

Developing Operating Tests for Larger Classes

Mark Bates

Senior Operations Engineer

NRC Region II

Purpose of Presentation

- Discuss methods that may allow for more efficient operating test administration to larger classes while not sacrificing the quality of the evaluation.

Overview

- Operating Test Requirements Relevant to Operating Test Efficiency
- Operating Test Development
- Schedule Development
- Operating Test Administration
- Questions / Discussion

Operating Test Requirements/Allowances

- No day-to-day repetition. [NUREG-1021, ES-302, Pg. 3]
- Upgrade SRO applicants receive either 2 or 3 in-plant JPMs. [NUREG-1021, ES-301, Pg. 14]
- Minimum number of events and transients for each applicant. [NUREG-1021, Form ES-301-5]
- Simulator JPMs can be given in MCR. [NUREG-1021, ES-302, Pg. 6]
- Simultaneous simulator JPMs are allowed. [NUREG-1021, ES-302, Pg. 6]

Operating Test Development

- THINK “SCHEDULE” WHEN DEVELOPING THE OPERATING TEST OUTLINES!!!!!!

Operating Test Development

- One or two simulator JPMs may be conducive to administering in the MCR.
- Two or three spare JPMs could be developed (allows management of large blocks of time):
 - RO applicants are required to receive 8 simulator system JPMs. (SRO-I: 7)
 - There are nine safety functions.
 - Choose a spare JPM from the safety function not used by either the RO or SRO-I applicants.
 - Choose one or two other spare simulator JPMs.

Operating Test Development

- Develop Admin JPMs that are conducive to group classroom administration:
 - No added value by performing in simulator.
 - Consider photos of instruments and computer screens (especially when procedures state which screen to use).
 - Caution should be used when supplying parameters that would be obtained from the simulator (cueing).
 - Minimize Admin JPMs that require an examiner cue or prompt.

Operating Test Development

- Consider developing simulator JPMs that can be administered concurrently.
 - Ensure that tasks do not interfere with each other:
 - Consider alarms
 - Consider communications
 - Consider potential to cue an alternate path JPM
 - I.E., One EDG JPM coincident with a ventilation JPM.

Operating Test Development

- Admin JPMs need to evaluate the SRO at a higher level than the RO. This does not mean that all of the Admin JPMs are required to be different for the SROs.
- Some scenario events can be credited for both RO and BOP (I.E., Power Reduction: RO could get credit for a “reactivity” while the BOP receives credit for a “normal”).

Operating Test Development

- Consider developing the Audit Exam outlines and NRC Exam outlines at the same time, using the same exam writer. (remember: no duplication is allowed)
 - Experience has shown that this is beneficial when developing ~ 8 scenarios and 15 JPMs for an audit exam, another ~ 8 scenarios and 15 JPMs for an NRC exam.

Operating Test Development

- What should outlines include?
(Identify problems early in the process)
 - JPMs:
 - Title, Safety Function, Sim, MCR, EOP, etc
 - Narrative description
 - List of verifiable actions
 - Can it be administered in MCR?
 - Spare task?
 - Scenarios
 - Title of Event
 - Narrative description
 - Tech Specs, Critical tasks, Contingency procedures

Schedule Development

- Rules of Thumb:
 - The simulator is usually critical path (keep it busy).
 - Keep all three examiners busy all the time.
 - Only plan on three scenarios per day.
 - Saturday administration is an option (at discretion of exam team – prevent 2nd/3rd week).

Schedule Development

- Consider using “station keeping”.
- Ensure that sufficient support staff is available to sequester and transfer applicants during administration.
- Pre-brief crews outside of the simulator. – NRC does not need to be present (JPMs and scenarios).
- Use time-compression only when there is no impact on exam administration.
- SRO-U applicants can do three in-plant JPMs and 2 simulator JPMs to complete their five systems tasks.
- Ensure sufficient reference material is available to support classroom JPMs.

Schedule Development

- Build flexibility into schedule
 - Use of spare JPMs.
 - Alternate Path (Target 5 – one of the spares may be alternate path).
 - Know which JPMs can be pulled forward.
 - Know which JPMs have high variability in anticipated completion time.
 - Know which scenarios are likely to run quicker and can be paired with JPMs.

Operating Test Administration

- Be ready to place the simulator in RUN at an agreed upon time – licensee should be ready with the simulator, examiners should be ready and on station, and applicants should be briefed and ready to walk down panels at an agreed upon time to start each day.

Operating Test Administration

- Have sequestering personnel in place at the appropriate times to both monitor applicants waiting for another piece of the test and to transfer applicants from one station to the next.

Validation is Key

- Good validation supports efficiency:
 - Accurate validation times results in better scheduling.
 - Accurate material for the examiners to use results in a more efficient prep week (Prep week cannot be a “Development” week, especially with more material to validate).
 - Thorough validation is in the best interest of all stakeholders, including the applicants.

Validation is Key

- Potential consequences of poor validation
 - Exams may get delayed (Due to prep week not completed or final submittal not completed).
 - NRC will not be able to collectively support the licensee's exam needs as well if the tests take extra time to administer.
 - Applicants feel more stress if test administration is not efficient and takes longer to complete.

Questions / Discussion

Mark A. Bates

Senior Operations Engineer

Operations Branch

Region II

United States Nuclear Regulatory Commission

245 Peachtree Center Ave., NE, Suite 1200

Atlanta, GA 30303-1257

404-997-4612