NRC INSPECTION MANUAL

CNRI/DOCP/RAB

INSPECTION MANUAL CHAPTER 0609 APPENDIX D

PUBLIC RADIATION SAFETY
SIGNIFICANCE DETERMINATION PROCESS

Effective Date: August 7, 2026

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0609D-01 INTRODUCTION

The significance determination process (SDP) in this Appendix provides a means for NRC staff to initially screen as minor or more-than-minor and, if necessary, assess the significance of performance deficiencies within the Public Radiation Safety Cornerstone. The SDP is depicted as a set of interconnected diagrams that provide risk-informed decision-making criteria for dispositioning inspection findings. A single issue should be evaluated using all applicable branches of the SDP with the final significance determined by the outcome that provides the highest significance. The diagrams shall be used in conjunction with the relevant text in the body of this document. The basis to this SDP can be found in, IMC 0308, Attachment 3, Appendix D, “Technical Basis for Public Radiation Safety Significance Determination Process.”

0609D-02 GUIDANCE

02.00 MORE-THAN-MINOR SCREENING GUIDANCE

Each issue entering the SDP must first be screened using the more-than-minor (MTM) criteria in this section.

The screening criteria in this section apply to all performance deficiencies (PDs) in the public radiation safety cornerstone. These criteria exist in three general areas: (1) a regulatory dose limit being exceeded; (2) unplanned, unintended exposure situation; and (3) failure of a radiation protection program barrier. PDs that do not fall within these general areas are Minor.

The MTM criteria are intended to: (1) ensure that PDs that could result in findings of higher significance are appropriately screened through the applicable SDP criteria, and (2) ensure that issues that represent failures of radiation protection program barriers are documented in inspection reports to facilitate future follow-up in problem identification and resolution inspections and for operating experience purposes.

A radiation protection program is composed of several barriers to ensure adequate protection of occupational and public health and safety through defense-in-depth. A radiation protection barrier is a program element that serves a specific radiation safety function. Examples of barriers include effluent monitoring and control programs and transportation controls. A Minor PD in the implementation of a single radiation protection barrier results in a minimal reduction in the protection of health and safety. However, a PD that renders a radiation protection program barrier ineffective, or indicates that a barrier is ineffective, would be appropriately classified as a MTM PD.

The following screening considerations are evaluated in order to determine whether a PD screens as Minor or More-than-Minor:

A. Did the PD result in a regulatory limit being exceeded?

- a. If NO, go to 02.00 B.

☐ b. If YES, then the PD is more-than-Minor

B. Did the PD result in an unplanned/uncontrolled release of radioactive material to the unrestricted area?

☐ a. If NO, go to 02.00 C.

☐ b. If YES, and any of the following apply, the PD is more-than-Minor and should be screened using the appropriate SDP, otherwise the PD is Minor

i) [1]Transportation package breach of a nonexcepted package.
ii) Category 2 or greater Quantity of Radioactive Material as defined in 10 CFR Part 37 is not adequately physically protected in transit.
iii) Category 2 or greater Quantity of Radioactive Material as defined in 10 CFR Part 37 either lost from site or during transit.
iv) Material released (e.g., effluents, contaminated tools etc.) results in a calculated TEDE or TED to a member of the public of in excess of 25 mrem.
v) Under-classification of radioactive waste intended for near-surface disposal in accordance with 10 CFR 61.55.

[1]Note: If the performance deficiency involves a correctly classified shipment in one of the radioactive material, excepted package classifications (i.e., UN2908, UN2909, UN2910, and UN 2911), then it should be dispositioned as a minor violation.

C. Did the PD result in a failure of a radiation protection program barrier?

☐ a. If NO, Stop. The PD is Minor.

☐ b. If YES, and any of the following apply, the PD is more-than-Minor and should be screened using the appropriate SDP, otherwise the PD is Minor

i) Failure of the effluent program as described in Section 02.01
ii) Failure to perform environmental monitoring of an exposure pathway if the pathway contained radioactivity or radiation levels that exceeded the dose limitations reflected in the licensee's effluent technical specifications
iii) Incorrect packaging used for nonexcepted transportation package
iv) Failure to provide vital communication, information, or notification requirements as described in Section 02.04
v) Physical security deficiency associated with Category 2 or greater Quantity of Radioactive Material as defined in 10 CFR Part 37, that is stored outside of the security protected area
vi) Failure associated with Certificate of Compliance as described in Section 02.04

02.01 RADIOACTIVE EFFLUENT RELEASE PROGRAM

The Radioactive Effluent Release branch of the SDP (see Figure 1) focuses on the licensee's routine (i.e., non-accident) radioactive effluent release program. Issues involving radioactive effluent releases resulting from accidents are addressed per the NRC Enforcement Policy. This branch of the SDP addresses findings involving radioactive effluents, leaks and spills and direct radiation from the facility. It assesses the licensee's ability to monitor and maintain radioactive

effluents at levels that are within the licensee's radiological effluent technical specifications criteria (as promulgated in the Offsite Dose Calculation Manual). Inspection findings involving deficiencies in monitoring, maintaining, and reporting radioactive effluent releases, performing direct radiation measurements and completing evaluations of doses to members of the public will be evaluated through this branch of the SDP.

If the licensee has a failure to implement the radioactive effluent release program that is not screened out as minor, the finding should be further evaluated for dose consequences.

Examples of a failure to implement the radioactive effluent release program are:

a. Significant deficiency in implementing the effluent release program as defined in the plant's Technical Specifications, resulting in the gross inability or gross inaccuracy in characterizing an effluent release.

b. Significant deficiency in evaluating an effluent release (either planned or unplanned) where the resulting dose has been grossly underestimated.

c. Significant deficiency in calibrating effluent monitors used to assess effluent releases, resulting in a gross inability or gross inaccuracy in characterizing an effluent release.

d. Failure to have any data by which to assess the dose to a member of the public from an effluent release (i.e., no monitor data, no independent sample data, no actual release sample data, etc.). Usually the licensee has enough plant data (e.g., from tank volumes and periodic sample analysis of the radioactive material in the tank) to reconstruct a source term and calculate a bounding dose from the unmonitored release.

e. Failure to identify a significant radiological release event or assess the dose consequences and the impact to the environment in a timely manner, consistent with Offsite Dose Calculation Manual (ODCM) requirements.

Note: A failure to implement the radioactive effluent release program involves more than isolated performance deficiencies in implementing the program. Isolated performance deficiencies would generally be screened out as minor issues because they do not represent a failure of a radiation protection program barrier.

The following criteria are used to evaluate the public dose[1, 2] consequences of a finding:

[1] Public dose limit, as used in this section, refers to the limit established in 10 CFR 20.1301(a), unless a higher limit has been approved in accordance with 10 CFR 20.1301(b) or 10 CFR 20.1301(d).

[2] For purposes of this section, unless otherwise indicated, the dose used to determine the significance of a finding represents the actual dose received, or the best estimate of the dose received, by an individual member of the public. This should be distinguished from calculated doses to hypothetical members of the public used for purposes of demonstrating compliance with the public dose limit. A calculated dose to an "individual likely to receive the highest dose," as described in 10 CFR 20.1302(b)(i), is a method for demonstrating compliance with the public dose limit in 10 CFR 20.1301 and is not necessarily equivalent to a dose received by an actual member of the public. Therefore, it is appropriate to disposition calculated non-compliances with the dose limit as green findings as appropriate.

- If the finding resulted in a release of radioactive effluent that, exceeded 25 mrem TEDE or TED to a member of the public but did not exceed the public dose limit, the SDP classifies the event as Green.

- If the finding resulted in a release of radioactive effluent that, exceeded the public dose limit but did not exceed 5 times the public dose limit, the SDP classifies the event as White.

- If the finding resulted in a release of radioactive effluent that exceeded 5 times the public dose limit but did not exceed 10 times the public dose limit, the SDP classifies the event as Yellow.

- If the finding resulted in a release of radioactive effluent that exceeded 10 times the public dose limit, the SDP classifies the event as Red.

02.02 RADIOACTIVE ENVIRONMENTAL MONITORING PROGRAM

This branch of the SDP (see Figure 1) focuses on the licensee's ability to operate a compliant radioactive environmental monitoring program. The environmental monitoring program verifies the effectiveness of the plant systems used for controlling the release of radioactive effluents and direct radiation, and confirms the levels of radioactive material in the environment and direct radiation exposures to members of the public. Because these are not controlling functions, a Green significance is given to all findings involving environmental monitoring programs. It is important to note, that the issue would have had to have screened to more-than-minor per the guidance in section 02.00 to be considered a finding. However, when the environmental monitoring program identifies unexpected radiological conditions in the environment, the performance deficiencies should be assessed under the Radioactive Effluent Program branch of this SDP.

02.03 RADIOACTIVE MATERIAL CONTROL PROGRAM

This branch of the SDP (see Figure 1) focuses on the licensee's radioactive material control program. It assesses the significance of findings involving the inadvertent release and/or loss of control of licensed radioactive material to a controlled area or unrestricted area that can cause an actual or credible radiation dose to members of the public. When dispositioning these findings, the dose impact to a member of the public in the restricted area, controlled area or the unrestricted area (as calculated by the licensee) must be known. It should be noted that doses from discrete radioactive particles (also known as hot particles, or fuel fleas) are not within the scope of the radioactive material control SDP if the doses do not result in a total effective dose equivalent (TEDE) dose as defined in 10 CFR Part 20.

The following criteria are used to evaluate the public dose consequences of a finding:

- The finding is Green if the public dose exceeded 25 mrem TEDE or TED but did not exceed the public dose limit.

- The finding is White if the public dose exceeded the public dose limit but did not exceed 5 times the public dose limit.

- The finding is Yellow if the public dose exceeded 5 times the public dose limit but did not exceed 10 times the public dose limit.

- The finding is Red if the public dose[3,4] exceeded 10 times the public dose limit.

02.04 TRANSPORTATION

This section of the SDP focuses on the licensee's ability to safely transport radioactive material on public roadways in accordance with regulations. This section is intended to be used for findings involving those radioactive material shipments classified as Low Specific Activity I (LSA-I) through Fissile Radioactive Material. These shipments (i.e. non-excepted package shipments) are described as Schedule 5 through 11, respectively, in NUREG-1660, "U.S. Specific Schedules of Requirements for Transport of Specified Types of Radioactive Material Consignments." If the performance deficiency involves a correctly classified shipment in one of the radioactive material, excepted package classifications (i.e., UN2908, UN2909, UN2910, and UN 2911), then it should be dispositioned as a Minor violation. However, if the shipment was incorrectly classified in the radioactive material, excepted package classifications, but was actually an LSA-I through Fissile Radioactive Material shipment, then this branch of the SDP is used.

A. Incorrect Packaging Used

This branch of the SDP (see Figure 2) categorizes the significance of a licensee's failure to properly package and ship radioactive material; regardless of whether the shipment occurred without incident.

The finding is Green when radioactive material is shipped in the incorrect packaging and the prescribed package is less than Type B (i.e., the shipped material does not exceed Type A quantity, or is composed of LSA or SCO that meets the applicable conditions of transport of 49 CFR 173.427).

The finding is White when radioactive material is shipped in the incorrect packaging and the prescribed package is a Type B (i.e., the shipped material exceeds a Type A quantity, or is composed of LSA or SCO that exceeds the applicable conditions of transport of 49 CFR 173.427).

If the shipped radioactive material activity exceeds multiples (i.e. 5 times and 10 times) of the Type A limit or, in the case of LSA or SCO the approximate external exposure rate at 3

[3]Public dose limit, as used in this section, refers to the limit established in 10 CFR 20.1301(a), unless a higher limit has been approved in accordance with 10 CFR 20.1301(b) or 10 CFR 20.1301(d).

[4]For purposes of this section, unless otherwise indicated, the dose used to determine the significance of a finding represents the actual dose received, or the best estimate of the dose received, by an individual member of the public. This should be distinguished from calculated doses to hypothetical members of the public used for purposes of demonstrating compliance with the public dose limit. A calculated dose to an "individual likely to receive the highest dose," as described in 10 CFR 20.1302(b)(i), is a method for demonstrating compliance with the public dose limit in 10 CFR 20.1301 and is not necessarily equivalent to a dose received by an actual member of the public. Therefore, it is appropriate to disposition calculated non-compliances with the dose limit as green findings as appropriate.

meters corresponding to those multiples, as applicable, then the significance of the finding increases to Yellow or Red, respectively.

B. Radiation Limits Exceeded

The external radiation level branch of the SDP (see Figure 2) provides for a graded approach for determining the significance of findings. When assessing the significance of a finding, consideration can be given to risk-informing outcomes based on the accessibility of the package to members of the public. An accessible area is defined in this SDP as an area that can reasonably be occupied by a major portion of an individual's whole body. In addition to accessibility, consideration may be given to risk-informing findings associated with situations where only a small area of a package exceeds the radiation limits if the licensee averaged radiation levels over a cross-sectional area of a probe of reasonable size, as described in IMC 0308, Attachment 3, Appendix D.

A Green significance is given to those findings in which an external radiation limit was exceeded, but the dose rate was not accessible by the public and the dose rate did not exceed 2 times the applicable limit.

A White significance is given to those findings in which an external radiation limit was exceeded, and (1) either the dose rate was accessible by the public, or (2) the dose rate was not accessible by the public, but it exceeded twice the applicable limit, but did not exceed five times the limit. The NRC can consider mitigating factors for determining if a finding reaches the White significance (e.g., location/size of the radiation field, whether the shipment was exclusive use, etc.). In some cases, exceeding limits may still result in conditions of very low radiation risk to the public.

A Yellow significance is given to those findings in which an external radiation limit was exceeded by 5 times but did not exceed 10 times the limit.

A Red significance is given to those findings in which an external radiation limit was exceeded by 10 times the limit.

The "surface contamination" branch (see Figure 2) addresses findings associated with removable (or non-fixed) surface contamination requirements; this branch provides for a graded approach for assessing the level of significance of findings. Exceeding the limit yields a Green finding and then increasing multiples of the limit provides for White (>5x) and Yellow (>50x). For Red findings the surface contamination levels must not only exceed 100 times the limit, but the unrestricted area must have been contaminated as well.

C. Breach of Package during Transit

The "Package Breach" branch of the SDP (see Figure 3) provides for a graded approach for assessing the level of significance of findings.

A Green significance is given to those findings in which there was no loss of contents from the package and the radioactive material was shipped in less than a Type B package.

A Green significance is given to those findings involving a loss of contents from a general design package, provided there was no actual dose to a member of the public or a responder.

A White significance is given to those findings in which there was a loss of contents from the package and the radioactive material was shipped in less than a Type B package (not including a general design package).

Additionally, a White significance is given to those findings in which there was a loss of contents from any package less than a Type B package where actual doses were given to the public or responders and the dose to a member of the public did not exceed 500 mrem TEDE or TED and/or the dose to an radiation worker did not exceed 5 rem TEDE or TED.

Note, this significance is higher than would be given in situations covered by section 02.01 and 02.03 of this SDP and as it relates to occupational exposure limit exceedances in IMC 0609, App C, because the significance of a transportation breach finding that would result in these types of doses is qualitatively higher than the situations covered under those SDPs.

A Yellow significance is given to those findings in which there was a loss of contents from the package and the radioactive material was shipped in less than a Type B package, where the dose to a member of the public exceeded 500 mrem TEDE or TED, but did not exceed 1 rem TEDE or TED, and/or the dose to a radiation worker exceeded 5 rem TEDE or TED, but did not exceed 25 rem TEDE or TED.

A Red significance is given to those findings in which there was a loss of contents from the package and the radioactive material was shipped in less than a Type B package, where the dose to a member of the public exceeded 1 rem TEDE or TED and/or the dose to a radiation worker exceeded 25 rem TEDE or TED.

A Yellow significance is given to those findings in which there was no loss of contents from the package, but the radioactive material was shipped in a Type B package.

A Red significance is given to those findings in which there was a loss of contents from a Type B package in less than or equal to hypothetical accident conditions.

D. Certificates of Compliance

The following discussion provides a step-by-step description of the decision steps which make up the Certificate of Compliance (CoC) portion of the SDP (see Figure 4).

1. For the 1st decision block, Design Documentation Deficiency, the finding is Green if the finding involves a documentation deficiency related to maintenance or use of an NRC-approved package and does not involve the failure to perform a required action. Examples of documentation deficiencies include, but are not limited to, the failure to properly document compliance with:

    a. 49 CFR requirements such as shipping papers
    b. 10 CFR 71.87, Routine determinations (failure to document performance of the loading checklist)
    c. 10 CFR 71.89, Opening instructions (failing to document providing them when necessary)
    d. 10 CFR 71.91, Records (shipment records and evidence of package quality)
    e. 10 CFR 71.95, Reports

f. CoC conditions such as the loading/unloading requirements of Section 7 of the Package SAR or CoC holder supplied procedures (including failure to use latest revision)
g. CoC conditions such as the maintenance requirements of Section 8 of the Package SAR or CoC holder supplied procedures (including failure to use latest revision)

2. For the 2nd decision block, Maintenance/Use Performance Deficiency, the finding is Green if the finding involves physical problems with the package or the failure to verify the physical condition of the package. Examples of performance deficiencies include, but are not limited to:

   a. 10 CFR 71.87, Routine determinations (failure to perform the loading checklist, verify package is in unimpaired physical condition)
   b. 10 CFR 71.89, Opening instructions (failure to provide them when necessary)
   c. Package is found to not meet the basic design criteria of the CoC (wall thickness is too thin, empty weight is incorrect, package is rusted/corroded beyond tolerances)
   d. CoC conditions such as the loading/unloading requirements of Section 7 of the Package SAR or CoC holder supplied procedures
   e. CoC conditions such as the maintenance requirements of Section 8 of the Package SAR or CoC holder supplied procedures as evidenced by the wrong closure bolts, wrong gaskets (no gasket), or weld problems
   f. 10 CFR 71.85, Preliminary determinations or Section 8 of the SAR (failure to verify that the container is in accordance with the CoC)

3. For the 3rd decision block, Minor Contents Deficiency, the finding is Green if it involved a failure to meet a CoC criteria for cask contents that did not adversely impact the following: temperature, pressure, geometry, weight, burn-up, enrichment, or moderator specification nonconformance. Examples of these types of findings are:

   a. Minor structural component left out or improperly configured (those not required to maintain content arrangement)
   b. Non-load bearing and not shielding related
   c. Non-fissile material curie content exceeds the specification in the CoC
   d. A non-fissile isotope other than what is allowed by the CoC is loaded
   e. Residual water in a non-fissile package
   f. Inclusion of non-radioactive material not intended to be in the package

4. For the 4th decision block, Major Contents Deficiencies, if it is determined that the package contained material such that a critical parameter was outside of the limits of the CoC, or that the closure/containment system was deficient, then the significance would be determined here. The finding would be White if one critical parameter deficiency was identified. The finding would be Yellow if more than one critical parameter deficiency was identified. Examples of critical parameters which could result in major contents deficiencies are:

   a. Temperature
   b. Pressure
   c. Geometry/configuration
   d. Weight

e. Burn-up
f. Enrichment
g. Moderator presence when not allowed/moderator exclusion when required
h. Neutron absorber not present when required
i. Fissile material curie content or quantity exceeds the specification in the CoC
j. Major structural item left out (internal brace, basket, shoring, foam, shielding etc.) or structural deficiency/failure.

E. Failure to Make Notifications or Provide Emergency Information

This branch of SDP (see Figure 5) focuses on vital communication, information, and notification requirements that must be met by the licensee. Shippers of hazardous materials are required to provide emergency response information in certain situations. Failure to provide these required notifications could seriously hamper or prevent the ability of the federal, state and local agencies to adequately respond as needed to transportation events and accidents. By hampering or preventing this regulatory response, the public health and safety could be negatively impacted.

For Block N1 (10 CFR 71.97), the finding is White if the licensee fails to make the required notifications to the governor of a State, the governor's designee, or the Tribal official before the shipment entered the state's or reservation's boundary for interstate shipments. For intrastate shipments, if the shipment was put on public roads/rails before the Governor, their designee, or the Tribal official received the required notification, then a finding is White. If the licensee fails to meet a timeliness of notification requirement (i.e., notification not postmarked at least 7 days before the 7-day shipment period or at least 4 days before the 7-day shipment period if a notification is sent by other means), then the finding is Green. The NRC can consider information provided by the licensee that would assist in dispositioning the significance of the finding (e.g., letter from state agency characterizing the impact of the non-compliance). Such information would be considered through the normal SERP process.

For Block N2 (49 CFR 172.602 non-compliance), the finding is White if the licensee fails to provide the required emergency response information to the shipment carrier and the error or omission would seriously hamper emergency response efforts. Examples of violations that would seriously hamper emergency response efforts include:

a. substantial errors or omissions (e.g., missing pages or uncommunicated hazards) in communicating the immediate hazards to health; risks of fire or explosion; and immediate precautions—or,

b. if the aforementioned information is in an unusable/unreadable format.

c. discrepancies between the basic description information (e.g., proper shipping name and United Nations identification number) and the package markings that would significantly hamper emergency response actions.

If the finding involves a deficiency in emergency response information that would not seriously hamper emergency response efforts, then the finding is Green. Examples of these cases include situations where errors are made in emergency information, but the hazards contained in the shipment are still sufficiently communicated.

For Block N3 (49 CFR 172.604 non-compliance), the finding is White if during an actual emergency the licensee does not respond in a timely manner in accordance with the requirements (or had not provided the 24-hour telephone number). For an incorrect or missing emergency response telephone number, as required by 49 CFR 172.604, if there were no actual accidents or situations where the emergency contact information was needed, then the risk significance would be very low, and the finding is Green.

For Block N4 (10 CFR 20.1906), the finding is White if the licensee's receipt surveys show 1) the package's external radiation levels in excess of five times the Part 71 limits, or 2) the surface radioactive contamination level in excess of five times the Part 71 (49 CFR 173) limits, and the licensee fails to make notifications to the final delivery carrier. Other non-compliances are Green. A finding that involves a licensee's failure to notify the NRC when required is to be dispositioned as a Traditional Enforcement violation as stated in section 2.2.4 of NRC's Enforcement Policy (i.e., as a violation that may impact the ability of the NRC to perform its regulatory oversight function).

02.05 LICENSING REQUIREMENTS FOR LAND DISPOSAL OF RADIOACTIVE WASTE

A. Near Surface Disposal Nonconformance

This section of the SDP (see Figure 4) evaluates findings related to the classification (i.e., Class A, B, C, etc.) and characterization of radioactive material intended for near-surface disposal at facilities licensed for such activities.

The finding is White if a licensee ships Class C or greater waste and it is determined that the waste was under-classified when considering the requirements of 10 CFR 61.55 (e.g., waste classified as Class A or Class B, but later found to be Class C or greater). Other violations of 10 CFR 61.55 that do not involve under-classification are Green.

The finding is White if a licensee ships Class A or Class B waste and it is determined that the waste was under-classified when considering the requirements of 10 CFR Part 61.55 and the finding involved the improper disposal of the waste, contrary to the requirements of 10 CFR 61.56. The finding is Green if the under-classification of Class A or Class B waste did not result in the improper disposal of the waste.

02.06 PHYSICAL PROTECTION OF CATEGORY 1 AND CATEGORY 2 QUANTITIES OF RADIOACTIVE MATERIAL PER 10 CFR PART 37

This section of the SDP (see Figures 6 & 7) focuses on findings associated with the licensee's physical protection of Category 1 and Category 2 radioactive material, as defined in 10 CFR Part 37. These findings can occur while the material is on site or while the material is in transit to another facility. Oftentimes, Part 37 violations result from failures on the part of licensees in identifying that radioactive material exceeded the Category 2 threshold. In these instances, multiple Part 37 findings may be identified, and it may become necessary to evaluate the significance of the combined impact of multiple findings as described in Section 02.06 of IMC 0308, Attachment 3, Appendix D.

The applicability of this SDP depends on where the radioactive material is located and what protective measures the licensee has put into place to protect the material.

First, the licensee is exempt from Subpart B and C of Part 37 in cases where radioactive material exceeding the Category 2 threshold is protected under the Part 73 program as documented in either the Part 73 security plan or a Part 37 security plan. RIS 2015-15 provides the staff's position on the applicability of this exemption and the criteria that must be documented by the licensee (i.e., physical protection measures, material accountability and training). The portions of this SDP that address non-compliances with 10 CFR Part 37, subparts B and C do not apply in cases where a licensee is exempt from Subparts B and C.

Second, in cases where material is in the protected area (PA), but the licensee has not documented that the material is protected under the Part 73 program, then the finding should be dispositioned using this SDP; with consideration given to the security that is provided to the PA by Part 73 requirements.

Lastly, in cases where the radioactive material exceeding the Category 2 threshold is not located within the PA then findings regarding this material should be dispositioned using this SDP.

Failures to respond, investigate, or report per 10 CFR 37.49(d), 10 CFR 37.79(c), 10 CFR 37.57, or 10 CFR 37.81, respectively, shall be dispositioned using Traditional Enforcement as violations that may impact the ability of the NRC to perform its regulatory oversight function to determine the severity level of the associated violation and this SDP, to determine the significance of the finding for ROP assessment purposes.

A. Part 37 Finding - Actual loss of material (i.e., any Part 37 finding that is a causal factor in the actual theft or diversion of material)

   Instances of actual theft or diversion of radioactive material would likely be the subject of NRC investigations. To ensure that the staff's inspection efforts do not impede or otherwise affect any investigations, NRC staff should contact NRC's Office of Investigations to determine the appropriate course of action in those cases. Additionally, findings that are causal factors in actual theft and diversion would be dispositioned using Traditional Enforcement as violations that resulted in actual safety or security consequences, to determine the severity level of the associated violation, and this SDP, to determine the significance of the finding for ROP assessment purposes.

   The finding is Yellow if the finding was a causal factor in the actual theft or diversion of Category 2 radioactive material.

   The finding is Red if the finding was a causal factor in the actual theft or diversion of Category 1 radioactive material.

B. Part 37 Subpart A, B or C Finding - Access granted to individual who is not trustworthy and reliable

   In cases where the licensee is satisfying the requirements of Subpart B to 10 CFR 37 through programs established to meet personnel access authorization requirements for nuclear power plants in accordance with 10 CFR 73.56, NRC physical security inspection personnel should be consulted to determine if the finding should be dispositioned using an SDP in the Physical Security cornerstone. Because access to PAs is controlled by Part

73.56 programs, this SDP should only be used to evaluate findings involving access authorization to Category 1 or Category 2 radioactive material that is stored outside of the PA.

If the finding resulted in the licensee granting unescorted access authorization to radioactive material of Category 2 quantity or greater to an individual who was not trustworthy or reliable (including actual access to the material, as well as the ability to access the material), then the finding is White.

In situations where the licensee completes a timely and adequate background investigation or supplements the existing background investigation to address the underlying performance deficiency, to obtain information which the licensee can use to conclude that the individual was in fact trustworthy and reliable at the time unescorted access was granted, then the finding is Green—even if such actions are taken after the non-compliance is identified and even if the finding was NRC identified. However, if the licensee does not conduct a background investigation or supplement the existing background investigation, or if the licensee cannot conclude using the newly acquired information that the individual who was granted access was trustworthy and reliable, then the finding would remain White.

“Timely” as used in this section of the SDP is defined as the licensee being able to make an adequate trustworthy and reliability determination within the time period it would take the NRC to disposition the finding using the Significance and Enforcement Review Panel Process described in IMC 0609, Attachment 1.

C. Part 37 Subpart A, B or C Finding - Ineffective security zone

An ineffective security zone is one where a reasonable analysis would indicate the radioactive material is not physically protected from unauthorized access as intended by 10 CFR Part 37. For the purposes of this SDP, an ineffective security zone is one in which deficiencies exist that result in concurrent failure of physical barriers/direct observation of the security zone and inability of the licensee to monitor and detect unauthorized access to security zones. Refer to Figure 6 as an aid in identifying if a security zone was ineffective.

Examples of failures of physical barriers and/or direct observation processes include uncontrolled keys (or combinations) to doors which serve as part of the physical barrier such that personnel who are not trustworthy and reliable have access to the keys (or combinations); physical barriers that are not continuous, or have openings greater than 96 square inches where the smallest dimension is equal to or greater than 6 inches that are not hardened as described in A3 of 10 CFR 37.47, “Security Zones,” in NUREG-2155; and lapses in direct observation for extended periods of time.

Examples of inability to monitor and detect unauthorized access include failures of the primary and alternate intrusion detection systems; lapses in monitoring of video surveillance for extended periods of time; not enabling the intrusion detection system as required (e.g., not setting an alarm); or lapses in direct observation for extended periods of time.

For the purposes of this section, “extended periods of time,” is defined as the amount of time it would take an unauthorized person to access and remove the radioactive material from its intended location; if the licensee does not provide a reasonable analysis and basis for this period of time, the NRC will use best available data as a basis.

If the finding(s) being evaluated resulted in (1) a failure of the physical barrier or direct observation process that is used to control access to the security zone, and (2) an inability to monitor and detect unauthorized access to the security zone without delay, then the security zone is considered ineffective, and the finding is White.

In cases where the radioactive material is located within the PA of a nuclear power plant, but the licensee has not adequately described the material in a security plan, then the finding is Green.

D. Part 37 Subpart A, B or C Finding - Deficient Security Zone and Deficient Material Detection Capability

A deficient security zone is one in which there are one, or more, findings associated with the security zone or monitoring of access to the security zone; however, the non-compliances underlying the finding(s) do not result in an ineffective security zone. If the finding being considered results from a violation of 10 CFR 37.47 or 10 CFR 37.49(a)(1) – (2), then the security zone is considered deficient, and the status of the material detection capability should be evaluated to determine the significance.

Non-compliances in meeting the following requirements are examples of deficient material detection capabilities. For Category 1 radioactive materials, immediate detection of any attempted unauthorized removal must be provided by (1) electronic sensors linked to an alarm; (2) continuous monitored video surveillance; or (3) direct visual surveillance. For Category 2 radioactive materials material detection is provided by weekly verification through physical checks, tamper indicating devices, or other means to ensure the radioactive material is present.

If the finding(s) being considered results in a concurrent deficient security zone and a deficient material detection capability, then the significance of the finding(s) is White.

If the finding(s) being considered does not result in a concurrent deficient security zone and a deficient material detection capability, then the significance of the finding(s) is Green.

E. Part 37 Subpart D Finding - License Verification

If a licensee transfers material exceeding the Category 2 limit to a recipient not licensed for the receipt of the type, form, and quantity of radioactive material (and for Category 1 material, at the location where the material will be delivered), and the licensee is unable to regain custody of the material, then the finding is Yellow if the material is Category 2 and Red if the material is Category 1.

If the licensee delivers material to an entity or location not licensed for the material, but regains custody of the material, then the finding is White.

If a finding occurs in license verification and before the material is delivered to the recipient the licensee can either (1) recall/redirect the shipment, or (2) complete the verification, then the finding is Green. Additionally, if the licensee determines that the recipient was licensed to receive the material (even if the verification occurred after the material was delivered), then the finding is Green.

F. Part 37 Subpart D Finding - Preplanning and Coordination

If the finding resulted in a failure to adequately provide advanced notification of a Category 1 shipment, then the finding is White.

If the finding resulted in a failure to adequately coordinate the delivery of a Category 2 shipment, then the finding is White. However, if a recipient fails to confirm with the originator receipt of Category 2 quantity of material, then the finding is Green.

The assigned significance of these types of findings can be lessened if the licensee can demonstrate a minimal adverse impact on material security resulted from the finding. For example, if the state was still able to meet its functions; if a licensee procedurally verifies the arrival of all radioactive material shipments at the receiving facility at the expected shipment arrival time; or, if, for Category 2 shipments only, the carrier applies a tracking system that provides continuous active monitoring, which is in excess of the tracking required for a Category 2 shipment.

G. Part 37 Subpart D Finding - Physical Protection in Transit

NRC reactor licensees commonly use third party carriers to transport radioactive materials. In these cases, if a violation of NRC requirements occurs the violation must be evaluated from the perspective of whether a performance deficiency occurred on the part of the NRC licensee that contracted with the third party. If a performance deficiency occurred and it screens to more-than-minor, then a finding is assigned to the licensee at a significance level as determined by this SDP. If a more-than-minor violation occurs absent a performance deficiency on the part of the NRC licensee, then follow the screening guidance in IMC 0612, App B for these types of situations.

Findings that indicate significant deficiencies in physical protection of material while in transit are White. Otherwise, the finding is Green.

1. Significant deficiencies in physical protection of Category 1 material are:

   - Failure to establish and maintain a movement control center (MCC) for the duration of the transit

   - Failure to establish and maintain primary and secondary means of communication between the transport and the MCC prior to commencing transit (however, deficiencies that result in isolated failures of either the primary or secondary means of communication are Green provided the licensee commenced the transit with both means in place, and, at all times during the transit, there existed at least one form of continuous communication between the transport and the MCC)

   - Failure to establish active monitoring by a tracking system (e.g., telemetric position monitoring system or alternate) prior to commencing transit (however, deficiencies that result in isolated failures of the tracking system during transit are Green if an acceptable secondary means of maintaining positive confirmation of the location, status and control over the shipment is provided for the duration of the transit)

   - Procedural deficiencies that result in failures to adequately respond to actual or attempted theft or diversion of Category 1 material while in transit

- Failure to provide an accompanying driver, if required

2. Significant deficiencies in physical protection of Category 2 material are:

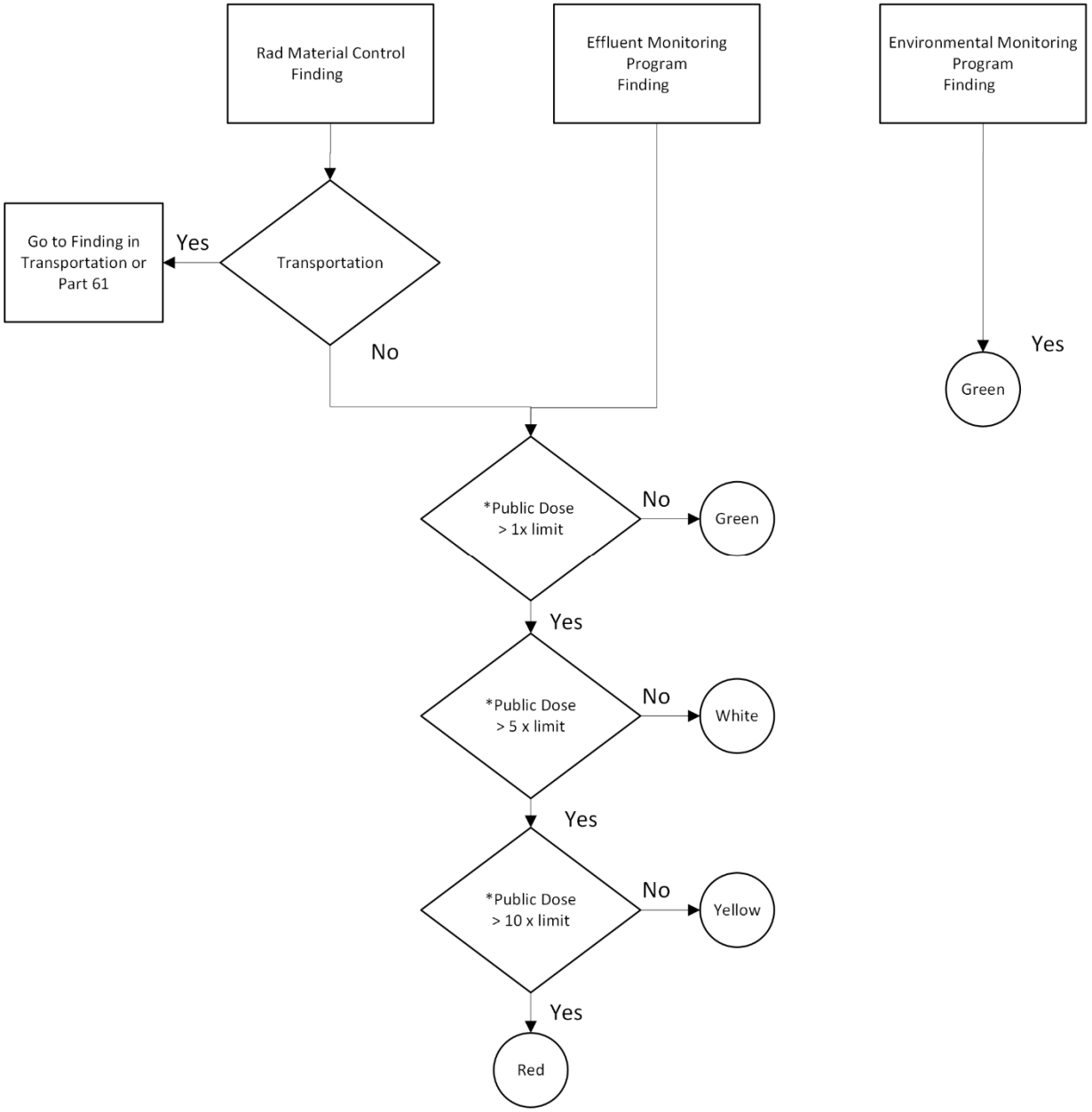
   - Failure to establish and maintain the ability (or use carriers that maintain the ability) to identify when and where the package was last and when it should arrive at the next point of control for the duration of the transit (i.e., constant control and surveillance)

   - Failure to establish and maintain the ability (or use carriers that maintain the ability) to immediately communicate to summon appropriate response or assistance

   - Failure to use carriers that require authorized signature prior to releasing the package

END

Figure 1: Rad Material Control, Effluent Release Program and Environmental Monitoring Program SDP Flowchart



*Note: Public dose limit, as used in this section, refers to the limit established in 10 CFR 20.1301(a), unless a higher limit has been approved in accordance with 10 CFR 20.1301(b) or 10 CFR 20.1301(d).

*Note: Unless otherwise indicated, the dose used to determine the significance of a finding represents the actual dose received, or the best estimate of the dose received, by an individual member of the public. This should be distinguished from calculated doses to hypothetical members of the public used for purposes of demonstrating compliance with the public dose limit. A calculated dose to an "individual likely to receive the highest dose," as described in 10 CFR 20.1302(b)(i), is a method for demonstrating compliance with the public dose limit in 10 CFR 20.1301 and is not necessarily equivalent to a dose received by an actual member of the public. Therefore, it is appropriate to disposition calculated non-compliances with the dose limit as green findings as appropriate.

Figure 2: Transportation–Incorrect Packaging and Rad Limits Exceeded SDP Flowchart

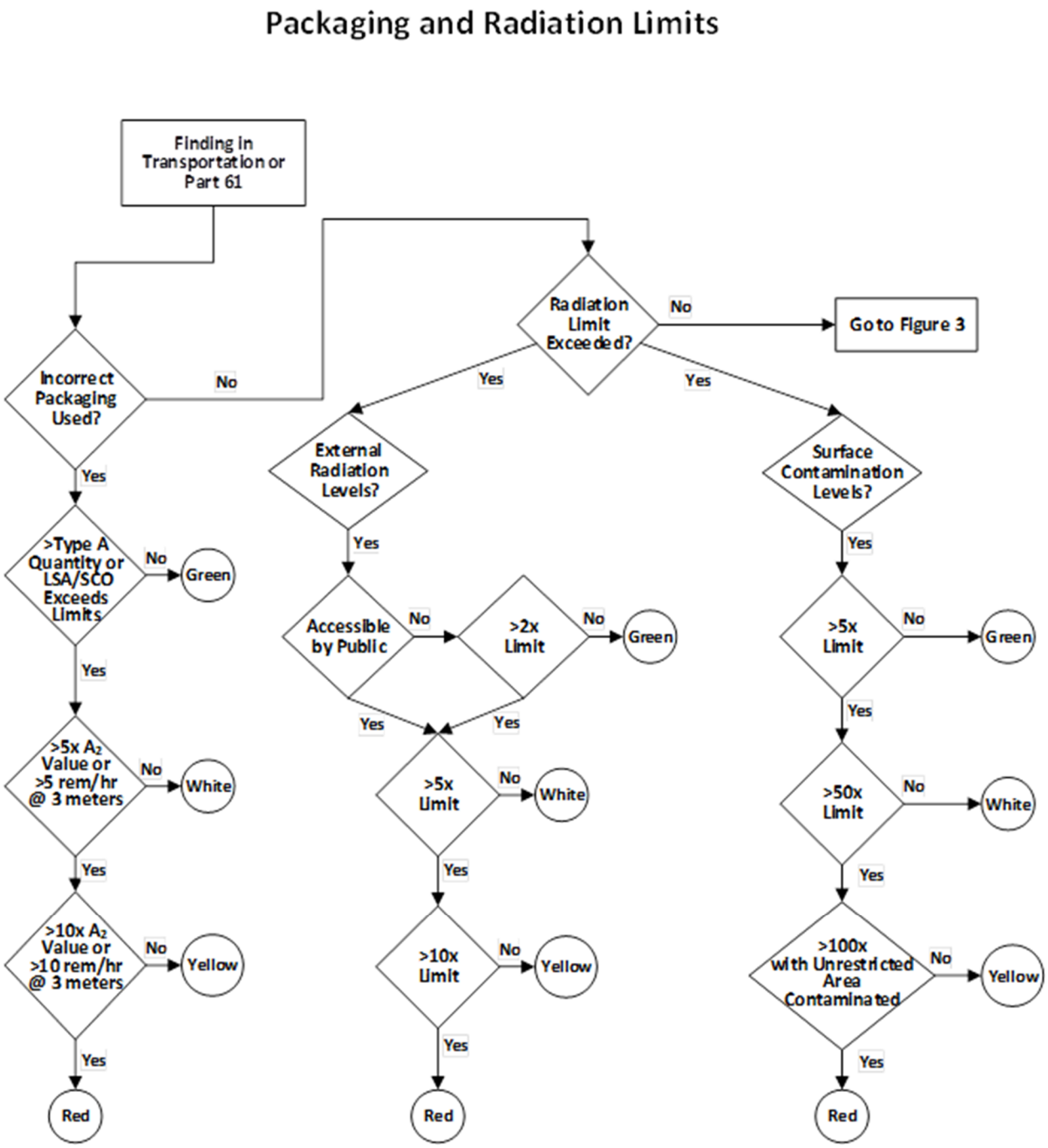


Figure 3: Transportation–Package Breach SDP Flowchart

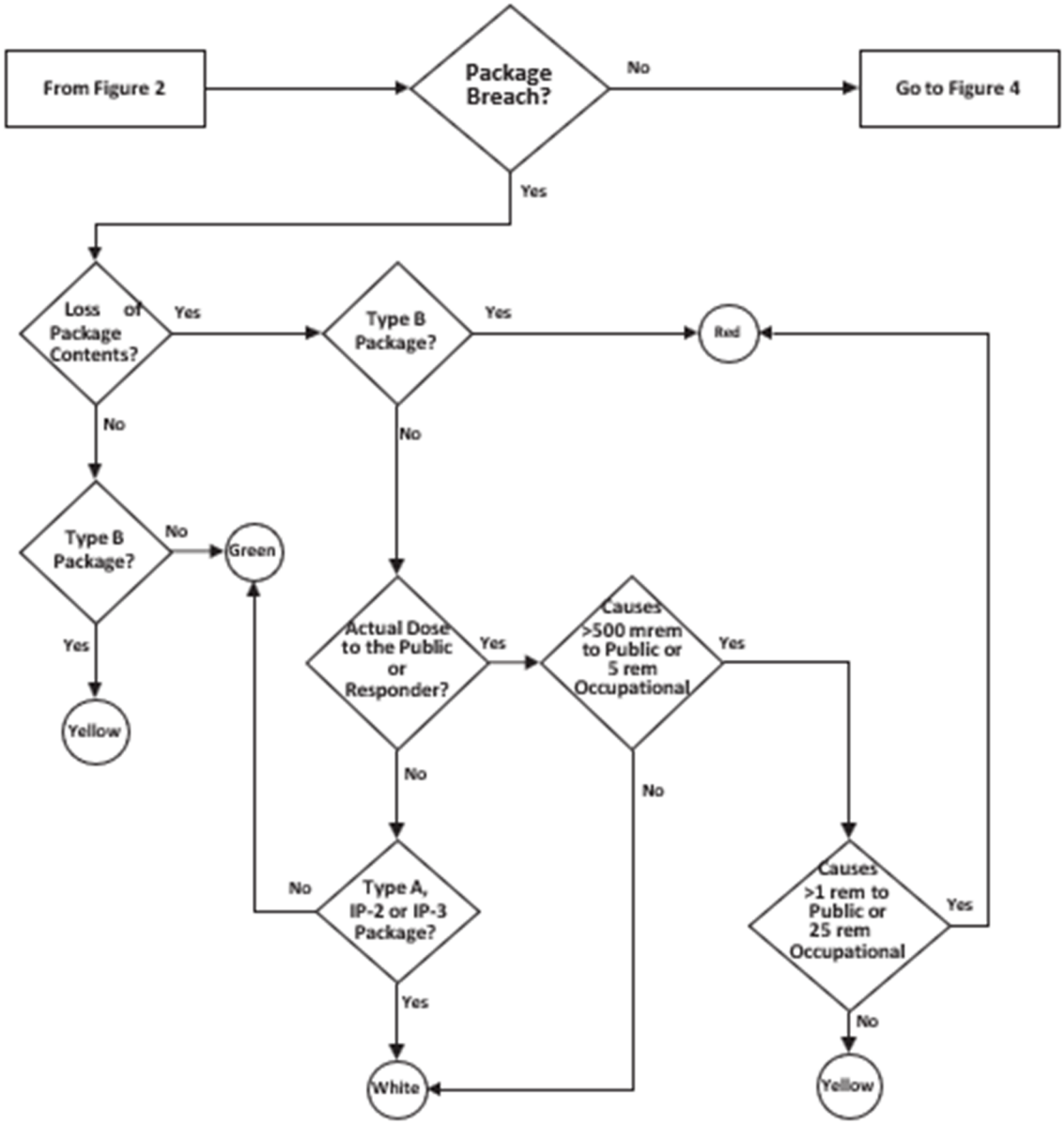


Figure 4: Transportation–Certificate of Compliance and Near Surface Disposal SDP Flowchart

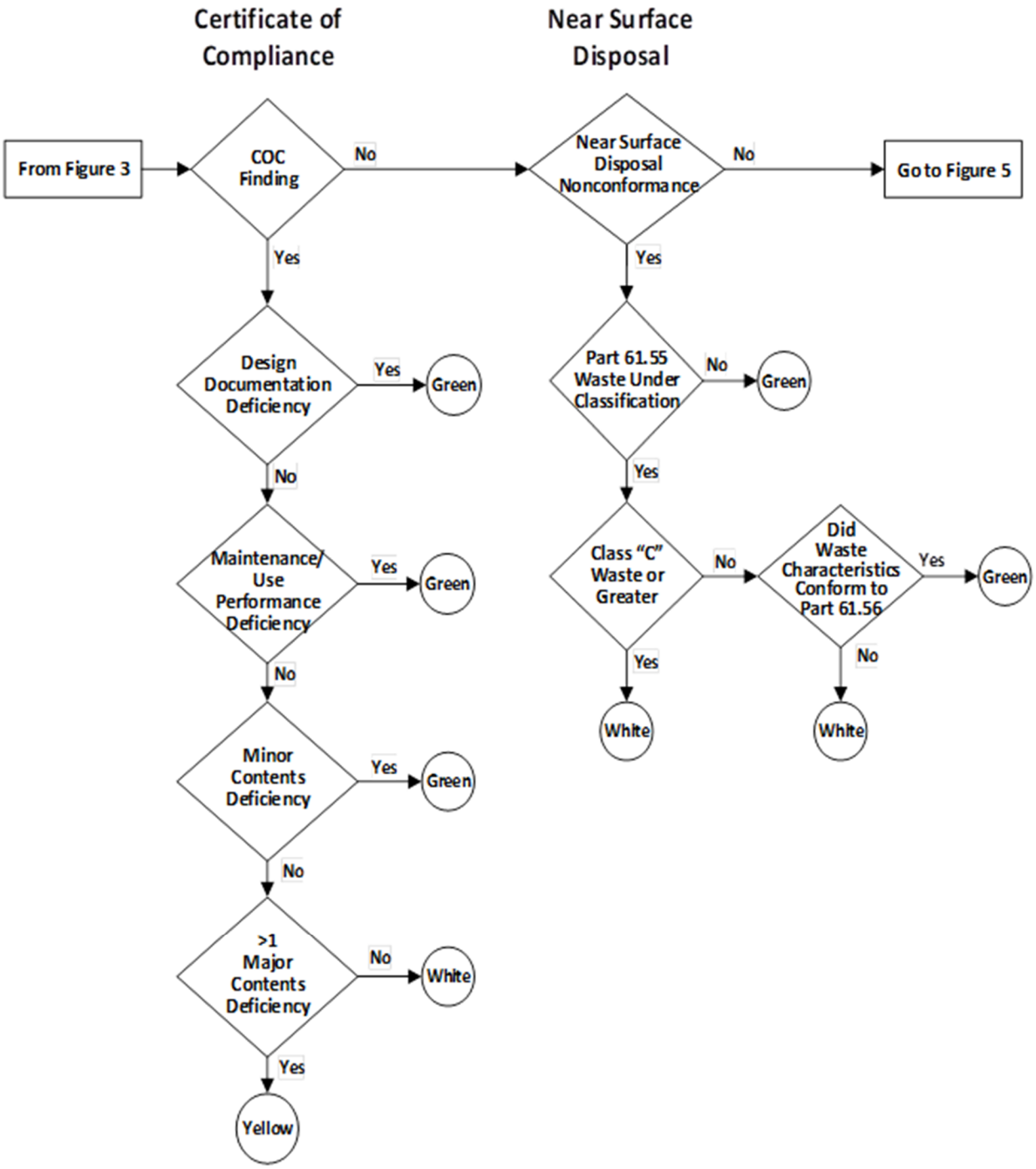
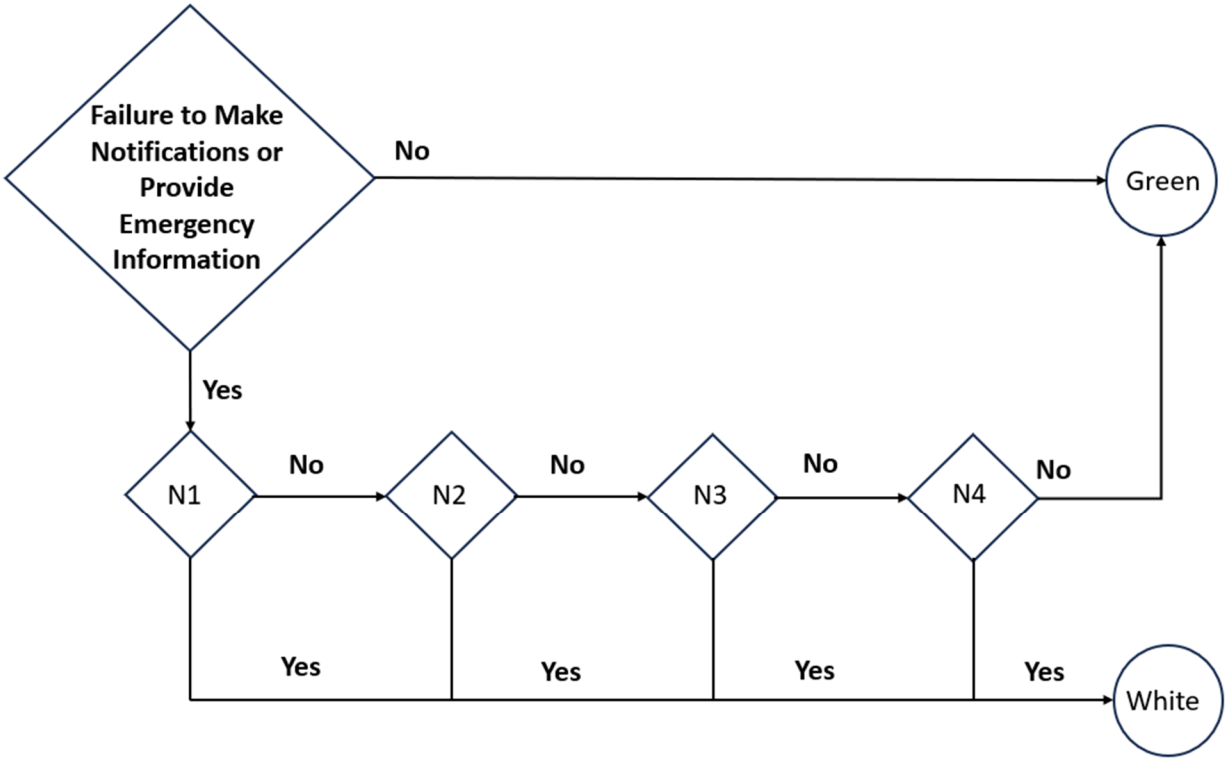


Figure 5: Transportation–Notification and Emergency Information SDP Flowchart



N1: Failure to comply with 10 CFR 71.97 – Made shipment without notifying the state governor, or Tribal official, prior to shipment entering state

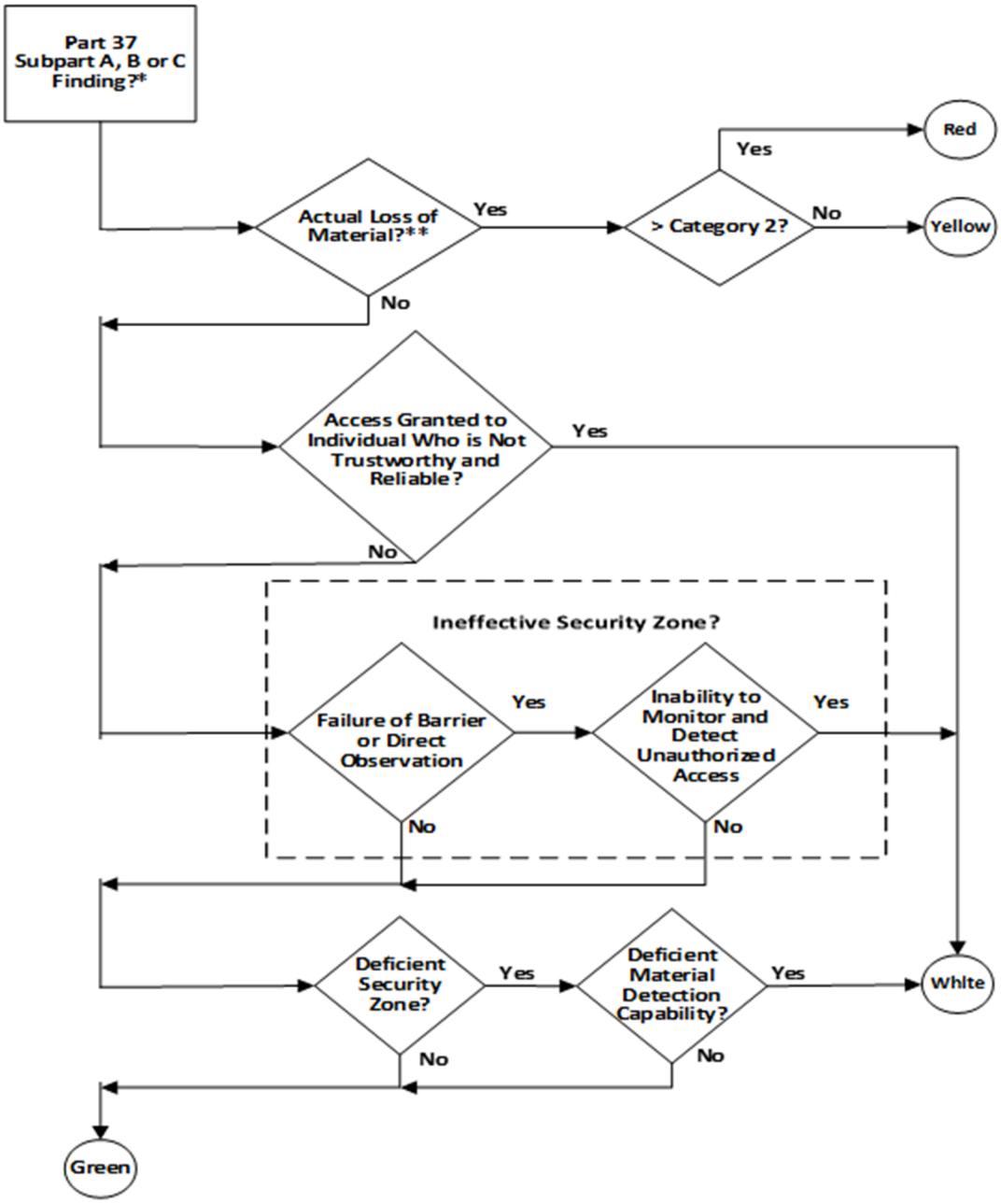
N2: Failure to provide emergency response info resulting in serious hampering of emergency response efforts

N3: Failure to respond during actual request IAW 49 CFR 172.604

N4: Failure to make notification of 5x limits exceeded as required by 10 CFR 20.1906

Figure 6: Part 37 Subpart A, B, or C Finding SDP Flowchart

Physical Protection of
Category 1 and Category 2 Quantities of Radioactive Material

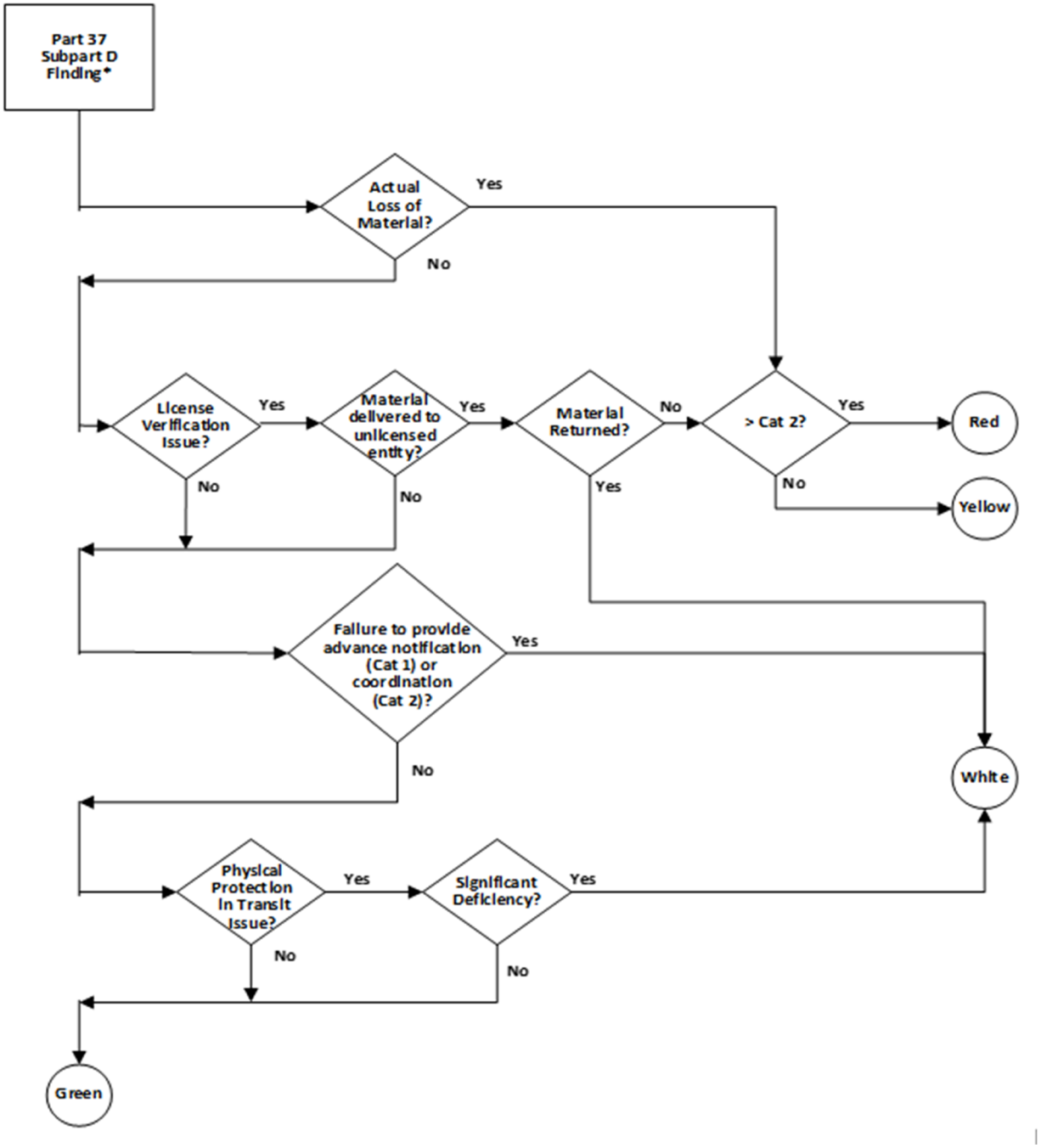


* Failures to respond or report per 10 CFR 37.49(d) or 10 CFR 37.57 shall be dispositioned using Traditional Enforcement as violations that may impact the ability of the NRC to perform its regulatory oversight function

** Consult with NRC Office of Investigations prior to dispositioning findings associated with actual cases of theft, diversion or sabotage of radioactive materials

Figure 7: Part 37 Subpart D Finding SDP Flowchart

Physical Protection of
Category 1 and Category 2 Quantities of Radioactive Material



* Failures to investigate or report per 10 CFR 37.79(c) or 10 CFR 37.81 shall be dispositioned using Traditional Enforcement as violations that may impact the ability of the NRC to perform its regulatory oversight function.

Attachment 1: Revision History for IMC 0609, Appendix D

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
	ML23318A439 04/21/00 CN 00-007	This IMC supports the New Reactor Oversight Program for the significance determination of findings. The significance determination process detailed in the manual chapter is designed to characterize the significance of inspection findings for the NRC licensee performance assessment process using risk insights as appropriate.		
	ML010240302 12/29/00 CN 00-030	IMC 0609, App D (Public Radiation Safety - Significance Determination Process) has been revised to incorporate stakeholder comments. It also expands the Part 61 finding section to add a Green finding event where previously there was only a White finding		
	ML020730754 03/06/02 CN 02-008	IMC 0609, Appendix D (Public Radiation Safety) has been revised to incorporate feedback from the regional inspectors based on its implementation. These include: 1. Additional guidance to clarify that the inspection period for the assessment of findings is for 2 years, based on eight rolling calendar quarters. 2. Additional guidance which added a quantitative dose value to determine when it is appropriate to use the SDP for risk assessment of a finding which involved a discrete radioactive particle. 3. Additional guidance to clarify the types of radioactive material covered by the SDP. 4. The narrative discussion was revised to agree with the headings in the SDP flowcharts. 5. Clarifying the handling/processing of DRP exposure occurrences		

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
	ML023380222 11/15/02 CN 02-042	IMC 0609, Appendix D (Public Radiation Safety SDP) has been revised to modify the use of the "greater than five occurrence" counter. Findings in the program will no longer be counted as an occurrence when the finding involves licensed radioactive material within the licensee's Protected or Restricted Areas.		
	ML032100204 07/24/03 CN 03-025	IMC 0609, Appendix D (Public Radiation Safety - Significance Determination Process) has been revised to clarify the intent of the SDP as a result of questions posed by an ROP Feedback Form. The changes now allow for consideration of 'accessible' locations of the radioactive package and a more graded approach that allows for a GREEN finding if exceeded dose rates are inaccessible to the public and not greater than two times the Department of Transportation limit.		
N/A	ML062890413 10/16/06 CN 06-027	This IMC has been revised to incorporate comments from the Commission in which the term public confidence has been change to openness	N/A	N/A
N/A	ML072970802 02/12/08 CN 08-007	This IMC has been revised to incorporate changes approved by the Commission in SECY-07-0112, including eliminating the White finding in the Environmental Monitoring branch. Other changes include removing the Yellow finding from the Low-Level Burial Ground branch and eliminating the aggregation of findings in the Radioactive Materials Control Branch.	N/A	ML080220247

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
N/A	ML20346A515 09/24/21 CN 21-032	This issue is a major revision that was coupled with a revision of corresponding bases in IMC 0308, Att 3, App D. Changes include addition of guidance to address inspection findings involving 10 CFR Part 37 at Part 50 licensees; updated guidance within the transportation SDP to address incorrect packaging of radioactive material; to provide more detail when dispositioning package breach issues and clarification that white significance for notification issues should be assigned to those issues that seriously hamper emergency response efforts. Additionally, information that explains bases was moved to IMC 0308, Att 3, App D to better align both documents with their intended purposes. Approval for this change was obtained from the Commission in accordance with Management Directive 8.13, “Reactor Oversight Process” January 31, 2020 through COMSECY-21-0010 (ML21144A140) and SRM-COMSECY-21-0010 (ML21231A250) Conducted public meetings as summarized in the following: ML21039A660 – October 21, 2020 ML21078A504 - February 25, 2021	Staff Public Radiation Safety SDP Tabletop Sessions (01/22/2021, 01/26/2021, 01/28/2021) Verbal discussion of changes during the 2021 HP Counterpart meeting. 09/07/2021	ML20349A077 Closed FBFs: 0609D-2197 ML21250A322 0609D-2099 ML21250A321

Commitment Tracking Number	Accession Number Issue Date Change Notice	Description of Change	Description of Training Required and Completion Date	Comment Resolution and Closed Feedback Form Accession Number (Pre-Decisional, Non-Public Information)
	ML26146A239 Date 8/7/2026 CN 26-036	This issue is a major revision. Added Section 02.00 to provide more-than-Minor screening guidance. Revised Section 02.01 to modify significance of effluent findings and remove reference to ALARA consistent with agency actions in response to Executive Order 14300 Section 5(b). Revised Section 02.04.C to modify significance of transportation findings as it relates to public doses. New Figure 1 that corresponds with Section 02.00. Revised Figure 3 to correspond with Section 02.04.C. Revised Figures 6 and 7 to fix issues with logic.		ML25301A230 ML26138A274