Power Plant Simulation Conference 2020
Chattanooga, Tennessee
January 14, 2020

James B. Florence
ANS–3.5 Working Group
ANS–3.5–2018 Topic Overview

- ANS–3.5 Development Statistics
- Introduce ANS–3.5 Working Group
- ANS–3.5–2018 Project Status
- ANS–3.5–2009 Transition Status
- Questions
16 active members;
675 collective years of experience in the nuclear industry;
479 years of simulation-related experience;
249 years of operator training experience;
working group continuity was preserved by members with a range of 1 to 29 years of previous working group participation;
12 face-to-face meetings since 2010;
7,680 man-hours;
$960,000 labor dollars;
$288,000 travel costs;
significant participation from the industry, and;
101 comments addressed/resolved
Officers

- Jim Florence (Cooper) – Chair
- Bob Felker (Western Services Corp) – Vice Chair
- Keith Welchel – Secretary
- Butch Colby – Editor
- SK Chang – Style Editor
- Bernard Litkett (NRC) – Parliamentarian
Bill Fraser (Westinghouse)
Robert Goldman (Grand Gulf)
David Goodman (Comanche Peak)
Jody Lawter (Summer)
George McCullough (Exitech Corp)
Michael Petersen (Monticello/Prairie Island)
Pablo Rey (Tecnatom – Spain)
James Sale (Independent)
Frank Tarselli (Independent)
Larry Vick (Independent)
Approved Scope:

- This standard establishes the functional requirements for full scope nuclear power plant control room simulators that are subject to U.S. Nuclear Regulatory Commission (NRC) regulation for use in operator training and examination. The standard also establishes criteria for the scope of simulation, performance, and functional capabilities of nuclear power plant control room simulators.

- This standard does not establish criteria for the use of simulators in operator training programs.
ANS-3.5–2018 was “balloted” to the ANS Large Light Water Reactor Consensus Committee (LLWRCC) in May 2017.

ANS-3.5–2018 was approved by the ANS LLWRCC subsequent to a “reconsideration” ballot on In November 2018.

Second “reconsideration” ballot issued to the ANS LLWRCC on 01/15/19; ballot closed on 01/29/19.

ANSI approval achieved on 10/10/19.

ANS-3.5–2018 available for purchase on 11/06/19.
ANS–3.5–2018 Project Status

What’s Different in the 2018 Standard?

- Addresses comments from the original 2009 Standard review effort
- Addresses next generation simulators
- Deleted/modified definitions; introduced “discrepancy” in lieu of noticeable difference, deviation and deficiency
Deleted Malfunction List in Section 3.1.4; a footnote references the "control manipulations/plant evolutions" list in the Code of Federal Regulations, Part 10CFR55.59 "Requalification" § (c)(3)(i) where the malfunction list was originally derived.

Changed Section 3.4/4.4 to from “Simulator Testing” to “Performance Testing”

Moved verification/validation testing to Section 5, Configuration Management

Moved Assessment of Deviations to Section 5
ANS–3.5–2018 Project Status

- Defined Testing Periodicities
  - Limits of Simulation
  - Steady-state & Normal Evolutions
  - Malfunctions
  - Physical Fidelity & Human Factors
  - Instructor Station Capabilities
  - Real Time & Repeatability

- Defined testing configurations for various performance tests (fully integrated vs. non-integrated)

- No changes to scenario-based testing!!!
Section 5:

- initial design vs. change control
- performance benchmark (steady-state & transient testing)
- noticeable differences
- resolution of discrepancies
- verification/validation testing
Appendix B deleted; transient list deleted, steady-state parameters moved to Section 4

Clarified that previously selected transients may be used (for legacy plants); transients tests confirm overall simulator model completeness and integration

Re-lettered Appendices C & D

Readability/clarity
No additional transitions since 2018

1985 Standard – Hatch, Sequoyah, Watts Bar, Browns Ferry, Comanche Peak, Palo Verde, Fermi

1998 Standard – Perry

With the exceptions noted above, all other U.S. simulation facilities currently conduct business to the ANS–3.5–2009 Standard.
The ANS–3.5 Webpages can be accessed via:

- www.ans.org
- https://www.usug.org/

Find:

- Scope Statement
- Membership Contact Information
- Meeting Locations
- Meeting Minutes
- Link to ANS–3.5 Inquiry Process
- How to submit inquiry requests