

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-271/92-02

Docket No. 50-271

License No. DPR-28

Licensee: Vermont Yankee Nuclear Power Corporation
RD5, Box 169
Brattleboro, Vermont 05301

Facility Name: Vermont Yankee Nuclear Power Station

Inspection At: Vernon and Brattleboro, Vermont

Inspection Conducted: January 13-17, 1992

Inspector s:

S. K. Chaudhary

S. K. Chaudhary, Sr. Reactor Engineer,
Systems Section, Engineering Branch, DRS

1/28/92

date

Approved by:

P. K. Eapen

Dr. P. K. Eapen, Chief, Systems Section,
Engineering Branch, DRS

1/28/92

date

Area Inspected: Routine, unannounced inspection to review the licensee activities in the area of engineering and technical support; especially, the design change and modification process was reviewed in detail.

Results: Engineering program had been improved; design change and modification packages were comprehensive; design basis reconstitution program was satisfactorily progressing; independent audits and self assessments had been performed; staffing and staff training were adequate; and safety evaluations were technically adequate.

No safety concerns were identified.

1.0 Engineering and Technical Support (37700)

The purpose of this inspection was to assess the licensee's engineering activities and technical support functions in assuring and enhancing plant safety. To assess the effectiveness of the licensee's activities, areas such as: 1) changes in the engineering and technical support program and organization; 2) technical and procedural adequacy of design change/modification; 3) design basis reconstitution program; 4) self assessments and audits in this area; 5) staffing, training, and contractor support in this area; and 6) technical adequacy of safety evaluations for design changes were reviewed and evaluated.

A sample of selected design change and modification packages was specifically reviewed to verify that these design changes/modifications did not require NRC approval; and were in conformance with the requirements of the plant technical specifications (TS), 10CFR 50.59, Safety Analysis Reports, and the licensee's quality assurance program.

1.1 Findings

Changes in Engineering and Technical Support Program

The licensee reorganized the engineering and technical support functions in the spring of 1991 to enhance the effectiveness and efficiency in this area. The new engineering organization directly reports to a corporate vice-president. The new engineering organization has already implemented certain initiatives to strengthen weak areas.

These new initiatives included engineering's involvement in plant "housekeeping"; special emphasis and staffing of fire protection; enhancement of training in the engineering department; and greater involvement in and control over contractor support in procurement, fabrication, and installation of design changes. The greater engineering controls over contractor/supplier activities appear to be effective in improving contractor quality assurance efforts.

In addition, the one responsible engineer concept (a single engineer from design to installation closeout) appears to provide greater focus on the technical and procedural adequacy of modification efforts, and enhances the expertise of the assigned engineer in such areas as design, procurement, safety evaluations, and construction.

Technical and Procedural Adequacy of Design Changes and Modifications

Four recent modifications were randomly selected for review to verify that the design change for these modifications conformed to the requirement of the TS, and did not adversely affect the safety of the modified systems. The NRC inspection procedure IP 37700 was used as a guide in the review of these modifications. The modifications selected were: PDCR 91-002, Containment Spray System Valve Improvement; PDCR 91-009, LRW Containment Valve Replacement; EDCR 89-409, Conversion of Core Spray Valves; and EDCR 90-409, VY Cable Separation Reroute.

Two of the above modifications were designed by the licensee's site engineering organization (PDCRs 91-002 and 91-009), and the other two (EDCRs 89-409 and 90-409) were designed by the offsite engineering organization of Yankee Nuclear Services Division (YNSD) located in Bolton, Massachusetts.

Based on the review of the above modification packages, the inspector determined that:

- the design changes/modifications were properly reviewed by onsite/offsite review organizations;
- the design change process was adequately controlled by approved procedures;
- the design changes were technically adequate, with sufficient engineering detail;
- design input/output was adequately controlled;
- the packages included a list of affected documents, and marked up copies for "as-built" revisions;
- that preventive maintenance/surveillance test requirements were evaluated and specified where necessary; and
- adequate procedures for installation and tests were included with the design change packages.

Design Basis Reconstitution Program

The licensee's "design basis reconstitution" program is progressing effectively. The computer database contains a listing and tabulation of most design basis documents. The licensee does not plan to rewrite and generate new system descriptions to consolidate the design basis information now available in various discrete documents. The licensee, however, has planned a detailed review and upgrade of system descriptions included in the safety analysis report. The efforts to improve the accuracy of system descriptions included the following elements:

- all descriptions of automatic system functions will be verified for consistency with current plant configuration;
- normal valve position or system limit will be verified against current operating procedures;
- system operations limits will be verified against plant design.
- final safety analysis report information will be compared to corresponding TS sections to ensure agreement.

The above elements appeared to be adequate in resolving past inconsistencies between available design documents and as-built plant configuration.

Independent Audits and Self Assessment

The licensee has a formal and structured program of quality assurance audits. In addition to that, a temporary program of internal audits has been implemented by the engineering organization. Although the internal audits were not as comprehensive and formalized as independent QA audits, it provided an additional layer of assurance for early identification of problem areas requiring management attention. For example, their internal audits identified lack of effective engineering involvement in housekeeping, fire protection and receipt inspections.

In 1991, the licensee performed an audit with personnel from other utilities and Yankee Nuclear Services Division (YNSD) of the Yankee organization. The audit covered the areas of operating experience assessment and corrective actions, and was comprehensive. Results of this independent audit indicated that these programs were generally effective. Another audit (VY-91-16) specifically covered the area of corrective action. The results indicated that the new corrective action procedure which was implemented in June 1991, has improved the process, and appeared to be effective.

Staffing and Training

The onsite engineering department consist of approximately twenty-six engineers, plus necessary support personnel. The support personnel include administrative, clerical, internal document control, and receipt inspection personnel. One contract engineer was employed by the department at the time of this inspection. The staffing level was adequate as evidenced by the absence of a backlog in the design change/modification and technical support area.

The inspector reviewed the design change status report issued in January 1992. Out of a total of thirty-one (31) high priority EDCR/PDCRs, approximately 50% (16) had been completed and others were at various stages of development. Approximately 42% (13) were behind the originally established schedule, but were anticipated to be finished before the 1992 scheduled refueling outage. The inspector did not identify any backlog of design changes leftover from 1990 outage.

In the area of training of the engineering staff, the inspector determined that the engineering department had a very detailed and comprehensive training schedule for engineers. The training was grouped in three categories: 1) core; 2) position specific; and 3) elective. The elective training was designed for professional development and enhancement of the management capability of engineers. The training schedule for 1992 was already approved and budgeted. The engineers actively participate in owners group and industry technical organization.

Safety Evaluation for Design Change

The inspector reviewed the safety evaluations performed for the modifications to assess the technical adequacy and scope of these analyses.

Based on these reviews and discussions with licensee engineers, the inspector determined that the evaluations for the selected modifications appeared technically adequate. However, the inspector noted that the analyses and evaluations documented for EDCRs were much more detailed and of higher quality than those for PDCR done at site.

Although technically adequate, the PDCR safety evaluations were not as detailed and contained standard statements to describe the underlying analyses, rather than indicating an individual in-depth analysis for the proposed design change. The licensee was planning comprehensive training in this area to improve performance.

Conclusion

Based on the above findings, the inspector concluded that the reorganization of the engineering department improved technical focus and broadened the involvement of engineering in the assurance of plant safety. Although the organization is still maturing, the emphasis on enhancing the timeliness and effectiveness of technical support to the plant was evident. The implementation of project ownership concept (single responsible engineer) has improved the design changes/modification process. The "project scoping memo" for design change continues to be of high quality, and continues to be effective in providing meaningful reviews from a variety of perspectives from other departments and individual. Although not complete, the "design basis reconstitution" effort is also contributing to the process of design change and technical support efforts. It was evident by the extensive use of this information by technical personnel in the engineering and maintenance department. The self assessment effort also was effective, especially in identifying concerns with interface and communication with external organizations. The staffing and training of technical personnel were adequate as evidenced by a lack of high priority design backlog. However, there appeared to be some concerns in the depth and quality of safety evaluations performed for PDCRs. The licensee, however, had recognized this problem, and was in the process of planning additional training in this area to improve performance.

No public health and safety concern was evident in this area. Additionally, no violation of regulatory requirements was identified.

2.0 Management Meetings

At the conclusion of this inspection, the inspector met with the licensee management (Attachment 1) on January 17, 1992, where the inspector summarized the scope and findings of the inspection.

The licensee did not indicate that any proprietary material was included within the scope of this inspection.

ATTACHMENT 1

Persons Contacted

Vermont Yankee Power Corporation

D. A. Reid, Plant Manager
R. D. Pagodin, Technical Services Superintendent
R. J. Wanczyk, Operations Superintendent
B. R. Buteau, Engineering Director
G. Cappuccio, Mechanical Engineering and Construction Supervisor
D. L. Phillips, Electrical Engineering and Construction Supervisor
R. P. Grippardi, Quality Assurance Supervisor
J. M. DeVincentis, Technical Programs Supervisor
N. M. Mattel, Principal Engineer

U.S. Nuclear Regulatory Commission

H. Eichenholz, Senior Resident Inspector
P. Harris, Resident Inspector

In addition to the above, the inspector contacted other licensee personnel as the inspection interfaced with their areas of responsibility.