A. PURPOSE

This standard describes how to administer operating tests to initial license applicants in accordance with the requirements of 10 CFR 55.45. It includes policies and guidelines for administering both the walk-through and the integrated plant operations categories of the operating test. It is assumed that the operating test was prepared in accordance with ES-301.

B. BACKGROUND

As noted in ES-201, facility licensees will generally prepare proposed operating tests in accordance with ES-301 and submit them to the responsible NRC regional office for review and approval. Regardless of whether it was prepared by the facility licensee or the NRC, every operating test will be independently administered and graded by an NRC licensing examiner in accordance with the instructions contained herein and in ES-303.

C. RESPONSIBILITIES

1. Facility Licensee

The facility licensee is responsible for the following activities:

a. Make the plant and simulation facility available, as necessary, for validating and administering, Category A (administrative topics), Category B (control room and in-plant systems), and Category C (integrated plant operations) of the operating tests.

b. Safeguard the integrity and security of the operating tests in accordance with facility procedures established pursuant to 10 CFR 55.40(b)(2) and the guidelines discussed in Attachment 1 of ES-201.

c. Provide administrative and logistics support (e.g., personnel to operate the simulation facility, surrogate operators, etc.) to facilitate the administration of the operating tests in accordance with Section D.

d. Inform the NRC regional office in writing if an applicant withdraws from the examination process before it is complete.

2. NRC Regional Office

The NRC regional office is responsible for the following activities:

a. Work with the facility contact to coordinate the operating test administration schedule in a manner that maximizes efficiency and maintains security. Normally, the operating tests should be administered within 30 days before or after the written examinations. The region shall obtain concurrence from the

NRR operator licensing program office if the examination dates diverge by more than 30 days. (Refer to ES-201 for additional guidance regarding examinations that have to be rescheduled to achieve an acceptable product.)

b. Administer the operating tests in accordance with Section D.

D. TEST ADMINISTRATION INSTRUCTIONS AND POLICIES

1. General

a. Before beginning the operating test, an examiner shall brief the applicant(s) using Parts A, C, D, and E of Appendix E. To save time, it is recommended that the examiner(s) brief the applicants as a group.

b. If an applicant requests to withdraw during any part of the examination process, the examiner shall inform the applicant that this will result in automatic license denial and that he or she may reapply in accordance with 10 CFR 55.35. The chief examiner will request the facility licensee to document the applicant's withdrawal in a letter to the NRC regional administrator.

c. Each applicant listed on the examination assignment sheet (see ES-201, Attachment 4) shall be administered an operating test as indicated under "Examination Type."

d. For purposes of test integration and continuity, the chief examiner should generally schedule the same examiner to administer all three operating test categories to an applicant. However, under certain circumstances, such as when a licensee's simulation facility is not located near the plant or if a licensee requests examinations for an unusually large group of applicants, the responsible regional supervisor may authorize the chief examiner to divide the operating test categories and subcategories among different examiners (simulator operating tests consisting of multiple scenarios shall not be divided among examiners). The chief examiner will be responsible for ensuring that each applicant gets a complete operating test and that the tests are thoroughly and accurately documented.

Normally, an NRC examiner will be assigned to individually evaluate each applicant during the simulator operating test. However, if a three-person operating crew consists entirely of senior reactor operator (SRO) upgrade applicants (who do not have to be evaluated on the control boards), the chief examiner may assign only two examiners to observe the crew. Although the applicants in the reactor operator and balance of plant positions may not be individually evaluated, they will be held accountable for any errors that occur as a result of their action(s) or inaction(s) and graded on their ability to “Operate the Control Boards” (i.e., SRO Competency 5). SRO-instant applicants will always be individually evaluated by an NRC examiner regardless what operating position they are filling during a given scenario.

e. The examiner is expected to administer the planned operating test in accordance with the prepared and approved walk-through test outlines (Forms ES-301-1, "Administrative Topics Outline," and ES-301-2, "Control Room Systems and Facility Walk-Through Test Outline") and simulator scenarios (Forms ES-D-1, "Scenario Outline," and ES-D-2, "Operator Actions"). Examiners shall document every significant aspect of each applicant's performance for later evaluation, but they shall *not* use the applicant's unplanned actions and statements to displace any part of the planned operating test.

Normally, examiners should substitute or replace planned operating test materials only if it is determined that an item is invalid or impossible to perform or simulate because of unanticipated access restrictions or equipment failures.

f. Examiners may administer the same operating test (walk-through and simulator) to consecutive applicants and crews on the same day, but they must ensure that the security of the operating test is maintained. The same simulator scenarios shall not be repeated during successive days.

If previously agreed upon by the facility licensee, examiners may also administer the same operating test (walk-through and simulator) by dividing the test into segments that can be administered to all of the applicants on the same day. This will minimize the amount of effort required to develop different operating tests but will complicate the scheduling process.

g. The examiner should normally administer Categories B and C of the operating test first and attempt to concurrently evaluate as many of the planned administrative subjects in Category A as possible. The remaining administrative subjects should then be evaluated in accordance with the approved outline.

h. The examiner must take sufficient notes to facilitate the thorough documentation of any and all applicant deficiencies in accordance with ES-303. The examiner must be able to cross-reference each comment to a specific JPM, simulator event, or question.

I. The making of videotapes during the administration of operating tests is not authorized.

j. The number of persons present during an operating test should be limited to ensure the integrity of the test and to minimize distractions to the applicants.

- Except for the simulation facility operators, no other member of the facility's staff shall be allowed to observe an operating test without the chief examiner's permission. Facility management and other personnel deemed necessary by the facility licensee should generally be allowed access to the examination (under security agreements, as appropriate), provided the simulation facility can accommodate them and there is no impact on the applicants.

Although the simulation facility operator will normally assume the role of the other personnel that the applicants direct or notify regarding plant operations, the chief examiner may permit other members of the facility training or operations staff (e.g., a shift technical advisor (STA)) to augment the operating shift team if necessary. The chief examiner shall fully brief those individuals regarding their responsibilities, reporting requirements, duties, and level of participation before the operating test begins. All participants in the testing process must also be mindful of their responsibilities with regard to examination integrity pursuant to 10 CFR 55.49.

When surrogate operators are required to complete the operating crew (e.g., during retake tests or for a class consisting entirely of ROs), the chief examiner shall ensure that the surrogate operator(s) are briefed regarding the content of the scenario(s) and their expected actions in response to every event. The examiners must not restrict the surrogate operators' activities to such an extent that the applicants being evaluated are required to assume responsibilities beyond the scope of their position. The surrogate operators do not need to be licensed at the facility, but they must have the knowledge and ability required ~~will be expected~~ to assume the full responsibilities of the roles they take in the operating test. Consultations with an STA shall be conducted in accordance with the facility licensee's normal control room practice; e.g., an STA shall not be stationed in the simulator if they are on-call at the site. The STA should not take a proactive role in assisting or coaching the applicants because it would hinder the examiners' ability to evaluate the applicants' competence. Examiners shall run additional scenarios if necessary to make a licensing decision.

If the facility licensee normally operates with and is required by its technical specifications to have more than two reactor operators (ROs) in the control room, the chief examiner may authorize the use of additional surrogates to fill out the crews. In such cases, examiners must take care that the presence of additional operators does not dilute the examiners' ability to evaluate each applicant during the required number of events and on every applicable competency and rating factor. Examiners shall not hesitate to run additional scenarios, as necessary, to ensure that every applicant is given the opportunity to demonstrate his or her competence. Only one individual (applicant or surrogate) is allowed to fill a shift supervisor or manager position during the simulator operating test.

- Under *no* circumstances will another applicant be allowed to witness an operating test. Operating tests are not to be used as training vehicles for future applicants.

- Other examiners may observe an operating test as part of their training or to audit the performance of the examiner administering the operating test.

- The chief examiner may permit other NRC employees, such as resident inspectors, regional personnel, researchers, or NRC supervisors, to observe an operating test. Personnel who are not NRC employees (e.g., representatives from the Institute of Nuclear Power Operations (INPO)) may observe the operating tests with prior approval from the NRR operator licensing program office. The chief examiner will control the observer's activities in accordance with guidance provided by NRR. The examiner should also give the applicant the opportunity to object to the presence of observers.

k. The chief examiner should confirm with the facility licensee that the simulator instructor's station, programmers' tools, and external interconnections do not compromise operating test security while conducting examinations (refer to Section F of Appendix D). The primary objective is to ensure that the exam material cannot be read or recorded at other unsecured consoles and that examination material is either physically secured or electronically protected when not in use by individuals listed on the security agreement.

l. The chief examiner should arrange for any NRC examiners who are not familiar with the facility to obtain a tour before they administer any operating tests. The tours shall not be conducted or observed by any of the applicants. In addition, the tours should concentrate on areas of the plant that will be used during the examination process, such as the control room, the simulation facility, and planned walk-through locations.

m. The chief examiner will conduct an exit briefing with the facility licensee after the operating tests are complete. The briefing should address any generic weaknesses noted during the operating tests and any other significant issues (e.g., problems with the reference material, the simulation facility, or the plant) that might be addressed in the examination report. The individual operating test results are predecisional until approved by NRC management in accordance with ES-501 and shall *not* be shared with the facility licensee during the exit briefing.

2. Walk-Through (Categories A and B)

a. The examiner should validate any JPMs that were not previously validated by the facility licensee or by the NRC during a preparatory site visit. This is particularly important for complex JPMs and those that require the applicant to implement an alternative method directed by plant procedures.

b. To the extent possible, the examiner should have the applicant perform the control room JPMs on the simulator, rather than asking the applicant to describe how he or she would accomplish the task.

If the examiner observes a discrepancy between the simulator setup and the conditions specified in a JPM, then the examiner shall stop the JPM and correct the situation, as necessary. If the task can be completed with different values

(e.g., wind direction when determining a protective action recommendation during an emergency), then the examiner shall document the differences and coordinate with the facility contact and the NRC chief examiner to validate the applicant's response under the actual conditions.

The chief examiner is expected to coordinate the administration of the JPMs to maximize the use of the simulator. To increase efficiency, different JPMs may be administered simultaneously to multiple applicants, but the examiners must ensure that mutual interference is minimized and test integrity is not compromised.

Under certain circumstances, it may be more efficient to administer some or all of the JPMs in "station-keeping" mode, in which the examiners remain in position at designated operating stations and the applicants, under escort, rotate through the various stations. Such arrangements would have to be agreed to by and coordinated with the facility licensee; moreover, the guidelines in Sections D.1.d and D.1.f would apply.

When JPMs or discussions are conducted in the control room, the examiners shall make every effort to accommodate and not interfere with normal shift operations. The chief examiner should request that the facility training manager notify the shift supervisor when the NRC will be conducting examination activities in the control room. If the number of persons or the noise level in the control room is excessive, the examiner should, if possible, move to a quieter location, modify the sequence of the JPMs and return when the level of activity in the control room has abated, or ask the facility training manager to address the issue.

c. The examiner should encourage the applicant to sketch diagrams, flow paths, or other illustrations to aid in answering the examiner's questions. In all cases, the examiner shall collect the supporting material because it provides additional documentation to support a pass or fail decision (refer to ES-303). To facilitate copying, the applicant's drawings should be restricted to one side of separate sheets of 8.5-inch by 11-inch paper; the back of Form ES-303-1 or its attachments shall *not* be used for this purpose.

d. The examiner should encourage the applicant to use such material as facility forms, schedules, and procedures if they are relevant to the questions asked.

e. The examiner should be careful not to infer excessive system and administrative knowledge from observations made during Category C. The examiner should keep in mind that the applicant's proficiency in every administrative topic and each control room and in-plant system should be deliberately evaluated in accordance with the operating test that was prepared in accordance with ES-301.

f. As stated in 10 CFR 55.45(a), the operating test requires the applicant to

demonstrate an understanding of and the ability to perform the actions necessary to accomplish a representative sample from among 13 items listed in the rule. If the applicant correctly performs a JPM (including both critical and noncritical steps) and demonstrates familiarity with the equipment and procedures, the examiner should infer that the applicant's understanding of the system/task is adequate and refrain from asking follow-up questions. However, if the applicant fails to accomplish the task standard for the JPM, exhibits behavior that demonstrates a lack of familiarity with the equipment and procedures, or is unable to locate information, control board indications, or controls, the examiner should ask performance-based follow-up questions as necessary to clarify or confirm the applicant's understanding of the system as it relates to the task that was performed.

Similarly, if the applicant gives an ambiguous answer to a prescripted administrative question in Category A, the examiner is expected to ask probing questions to ensure that the applicant understood the original question and the applicable knowledge or ability. The examiner shall document all performance-based questions and answers for later evaluation.

If an applicant volunteers additional or corrected information after having completed a task or question, the examiner shall offer the applicant the opportunity to take whatever actions would be required in a similar situation in the plant. The examiner will record any revisions to previously performed tasks or answers for consideration when grading the operating test per ES-303.

g. The examiner should practice other good walk-through evaluation techniques as discussed in Section D of Appendix C.

3. Simulator Test (Category C)

a. Before administering the test(s), the examiners will validate each scenario on the simulator to ensure that it will run as intended. Scenarios that were adapted from previous NRC examinations at the facility or from the facility licensee's bank may not require real-time validation. At a minimum, the examiners will "dry run" those events having variable inputs and questionable outcomes and discuss the remainder of the scenario with the facility's simulator instructor to ensure that it will run as planned.

In some cases, the scenarios can be validated while the applicants are taking the written examination. However, it may be beneficial to validate the scenarios during a preparatory site visit as determined by NRC regional management (refer to ES-201).

b. The examiners will take precautions to prevent the scenarios from being revealed to the applicants before the tests begin. If significant portions of the scenarios are dry run or otherwise reviewed with the simulator instructor(s), the chief examiner shall ask the instructor(s) to sign a security agreement (Form

ES-201-3) to protect the integrity of the simulator test.

c. The examiners should revise all copies of Forms ES-D-1 and ES-D-2 to reflect any changes made to the scenario events or the expected operator actions as a result of the scenario validation runs and reviews. These revisions should be neatly written in ink so that the forms can be used in the final write-up of the simulator test, as discussed in ES-303.

d. The examiners should review the scenarios together and discuss the required procedures, technical specifications, special circumstances, and so forth, related to the scenarios.

e. Immediately before beginning the simulator tests, the examiners should review the scenario events with the simulator operator and provide him or her with a copy of Form ES-D-1. This review should familiarize the operator with the sequence of events to ensure that they will proceed as planned. This is particularly important if the simulator operator during the test is not the same individual who assisted in validating the scenarios.

f. The examiners should identify important plant parameters to be monitored during each simulator scenario. The chief examiner should ask the simulator operator to record selected parameters, if possible, on the facility's safety parameter display system(s). Parameter readings should be collected at meaningful intervals, depending on the parameter, the nature of the event, and the capability of the simulation facility. The chief examiner should retain the recordings as backup documentation to augment the notes taken by the examiners during the simulator test.

g. The examiner in charge of each scenario should arrange a suitable communication system with the simulator operator so that he or she can be prompted to insert the malfunctions without cuing the applicants. Malfunctions may be planned for a predetermined time or power level so that the examiners and the facility operator are aware of the event that is occurring or pending.

   If necessary, the examiners may use time compression to speed up the response of key parameters so that the scenario can proceed to the next event within a reasonable time. Time compression is acceptable as long as it is used judiciously and the operators are given sufficient time to perform the tasks that they would typically perform in real time. If the examiners intend to use time compression, they should inform the applicants of that fact during the operating test briefing (refer to Section D.1.a). The examiners should also mitigate the potential for negative training by debriefing the applicants after any scenario in which time compression was used.

h. Before beginning each scenario set, the examiners should have the simulator operator advance any control room strip chart recorders that may prove useful in recreating the sequence of events. The charts should be clearly marked with the

date, time, and examiner's initials so that they can be accurately matched with the correct operating crew.

l. The chief examiner should ensure that the simulator operator (or examiner) playing the role of other plant personnel is aware of the time scale for responding to the applicants' requests for information. For example, fast-time could be specified for auxiliary operator checks or lineups to prevent long delays in simulated operations, while maintenance and chemistry sample information can be provided with normal time delays to present the applicants with the same analysis problems that they will face as operators.

j. Before the simulator test begins, the examiners shall caution the simulator operator to provide only information that is specifically requested by the applicants and does not compromise the integrity of the examination. When the simulator operator is briefing the applicants or communicating with them on the telephone, the examiners should monitor the conversation to ensure that the information provided is appropriate and does not cue the applicants.

k. Each examiner should use the expected actions and behaviors listed on Form ES-D-2 as a guide while administering the simulator tests. If an applicant performs as expected, the examiner may simply note in the left-hand column of the form the time when the expected actions occurred. However, if an applicant does not perform as expected, the examiner should note the applicant's actions (or lack of actions) next to or below the expected action and follow up with appropriate questions after the simulator scenario is completed (refer to Section D.3.l).

Each examiner must determine the best way to document the applicant's actions. Some examiners record a minute-by-minute account of all key plant events and the applicant's actions as they occur; other examiners only record the applicant's significant actions. Each individual examiner should develop his or her own examination documentation technique; however, the documentation must provide an adequate basis for a licensing decision. In addition, the examiner's notes must provide sufficient information to allow the examiner to confidently judge the applicant's performance on the competencies described in Appendix D.

l. Examiners shall limit discussions with the applicants during the scenarios both to maintain realism and to avoid distracting the applicants from operating the plant. The examiners' questions during the scenarios should be limited to those that are necessary to assess the applicants' understanding of plant conditions and the required operator actions. Whenever possible, the examiner shall defer questioning the applicant until a time when the applicant is not operating or closely monitoring the plant (preferably after the simulator has been placed in "freeze"). The examiner's follow-up questions or concerns can generally be addressed during a brief question and answer period after each scenario or

during the control room systems and facility walk-through portion of the operating test (i.e., Category B) if it is performed after the simulator test.

m. The examiners who administer the simulator test shall confer immediately after completing the scenario set to compare notes and to verify that each examiner observed his or her applicant perform the required number of transients and events in a manner sufficient to justify an evaluation of all the required competencies. If necessary, the examiners shall run an additional scenario to ensure that the required evolutions and competencies are covered. All scenarios will be planned and documented in accordance with Section D of ES-301.

The chief examiner shall ensure that the examiners' observations are consistent and that their findings are mutually supportive. If a performance deficiency is "shared" by more than one applicant, it should be noted by both evaluating examiners. Ideally, this cross-check should be accomplished as soon as possible after running the scenarios while still at the facility. The cross-check must be accomplished before finalizing the examination results in accordance with ES-303.

n. If the applicants did not perform as expected, the examiner shall ask the simulator operator to provide copies of the logs, charts, and other materials that may be required after leaving the facility to evaluate and document the applicants' performance. The examiner of record shall retain all documentation related to any operating test failure until the proposed denial becomes final or a license is issued.

The chief examiner should also ask the simulator operator to retain copies of the same materials until all applicants are licensed or all appeals are settled, as suggested in the sample corporate notification letter shown in ES-201, Attachment 3.

o. If the simulation facility should become inoperable and cause excessive delay of the operating tests, the chief examiner should discuss the situation with the facility licensee and the responsible regional supervisor so that management can make a decision regarding the conduct of the operating tests. It may be necessary to reschedule the simulator examinations for a later date.

The simulator should be considered inoperable under any of the following conditions:

- The simulator exhibits a mass/energy imbalance, erratic logic, or inexplicable panel indications during model execution.
- The simulator exhibits unplanned and unexplained events or malfunctions that cause the applicants to divert from the expected responses and success path of the planned scenario.
- The simulator automatically goes to the "freeze" state during a scenario

or a "beyond simulated limits" alarm is received on the instructor station.

- The simulator instructor informs the examination team that a software module has halted or "kicked out."

Occurrence of any of these abnormal simulator operating conditions during an examination constitutes sufficient cause to stop the scenario. Evaluations of the applicants' performance during any of these simulator malfunction conditions may be unreliable.

When the simulator has been restored to full operability, the chief examiner will determine if the scenario requires replacement, may be resumed in progress, or may be restarted from the beginning.