Information to support this assertion was provided in a letter dated July 30, 1993.[2] NNECO considers this subtopic closed based on NRC Staff review and concurrence provided by letter dated December 30, 1993.[3]

Topic 1.14.5--Appendix J Modifications (Penetration X-22) (CIVs AC-162, AC-50)

This topic was described in detail in our October 23, 1992 ISAP submittal. In summary, containment penetration X-22, which is the drywell compressor discharge to containment penetration, is not currently tested as specified in 10CFR50 Appendix J. As such, the present scope of the project consists of installing test connections to permit Appendix J leak rate testing of the containment isolation valve (CIV) at penetration X-22. The proposed project would add three test connections, plus a manual block valve.

This project received a very low overall ranking due to the small public safety benefit, negligible personnel safety benefit, and negative personnel productivity benefit. The October 23, 1992 ISAP evaluation of this topic indicated that no modifications were scheduled, but that NNECO was developing a proposal for overall Appendix J resolution which may result in more appropriate modifications. As such, further evaluation has resulted in a preliminary determination that Appendix J, Type C testing of check valves AC-48, AC-49, and AC-51, in conjunction with the Type A testing of penetration X-22 will appropriately demonstrate the leak tightness of this penetration. Therefore, valves AC-48, AC-49, and AC-51 would be designated as the CIVs. This determination is currently undergoing internal review. NNECO plans to finalize its position shortly and will advise the Staff accordingly. No modifications are scheduled and this topic is considered closed pending NRC review and approval.

Topic 1.14.6--Appendix J Modifications (Penetration X-42) (CIVs SL-7, SL-8)

This topic was described in detail in our October 23, 1992 ISAP submittal. In summary, containment penetration X-42, which is the standby liquid control penetration, is not currently tested as specified in 10CFR50 Appendix J. As such, the present scope of the project consists of installing test connections to permit Appendix J leak rate testing of the CIVs at penetration X-42.

The proposed project would add a test connection downstream of SL-8.

This project received a low overall ranking due to the small public safety benefit, negligible personnel safety, and negative personnel productivity benefit. As such, no modifications are currently scheduled. Preliminary assessments indicate that an exemption from Appendix J, Section III.C is justified for this penetration. This determination is currently undergoing internal review. We plan to finalize our course of action shortly, and will advise the Staff accordingly. No modifications are contemplated. Therefore, this topic is considered closed pending NRC review and approval.

Topic 1.14.7 and Topic 1.14.8--Appendix J Modifications (Penetrations X-204 A, B, and C) (CIVs LP-2A thru D and CIVs CS-2A, 2B)

As was discussed in our October 23, 1992 ISAP submittal, containment penetrations X-204 A, B, and C, which are emergency core cooling system tie-ins to the suppression pool, are not currently tested as specified in 10CFR50 Appendix J.

As such, the original scope of the project consisted of installing test lines to permit Appendix J leak rate testing of the CIVs at penetrations X-204A, B, and C.

This project received a very low overall ranking due to the small public safety benefit, negligible personnel safety, and negative personnel productivity benefit. In addition, the estimated cost of the modifications to the low pressure coolant injection and core spray systems is approximately $12 million and $1 million dollars, respectively. Based on this, no modifications were scheduled.

Subsequently, NNECO determined that these valves are not required to close during an accident, and will remain covered with water during and after an accident. As such, these valves will not perform a containment isolation function as defined in Appendix J. Moreover, our preliminary assessment indicates that the penetrations are not required to be tested in accordance with Appendix J. This determination is currently undergoing internal review. We plan to finalize our position shortly and will advise the Staff accordingly. No modifications are contemplated. Accordingly, NNECO proposes that this topic be closed, pending NRC review and approval.

Topic 1.14.9--Appendix J Modifications (Penetration X-210 A and B) (CIVs LP-44A, B, LP-26A, B, CS-14A, B)

This topic was described in detail in our October 23, 1992 ISAP submittal. In summary, containment penetrations X-210 A and B are not tested as specified in 10CFR50 Appendix J. The scope of the project consisted of installing test lines to permit Appendix J local leak rate testing of the CIVs at penetrations X-210 A and B. All of the subject penetrations are part of closed loop systems. The proposed project would have installed manual block valves and/or test lines on each of the 6 lines.

This project received a very low overall ranking due to the small public safety benefit, negligible personnel safety, and negative personnel productivity benefit. Note that the estimated cost of the modifications is approximately $7 million dollars. As such, no modifications were scheduled.

Subsequently, NNECO determined that these valves are not required to close during an accident, and will remain covered with water during and after an accident. As such, our preliminary assessment is that these valves will not perform a containment isolation function as defined in Appendix J. This determination is currently undergoing internal review. We plan to finalize our position shortly and will advise the Staff accordingly. No modifications are contemplated. As such, NNECO proposes that this topic be closed pending NRC review and approval.

Topic 1.43--Water Hammer

This topic was addressed in detail in previous submittals. The proposed changes consisted of the addition of an undervoltage alarm for the vital AC bus and upgraded procedural guidance. These steps would reduce the contribution to core melt frequency from over 10% to approximately 3% for the loss of vital AC event. This project received a very high overall ranking due to its benefit in public safety and economic performance. Accordingly, the addition of an undervoltage alarm for the vital AC bus was completed on schedule during the 1991 refueling outage. Additionally, Procedure ONP 506B has been implemented, associated training has been conducted, and other vessel level indication improvements have been completed. As such, most of the public safety benefit of this topic has been realized. Therefore, NNECO no longer plans to install an additional DC powered level indicator on the main control board and this topic is considered closed.

Topic 1.43.1--Reactor Vessel Overfill Protection

This subtopic was discussed in detail in our previous ISAP update reports. The project proposed to change the power supply from vital AC to instrument AC for two of the four vessel level transmitters which are part of the feed pump high level trip logic (LITS-263-59B and LT-646B). The associated logic wiring changes necessary to make the feed pumps trip on high level, independent of vital AC power, would have also been made. These proposed modifications received a medium ranking due to the small public safety score and the small remaining project cost. Although these modifications were previously scheduled in the IIS for implementation during the Cycle 14 refueling outage, NNECO reassessed the overall benefit of implementing this modification and has determined that it will not implement the above modifications. Accordingly, NNECO proposes closure of this topic.

Topic 1.118--Plant Heating Steam System

Previous ISAP submittals indicated that the majority of this project had been completed, with the last phase of these modifications scheduled for completion by the end of 1992. Due to the fact that a significant portion of this project's benefit has already been realized, NNECO has assessed the relative merits of completing the last phase of this project and has determined that the remainder of this project will not be implemented. This is consistent with our ongoing efforts to more closely scrutinize projects having a significant resource impact and minimal safety significance. As such, NNECO proposes that this topic be closed.

Topic 1.121--Postaccident Hydrogen Monitor

NNECO provided the Staff with an off-cycle ISAP reevaluation[4] for the postaccident containment hydrogen monitoring system in response to the Staff's request[5] and was incorporated into the October 23, 1992 ISAP report.

The Staff's concern was that a backup (i.e., redundant channel) to the existing hydrogen monitor be available within 30 minutes following a postulated accident. The evaluation detailed in the October 23, 1992 ISAP report did not credit the postaccident sampling system as a backup method of postaccident hydrogen monitoring. Importantly, this evaluation went beyond design basis accidents. The proposed project conceptually involved the installation of a redundant hydrogen monitor such that no single failure of either the instrumentation, auxiliary supporting features, or power sources would cause the loss of the hydrogen monitoring function postaccident. An NRC safety evaluation report dated September 7, 1993,[6] documented the Staff's acceptance of NNECO's position. Therefore, this topic is considered closed.

References

(1) M. L. Boyle letter to E. J. Mroczka, "Postaccident Neutron Flux Monitoring for BWRs--(ISAP Topic 1.09) Millstone Nuclear Power Station, Unit No. 1," dated February 13, 1990.

(2) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Regulatory Guide 1.97--BWR Neutron Flux Monitoring (TAC No. M51106)," dated July 30, 1993.

(3) J. W. Andersen letter to J. F. Opeka, "Millstone Nuclear Power Station, Unit 1 — Conformance to Regulatory Guide 1.97, Revision 2 (TAC No. M51106)," dated December 30, 1993.

(4) J. F. Opeka letter to U.S. Nuclear Regulatory Commission, "Postaccident Containment Hydrogen Monitoring (TAC No. M54545)," dated June 10, 1992.

(5) D. H. Jaffe letter to J. F. Opeka, "Post-accident Containment Hydrogen Monitoring, TMI Action Item II.F.1.6 (TAC No. M54545)," dated February 12, 1992.

(6) J. W. Andersen letter to J. F. Opeka, "Millstone Nuclear Power Station, Unit No. 1—NUREG-0737, TMI Action Plan Item II.F.1.6, Post-Accident Hydrogen Monitors (TAC No. M83986)," dated September 7, 1993.