February 29, 2000

MEMORANDUM TO: Cynthia A. Carpenter, Chief
Generic Issues, Environmental, Financial
and Rulemaking Branch
Division of Regulatory Improvement Programs, NRR

FROM: Joseph L. Birmingham, Project Manager/***AR***
Generic Issues, Environmental, Financial
and Rulemaking Branch
Division of Regulatory Improvement Programs, NRR

SUBJECT: SUMMARY OF PUBLIC MEETING WITH THE NUCLEAR ENERGY INSTITUTE (NEI) REGARDING PERFORMANCE INDICATORS (PIs) FOR ASSESSING RADIATION PROTECTION PROGRAMS AND ASSESSMENT OF RADIATION PROTECTION INSPECTION FINDINGS

On February 16, 2000, a representative of the Nuclear Energy Institute (NEI) met with Nuclear Regulatory Commission (NRC) technical staff at NRC Headquarters in Rockville, Maryland. Attachment 1 provides a list of workshop attendees.

The purpose of the workshop was to continue discussion of the performance indicators and significance determination process (SDP) used by the NRC to assess licensee radiation protection programs at power reactors.

The meeting commenced with a discussion of the public radiation safety cornerstone including transportation and Part 61 SDP and background supporting text. The NRC staff discussed the proposed changes to the supporting text (provided in Attachment 2). The NEI Senior Project Manager agreed to provide feedback on the proposed changes in the near future, while the NRC staff gets feedback from Region health physics counterparts.

The NRC staff discussed the ongoing revision of the ALARA SDP in the Occupational Radiation Safety Cornerstone including the transfer of blocks 2-4 from the SDP to an inspection procedure or Manual Chapter (provided in Attachment 3). These series of “filtering” blocks serve to remove potential findings that have low significance and thus should not result in green findings. NEI agreed to the proposed changes. NRC staff noted that they were still considering NEI’s proposal to modify the SDP block 4 to have the same numerical value for the PWR and BWR actual job dose and should have a final position for the next scheduled meeting.

NEI continued the discussion of the need to provide effective screening or filtering mechanisms for the Occupational Radiation Safety SDP and the Transportation/Part 61 branch of the Public Radiation Protection SDP. With effective screens in place, the overall number of green findings would drop and green findings would then have a more uniform level of risk significance. The NRC staff supported this concept and agreed to try to move in that direction.

The NRC's Public Radiation Safety SDP logic diagram, under the rad material control branch, has a decision block, >5 Events, which if answered "yes" leads to a white finding. As follow up to an industry question, the NRC staff believes no change is needed in this logic, based on the following points. The five different loss of material control events could have five different root causes (unlikely to be corrected by licensee self-identification and corrective action programs). Also, these events are dose-based by design the with potential for impacting the same group of people offsite. NEI had no further comments on this issue.

The Occupational Performance Indicator (OPI) threshold and time interval are undergoing a review by industry and the NRC staff. Both groups are working with the same set of reported PI data with a shared goal of moving to a rolling one-year time interval with an appropriate number of PI hits for governing movement up and down the performance bands. The current OPUSES has a rolling 3-year (12 quarters) time interval with a varying number of PI hits to move from the different bands of performance (green to white and white to yellow). By the end of February, these validation studies should be completed and a comparison of results made and a consensus achieved. Based on a preliminary review of the plant OPI data, NEI noted that no obvious correlation (not statistically significant) was seen between the number of OPI hits and the number of major refueling/maintenance outages.

The final discussion topic focused on the 100 mrem unintended dose OPI. Industry suggested that at higher work area dose rates this 100 mrem value may be too small. That is, at high dose rates, a worker could easily exceed the allowable authorized dose by 100 mrem with no radiation barrier failure. Also, other variables, (e.g., variance of thermoluminescent dosimeter (TLD) performance and differences between TLD and electronic dosimeters), have an impact on this incremental dose measurement. After discussion, the NRC and NEI agreed that the proposal offered at the February 9, 2000, public meeting would not be adopted. Both NEI and NRC agreed that some work area high dose rate level (where the 100 mrem increment would be increased) might be needed. NEI agreed to draft a frequently asked question (FAQ) and answer to describe the rationale for this issue. NEI offered an alternate solution -- for high radiation areas greater than 1000 mrem/h, do not use the 100 mrem unintended dose OIP. NRC agreed to consider this suggestion and to discuss it further at the next meeting.

The meeting was adjourned.

Project Number 689

Attachments: As stated

cc: w/att: See list

CONTACT: James E. Wigginton, IOLB/NRR
(301) 415-1059

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OFFICE	RGEB	SC:RGEB
NAME	J.Birmingham:sw	S. West
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R.Pedersen
S.Klementowicz
D.Hickman
S.Sanders
P.Kadambi

List of Attendees

Radiation Protection Performance Indicator/Inspection Findings Meeting
February 16, 2000

Name	Organization
Ralph Anderson	NEI
Steve Klementowicz	USNRC
Roger Pedersen	USNRC
Jim Wigginton	USNRC
Stewart Schneider	USNRC
Joe Birmingham	USNRC
Serita Sanders	USNRC
Don Hickman	USNRC

Attachment 1

TRANSPORTATION AND PART 61

Radiation Limits Exceeded

The limits on radiation levels of a package offered for transport are found in 49 CFR 173. These include both limits for external and removable surface contamination. The external radiation level limits vary somewhat as a function of the type of shipment (non-exclusive and exclusive- use). Specific limits exist also as a function of distance from the package and for the area occupied by the driver. These external radiation limits are found in 49 CFR 173.441 and are duplicated in Part 71.47 (as related to Type B radioactive material shipments).

The limits for removable (non-fixed) surface contamination on a package are found in 49 CFR 173.443 (Table 11) and vary as a function of type of shipment (non-exclusive and exclusive use), and vary relative to the type of nuclides (alpha, and beta/gamma emitters). Additionally for certain exclusive-use shipments, the surface contamination levels can be ten times higher during the shipment.

The external radiation level branch provides for a graded approach for assessing the level of significance of findings. Exceeding any of the limits and increasing multiplies of the limits provide for WHITE, YELLOW and RED findings.

The removable surface contamination level branch provides for a graded approach for assessing the level of significance of findings. Exceeding any of the limits and increasing multiplies of the limits provide for WHITE, YELLOW and RED findings. Note that to have a RED finding, the surface contamination levels must not only exceed 100 times the limit, but the unrestricted area must have been contaminated as well.

TRANSPORTATION AND PART 61

Breach of Package During Transit

DOT and NRC shipping regulations relative to packaging requirements are diverse. Generally, these requirements become more stringent as a function of several factors. As the quantity, type, form (i.e.,readily dispersible) of radioactive material varies (increases), then the potential impact on the public (dose) increases as a result of a package breach during transit. For purposes of significant risk determinations, a package breach means a loss of containment. The actual or potential impact on the public from a package breach then is a function of the package contents. For Type A packages normal conditions of transport are assumed; this includes rough handling tests as specified in the DOT regulations (i.e., drop, water, puncture and crush tests). Thus, during normal conditions of transport Type A packages are designed to prevent the loss or dispersal of radioactive material contents, and maintain radiation levels below limits. If a breach occurs under conditions more adverse than the rough handling tests , then a breach finding would not be appropriate unless it can be shown that licensee negligence contributed to the loss of containment. If a breach occurs during transit with equal to or less than the normal conditions of transport and the licensee failed to meet transportation requirements (resulting in the breach), then a breach finding is appropriate.

Type B packages must meet the performance and packaging requirements of Type A, as well as beyond normal conditions of transport. They are designed to withstand hypothetical serious accident conditions with no loss of containment (no breach), as measured by leak-rate testing. These design considerations and criteria are contained in 10 CFR Part 71.73, and include free fall, crush, puncture, fire, and water immersion. Given these rigorous design requirements, any breach of a Type B package in transit (in less than hypothetical accident conditions) is a candidate for a Yellow or Red finding. If the licensee failed to meet the transportation requirements, and this failure contributed to the breach, then a breach finding is appropriate. The significant risk determination after a design basis accident will be determined on a case-by-case basis.

The less-than-or-equal-to Type A shipment branch provides for a graded approach for assessing the level of significance of findings. If a breach in a Type A container occurs as a result of the failure to meet transportation requirements, but no loss of control of the contents is evident, then the finding is Green. An example could be a solidified radwaste liner, inside a Type A package where the closure lid was loose (not tightened down). In this case, given the form of the radioactive contents, loss of control of the material is very unlikely. However, on a similar shipment, failure to properly torque the closure lid bolts (35 ft-lbs versus required 45 ft-lbs) is not a breach, assuming the licensee analysis demonstrates that package integrity would be maintained during the normal conditions of transport.

While power reactor shipping history has demonstrated that serious mishaps are highly unlikely, if a transportation incident occurs with a package breach, then public dose consequences could result. The next two blocks in the Type A branch (assuming a breach) focus on public and occupational doses that occur as a result of the loss of control of package contents. These are actual doses to real individuals, and depending on the level, would lead to either Yellow or Red findings. Note that for a member of the public, the dose would in almost all cases be an estimate. Designated on-scene trained responders (e.g., local county Hazmat emergency team) would be designated occupational workers, subject the occupation dose limits.

The greater-than-Type A branch provides for a Yellow finding, assuming no loss of control of package contents. A Red finding would result if package contents control was lost. An example of a Yellow finding is where a receiving facility finds the incoming shipment (irradiated components) package's drain valve on the package open -- a direct pathway to environment, but no potential for loss of control of materials (assuming normal conditions of transport). A Red finding is appropriate for the same "open valve" scenario if the package contents were spent fuel -- fission product gases released continuously to the environs during the shipment, assuming normal conditions of transport. However, in the event of a transportation accident that led to loss of fuel integrity, public dose consequences could exceed acceptable levels before adequate protective measures could be implemented.

TRANSPORTATION AND PART 61

Low Level Burial Ground Access

Nuclear power plants ship low-level waste (LLW) to licensed LLW burial grounds. These facilities (typically licensed by the host State) have the responsibility and authority to grant access to licensees for disposal of LLW. These LLW burial grounds have specific disposal criteria (aside from DOT/NRC shipping regulations) that licensees must meet (e.g., Waste Characterization, Part 61.56). In the past, some NRC licensees did not meet the acceptance standards of the LLW burial ground, and were issued temporary bans -- the burial ground would not accept LLW from non-compliant licensees for extended time periods. As the receiving party, the LLW burial facilities are required to inspect for certain noncompliances with shipping regulations. Repeated failures to meet these and the disposal grounds requirements can weigh in on the LLW facilities decision to prohibit access to the LLW burial site. While recent NRC licensee performance has been excellent, if a licensee is banned for an extended period of time (typically one month, based on repeated performance failures and shortcomings), the finding is Yellow.

Part 61 Finding

If a licensee ships waste and it is determined that the waste was under-classified, contrary to the requirements of 10 CFR Part 61.55 (e.g., waste classified at Class A, but later found to be Class B), then the finding is White.

TRANSPORTATION AND PART 61

[Draft proposed revisions to this logic branch are in ***bold italics***, 2/15/00]

Failure to Make Notifications or Provide Emergency Information

This branch of the logic diagram focuses on vital communication and information, and notification requirements that must be provided by the licensee. Shippers of hazardous materials are required to provided emergency response information. ***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, with an attendant loss of public confidence.***

These requirements (in 49 CFR Part 172, Subpart G, Section 172.600) apply to any shipment which is required to have shipping papers. Shipments of excepted radioactive material packages (limited quantities, “empty” packages, etc) are not subject to the emergency response information.

NRC regulations (10 CFR 71.97) require advance notification to state governors for shipments of irradiated reactor fuel and nuclear waste under certain conditions. These notifications include quantity and form, and type of shipping container required. Notifications must be made in a

timely manner to all the states hosting the radioactive material shipment. Additionally, 10 CFR 20.1906 requires receivers of certain packages of radioactive materials to perform timely external and surface contamination radiation monitoring upon receipt of the packages. If applicable radiation limits are exceeded, the receiving licensee must then report the event to the appropriate NRC Regional Office.

For Block N1 (10 CFR 71.97 non-compliance), if the licensee fails to make the required notifications before the shipment entered the State's boundary (crossed the State line) for interstate shipments, the finding would be WHITE. For intrastate shipments, if the shipment was
put on public roads/rails before the Governor received the required notification, then a finding would be WHITE. Note that any other timeliness noncompliances (e.g., notification not postmarked at least 7 days before the 7 day shipment period), these findings would be GREEN.

For Block N2 (49 CFR 172.602 non-compliance), if the licensee fails to provide the required emergency response information to the shipment carrier (the shipment leaves the licensee's facility and control without the required information), the finding is WHITE. If the carrier misplaces or loses the material (beyond the licensee's control), the finding is GREEN.

For Block N3 (49 CFR 172.604 non-compliance), 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), the finding is WHITE.

For Block N4 (10 CFR 20. 1906), if the licensee's receipt surveys show 1) the package's external radiation levels in excess of 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 facility fails to make an immediate report, then the finding is WHITE. Other noncompliances are GREEN.

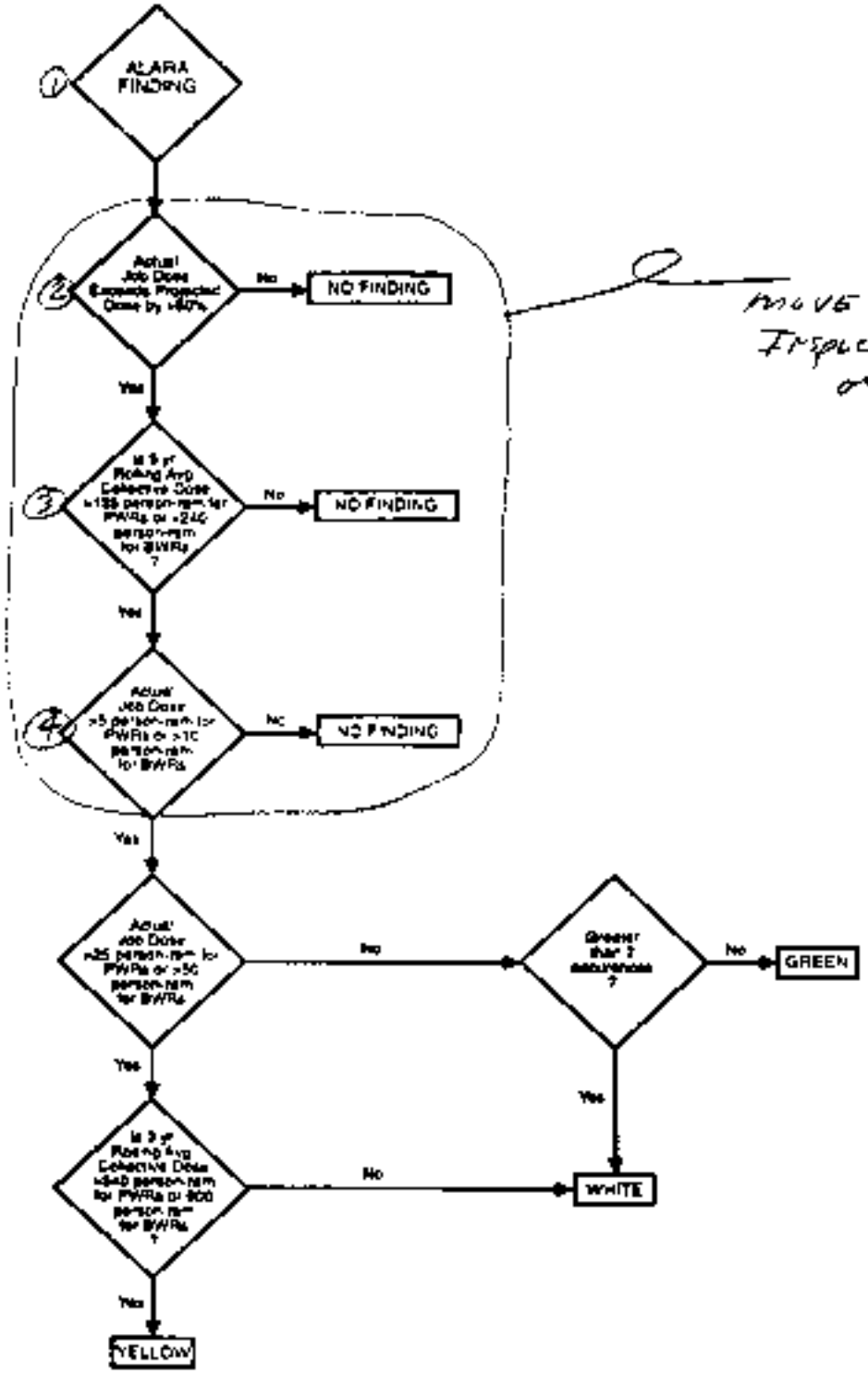
TRANSPORTATION AND PART 61

Certificates of Compliance

<UNDER DEVELOPMENT BY NMSS>

OCCUPATIONAL RADIATION SAFETY (ALARA)

Draft



MOVE TO Inspection Procedure or Manual Chapter

Attachment 3

cc: Mr. Ralph Beedle
Senior Vice President
and Chief Nuclear Officer
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Alex Marion, Director
Programs
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. David Modeen, Director
Engineering
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Anthony Pietrangelo, Director
Licensing
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Jim Davis, Director
Operations
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Nicholas J. Liparulo, Manager
Nuclear Safety and Regulatory Activities
Nuclear and Advanced Technology Division
Westinghouse Electric Corporation
P.O. Box 355
Pittsburgh, Pennsylvania 15230

Ms. Lynnette Hendricks, Director
Plant Support
Nuclear Energy Institute
Suite 400
1776 I Street, NW
Washington, DC 20006-3708

Mr. Charles B. Brinkman, Director
Washington Operations
ABB-Combustion Engineering, Inc.
12300 Twinbrook Parkway, Suite 330
Rockville, Maryland 20852

Mr. Robert R. Campbell, President
Nuclear HVAC Utilities Group
Tennessee Valley Authority
1101 Market Street, LP4J-C
Chattanooga, TN 37402-2801

Mr. Dennis Adams
Nuclear HVAC Utilities Group
ComEd
1400 Opus Place
Downers Grove, IL 60515