

Dynamic Simulator Critical Tasks (CTs)

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Critical Tasks (CTs)

- CTs are tasks that are “**essential to safety.**”
- If an automatically actuated plant system would have been required to mitigate the consequences of an individual’s incorrect performance, or the performance necessitates the crew taking compensatory action that would complicate the event mitigation strategy, the task is safety significant.

Examples of CTs

- degradation of any barrier to fission product release
- degraded emergency core cooling system (ECCS) or emergency power capacity
- a violation of a safety limit
- a violation of the facility license condition
- incorrect reactivity control (such as failure to initiate emergency boration or standby liquid control, or manually insert control rods)
- a significant reduction of safety margin beyond that irreparably introduced by the scenario

Examples of CTs (cont.)

- effectively direct or manipulate engineered safety feature (ESF) controls that would prevent any condition described in the previous paragraph
- recognize a failure or an incorrect automatic actuation of an ESF system or component
- take one or more actions that would prevent a challenge to plant safety
- prevent inappropriate actions that create a challenge to plant safety (such as an unintentional reactor protection system (RPS) or ESF actuation)

CTs Must Be Cued

EXAMPLES OF APPROPRIATE CUES:

- verbal direction by or reports from other crew members
- procedural steps, such as satisfying entry conditions, flow chart decision points, and “response not obtained” columns
- indication of a system or a component malfunction (including passive failures) by meters or alarming

Measurable Performance Indicators

- Objective CT Evaluation Criteria
 - A measurable performance indicator consists of positive actions that an observer can objectively identify taken by at least one member of the crew.
 - Criteria that simply describe performing an action after a condition is present introduces subjectivity.

Examples of Measurable Performance Criteria

- During a loss of secondary heat sink
 - Establish AFW flow to at least one SG to prevent exceeding Bleed and Feed Criteria in FR-H.1.
- During a SBLOCA
 - Secure RCPs within a specified time (i.e. 5 minutes) after SCM=0.

Examples of Subjective Performance Criteria

- Manually insert control rods when the turbine trips and the reactor fails to trip.
 - Question: How soon do they need to insert control rods? What constitutes unsatisfactory performance?
- Perform an action prior to exiting a certain procedure (i.e. Initiate Emergency Boration).
 - What if one crew moves slower through a certain procedure? Was performance still satisfactory?

Examples of Performance Criteria That Cannot Be Measured

- understanding (such as of the significance of a certain plant response)
- verification that an expected response has occurred
- passive observations (such as monitoring the performance of a system)

Examples of events that don't meet the CT criteria

- Taking manual control of an automatic safety system (**only if the auto-initiation feature fails to work**)
- If the manual system has also failed and no action will be effective

Performance Feedback

- Each CT must provide at least one member of the crew with performance feedback. This requirement must be met for all CTs.

Significance of Inadequate CT Performance

- Applicants are individually evaluated on their performance on various Rating Factors within a Competency.
- Zero mistakes in a Rating Factor results in a score of 3.
- One mistake in a Rating Factor results in a score of 2.
- Two mistakes typically results in a score of 1, unless a 2 can be justified.
- Only one mistake related to a CT results in a score of 1.

NUREG-1021 FORM ES-303-1

Competencies/ Rating Factors (RFs)	RF Weights	RF Scores	RF Grades	Comp. Grades	Comment Page No.
5. Directing Operations					
a. Timely & Decisive Action	0.30	1	0.30	2.40	
b. Oversight	0.30	3	0.90		
c. Solicit Crew Feedback	0.20	3	0.60		
d. Monitor Crew Activities	0.20	3	0.60		
				NOTE: Comp Grade of > 1.8 is usually passing	

How many CTs are required?

- NUREG-1021, Form ES-301-4, provides Quantitative Attributes that suggests that scenarios should contain 2 – 3 CTs.
- The quantitative attribute **target** ranges that are specified on the form are not absolute limitations; some scenarios may be an excellent evaluation tool, but may not fit within the ranges. A scenario that does not fit into these ranges shall be evaluated to ensure that the level of difficulty is appropriate.

Good Practices

- Record helpful plant parameters that are being used as CT objective evaluation criteria.
 - Steam Generator Levels
 - Subcooling Margin (SCM)
 - Reactor Coolant Flow
 - Auxiliary Feedwater Flow

More Good Practices

- All CTs shall be flagged in a manner that makes them apparent to the individuals who will be administering the operating test (e.g., by using underlines, asterisks, or bold type), and the measurable performance indicators shall be identified.

Common Confusion

- A CT for a simulator is different from a Critical Step (CS) for a JPM. The terms are commonly, and incorrectly, interchanged. It is just important to know that they have different meanings. A CS is a JPM term that simply refers to a step that must be correctly completed in order to successfully complete the intended task.

Introduction of New CTs During Scenario

- Applicants have the potential to introduce new CTs during the exam if they take actions that were not anticipated by the exam developers.
- These tasks will be evaluated using the same criteria mentioned throughout this presentation.

Risk of Not Having Objective Evaluation Criteria

- The applicant's assigned examiner must use his best judgment to make a licensing decision keeping in mind that the NRC's mission is to protect public health and safety.
- A license denial could occur.
- The issue, if the applicant chooses to appeal, could be decided by NRR after they complete an independent review.

Questions