PROCUREMENT STRATEGY FOR ENVIRONMENTALLY QUALIFIED MATERIAL

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INTRODUCTION

Environmental Qualification (EQ) is the process of demonstrating that essential safety-related equipment required to mitigate the consequences of a design-basis accident will perform as intended when exposed to the harsh environmental conditions of the accident at any time during the station life.

Procurement is the cornerstone of a successful continuing EQ program. Invalidation of the equipment qualification already established and costly re-work may result if an integrated procurement effort is not incorporated into the existing EQ programs.

The In-Service Nuclear Stations EQ program incorporates modifications to the normal procurement process and places increased requirements on vendors. These modifications will change the process for requisitioning materials as well as the acquisition process itself.

HISTORY

At many operating nuclear stations, inspection of installed equipment demonstrated that uncontrolled substitution had slowly degraded the environmental qualification initially achieved. The procurement system that had been adopted did not ensure that the devices supplied were qualified or could maintain the qualification of those components for which qualification had been previously established.

The procurement process allowed the acquisition of devices which did not conform with the "form," "fit" or "function" of the original components. The process did not allow for unique identification of the components nor did it sufficiently describe the device to be supplied and the documentation required to retain qualification. Consequently, it was not possible to adequately demonstrate the similarity or the traceability to the component initially qualified. Therefore, some stations have had to face the costly and time-consuming process of re-establishing the previous component qualification.

At Ontario Hydro, for Pickering and Bruce Nuclear Generating Stations, we are embarking on a program to verify the environmental qualification of the essential safety and safety-

related equipment. The planned EQ procurement program will also prove beneficial to Darlington NGS which has begun to order replacement parts for maintenance of the equipment previously qualified. This will assure that the qualification previously achieved will be maintained.

OUTLINE OF THE STRATEGY

The key elements of the strategy are identification of the EQ requirements for the equipment to be purchased and identification of suppliers capable of delivering the required equipment. The objective of this strategy is to provide traceability such that changes in fit, form, function, materials of construction, manufacturing processes, etc. are documented and the desired component operation under harsh environmental conditions is demonstrated.

Engineering and Operations must clearly convey to the Purchasing and Material Management Division the requirements of the equipment to be purchased and ultimately to the supplier via the procurement process. To achieve this, the buyers must be made aware of the technical, quality assurance and EQ requirements. The supplier, in addition to meeting the specification, must also be aware of the EQ requirement for traceability so that a linkage can be made between the equipment being supplied and the equipment qualified, regardless of whether qualification was achieved by analysis or testing.

Currently, all requisitions with EQ requirements are being processed by one centralized, knowledgeable unit in the Purchasing and Material Management Division. To ensure that these documents are routed to this unit, the purchase requisition associated with environmentally qualified devices will have a distinctive identifier. In addition, all environmentally qualified components or subcomponents will have a unique stock code number which will aid in the routing of purchase orders and ensure that "like for like" replacement occurs. Thus, routing of the requisition to the unit designated to handle EQ purchases will be assured. The buyers will then be aware of the special requirements for EQ components and if they have not been properly specified, they will contact the originating department to ensure that the appropriate data is obtained and transmitted to the vendor.

It is the role of the Purchasing and Material Management Division to identify suitable suppliers of environmentally qualified equipment. Some of the considerations in such a determination are early identification of potential suppliers of EQ products, an evaluation of a suppliers's capability to provide such devices and audits.

In evaluating a supplier's capability to provide environmentally qualified components, consideration must be given to the supplier's ongoing support of the product line and the financial

stability of the organization. Due to the high cost of re-qualification, it is preferred to deal with organizations which are committed to supplying equipment over the life of the station and meet both the QA and EQ traceability requirements.

Thus, it will be necessary to identify potential suppliers early in the program. This will enable us to investigate alternative courses of action should difficulties be encountered in the qualification of any installed device. Potential suppliers will be identified largely by our inspectors through an assessment of existing vendors while conducting their normal inspection and verification activities and by appropriate use of vendor data obtained via Nuclear Utilities Procurement Issues Committee (NUPIC) or other suitable sources. Some of the considerations involved in such a determination are the manufacturing plant's quality assurance program; a documented process for controlling design, material and process changes; previous history of supplying environmentally qualified components; audit results; past performance etc.

The supplier, in committing to deliver the equipment, is also committing to meet the requirements identified. Of key concern is the ability to provide traceability of qualification from the tested or analyzed component to the one delivered. Steps are underway to pre-qualify vendors based on their capability not only to provide the product, but also to provide the traceability necessary to ensure that the basis for the original qualification is maintained. Typically, the manufacturer must demonstrate that a documented and effective program is in place that will provide proof of similarity as well as demonstrating for the component that any changes made in materials, the design process or manufacturing process have not had an adverse impact on the qualification previously established.

The EQ program for the In-Service Nuclear Stations, in addition to the above, needs to establish the qualification of equipment previously installed. As part of the process, vendors of the equipment already installed need to be contacted. Here the EQ unit and the Purchasing and Material Management Division must work as a team to ensure that the information required to support qualification is retrieved. This information will be factored into the solution adopted if the equipment is deemed to be unqualifiable. Some of the key considerations are: the availability of spare parts, the remaining qualified life, the costs of modifications (upgrade, replace, relocate or enclose existing devices). These deliberations will necessitate discussions both with Purchasing and Materials Management Division as well as Operations and Engineering in order to identify a preferred solution.

CONCLUSIONS

A successful environmental qualification program depends strongly on a clear understanding of the requirements for each component purchase and the identification of suitable vendors to meet these needs. In order to ensure that qualification is achieved, all those involved must be aware of their responsibilities - this involves training. A comprehensive training program has been planned not only to address the needs of the staff directly involved in the acquisition process, but also to provide awareness sessions for those on the periphery.

With the knowledge gained through training and the close co-operation of the EQ engineering unit with the Purchasing and Materials Management Division, the EQ requirements can be clearly conveyed to the vendors and thus environmental qualification of safety equipment achieved and maintained.