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4.3 Piping Systems and Supports (602 hrs.; 24%)

There were seven inspections conducted in this area (1 resident, and 6 resident and specialist). The majority of the inspection work occurred in Unit 1. The large bore piping and associated installation of supports is essentially complete in Unit 1. The installation of small bore piping and supports is also in an advanced stage.

During this assessment period, the overall quality of the licensee's work in this area has been good. Strong management attention was evident in the resolution of concerns identified by both the licensee and NRC. The licensee's followup and handling of 10 CFR 21 reports (Bergen-Paterson EA-3 clamps), is a good example of management's attention and commitment to quality.

A problem identified by NRC at other plants involved use of carbon steel clamps on stainless steel piping. The concern stemmed from a difference in the coefficient of thermal expansion between these materials. Followup by NRC at Limerick disclosed that the licensee had previously identified, evaluated, and resolved this problem for the Limerick facility. This indicates the licensee's commitment to the prompt resolution of identified technical concerns.

Although the licensee's program and management attention in this area has been strong, some problems have been identified by NRC that require further licensee analysis and resolution. These include the heavier-walled piping and the material substitution issues listed in Section 4.9 of this assessment. Neither of these issues are considered programmatic weaknesses, but rather isolated problems.

An NRC concern developed at the end of the period involved two supports attached to an NSSS system (reactor coolant recirculation loop piping). System construction was substantially complete and the system had been turned over to the licensee's Startup organization. However, NRC observations found two supports which did not appear to meet design and functional requirements. Followup by NRC further disclosed that there may be a problem in the interface between the Engineer-Constructor (E-C), G.E., the NSSS Supplier, and the licensee's cognizant organizations regarding some installation requirements for NSSS-supplied supports. Additionally, it appeares that neither field engineering, construction, nor the quality control verification program had identified the deficiency. Followup by the licensee is under way to determine the cause and effect of this problem. However, it should be noted that NRC-identified problems only exist on two of many such supports in the plant.

Observations by the resident inspector and the Construction Inspection Team indicated that a strong construction QC program was in place. In addition to the E-C's well staffed and trained QC organization, the

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licensee's QA organization also is staffed by well trained and knowledgeable QA engineers. The resident inspectors have noticed that the licensee's QA engineers have performed more than the required inspections and surveillances in this area.

Conclusion

Category 1

Board Recommendation

NRC Region I should continue routine inspections of pipe supports by resident and region-based inspectors.

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4.4 Safety-Related Components (133 hrs.; 7%)

There were three inspections conducted (2 resident and specialist; 1 specialist) in this area. In addition, considerable independent inspection effort was spent in this area. The inspections covered safety-related components within the reactor coolant pressure boundary, outside the pressure boundary, and the installation of reactor internals. Most of these activities involved Unit 1 work.

The licensee plans and assigns priorities using dedicated planners and schedules for each system. Additionally, staffing has been increased to monitor and control completion and turnover of systems. Procedures have been well defined for the control of activities, and indicate that there has been adequate review and attention on the part of both site and corporate management. In the area of reactor vessel and internals, the NRC inspectors observed that the access control measures implemented for entry into the reactor vessel during the internals installation precluded contamination of the vessel and assured controlled conditions for the work. An additional indication of the licensee's strong performance in this area was exhibited following an event during which the reactor steam separator was damaged in a fall from its storage dunnage. The licensee and the NSSS vendor promptly assessed the damage and developed an interim and permanent plan of corrective action. Scheduling dictated the damaged steam separator be used during the performance of the reactor internals vibration test. The licensee, in response to NRC questions, performed a comprehensive and technically sound review of the impact the use of the damaged separator would have on the results of the internals vibration test. Overall, the licensee's program in this area has been well managed with much evidence of quality assurance consideration.

A problem identified by the licensee involved an instance of unauthorized welding on the reactor pressure vessel (RPV). A worker ground clean a six inch square on the vessel and partially welded a 4"x4"x3/8" angle for hanger support to the reactor vessel. The bioshield was the intended and correct location for the weldment. The problem was resolved satisfactorily by removing the support angle and placing it at the proper location and by evaluating and dispositioning the effects of the weld on the RPV. A second problem involved the qualification of the welding technique for the control rod drive mechanism in-core housing to guide tube socket welds. The licensee identified defective welds on this system. However, NRC followup of this deficiency determined that the weld defects were attributable to use of an improper weld qualification technique. The licensee's subsequent followup and resolution of this problem was prompt and effective.

NRC inspection found that the above problems were isolated ones. In the first case, the drawing was misinterpreted, and in the second case, the GE-specification, although meeting the ASME code requirements, did

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not prove adequate for the work. However, it must be noted that the E-C's specification for weld qualification under which most of the component work has been performed exceeds code requirements, and is adequate to provide quality finished work.

With other safety-related components, NRC inspections also indicated the program was well managed with adequate consideration of quality assurance. The installation of components were well planned, installation requirements were properly implemented, and inspections were satisfactorily performed.

The licensee has a strong training and qualification program. Welder qualification has been above code requirements. Both engineering and craft personnel have structured programs to improve their skills. Additionally, licensee senior management received monthly training progress reports. In-process and final quality control inspections have been properly documented and readily retrievable. A large and well trained staff of QC engineers, technicians, and inspectors also indicated licensee's commitment to the assurance of quality.

Conclusion

Category 1

Board Recommendation

NRC Region I should maintain routine resident inspection of this area and provide region-based support for the reactor internals installations and other specialized work.