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POLICY ISSUE (Information)

December 31, 1992

SECY-92-436

For: The Commissioners

From: James M. Taylor
Executive Director for Operations

Subject: STATUS OF DEVELOPMENT OF THE NRC'S NEW CONSTRUCTION
INSPECTION PROGRAM

Purpose: To inform the Commission of the staff's activities for developing a construction inspection program (CIP) that incorporates lessons learned from construction and inspection experience and the requirements of 10 CFR Part 52 for future reactor designs.

Summary: In developing a new CIP, the staff is reviewing lessons learned, automating the inspection information in a data base, and incorporating statistical methodologies for selection of inspection samples. The staff is developing the construction inspection program in close coordination with the design certification process and the development milestones are linked to final design approval, design certification, and issuance of a combined operating license.

Background: In a memorandum (COMIS-91-015) dated November 21, 1991, the Commission directed the staff to review Report 90-31H, "Review of the NRC Staff's Responses to Congressional Inquiries Regarding Joseph Wampler and the Welding Program at Seabrook Nuclear Station," from the Office of Inspector General (OIG) for lessons learned and to propose corrective actions. The staff informed the Commission of the results of its review and six proposed actions in two memorandums to the Commission dated February 12 and March 27, 1992.

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SECY NOTE: TO BE MADE PUBLICLY AVAILABLE IN 10 WORKING DAYS FROM THE DATE OF
THIS PAPER.

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The Chairman, in a memorandum dated June 11, 1992, requested the staff to inform the Commission when two of the six proposed actions (Items 1 and 4) were completed (WITS 9200041). Item 1, in which the staff committed to provide better assurance that NRC construction inspection reports contain adequate as well as accurate information, was completed on June 18, 1992. On that date, the Director, Office of Nuclear Reactor Regulation (NRR), issued a memorandum to the regional administrators with new guidance for preparing construction inspection reports. The guidance will be incorporated into Inspection Manual Chapter 0610, "Inspection Reports," when a planned revision of the manual chapter is issued in 1993.

In Item 4, the staff committed to strengthening the NRC's construction inspection program for future plants and to improve the continuity of NRC presence on site during construction to ensure that important activities are adequately covered and that knowledge of these activities is better retained within the agency. The staff has improved its implementation of the current inspection program for plants that are not yet licensed and is developing a new construction inspection program for future reactors. The Commission will be informed of the status of this new program as its development progresses.

On April 15, 1992, the staff informed the Commission in SECY-92-134, "NRC Construction Inspection Program for Evolutionary and Advanced Reactors Under 10 CFR Part 52," of its efforts to develop a new construction inspection program. The efforts include using the Bellefonte site as a pilot for determining the efficacy of an approach to managing the inspection program that correlates plant systems to the various construction disciplines and activities.

The staff informed the Commission, in a November 23, 1992, Commission briefing, of its plan to issue a Commission paper to discuss the status of its construction inspection program for plants licensed under 10 CFR Part 52 (WITS 9200282). This paper fulfills this commitment. In a separate staff requirements memorandum dated December 7, 1992, the Commission asked the staff to evaluate the practicality of formulating and submitting to the Commission the NRC's construction inspection program before issuing the final design approval for General Electric Company's (GE) advanced boiling water reactor (ABWR) (WITS 9200295). This paper also addresses this Commission request.

Discussion:

The staff is developing a new NRC construction inspection program to accommodate the requirements for future reactors licensed under 10 CFR Part 52 and to incorporate lessons

learned from experience with the current program. The new program's structure will accommodate requirements from Part 52 for inspections, tests, analyses, and acceptance criteria (ITAAC); design acceptance criteria (DAC); and other commitments made by vendors during the design certification process and licensees during the combined license (COL) process.

The generic construction inspection program will enable the staff to incorporate the certified design and, later, the combined license requirements that the NRC will verify in order to make a determination to allow facility operation. The staff's development activities include (1) reviewing lessons learned from experience at construction sites; (2) automating the inspection data to permit better management of the program and easier retrieval and analysis of the data and, later, to accommodate ITAAC, DAC, and other commitments; and (3) incorporating into the program statistical methodologies for selection of inspection samples.

The staff reviewed the results of major audits, analyses, investigations, and reports of past construction problems and the NRC's inspection program. The documents reviewed included OIG Report 90-31H on NRC's response to Congress regarding Seabrook welding issues; SECY-82-352, "Assurance of Quality"; SECY-84-124, "Report to Congress on Improving Quality and the Assurance of Quality in the Design and Construction of Commercial Nuclear Power Plants (Ford Amendment Study)"; SECY-85-65, "Quality Assurance Program Implementation Plan"; and NUREG-1278, "Vogtle Unit 1 Readiness Review." Many of the recommendations from these earlier reports, such as increasing the number of resident inspectors and greater emphasis on team inspections, were previously incorporated into the NRC's construction inspection program in the mid 1980's and will be given additional emphasis in the new program.

As an example, the staff envisions an onsite inspection group of 6 to 12 technical staff plus administrative support for plants licensed under 10 CFR Part 52. The group will report to a manager who will have responsibility for implementing the inspection program. A previous recommendation for a complete design before starting construction is integral with the licensing process of Part 52, and the staff is discussing with the Nuclear Management and Resources Council (NUMARC) implementing concepts such as readiness reviews and "sign-as-you-go" (SAYGO) for inspection of plants licensed under Part 52. The staff discussed the SAYGO concept and its incorporation into the NRC's construction inspection program in SECY-92-134.

As a result of the problems with the weld records at Seabrook, the welding and nondestructive examination procedures will be rewritten, or new procedures developed, with improved guidance to NRC inspectors for sample selection and review of weld documentation. The standard safety analysis report (SSAR) for each design will include the specific requirements for verifying the critical welds, primarily those welds forming the reactor coolant pressure boundary. Thus, the critical weld requirements and the associated nondestructive examination requirements for these systems will be identified and inspected by the licensee, and available for inspection by the NRC, before fuel is loaded into the reactor vessel.

As concluded in the Ford amendment study (NUREG 1055), experience shows that the NRC's construction inspection programs in the 1970's and early 1980's were unable to recognize the significance and magnitude of problems and slow to act on problems. Therefore, the new program includes elements, such as an inspection data base and periodic management reviews, to improve the analysis of inspection data and increase the communication of the analysis results to NRC management.

Consequently the staff is developing, with contractor assistance, a data base that will aid NRC managers in managing the construction inspection program at future plants. The data base will correlate objective information about the items inspected to (1) the associated plant systems; (2) inspection procedures from the construction inspection program (NRC Inspection Manual Chapter 2512); (3) associated ITAAC, DAC, other COL acceptance criteria, and other commitments from the certified design and combined license for Part 52 licenses; and (4) associated inspection findings such as violations, deviations, and unresolved items. Other issues identified for followup inspection, such as generic issues and significant licensee-identified problems, also will be correlated within the data base.

When the data base is fully developed for plants licensed under Part 52, the staff will be able to sign off that the inspection program has been completed at specific SAYGO points during construction and will sign off the completion of the inspection program for each plant safety system when construction of each system is completed. Several issues the staff is considering while developing the data base and inspection program include (1) the correlation between SAYGO points and ITAAC, (2) other factors necessary for the staff to conclude that requirements have been satisfactorily met, such as the results of preoperational testing and the effectiveness of licensee programs for quality assurance, reli-

ability assurance, and procurement, and (3) the program requirements necessary to address problems arising from system interactions after some of the systems have been signed off.

As a trial effort, the data base will be used for the Bellefonte site, starting with historical inspection data currently being extracted from existing NRC inspection reports. When construction resumes at Bellefonte, new inspection information will be added to the data base. The data base for Bellefonte will not include SAYGO elements because the staff plans to use the current IMC 2512 program when construction resumes at the plant. The prototype data base for use at Bellefonte is scheduled to be completed by mid-1993. The staff will use the data base structure as it continues to develop the inspection program for future reactors licensed under Part 52 and will use the data base to develop methods for accommodating SAYGO and ITAAC into the construction inspection program.

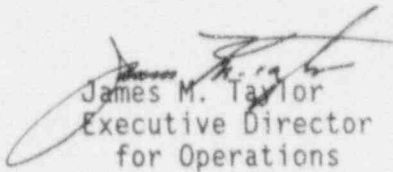
The staff is developing the new program while closely following the Part 52 design certification process. As each future design nears certification, the staff will incorporate into the generic data base structure the plant system, ITAAC, DAC, and other commitment information specific to that design, creating a program for each certified design. The design-specific program will then be modified for a specific plant by incorporating site-specific requirements, SAYGO points consistent with the ITAAC and schedule for plant construction, and commitments at the COL stage.

The staff plans to consider the feasibility of applying expanded sampling techniques to construction inspections. The methodologies could be utilized to provide a strong basis in support of a final conclusion of plant safety prior to plant operation. The first effort would be to identify previous studies of this type for application to this program. An analysis would be conducted to estimate sizes of inspection samples for various installations and records and determine how many inspectors would be necessary to provide the appropriate assurance.

The staff is developing the construction inspection program in close coordination with the design certification process and the development milestones are linked to the final design approval, design certification, and COL issuance. A list of the major activities for developing the inspection program and the planned completion for the activities is enclosed. The staff plans to develop and issue in 1994 the NRC inspection manual chapters for the construction inspection program and inspection reports for future reactors.

The staff will develop the data base to incorporate the design specific information as the information becomes available during the process leading to FDA.

Budgeted resources for contractor support were redirected to support the development of the construction inspection program. The resources for this effort will be addressed during the next update of the NRC's Five Year Plan.



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for Operations

Enclosure:
Major Tasks for Construction
Inspection Program Development

DISTRIBUTION:
Commissioners
OGC
CAA
OIG
CA
OPP
DCD
Central Files
Regional Offices
EDO
ACRS
SECY

Enclosure

MAJOR TASKS FOR CONSTRUCTION INSPECTION PROGRAM DEVELOPMENT

PROGRAM DEVELOPMENT TASK		SCHEDULED COMPLETION
1	Develop Systems-Based Approach to Construction Using Bellefonte Reactivation for Trial Program	1995
1.1	Develop prototype database	June 1993
1.2	Establish baseline to current inspection program	July 1993
1.3	Use database to plan, schedule, and document future inspections at Bellefonte	1994-1995
2	Revise Systems-Based Approach for Evolutionary and Passive Design Reactors - Develop Generic Systems-Based Approach	December 1993
3	Revise Generic Systems-Based Approach for Specific Advanced Designs - ABWR and CE System 80+	At Design Certification
3.1	Incorporate systems from certified design application	At Final Design Approval
3.2	Incorporate design-specific ITAAC and DAC requirements, SAYGO points, and other commitments	At Design Certification
3.3	Incorporate site-specific requirements, commitments, and SAYGO points	At Combined License
4	Develop New Inspection Program Documents	1995
4.1	Conduct studies for statistical approach to inspection sampling	December 1993
4.2	Develop and issue NRC inspection manual chapters for construction inspection program and reports	1994
4.3	Review and revise existing inspection procedures	1995
4.4	Develop new inspection procedures	1995