



# SOFTWARE QUALIFICATION TESTING

For the Installation of Commercially Available Digital Products  
in Nuclear Power Plants

**AMS' Software Qualification Testing program quantifies the reliability and fault tolerance of digital I&C systems before, during, and after installation in nuclear plants. Our program removes the high development and implementation costs associated with qualitative software quality assurance programs by providing performance-based evidence on the proficiency of software-based equipment under both normal operating conditions and in the presence of faults.**

Most off-the-shelf, commercially available digital equipment cannot be expected to conform to the rigorous software quality assurance (QA) processes required by nuclear regulators. Furthermore, digital testing often results in significant delays and cost overruns. These issues are particularly troublesome when dealing with safety instrumented systems where there is potential for common cause failures to compromise the redundancy of a safety-related system. As a result, many U.S. nuclear facilities have, in many instances, simply foregone the transition to digital technology.

To address these concerns, AMS has developed a software qualification testing program to consistently quantify the reliability of digital systems and detect designed-in software defects. To ensure the robustness of a given digital system, AMS' testing program evaluates these digital systems under a variety of extreme conditions, such as the presence of radio frequency interference or power supply disturbances.

With the AMS Software Qualification Testing program, nuclear facilities can have the assurance of knowing that new digital equipment will operate as expected under a variety of conditions without the high costs associated with a traditional software quality assurance program.

## BENEFITS OF AMS SOFTWARE QUALIFICATION TESTING

- Automated Testing Process
- Independent Verification and Validation
- Viable at all Stages of the Digital I&C Life Cycle
  - Integration and Qualification Testing during Installation
  - Acceptance Testing Post-Installation
  - Ongoing Maintenance Testing to Ensure Proper Functionality



## 10CFR50 Appendix B Program

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