Design Acceptance Criteria for Digital Instrumentations & Controls

ITAAC Closure Working Group

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Background

- SECY-92-053 describes design acceptance criteria (DAC) as:
  - A set of prescribed limits, parameters, procedures, and attributes upon which the NRC relies, in a limited number of technical areas, in making a final safety determination to support a design certification.
  - The concept of DAC would enable the staff to make a final safety determination, subject only to satisfactory design implementation and verification by the combined license (COL) licensee, through appropriate ITAAC.
  - It would be limited in use. For instrumentation and controls, DAC is used to accommodate rapidly changing technology.

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Example DAC

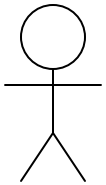
Table 2.5.2-8 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
11. The PMS hardware and software is developed using a planned design process which provides for specific design documentation and reviews during the following life cycle stages: a) Hardware and software development phase, consisting of hardware and software design and implementation b) System integration and test phase c) Installation phase	Inspection will be performed of the process. Inspection will be performed of the process used to design the hardware and software.	A report exists and concludes that the process defines the organizational responsibilities, activities, and configuration management controls for the following: a) Documentation and review of hardware and software. b) Performance of system tests and the documentation of system test results. c) Performance of installation tests

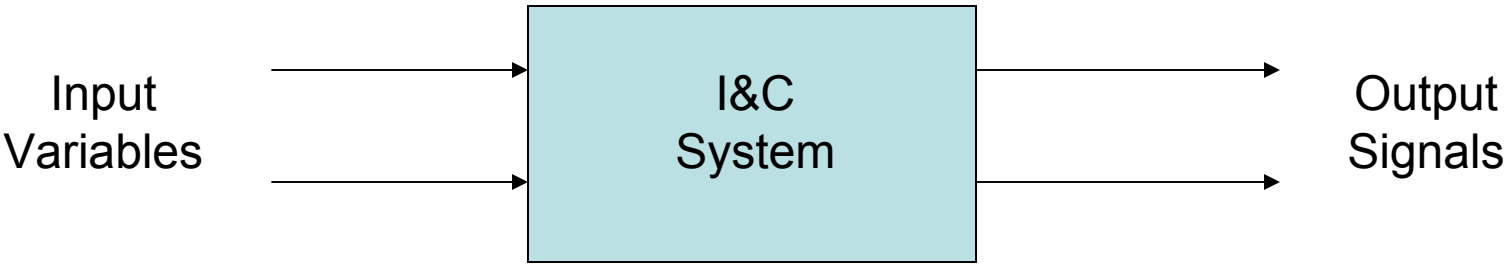
Applicable Regulations

- 10 CFR 52.47 requires for design certification applications:
  - Performance requirements and design information sufficiently detailed for inspection requirements and procurement, construction, and installation specifications, and
  - Evaluation against the Standard Review Plan.

I&C Interfaces



Human Interface
-Observed Variables
-Available Controls



Environmental Requirements
-Seismic
-Temperature/Humidity
-Electromagnetic Interference

Software Quality Planning

System Requirements
-Logic
-Timing

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Example 1

- IEEE Std. 603-1991, Clause 5.4 requires the equipment be qualified for environmental conditions.
- Information to provide in application would be minimum seismic, temperature and humidity, and electromagnetic interference withstand levels.

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Example 2

- IEEE Std. 603-1991, Clauses 5.3 and 5.15 requires quality and reliability for safety systems. Branch Technical Position 7-21 provides guidance for real-time performance and data communications.
- Information to provide in application would include minimum data rates, bandwidths, and data precision.

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Questions?