



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

February 14, 2000

MEMORANDUM TO: Edwin F. Fox Jr., Chief
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Operator Licensing, Human Performance & Plant Support Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

FROM: Stewart Schneider, Health Physicist 
Emergency Preparedness and Radiation Protection Section
Operator Licensing, Human Performance & Plant Support Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF JANUARY 19, 2000, PUBLIC MEETING WITH THE
NUCLEAR ENERGY INSTITUTE (NEI) REGARDING SIGNIFICANCE
DETERMINATION PROCESS TOOLS FOR ASSESSING RADIATION
PROTECTION PROGRAMS

On January 19, 2000, representatives of the Nuclear Energy Institute (NEI) met with representatives of the Nuclear Regulatory Commission (NRC) at the NRC's offices in Rockville, Maryland.

The purpose of this meeting was to discuss stakeholder comments submitted by NEI (letter dated December 29, 1999) on the occupational and public radiation safety significance determination process (SDP) and inspection procedures that were published in the *Federal Register* on July 26, 1999 (64 FR 40394). NEI provided copies of comments from this letter specific to the occupational and radiation safety SDPs and the inspection process (i.e., access control to radiological significant areas, ALARA planning and controls, and radioactive materials transportation and Part 61 (see Attachment 1)).

NRC informed NEI that the occupational and public baseline inspection procedure revisions (BIP) were completed and being provided to the Regions for their review. Public discussions on this matter will continue after the Regions have provided comments. Next, NEI summarized the issues discussed at last week's public workshop on the new inspection and oversight program held in Washington, D.C. NEI will provide NRC with industry's feedback on the workshop.

The discussion regarding the NEI comment letter started with NEI explaining that the responses were developed by an industry radiation protection task force. The NRC staff discussed the issue of discrete radioactive particles (DRPs). NEI noted that since DRPs can't give a total

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effective dose equivalent to a member of the public, DRPs should not be evaluated in the SDP for radioactive material control programs. NRC and NEI agreed in principle but DRPs will count as an occurrence. Resolution was reached on this matter. Discussion also focused on transportation and Part 61 issues. In the transportation SDP (see Attachment 2), industry does not believe the risk significance of the N1 and N4 white findings are consistent with other white findings in the SDP. The NRC staff noted that their rationale was documented by text supporting the SDP (used to train the regional inspectors). For both N1 and N4 as white findings (as a result of licensee's failure to notify), the States and NRC would be hampered in their response and follow up duties to protect the public. For N4, the staff did agree to examine the possibility of adjusting the reporting radiation levels (up from the existing Part 20.1906 levels).

The staff handed out the current draft flow diagrams for the Occupational Radiation Safety SDP and ALARA component (Attachment 3). Industry is concerned that green findings will be added up by NRC and that a nuclear power plant with many green findings will be looked at in a bad light as compared to a plant with only one or two green findings. Staff noted that the NRC has no intentions of summing green findings, for purposes of assessing licensee performance. Also of concern to NEI, was the matter of double counting a finding. That is, when the licensee identifies a performance indicator (PI) hit, then the NRC follows with running the PI event through the SDP resulting in least a green finding. NRC staff explained that current guidance is to determine all PI hits' risk significance using the appropriate SDP. However, the NRC staff did agree to consider establishing filtering criteria for inspection findings to screen out insignificant events—do not enter the SDP, and thus reduce the number of green findings.

The staff noted that inspection guidance must be properly connoted for the procedures to be implemented on a consistent basis by inspectors. NEI believes that at the concept level, there is too much detail in the ALARA BIP. The staff noted that the revised BIP has reduced emphasis on the source term area, and that ALARA inspection resources have been reduced.

The staff noted that a major issue that needs to be addressed, is a review of the PIs. The March 1 deadline should be met, but it is not critical if this date is not met. A list of action items in the radiation safety strategic area that resulted from this meeting will be assembled by the staff (Attachment 4).

Attachment 5 provides a list of public meeting attendees. The meeting was adjourned.

Attachments: As stated

cc w/att: See next page

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6. EP SDP Sheet 1 and 4 – After reviewing all other SDP's it appears that the EP SDP emphasis on the timely resolution of items placed PIDR/CAP is not consistent. A review needs to be performed to ensure that this criterion is not overly restrictive and is consistent with other processes.
7. EP SDP Sheet 5 - If a licensee fails to critique a misclassification of an NOUE on two drills, sheet 5 would classify the drill/exercise problem as "yellow." Such a classification is not on the same level of significance as a "yellow" on other PIs.

One way to consider repeat failures is in the NRC's review of the corrective action program, which should be designed to prevent recurrence of a significant condition adverse to quality. Corrective action programs should be designed to separate significant conditions adverse to quality from conditions adverse to quality. The level of causal analysis should be commensurate with safety significance. For example, a significant condition adverse to quality would receive a root cause analysis, whereas a condition adverse to quality would typically receive only an apparent cause analysis. Corrective actions for conditions adverse to quality are typically intended to fix the immediate problem but are not typically designed to prevent recurrence. Thus, repeat problems alone are not an indication of a "broken" corrective action program. Issues of repeat occurrence should be "flagged" for review during the corrective action program inspection module.

8. EP SDP Sheet 1, 4, and 5 –Need to determine if "Inspection/Exercise Observation" is the best wording for conditions that do not that go through the SDP and do not even warrant being GREEN. In addition, need to provide guidance as to how this information will be consistently conveyed to the utility.
9. EP SDP Sheet 4 and 5 – If a utility self-identifies an issue that is a failure to meet a PS and this issue is placed in the PIDR/CAP for resolution, will this issue be evaluated via the SDP by the inspectors and can it result in a green (or worse) finding?

Occupation Radiation Safety SDP

ALARA Findings

(Page A2-9) The discussion on "ALARA Findings" needs to be updated to reflect the revised SDP. The text is currently based on the 8/10/99 version of the SDP, rather than the most current 11/12/99 version that is shown.

(Page A2-13) Separate "actual job dose" criteria are shown in the fourth and fifth blocks, i.e., for PWRs and BWRs. The job-dose values have been derived as 4% and

20% values of the baseline collective dose values that serve as screening criteria (third block): We do not believe that the approach of using separate criteria for PWRs and BWRs is valid for the job-dose values because they implicitly represent criteria for a determination of relative dose-significance, rather than serving as a performance benchmark. The SDP should employ a single job-dose value in each of the blocks. We suggest that the two values in each block be averaged and rounded to a single digit, yielding 10 rem and 40 rem, respectively.

(Page A2-13) An applicable time period should be specified for the block, "Greater than 2 occurrences?" We suggest that an appropriate time period is "in the assessment period" (e.g., per year). This would be consistent with the approach taken in the public radiation safety SDP for radioactive material control.

Exposure Control Findings

General comment: The process for initial screening of items prior to entering the SDP in the area of occupational radiation safety is not well defined and understood. Explicit screening criteria should be provided similar to the screening criteria that are included in the ALARA SDP. Items of negligible safety significance and little or no potential for any consequence (i.e., with regard to radiation dose to workers) should be screened out as "observations," and not be entered into the SDP process with the result of becoming green findings. We suggest that such criteria screen out items that do not involve any of the following:

- Unintended exposure
- Substantial potential for overexposure
- Compromise of the ability to assess dose
- Violation of a regulatory requirement (e.g., 10 CFR Part s 19 or 20)

(Page A2-10) The SDP should include guidance to clarify that if an "unintended exposure" occurrence has been documented as a PI event, and also does not constitute an overexposure or a substantial potential for overexposure, it will not be documented as a green finding. If already documented as a PI event, the item will already have been placed into the licensee's corrective program, and "double-counting" as a green finding will be non-productive and potentially misleading.

(Page A2-10) The discussion of "unintended exposure" should be revised to improve clarity and consistency with the performance indicator (PI) for occupational radiation exposure control. The first paragraph characterizes any unintended dose that exceeds the exposure that exceeds the criteria in PI as "significant," which is potentially misleading and inconsistent with the SDP.

First, the discussion of the PI criteria (NEI 99-02 –Draft Revision D) is clear that: “the dose criteria are established at levels deemed to be readily identifiable, based on industry experience. The dose criteria should not be taken to represent levels of dose that are ‘risk-significant’. In fact the criteria are generally at or below dose levels that are required by regulation to be monitored or to be routinely reported to the NRC as occupational dose records.”

Second, the SDP would screen unintended dose occurrences at the levels of the PI criteria as “green,” which is by definition not significant.

(Page A2-12) The SDP chart should be revised to improve its internal consistency. The blocks for actual overexposures (i.e., consequences) have been appropriately derived from previous enforcement criteria at 1x and 5x the regulatory limits. In contrast, the blocks for events that involve a potential for overexposure lead to illogical conclusions regarding significance.

For example, an unintended dose occurrence that does not exceed the regulatory limit would be “green,” based on consequence. However, if the event occurred in an area with dose rate levels >25 R/hr, the event would be ranked as “yellow,” which is comparable to an overexposure. Further, the criterion of >25 R/hr lacks a firm basis in either historical performance or in implied significance. Also, the potential “red” finding associated with a “substantial potential” occurrence in a very high radiation area that does not involve an actual overexposure is not consistent with either the consequence-based blocks in the SDP or the bases for criteria in the enforcement policy.

We recommend that the “Area >25 R/hr” block be deleted, and that the finding associated with a “substantial potential” occurrence is “white” if it is not associated with a very high radiation area, and “yellow,” if it is.

Public Radiation Safety SDP

Public Radiation Safety (Rad Material Control, Effluent Release Program, and Environmental Monitoring Program)

(Page A2-17) Clarification should be provided that the dose values given in the SDP refer to the total effective dose equivalent (TEDE).

(Page A2-17) The SDP should include guidance to clarify that the dose-based criteria for public exposure explicitly do not apply to discrete radioactive particles. The presently available methods for estimating exposures from discrete radioactive particles do not reflect the current scientific understanding of potential health risk from such exposures. Discrete radioactive particles do not pose any substantive risk at the dose levels included in the criteria in the SDP because any resultant dose is highly

localized. This has been concluded in extensive research conducted by NRC and others, as well as in reports of the National Council of Radiation Protection and Measurements (NCRP). The scientific understanding of the negligible health risk posed by discrete radioactive particles has also served as the basis for Commission approval of proposed rulemaking to revise regulatory requirements for estimating controlling exposures from particles.

Transportation and Part 61

Guidance should be provided to clarify the regulatory bases and applicability for the SDP on Transportation and Part 61 (there currently is no guidance). For example, there is no apparent regulatory basis for the significance determination criteria in the section on "Low-Level Burial Ground (LLBG) Access Problem, nor is it clear what is meant by a "problem" that is not associated with "denial of LLBG access" or "Part 61 waste underclassification."

In the Certificate of Compliance (COC) section of the SDP, the meaning of the decision blocks on "minor contents deficiency" and ">1 critical contents deficiency" should be clarified.

In the section on "Radiation Limit Exceeded, "the logic flow should be revised to reflect the possibility that both the external radiation levels and the surface contamination levels criteria could be exceeded.

Physical Protection SDP

This SDP should be replaced with the version developed during the December 21, 1999 public meeting.

Fire Protection SDP

General

This SDP is more complex and less user friendly. It does not appear that the screening of deficient conditions would produce results that are consistent with the results that would be expected from the Reactor Safety SDP.

The credit for fire brigade actions and /or effectiveness does not appear to be consistent. The positive contributions of fire brigade intervention are discounted while fire brigade performance deficiencies can affect multiple schemes.

Clearly, the SDP developed for fire inspections is not risk informed but deterministically based. This philosophy is not consistent with other SDP modules

NEI Comment: This section sets an implicit expectation for augmentation staffing tests. As noted, there is no requirement in this area. This inspection guidance is overly prescriptive and establishes regulation through inspection.

03.03. Augmentation Backup System

If the backup augmentation system has not been tested since the last inspection, review the major elements of the backup system to determine if the elements are up-to-date (e.g., Call trees and Call out telephone lists). Determine by interview or, if necessary, by a special drill, whether personnel required to implement the system are knowledgeable regarding the back up system to augment onsite personnel in a timely manner. Coordinate any special drill with appropriate management.

NEI Comment: This section implies that we are required to conduct periodic tests/drills of our backup augmentation system. There is no requirement in this area. This inspection guidance is overly prescriptive and establishes regulation through inspection. This wording will also drive inspectors to request such a test each inspection interval adding burden to the licensee.

Access Control to Radiologically Significant Areas

(Page 4 –Section 02.02) The detailed inspection requirements pertaining to the review of electronic pocket dosimeter (EPD) alarm setpoints should be deleted. There is no basis for placing such a degree specific emphasis in the inspection requirements on the use of EPDs in high radiation areas. The use of EPDs is only one of several options for controls required by technical specifications. For example, the use of EPDs is not required if surveillance over access and work within a high radiation area is provided by an individual qualified in radiation protection procedures. The numerical criteria included in the inspection requirements have no apparent regulatory or technical basis. Such criteria may be taken to imply a regulatory requirement, when in fact, there is no such requirement. For example, typical wording in technical specifications includes a requirement that the “radiation monitoring device...alarms when a preset integrated dose is received,” without reference to numerical criteria or to a requirement for a dose rate alarm.

(Page 4 –Section 02.02) The sentence “Determine whether management and administrative controls are designed to maintain exposures ALARA” should be relocated to Attachment 02, “ALARA Planning and Controls.” Further the wording should be revised to be with 10 CFR Part 20, which refers to “procedures and engineered controls based upon sound radiation protection principles.”

(Page 4 – Section 02.02) The last paragraph refers to “high risk [emphasis added] airborne areas” as having the “potential for individual worker internal exposures of >30 mrem CEDE (12 DAC-hrs).” To improve clarity and consistency, we suggest that the wording be revised to simply refer to “airborne radioactivity areas as defined in 10 CFR Part 20.”

(Page 4 – Section 02.03) The reference to “dose rates >25 R/hr at 30 centimeters” should be deleted. Consistent with our comments on the occupational radiation safety SDP, the criterion of >25 R/hr lacks a firm basis in either historical performance or in implied significance. Further, there are no specific regulatory requirements that include such a criterion. For example, neither 10 CFR Part 20 nor standard technical specifications for light-water reactors contain such a criterion.

(Page 6 – Section 02.04a) The reference to “significant [emphasis added] exposures (>1 person-rem)” should be revised to be consistent with the criteria in SDP for ALARA findings. For example, the screening criteria in the SDP are based on 5 person-rem for PWRs and 10 person-rem for BWRs. Further, this item should be addressed in Attachment 02, “ALARA Planning and Controls.”

(Page 6 – Section 03.02) The purpose of the discussion in this section is not clear. Further, discussion of inspection of the use of continuous airborne monitors is more appropriately included in Attachment 03, “Radiation Monitoring Instrumentation.” It should either be revised to improve clarity and relocated to Attachment 03 or it should be deleted.

ALARA Planning and Controls

General Comments: This inspection procedure should be substantially revised to be more in line with “risk-informed and performance-based” principles as reflected the most current version of the SDP for ALARA findings. Prescriptive detail that goes beyond regulatory requirements should be deleted. The scope and extent of the procedure should be substantially reduced to be more in line with the concept of a “baseline” inspection program and to more appropriately reflect contemporary industry performance.

Suggestions follow for revising this procedure to reflect the general comments (above).

The inspection requirements and guidance should be focused on issues that are relevant to the SDP, i.e., which have a potential to lead to a finding. The SDP addresses ALARA planning and controls for jobs that exceed the criteria specified in the SDP and consideration of overall collective dose as compared

with the benchmarks contained in the SDP. Suggested changes to better focus the inspection procedure include the following:

- The sections on source term reduction and control (02.01c and d, 02.03, and 03.03) should be deleted because they are not relevant to the SDP, nor are they performance-based. In addition to being extraneous to the SDP, this material implies requirements that are outside the scope of applicable rules (e.g., 10 CFR Part 20). Such material may be more appropriate for a technical report, e.g., a NUREG.
- The criteria for selecting jobs for inspection should be revised to reflect the criteria in the SDP. For example, Section 02.05 refers to jobs with actual doses greater than 1 rem (versus 5 or 10 rem in the SDP) and Section 02.08 refers to jobs where the actual dose is >1.25 times the exposure estimate (versus 1.5 times in the SDP).
- The section on respiratory protection (02.09) is not an ALARA issue and should be relocated to inspection procedures for emergency preparedness. The inspection objective (01.01) clarifies that this inspection procedure covers "protection of worker health and safety from exposure to radiation from radioactive material during routine [emphasis added] civilian nuclear reactor operation."
- The section on declared pregnant workers (02.07) is not an ALARA issue and should be relocated to Attachment 01, "Access to Radiologically Significant Areas."
- The section on inspecting radiation worker performance (02.04) is redundant to a similar section in Attachment 01 (02.05). It should be consolidated within Attachment 01.

(Page 8 – Section 02.02a.1) The statement that "dose rate gradients (greater than a factor of 2) are often indicative of sources that are not effectively shielded" should be deleted. This statement does not reflect industry experience and is contrary to the concept of "as low as reasonably [emphasis added] achievable" (ALARA). First, without any context, the statement can lead to inappropriate conclusions, for example, the conclusion that an area with a dose gradient of 1 to 3 mrem per hour (i.e., greater than a factor of 2) is "not effectively shielded." Second, effective shielding is the result of an analysis that includes consideration of costs versus benefits in which the benefits are in terms of reduced dose, not in terms of uniform dose fields (i.e., with dose rate gradients less than or equal to 2). Finally, the prescribed use of numerical criteria without reference to specific regulatory requirements is not appropriate for an inspection procedure.

(Page 9 – Section 02.02b) The concept of rotating workers to balance exposures should be deleted because it lacks a regulatory basis and may be contrary to the ALARA principle. Selection of workers to perform specific tasks takes into account a number of factors, only one of which is dose. For example, such factors include needed level of job skills and experience, familiarity with the task, shift schedules, consideration of other tasks needing to be performed, etc. Further, attempts to distribute dose evenly among a number of workers can lead to an increase in the overall collective dose due to variability in specific job skills and experience and inefficiencies associated with work crew changes, shift turnovers, etc. Such a result is contrary to the ALARA principle.

(Page 10 – Section 02.05) The structure of this section implies that there are likely to be multiple occurrences at plants of jobs where actual exposure was more than 50% greater than estimated. For example, the inspection procedure refers to selecting “about 5 jobs of highest exposure significance where actual exposure was greater than estimated by 50%. Industry experience indicates that such occurrences at a facility are less frequent (e.g., fewer than two per assessment period). This section should be scaled down and revised to reflect contemporary industry performance and be more in line with the concept of a “baseline” inspection procedure.

Radiation Monitoring Instrumentation

(Page 16 – Section 02.02) The meaning of the reference to “continuous air monitors associated with the potential for 100 mrem CEDE (40 DAC-hrs)” should be clarified. We suggest wording such as “continuous air monitors used for monitoring airborne radioactivity areas.”

Gaseous and Liquid Effluent Treatment Systems

No comments.

Radioactive Material Processing and Shipping

(Page 5 – Section 01.02) – The sentence that refers to the Final Rule on Radiological Criteria for License Termination should be deleted as an inspection objective because it is not applicable to an operating reactor. See further comments regarding Section 02.06b, below.

(Page 6 – Section 02.06b) This section should be deleted because it utilizes inappropriate reference values for detection sensitivity of contamination monitoring instruments. The reference values shown in the table in this

section are intended to serve as screening values for surface contamination on building surfaces at the time of license termination. These values are derived from computer models that include a number of conservative assumptions, e.g., the area of surface contamination on floors and walls, re-suspension of the materials, and the presumed annual occupancy in the building. None of these assumptions are relevant to the vast majority of operational situations within the scope of this inspection procedure, nor are these values intended, even in the context of license termination, to be utilized as instrument detection criteria. In addition, the values shown reflect an implied dose of less than 25 mrem, which is not consistent with the SDP that utilizes a dose criterion of 5 mrem.

(Page 8 –Section 03.06) The reference to release of material from the Radiologically Controlled Area (RCA) should be changed to reflect release of material outside to an unrestricted area, i.e., outside of the protected area. The Inspection Objective states that the procedure applies to "...exposure to radioactive material released into the public domain." The boundary of the protected area, rather than the radiologically controlled area, better defines where the public may have limited access. Members of the public do not have unrestricted access within the protected area and are very unlikely to be able to receive exposure from "released" materials. Setting the reference in this section to the protected area boundary still retains a "buffer" on the concept of "public domain" because even outside of the protected area there is some degree of restriction on public access, i.e., within the owner-controlled area.

Radiological Environmental Monitoring Program

(Page 10 – Section 02.02 i) The reference to "overall effect on licensee dose projections" should be deleted. Dose projections are made in accordance with the methodology in the ODCM utilizing effluent sample and monitoring data. Environmental monitoring sample data are not typically utilized in making dose projections.

Access Authorization (AA) Program (Behavior Observation only)

INSPECTION REQUIREMENTS:

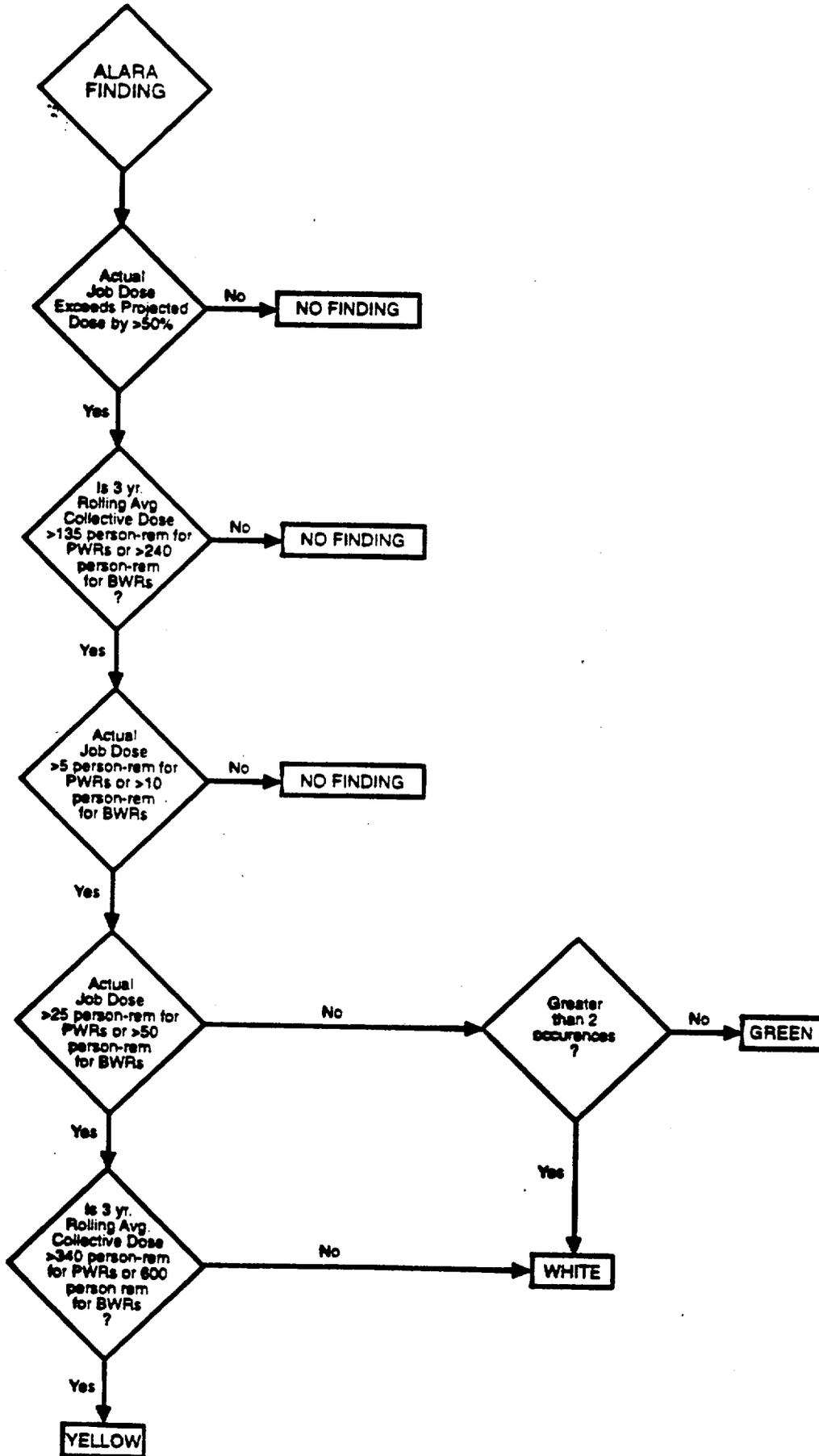
a. Inspection Planning:

During review of the semi-annual fitness for duty reports, note the number of tests for cause and number of confirmed positives during random testing. If there were a number of positive test results in the random testing and no individuals were identified by supervisors to be tested for cause, the

OCCUPATIONAL RADIATION SAFETY (ALARA)

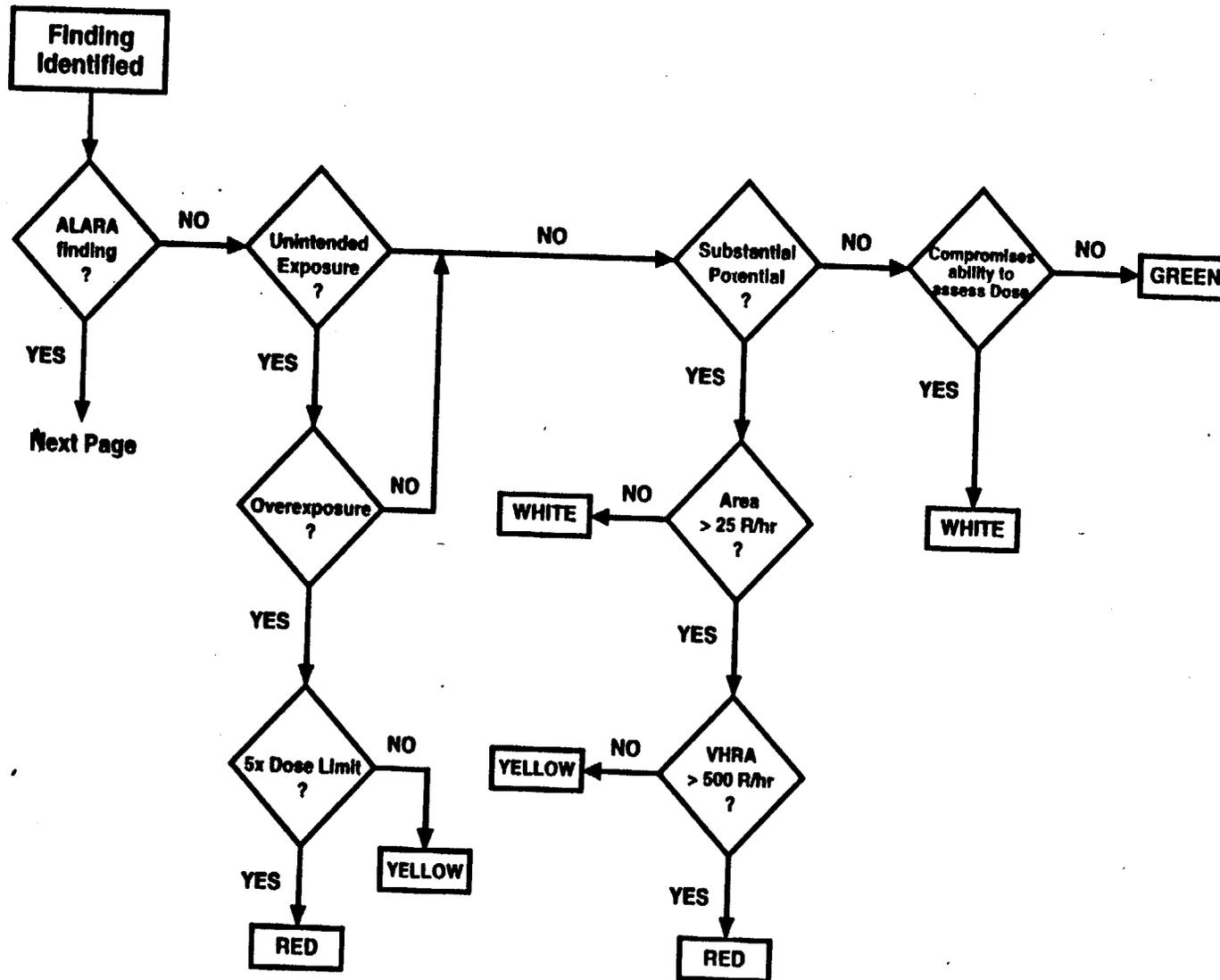
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Attachment 3



OCCUPATIONAL RADIATION SAFETY

Draft



Attachment 3

ACTION ITEMS FROM THE
JANUARY 19, 2000 PUBLIC MEETING
IN THE
RADIATION SAFETY STRATEGIC AREA

1. In the transportation portion of the Public Safety SDP, the NRC staff will revise the cask Certificate of Compliance criteria.
2. The NRC staff will review the logic of the SDP and ensure that similar outcomes (e.g., colored findings) have comparable significance. For outcomes in the SDP that have a basis in the goal of increasing Public Confidence, the NRC Staff will document the rationale, consistent with program policy.
3. In the material release portion of the Public Safety SDP, the NRC staff will review whether the P,I&R inspection process covers the three event issue. If so the staff will consider deleting from SDP.
4. In the ALARA portion of the Occupational Safety SDP, the staff will relocate the finding screening criteria from the SDP to a guidance document, consistent with program policy.
5. In the ALARA portion of the Occupational Safety SDP, the staff will clarify the basis for the "three or more occurrences" criteria. This is not P,I&R.
6. In the ALARA portion of the Occupational Safety SDP, the staff will review the separate dose levels for reactor classes in the SDP criteria, and revise the SDP as necessary.
7. In the Exposure Control portion of the Occupational SDP, the staff will review the NEI recommendation for the "findings" screening criteria in this area.
8. In the Exposure Control portion of the Occupational SDP, the staff will revise the SDP flow chart to remove the "Unintended Exposure" gate and change the significance outcomes in the "Substantial Potential" branch to make it logically consistent with the rest of the SDP.
9. As soon as the full PI data is available in the Occupational Radiation Safety Cornerstone, the NRC and NEI staff will evaluate it to see if the data provides a basis for:
 - Reducing the time frame and performance thresholds (e.g., 6 PI reports in 12 quarters).
 - Allow for high dose/dose-rate situations by expanding the definition of "Unintended Exposure" to include a percentage of the intended dose as well as the 100 mrem criteria currently in the definition.

**NEI/NRC MEETING ON INSPECTION FINDINGS IN RADIATION PROTECTION
LIST OF ATTENDEES**

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Larry Ricketson	NRC/Region IV
Mike Shannon	NRC/Region IV
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