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**Implementation of Environmental Qualification Program in Pickering Nuclear
Division**

Neil Mitchell
Ontario Hydro
Pickering ND

Abstract

Environmental Qualification [EQ] is the process of providing assurance that safety related equipment and systems will function as required following a Design Basis Accident which generates harsh environmental conditions. The process lists all the equipment required to function under accident conditions, assesses ability to function under those conditions, makes modifications as required to achieve the required capability and ensures the required measures are in place to maintain qualified status for remaining Station life. The safety related systems covered by the Pickering EQ Program are those required to control reactor power, cool the fuel, contain radioactivity and monitor critical safety parameters and all associated electrical, service water and instrument air support systems. The program considers Loss-of-Coolant-Accident [LOCA], Main Steam Line Break [MSLB] and all other Design Basis Accidents identified in the currently published Safety Analysis. The environmental phenomena considered by the program include temperature, pressure, radiation, steam and flooding. The qualification methodology is based on the IEEE-323 standard.

The goal of the program is to achieve full qualification status at best possible speed, provide equipment which has a high margin of safety and leave a program in place which is readily sustainable. The current target completion date is 2003; however, opportunities are being explored to attempt to accelerate completion. Qualification by a system oriented approach best addresses change management requirements. Qualification by equipment type oriented approach best addresses technical capability issues. The program uses hybrid approach to get the best mix. Equipment is qualified primarily on a system oriented basis; however, generic equipment qualification approaches are also used where significant safety benefit or efficiencies can be achieved. An extensive up front engineering effort is required to list and assess equipment. Engineered changes need to be prepared well in advance of installation dates. Impact on station operation is minimized by maximizing installation of changes on-power. Impact on station maintenance is minimized by consolidating EQ work with existing rehabilitation programs. Margin of safety is maximized by using existing, proven solutions to qualification inadequacies to the highest extent possible. Sustainability is maximized by broadly applying standardized fixes.