

Knowledge, Tools and Inspection Criteria for Knowing EQ Equipment Has Not Been Compromised

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Abstract

Canadian Nuclear Safety Commission audit findings identified Performance (System) Engineers knowledge, application of EQ Program controls and familiarity with EQ configurations was less than adequate. Performance Engineers were presented with training from EQ Subject Matter Experts concerning equipment field verifiable configuration requirements credited. The training provided photographs of correct and incorrect configurations, details of electrical interfaces and other external features of the equipment credited for EQ Safety functions.

When walkdowns began after the training, configurations challenging the qualification of equipment were found. The deficiencies included incorrect conduit drainage / slope for Solenoid Valves, Quick Disconnectors (EGS Type Multi Pin Electrical Connectors Series) not locked, T-Drains inverted / not installed, conduit and junction / splice box drainage paths not optimal, transmitter pinched o-rings and neck seal between sensor module and electronic housing broken (rotated), etc. A Technical Operability Evaluation determined Units were inoperable and a multi-unit shutdown occurred. Inaccessible areas were inspected with additional findings of the same nature. Repairs were completed and Units returned to service.

The EQ Field Guideline for Environmental Qualification Inspections and Walkdown will be presented. This guideline addresses 25 different types of EQ equipment, with inspection criteria, interfaces (conduit seals, drainage paths, et.al.) and has more than 60 photographs of in-situ equipment in both qualified and un-qualified conditions. It also provides Performance Engineering with Bend Radius, cable and equipment hot spots identification guidance and general criteria for degradation inspection. Apparent cause and root cause analysis by the utility for the various as-found conditions will be discussed. Changes in Engineering surveillance and walk down programs will be presented. A short introduction to the history of EQ in Canada will also be presented.