Construction Inspection Program
Lessons Learned

INTRODUCTION:

In 1991, NRC began work to revise the CIP to address programmatic weaknesses that had been identified during the inspection and licensing of several plants in the 1980s. The revision work was suspended in late 1994 because of lack of nuclear power plant construction. When the process to revise the CIP was suspended in 1994, work had been done to document the lessons learned from previous NRC construction inspections and from reviews of inspection practices overseas and modular construction techniques used in the U.S. shipbuilding industry.

The effort was renewed in 2001 when the Construction Inspection Team, composed of representatives from each region, from the new reactor licensing organization and from inspection program management in the Office of Nuclear Reactor Regulation, was formed and tasked with fully revising the program to be used for inspecting reactors to be licensed and constructed under 10 CFR Part 52. The current effort to develop the CIP has focused on addressing the various lessons learned listed below from previous NRC construction inspection experience.

Enclosure 2 discusses how the lessons learned were addressed and how the various inspection policy issues were resolved in the development of the new CIP.

LESSONS LEARNED

The 1991 effort identified the areas listed below to be addressed by a revised construction inspection program.

The location within the new construction inspection program where each issue is being addressed is indicated by the manual chapter(s) or CIP project identified in parentheses after each entry.

1. Inspection Program Management

    a. Ensure that the objectives of the inspection program support the licensing decision on whether all of the inspections, tests, and analyses are performed and that the prescribed acceptance criteria have been met by supporting the Commission finding in accordance with 10 CFR 52.103(g). (IMC-2503)

    b. Coordinate all aspects of the construction inspection program, including planning, scheduling and implementation, to ensure that all aspects of construction are properly inspected. (IMC-2503 and IMC-2504)

    c. Ensure operational readiness of the licensee to load fuel. (IMC-2504)

    d. Plan for the transition from the construction to the operating phase. (IMC-2504)

2. Inspection Program Structure and Implementation

   a. Begin onsite inspection whenever site preparation work begins, perhaps even before the combined license (COL) is issued. (IMC-2502)

   b. Establish inspection requirements for systems, structures and components as well as plant programs. (IMC-2503 and IMC-2504)

   c. Closely coordinate planning and scheduling of inspection activities with plant construction plans. (Primavera scheduling)

   d. Begin design engineering inspections in conjunction with the application review (first-of-a-kind engineering inspections). (IMC-2502)

3. Inspection Documentation

   a. Provide simple and coherent methods for inspectors to use to record the results of inspections. (IMC-0613 and CIPIMS)

   b. Ensure that inspection reports fully document all areas that have been evaluated during construction. (IMC-0613 and CIPIMS)

   c. Ensure balanced inspection reporting by documenting both satisfactory and unsatisfactory findings. (IMC-0613 and CIPIMS)

4. Quality Processes

   a. Verify the effectiveness of the licensee's quality processes. (IMC-2501, 2502, 2503, 2504)

   b. Ensure that the licensee can accurately translate high level design information into detailed engineering and fabrication drawings (engineering design verification). (IMC-2502 and 2504)

   c. Ensure the effectiveness of licensee oversight of the construction activities (problem identification and resolution). (IMC-2504 and IMC-2505)

UNRESOLVED INSPECTION PROGRAM ISSUES

While the work in the 1990s established a basic framework to guide the revision of the construction inspection program, specific details had not been established when the work was suspended. As a result, the unresolved inspection program issues listed below were also identified:

The location within the new construction inspection program where each issue is being addressed is indicated by the manual chapter(s) or CIP project identified in parentheses after each entry.

5. Determine the best method of publicizing significant findings, including whether to publish them in the Federal Register. (IMC-0613)

6. Determine if significant findings should be issued by routine or special inspection reports. (IMC-0613)

7. Refine the guidance on how the different types of inspection findings should be made and who should make them. (IMC-0613)

8. Clarify the organizational structure and responsibilities for developing and implementing the CIP, including the roles of regional offices. (SECY-06-0041, “Proposed Strategy to Support Implementation of the New-Reactor Construction Inspection Program”)

9. Define the extent of design engineering evaluations to be done as part of license application review, and the extent to which design engineering will be inspected under the CIP. It will be necessary to validate "first-of-a-kind” engineering, and the design engineering and design change processes, to ensure fidelity of construction drawings to approved design. (IMC-2502 and IMC-2504)

10. Define the protocol of licensee notification to NRC of ITAAC completions, NRC staff verification of the same, and the subsequent publication of Federal Register notices. (Future staff Commission paper and future NRR Office Instruction)

11. Review and revise inspection procedure 94300, "Status of Plant Readiness for an Operating License," to be consistent with 10 CFR Part 52 and CIP requirements. (IMC-2504)

12. Develop a policy to implement a Sign-As-You-Go (SAYGO) process for future nuclear power plant construction projects. (IMC-2503 and IMC-2505)

13. Establish policy for publicizing/docketing construction inspection reports (including the particulars of inspection report formats, and the format that should be used to make reports available electronically to the public). (IMC-0613)

14. Establish the significance of NRC management's certification that a construction inspection procedure has been satisfactorily completed, particularly with respect to ITAAC verifications, significant findings, and SAYGO points. (IMC-0613)

15. Develop policies for inspection sampling. (IMC-2503 and IMC-2504)