Appendix I

Licensed Operator Requalification
Significance Determination Process (SDP)

Introduction

The attached flowchart and matrix comprise the process for determining the risk importance of findings identified during an inspection of the licensed operator requalification program or during the Resident Inspector's inspection of requalification activities. This process covers only those findings related to the operator requalification program. It is the staff's position that performance errors made by a licensed operator leading to, or during an actual operational event, are an integral part of the overall outcome of the event and would be reflected in the event risk determination or ultimately in a performance indicator.

Each operator requalification issue should be screened to determine that it is a finding with greater than minor safety significance by using the screening questions of Inspection Manual Chapter 0612, Appendix B. At a minimum, minor questions 2 and 3, and SDP questions on Reactor Safety could be applicable to requalification issues.

This SDP starts when a greater than minor operator requalification finding is identified by a Regional Inspector based on IP 71111.11 and the sample of items selected or the licensee's test records, or by a Resident Inspector based on the IP 71111.11 Resident's Quarterly Review. It can be related to the programmatic aspects (e.g. exam grading, exam quality, exam security) or to the performance of licensed operators during the written exam or the annual operating test. This SDP is applicable to requalification findings related to all licensed operators, including both shift and staff crews, with either active or inactive licenses. The process is applicable to all license holders since a staff crew member could, at any time, be asked to go on-shift and because an inactive license holder needs only to spend the required time on-shift to activate a license. A crew is defined as any group of individuals evaluated as a single entity by the licensee on the basis of its performance on the dynamic simulator.

Simulator Operational Evaluation Matrix

The Simulator Operational Evaluation Matrix provides a guide to the obvious risk associated with the number of crews failing the annual operating test as related to the number of crews taking the test. The "Number of Crews that took the Annual Operating Test" includes multiple units in order to accommodate those instances where operators hold dual unit licenses. If a multiple unit site has separate unit licenses, the matrix should be used to assess the results at each of the units separately. The chart accommodates up to sixteen crews and eight UNSAT crews. If more crews are tested or are UNSAT in a particular cycle, the finding color can be determined by the percentages at the bottom of the chart. The information should be obtained by the Regional Inspector or Resident Inspector at the end of the testing cycle. Less than 20% failure rate is considered satisfactory and therefore does not constitute a finding to be recorded in an inspection report. A failure rate of 20% to 33% is considered to be a green finding to be turned over to the licensee for corrective action. An operating test failure rate greater than 33% but

less than 50% meets the criteria to be considered a White Finding. Should more than half the crews fail, it is considered to be a serious programmatic weakness and a Yellow Finding. Requalification operating test failure rate alone is never considered to be a Red Finding unless over half the crews failed and one or more of the failed crews are returned to the shift without remediation. Use of this matrix is explained in the description of the flow chart blocks.

The SDP Flow Chart

The Requalification SDP process starts with a single finding (Block #1) identified by the Regional or Resident inspectors during their conduct of Inspection Procedure 71111.11, "Licensed Operator Requalification Program." It includes issues identified by the Regional and Resident Inspectors on selected samples of data, from interviews, or analyses of the operating test results by Regional or Resident Inspectors at the end of the testing cycle. The process attempts to include only those aspects of the requalification program considered to be risk important. For example, the student feedback system in-and-of itself has little risk importance, but its review might lead the inspector to findings that are risk important. Findings screened out by the process should be reported as observations if they are indicative of trends or significant extent of condition (See IMC 0612, cross cutting issues).

The process first examines the overall requalification program by asking if less than 75% of the operators passed all portions of the exam (NUREG-1021, Rev. 9, ES 601, Conducting NRC Requalification Examinations). This results in a White Finding and may be indicative of the need for a "for cause" inspection.

The SDP assesses the risk significance of crew performance depending on the percentage of crews that have failed, whether they were remediated before returning to shift, and whether the licensee had a failure rate of green or higher (as determined by the SDP Simulator Operational Evaluation Matrix) in the previous annual operating test. The risk assessment of operator performance on the simulator should include all of the crews tested based on test records, even if the inspectors witnessed testing of only some of the crews.

The process examines inspector findings related to the licensee's grading of the exam to ensure that failed candidates or crews are properly identified and not passed inappropriately. The risk importance is not that the licensee's grading process was inadequate or flawed, but that inadequately trained operators may be allowed to go on shift. The ineffectualness of the grading process may be a contributing factor, but less than effective training is probably the root cause.

The next portions of the SDP are related to the written and walkthrough portions of requalification (pages 2, 3, and 4 of the flowchart) and address findings of exam quality, exam security, and the performance of multiple individuals. The risk determination assumes that a single individual failure in requalification does not rise to the risk significance of a Green Finding. However, when multiple failures are considered, more than 20% has been selected as the threshold for an unacceptable number of failures. This is consistent with the guidance of NUREG-1021, Rev. 9. Thus, more than 20% unacceptable written test items is the quality threshold; more than 20% of the operators

failing the written portion is the performance threshold; more than 20% of the operators failing the operating test walkthrough is the walkthrough performance threshold, etc.

The simulator portion of the SDP (page 4 of the flowchart) evaluates scenario quality and security. An individual failing in the simulator portion does not rise to the risk significance of a Green Finding. When multiple failures are considered, more than 20% has been selected as the threshold for an unacceptable number of failures. Finally, licensed operator records are evaluated to determine if more than 20% of the operator licensing records have operationally risk important deficiencies.

Flowchart Block Descriptions

#1 - This SDP starts after a single operator requalification finding is identified and screened through Manual Chapter 0612, Appendix B questions during an inspection of the licensed operator requalification program, by analysis of test records at the end of the cycle, or by a Resident Inspector's inspection of requalification activities. Each specific finding must be evaluated separately. A finding can be related to the programmatic aspects (e.g. exam grading, exam quality, operator licensing records) or to the performance of licensed operators during the written or annual operating test.

#23 - Based on the licensee's records, did less than 75% of the operators in this training cycle pass all portions of the exam? If so, it may be indicative of the need for a "for cause" inspection. The need for a training inspection should be determined by the Regional Management after the inspector has examined the licensee's test records at the end of the cycle.

#22 - Is the finding related to crew performance on the dynamic simulator operating test? Crew performance is a demonstration of the ability to effectively operate as a team while completing a series of critical tasks that measure the crew's ability to safely operate the plant during normal, abnormal, and emergency situations. The licensee will conduct its annual operator performance evaluations in accordance with the requirements of its NRC-approved requalification program. If the licensee fails crews based on poor performance related to competencies only (e.g. communication protocol, EOP place keeping), they will count as failures in this SDP. Depending on requalification program requirements, the licensee may record these as competency weaknesses for remediation purposes and not as failures.

#30 - Was the simulator operating test crew failure rate for the entire cycle greater than 50% (Yellow on matrix)? This information is determined by the Regional Inspector or by the Resident Inspector by examining the licensee's test records at the end of the cycle.

#31 - Were the failed crews (50% or less of total number of crews) remediated and successfully retested before they returned to shift? Even a single failed crew returning to shift is a potential risk and is considered to be at least a White Finding.

#32 - Were the failed crews (greater than 50% of total number of crews) remediated and successfully retested before they returned to shift? If "yes" this remains a Yellow Finding

due to the magnitude of the programmatic problem. If “no” it is a serious problem (Red Finding) and deserves significant NRC attention.

#33 - Was the operating test failure rate less than 20% or between 33% and 50%? Less than 20% failure rate and the failed crews satisfactorily remediated before returning to shift remains a minor finding. Failure rate between 33% and 50% and the failed crews satisfactorily remediated before returning to shift remains a White Finding.

#34 - If the failure rate in the current operating test cycle is between 20% and 33% (Green Finding) and it was green or higher in the last operating test cycle, this is a repeat finding, indicative of a potential weakness in the SAT process, and corrective actions have not been effective. The finding is escalated to a White Finding. If the failure rate in the current operating test cycle is white or higher, and it was green or higher in the last cycle, further escalation is unnecessary and the color remains green.

#2 - Is the finding related to incorrect or inappropriate grading of the written exam or operating test by the licensee? This can be determined by the inspector’s observation of the operating test or evaluation of the grading of a sample of the written exam.

#3 - Did the inspector identify a crew or individual operator operating test performance finding that should have resulted in a failure, but was not identified by the licensee? These findings are considered risk important, since operators or crews with unsatisfactory evaluations could be placed on shift.

#3A - A single failed operator returning to shift is not as risk important as a failed crew returning to shift since it is likely that a single operator’s potential error would be prevented or mitigated by the rest of his or her crew. Either indicates a programmatic issue that needs to be identified and corrected.

#4 - Is the finding related to the written exam? This finding may stem from student feedback or other personnel interviews as well as inspector observation and data analysis.

#5 - Is the finding related to the individual operating test quality, security or operator performance in the walkthrough (generally, job performance measures)? This finding may stem from student feedback or other personnel interviews as well as inspector observation and data analysis.

#6 - Is the finding related to the fidelity of the plant referenced simulator as compared to the real plant? This finding may stem from student feedback, personnel interviews, review of simulator performance tests, as well as inspector observation.

#7 - Is the finding related to the quality of the individual operating test? This finding may stem from student feedback, personnel interviews as well as inspector observation and data analysis. Has the appropriate information from the feedback system been incorporated into the individual operating test?

#8 - Has the integrity of the individual operating test been compromised? This refers to a failure to control the exam material, including the exam development, review, and validation process, such that exam integrity is affected (see 10 CFR 55.49). Knowledge of an exam

integrity compromise can occur through various means. The two principal means are: (1) the inspector's direct knowledge and/or evidence or information that such a compromise occurred, (2) an analysis of post exam results suspected to have been compromised that reveals the exam results attained are not probable nor likely given the past performance history of the operator. The second method is possible but not likely to be seen in the operating tests.

If the compromise is determined to be inadvertent and the test was rewritten prior to administration, it is not a risk important finding and the answer to this block is "no."

#9 - Have more than 20% of the operators who took the individual operating test in this training cycle failed? Individual operating test failures should include those identified in both walk throughs and dynamic simulator operating tests. The percentage should be determined by the Regional Inspector or by the Resident Inspector by examining the licensee's test records at the end of the training cycle.

#10 - Were more than 20% of the individual operating test items (i.e., job performance measures) reviewed by the inspector unacceptable? This is based on the sample selected by the inspector and the acceptance criteria established in NUREG-1021, Rev. 9, ES-601, Conducting NRC Requalification Examinations.

#11 - When the compromise was discovered (or should have been discovered), did the licensee take compensatory measures immediately? The risk importance increases if the test integrity was compromised, compensatory actions were not taken prior to the exam being administered, and the individual was returned to shift.

#12 - Do deviations or differences between the plant control room and the plant reference simulator negatively impact operator actions? There will always be some physical or functional differences between the simulator and the control room. The concern is how they impact the operator on the potential for negative training? Does the simulator meet the performance requirements of 10 CFR 55.46?

#13 - Is the finding related to the quality (accuracy, clarity, appropriateness, discrimination, etc.) of the written exam? Has information from the feedback system been incorporated into the written exam.

#14 - Has the integrity of the written exam been compromised? This refers to failure to control the exam material, including the exam development, review and validation process, such that exam integrity is affected (See 10 CFR 55.49). Knowledge of an exam integrity compromise can occur through various means. The two principal means are: (1) the inspector's direct knowledge and/or evidence or information that a compromise occurred and/or, (2) an analysis of post exam results suspected to have been compromised that reveals the exam results attained are not probable nor likely given the past performance history of the operator.

If the compromise is determined to be inadvertent and the test was rewritten prior to administration, it is not a risk important finding and the answer to this block is "no."

#15 - Have more than 20% of the operators who took the written exam in this training cycle failed? This should be determined, by the Regional Inspector or ~~by~~ the Resident Inspector, by examining the licensee's end of the cycle test records.

#16 - Were more than 20% of the written questions reviewed by the inspector unacceptable? This is based on the sample selected by the inspector and the acceptance criteria established in NUREG-1021, Rev. 9, ES-602, Attachment 1, Guidelines for Developing and Reviewing Open-Reference Examinations and Appendix B, Written Examination Guidelines.

#17 - When the compromise was discovered, or should have been discovered, did the licensee take compensatory measures immediately? The risk importance increases if the test integrity was compromised, compensatory actions were not taken prior to the exam being administered and the individual was returned to shift.

#18 - (intentionally left blank)

#19 - (intentionally left blank)

#20 - Is the finding related to the qualitative (realism, event sequencing, difficulty, etc.) or quantitative (number of normal evolutions, malfunctions, transients, etc.) aspects of the scenario? Has information from the feedback system been incorporated into the scenarios?

#21 Has the integrity of the scenario been compromised? This is a failure to control the scenario identity or material, including the development, review and validation process, such that operating test integrity is affected (See 10 CFR 55.49). Knowledge of a scenario integrity compromise can occur through various means. The two principal means are: (1) the inspector's direct knowledge and/or evidence or information that a compromise occurred and/or, (2) an analysis of post exam results suspected to have been compromised that reveals the exam results attained are not probable nor likely given the past performance history of the operator. The second method is possible but not likely to be seen in the operating tests.

If the compromise is determined to be inadvertent and the scenario was rewritten or another selected prior to administration, it is not a risk important finding and the answer to this block is "no."

#24 - Is the finding related to the licensee's program for maintaining active operator licenses and ensuring the medical fitness of its licensed operators?

#25 - Were more than 20% of the scenarios in the sample reviewed by the inspector unacceptable based on the criteria of NUREG-1021, Rev. 9, Form ES-604-1, Simulator Scenario Review Checklist, and Appendix D, Simulator Testing Guidelines?

#26 - When the compromise was discovered, or should have been discovered, did the licensee take immediate compensatory measures. The risk importance increases if the operating test was compromised, compensatory actions were not taken prior to the exam being administered and the crew or individuals were returned to shift.

#27 - Based on the sample selected by the inspector, did more than 20% of the records indicate deficiencies that could pose a potential risk to operations, as described in IP 71111.11, Licensed Operator Requalification Program, Section 03.08? For example, are crew members maintaining active licenses and are their qualifications current? Is the licensee complying with license conditions, notification of medical restrictions as required by 10 CFR 50.74(c), and are physical examinations up to date? Based on inspector judgement, administrative errors in the records that have no bearing on operational safety, should not be considered findings.

#28 - (intentionally left blank)

#29 - (intentionally left blank)

Simulator Operational Evaluation

September 21, 2000

Number of Crews
with
UNSAT Performance in the
Annual Operating Test

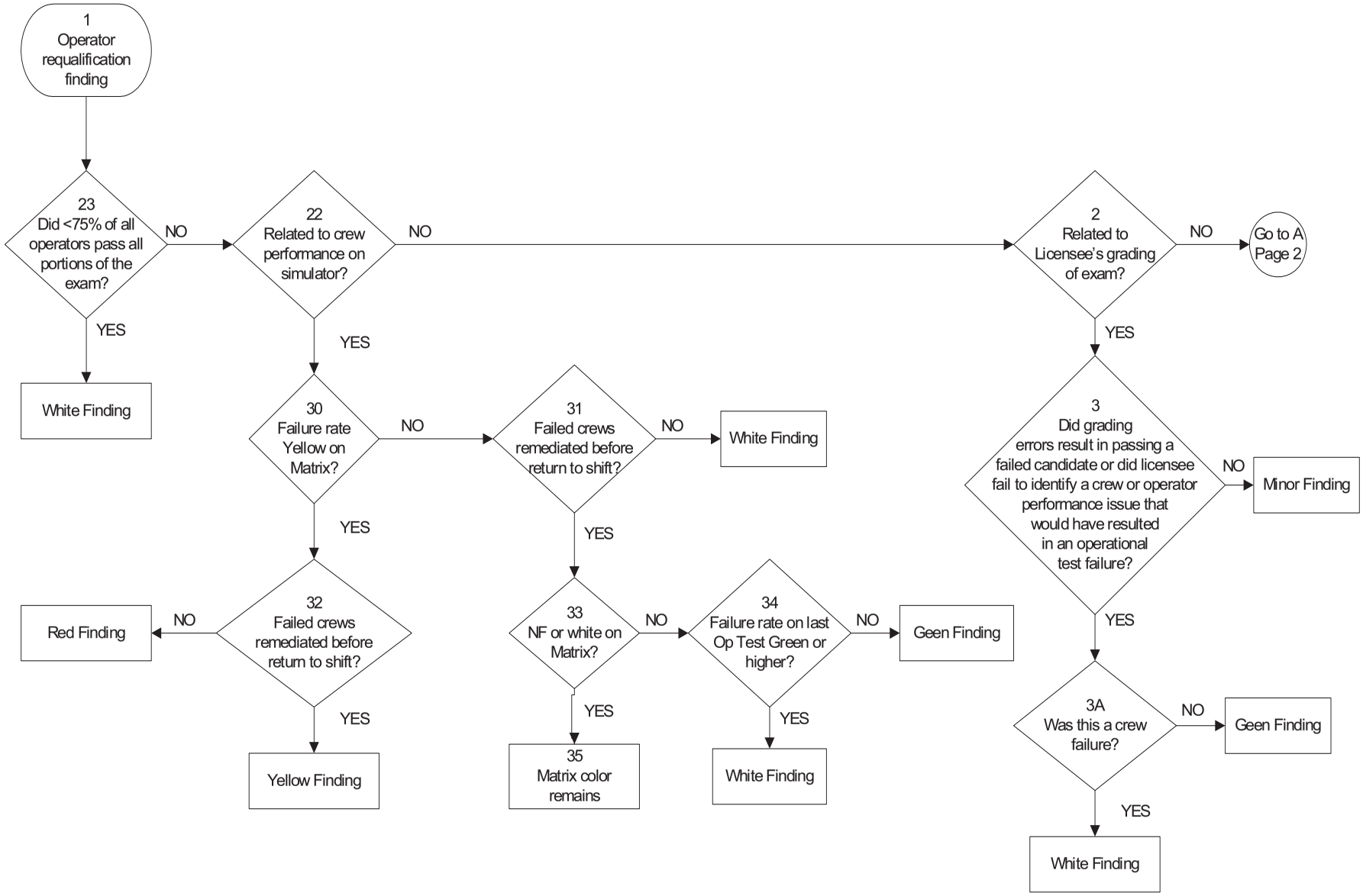
Number of Crews that took the Annual Operating Test (Includes Dual Units)

	1	2	3	4	5	6	7	8
4	G	W	Y	Y	NA	NA	NA	NA
5	G	W	Y	Y	Y	NA	NA	NA
6	NF	G	W	Y	Y	Y	NA	NA
7	NF	G	W	Y	Y	Y	Y	NA
8	NF	G	W	W	Y	Y	Y	Y
9	NF	G	G	W	Y	Y	Y	Y
10	NF	G	G	W	W	Y	Y	Y
11	NF	NF	G	W	W	Y	Y	Y
12	NF	NF	G	G	W	W	Y	Y
13	NF	NF	G	G	W	W	Y	Y
14	NF	NF	G	G	W	W	W	Y
15	NF	NF	G	G	G	W	W	Y
16	NF	NF	NF	G	G	W	W	W

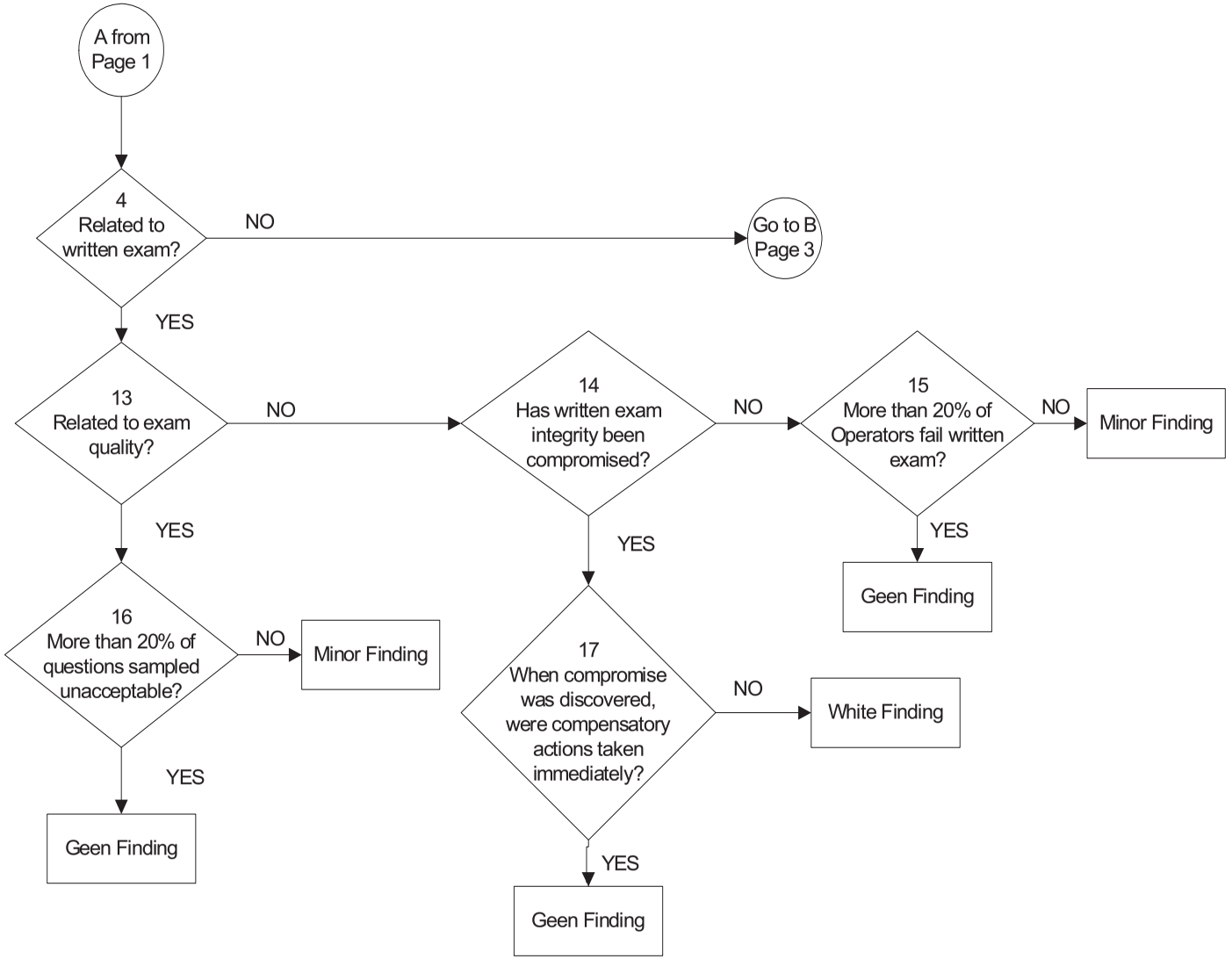
NF = < 20% Failure Rate - No Action
G = 20 - 33% Failure Rate
W = >33 - 50% Failure Rate
Y = >50% Failure Rate
NA = Not Applicable

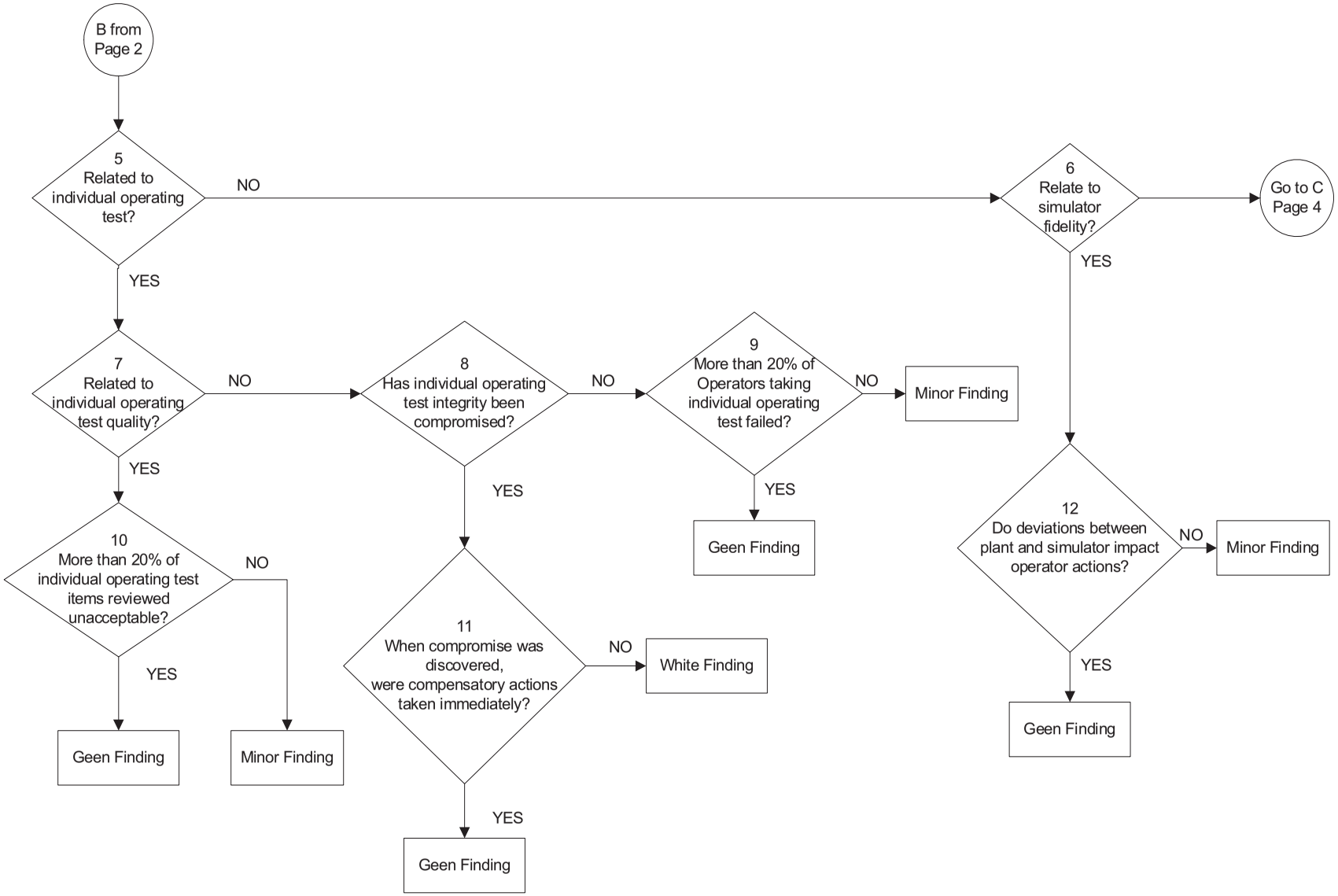
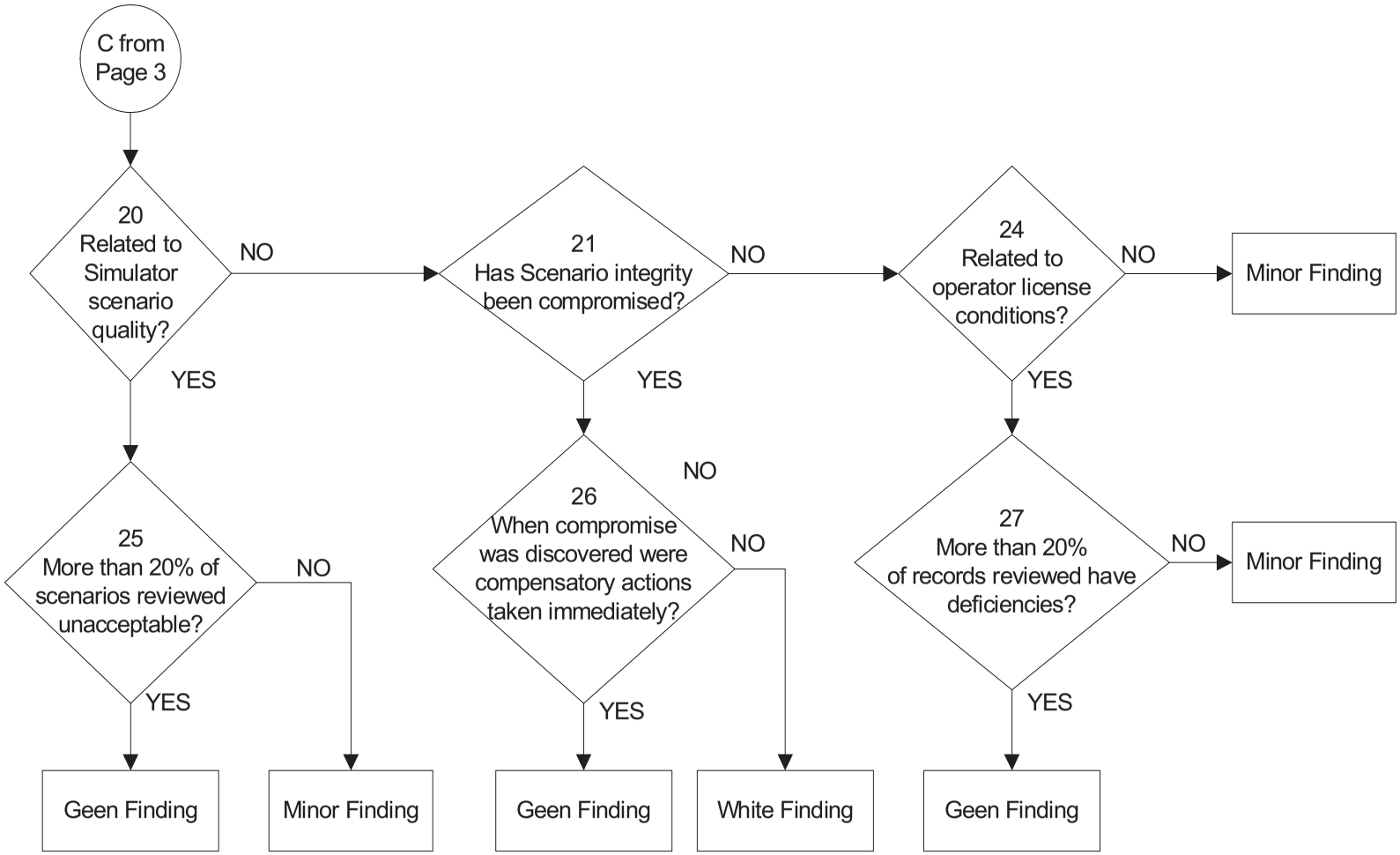
Note: If more than 16 crews are tested, or more than 8 crews are UNSAT in a given cycle, use the percentages above to determine the appropriate color.

Operator Requalification Human Performance SDP
Appendix I



Operator Requalification Human Performance SDP
Appendix I




B from Page 2
5 Related to individual operating test?
NO
YES
6 Relate to simulator fidelity?
Go to C Page 4
YES
7 Related to individual operating test quality?
NO
8 Has individual operating test integrity been compromised?
NO
9 More than 20% of Operators taking individual operating test failed?
NO
Minor Finding
YES
Geen Finding
YES
10 More than 20% of individual operating test items reviewed unacceptable?
NO
YES
Geen Finding
Minor Finding
YES
11 When compromise was discovered, were compensatory actions taken immediately?
NO
White Finding
YES
Geen Finding
12 Do deviations between plant and simulator impact operator actions?
NO
Minor Finding
YES
Geen Finding

Operator Requalification Human Performance SDP
Appendix I