THE UNITED STATES NUCLEAR REGULATORY COMMISSION'S

VENDOR INSPECTION PROGRAM

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The NRC conducts a program of inspection at licensee contractors and vendors to assure that quality assurance programs meet applicable NRC requirements. This inspection program, which was begun in 1965 and restructured in 1974, is discussed in the paper. A trial program has recently been initiated to evaluate the use of the ASME N-stamp inspection system to supplement NRC inspections. The criteria for NRC acceptance of such a third party inspection system are described in the paper.
1. **INTRODUCTION**

In the United States, the responsibility for the safety of a nuclear plant is placed on the holder of a construction permit or operating license (licensee) or an applicant for a construction permit or operating license (applicant). This means that in the construction of a nuclear plant the licensee or applicant retains full responsibility for the adequacy of plant design and the acceptability of delivered plant components even though the design and manufacturing work is performed by contractors or vendors. A principal function of the NRC is to assure that the licensee or applicant properly carries out his responsibility. This function is performed through a comprehensive program of inspection which includes the inspection of licensee contractors and vendors.

A most difficult part of the NRC's vendor inspection program is the inspection of offsite vendors (designers, manufacturers and service suppliers). These difficulties are caused by the large number of suppliers (approximately 1000), the geographical distribution across the entire United States and in some foreign countries, the variety of products and services supplied and the diversity of requirements that apply. Efficient utilization of the limited staff available for conducting vendor inspections is also a principal consideration.

2. **INITIAL VENDOR INSPECTION PROGRAM**

Beginning in late 1965, the then Atomic Energy Commission (AEC), Division of Compliance, initiated a limited program of inspection to determine whether certain quality measures were in effect at nuclear steam system suppliers (NSSS), architect engineers (AE), and component fabrication facilities. The program was designed to assure that specific nuclear services were maintained and components and equipment were manufactured in accordance with existing quality requirements. The purpose of this program was publicized, and it was carried out on a licensee or applicant "host basis." This means that entry into and inspection activities at a vendor facility were carried out under arrangements made by a "host" applicant or licensee. The program continued on this basis for the next several years with some program expansion in the way of frequency and diversity of inspections, and with the inspection activities conducted by personnel located in each of the five regional offices of the Division of Compliance. Except for a few instances, this program was satisfactory with respect to accessability of inspected organizations.
One significant problem during this time was inspection scheduling, because it was necessary to coordinate timing with two parties, i.e., the offsite vendor to be inspected and the licensee. Another significant problem at this stage of the vendor inspection program was effecting timely and appropriate corrective action because this was also a "host function." That is, licensees who were customers of inspected organizations were recipients of "Notices of Noncompliance" and were required to take steps as necessary with their vendor to correct, or deny, items of noncompliance. The licensees were then also required to provide documentary evidence of corrective action or commitments for corrective action. Needless to say, this was a time consuming process and difficult to deal with in terms of timely Commission evaluation of corrective action. By mid-1974, approximately 80 vendor facilities per year were being inspected in the manner just discussed.

3. CURRENT VENDOR INSPECTION PROGRAM

During 1974, a decision was made to restructure the vendor inspection program, with changes to be in the form of an eight point program discussed below:

1. Direct inspection, without the previous practice of "host licensee" access to vendors' plants. Direct inspections were to be based on one, or more, of the criteria identified below.

   a. Topical Reports, describing a vendor's quality assurance program, which would be approved by the Office of Nuclear Reactor Regulation (NRR) and verified through inspections performed by the Office of Inspection and Enforcement (IE) as being adequately implemented. The topical report approach was tailored principally to fit NSSS and AE organizations. To date, ten of the 24 active NSSS/AE organizations in the U.S. have received letters from IE confirming the adequacy of program implementation.

   b. NRC Quality Assurance Criteria For Nuclear Power Plants Contained In 10 CFR Part 50, Appendix B

      Inspections based on these criteria are normally limited to organizations manufacturing fuel components.

   c. ASME-Accepted Quality Assurance Programs

      These criteria are directed to organizations implementing QA programs, which have been accepted through audit and evaluation by representatives of the American Society for Mechanical Engineers (ASME).
d. Corporate Quality Assurance Programs

These criteria for inspection represent a set of standards, measures, and/or control mechanisms which inspected organizations identify as the program being followed to assure required product quality.

We have now covered the first part of the eight point program, direct inspection and inspection bases. The remaining seven points of the program are as follows:

2. Increasing our inspection staff for the vendor program by a factor of about four.

3. Increasing the rate of inspection by a factor of five to six. Although a staff increase by only a factor of four was planned, a "nonproportional" increase in inspections was anticipated as a function of increases in program implementation efficiencies. This was expected to occur as a result of centralization and standardization of activities (step four below) as well as by the positive effect of direct instead of "host" inspections.

4. Concentration of program personnel in a single regional office, as opposed to the previous arrangement of personnel in each of five regional offices.

5. Inspection scheduling and priority on a basis of the vendor's involvement in the nuclear industry.

6. Refined and concentrated accountability of program efforts. This has occurred as the result of sophistication of computer programs to accept and printout the results of inspections. This has been a long-term effort, and only recently became fully operational.

7. Expanded program visibility in the form of reports of inspection results to be available to members of the industry, as well as the general public.

8. Examination and evaluation of program progress and results, in terms of the advisability and feasibility of third part inspection by ASME personnel. This was to be an effort to determine, through inspection of organizations possessing ASME accepted QA programs, and through other forms of contact with ASME personnel, whether or not this would be a more effective way to qualify and monitor manufacturers' QA programs, as such programs relate to NRC requirements.
The purpose of the restructured vendor inspection program, as in the case of the program prior to restructuring, is to assure that quality assurance programs meet applicable requirements. The restructured program, formally titled the Licensee-Contractor Vendor Inspection Program (LCVIP), involves additional features which are discussed below:

1. The LCVIP program routinely extends into the licensee-contractor area, encompassing Fuel Manufacturers, Architect-Engineers, and Nuclear Steam Supply System Manufacturers. Previously, inspections of these organizations by the Commission were relatively infrequent and were "reactive" in nature or problem oriented.

2. The program provides a mechanism for reduced "exposure to audits" on the part of the industry. Repeating earlier comments, this means that NRC approval of QA programs allows NRC applicants and licensees to accept (without audit) licensee contractor and/or vendor QA programs insofar as such programs relate to 10 CFR Part 50, Appendix B.

The letters confirming the adequacy of program implementation mean that the recipient organizations may indicate to potential customers (NRC licensees and applicants) that their quality assurance programs, insofar as the control of purchased material, equipment, and services is considered, are constituted, and are being carried out, in a manner satisfactory to the NRC. It means, further, that prospective customers (NRC licensees and applicants) may identify confirmatory letters as a substitute for activities they may otherwise be required to carry out as a licensee or applicant to satisfy the requirements of 10 CFR Part 50, Appendix B. This procedure is designed to reduce a multiplicity of audits of organizations brought on by the fact that each licensee and applicant is required to determine that his vendors have a quality assurance program which meets NRC criteria. It is important to note that an NRC confirmation of adequacy of quality assurance program implementing means only that the program structure and implementation are satisfactory. It does not certify the quality of the product. Determining acceptability of the product remains a responsibility of purchasing licensees or their agents.

3. Provisions are in effect to publish the results of all vendor inspections in a quarterly report which is made available to all segments of the industry as well as to the general public.
The results of the vendor inspection program, between 1965 and mid-1974 (although difficult to characterize because histories were not diligently maintained, and because of the inherent "lag" between manufacture and "service proof" times) were such as to provide reasonable confidence that the program efforts clearly led to enhancement of the quality of nuclear components and equipment.

Subsequent to mid-1974, and initiation of the LCVIP program, the results of inspections continued to indicate enhanced quality of nuclear components, equipment, and services.

4. THIRD PARTY INSPECTION PROGRAM

Now, let me deal with the question of a third party inspection program. The NRC is currently conducting a trial program in conjunction with the American Society of Mechanical Engineers (ASME) N-stamp inspection system. This program is to cover a two year evaluation period on the part of both the NRC and ASME, to determine if a third party program of inspections would satisfy the NRC requirements for auditing suppliers of components manufactured under ASME accepted quality assurance programs.

As one would expect, this two year program requires close coordination with the ASME staff, the National Board of Boiler and Pressure Vessel Inspectors, and the authorized inspection agencies. It is further expected that both ASME and NRC will experience program changes during this "trial" period.

The NRC has established three basic criteria which must be met by any third party before their program will be accepted by the NRC. These criteria are as follows:

1. Requirements in the areas of quality assurance programs must be equivalent to NRC requirements.

2. Evaluation of supplier quality assurance programs must be equivalent to similar evaluations conducted by the NRC.

3. The inspection system must be effective in assuring conformance with requirements and consistent with NRC procedures.

If one compares the present ASME system against the above criteria, a degree of compatibility can be noted, but shortcomings can also be identified. During the two year trial program, the NRC will
seek to identify and encourage requirement changes necessary to meet the first criterion, we will audit the ASME survey team QA program evaluations to build a base of information to make judgements in this area, and finally we will audit the inspection and enforcement of ASME code requirements.

It should be recognized that there are several possible results of this trial program ranging from nonacceptance of the ASME program; acceptance of parts of the program, for example, only for static components (pipe, castings, vessels) to full acceptance of the program.

One effect of a fully acceptable program would be that an ASME N-stamp holder would be an "acceptable vendor" to NRC. This, in turn, means that further qualification of a vendor's quality assurance program, through inspection by NRC, or by NRC licensees, would not be required. This could be a major step in terms of reducing redundant inspections of vendors.

It should be made clear that NRC approval of the proposed program as just discussed means that further qualification of a vendor's quality assurance program would not be required. Any reference to product or product acceptance, which is and will remain the licensee's responsibility, has been carefully avoided.

5. CONCLUSION

We have concluded that our over-all vendor inspection program is a good one and is effective in achieving its purpose. The program has given visibility to the NRC quality assurance criteria for nuclear power plants as they apply to contractors and vendors and inspections conducted on a generic basis have led to a more uniform application of these criteria by designers, manufacturers, and service suppliers. Dealing directly with vendors in conducting inspections and in assuring that needed corrective action is accomplished has been an efficient and effective procedure. Further improvements in the inspection program can be accomplished and substantive efforts in the area of utilizing third party inspection systems to supplement NRC inspections are in progress.