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ACCESSION NBR:9507280123 DOC.DATE: 95/07/20 NOTARIZED: NO DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
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Document Control Branch (Document Control Desk)

SUBJECT: Responds to NRC ltr re violations noted in insp rept 50-397/95-16 on 950522-25.Corrective actions:documented surveys of dose rates around barrel performed & series of meetings held & mock-up training conducted.

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July 20, 1995
GO2-95-137
Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NO. NPF-21**
NRC INSPECTION REPORT 95-16
RESPONSE TO APPARENT VIOLATIONS

The purpose of this letter is to provide a response to the apparent violations contained in Nuclear Regulatory Commission (NRC) Inspection Report 95-16. Inspection Report 95-16 documents an inspection of radiation protection program activities conducted at Washington Nuclear Plant No. 2 (WNP-2) during the period May 22-25, 1995. Based on the results of the inspection, two apparent violations were identified pertaining to health physics oversight and instructions to radiation workers. In addition, the report identified one apparent non-cited violation pertaining to dosimetry problems, and one concern associated with the specific radiation work permit program. Our response consists of this letter and Appendices A and B.

In Appendix A, each apparent violation is addressed with an explanation of our position pertaining to validity, root cause, corrective actions, and significance and mitigating circumstances. Areas of the report where the Supply System feels that clarification would be beneficial is included in Appendix B.

The Supply System reaffirms its commitment to continue improvements in our Radiation Protection Program. The inspection by Messrs. Murray and Shannon provided a beneficial focus to enable the Supply System to make further program enhancements. In addition, we will continue to monitor our performance in this area and make adjustments where necessary.

Should you have any questions or require additional information, please contact either myself or Paul R. Bemis at (509) 377-4027.

Sincerely,

for J.V. Parrish (Mail Drop 1023)
Vice President, Nuclear Operations

MNH/slb
Attachments 280040

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APPENDIX A

I. EXECUTIVE SUMMARY

During a regularly scheduled NRC inspection of Health Physics activities conducted May 22 through May 25, 1995, two apparent violations of NRC requirements were identified. The apparent violations involved the failure to:

A. Maintain continuous health physics oversight of work activities in a high radiation area; and

B. Provide proper instructions to radiation workers.

While we do not agree with all of the concerns mentioned in the Inspection Report, our assessment concurs with your conclusion that Technical Specifications 6.8 and 6.12 were violated. Our discussion identifies the root cause for each event, its corrective actions, its significance and the relevant mitigating circumstances.

The two apparent violations arise from a single evolution involving the removal of twenty-two radioactive filters generated as a result of the chemical decontamination of the Reactor Water Cleanup (hereafter "RWCU") System and their transport to the radioactive waste processing area. During our review of this matter, a third event which occurred during this evolution was identified which constitutes a violation of Technical Specification 6.8. The third event relates to the failure to stop work at a radiological hold point. This event is discussed in connection with the second apparent violation.

The first apparent violation relates to the failure to provide continuous health physics coverage for workers in a high high radiation area during the transportation of the filters for interim on-site storage prior to shipment for disposal. This loss of coverage occurred when the two laborers transporting the filters entered an airlock without the Health Physics (hereafter "HP") Technician who had been providing continuous health physics coverage up to that point.

The Supply System acknowledges that the loss of continuous health physics coverage constitutes a failure to properly adhere to Technical Specification 6.12. There are, however, several factors that reduce the significance of this matter:

A. Continuous health physics coverage was lost for between four and six minutes;

B. Shortly after health physics coverage was unavailable, the laborers acted properly and in accordance with their training by foregoing attempts at righting the barrel and promptly removing themselves from the immediate exposure area until coverage could be reestablished; and

C. The total dose received by the two laborers during the transport of the filters was 97 and 101 mrem. This was consistent with the doses expected for the task (i.e., 100 mrem).

The second apparent violation relates to a failure to fully inform workers of the radiological conditions associated with the removal of the chemical decontamination filters. The Supply System acknowledges that it failed to provide all appropriate radiological information to workers relating to the RWCU chemical decontamination filter removal (hereafter "Filter Removal") evolution. The failure to provide radiological information constitutes a violation of Technical Specification 6.8.1.a as implemented by various sections of our Plant Procedures Manual (hereafter "PPM"). There are, however, several factors that reduce the significance of this matter:

A. Although management's expectation is for the Radiation Work Permit (hereafter "RWP") to be changed, the Lead HP Technician (hereafter "Lead HP") responsible for this evolution was aware of and verbally informed the involved workers before work began that radiological conditions would be other than those listed in the RWP;

B. The Lead HP reset the workers' alarming dosimeter set points to reflect expected radiological conditions;

C. The Lead HP provided continuous health physics coverage over the activities within the work area with a radiation dose rate monitoring device to ensure the involved workers' exposure did not significantly exceed the expected dose;

D. A separate HP Technician was present during the filter change-out evolution and dismissed one of the workers from further activities as a result of the dose received by that worker; and

E. The doses received, although higher than the alarm set points, were monitored and controlled throughout the evolution except during the time continuous coverage was lost.

The loss of continuous health physics coverage and the failure to provide complete radiological information to the workers are events which are not consistent with management's expectations. While these failures are of concern to Supply System management, given the mitigating circumstances, they did not represent an opportunity for a significant unplanned exposure. Further, prompt and comprehensive corrective actions have been implemented to assure that similar events will not reoccur.

II. SUMMARY OF FACTS

The Supply System generally agrees with the factual summary of the events contained in the NRC's Inspection Report. As requested in your June 21, 1995, letter specific areas of clarification or correction are noted in Appendix B.

Radiation Work Permit 9500076 (hereafter "RWP") was initiated on April 28, 1995. The RWP incorporated Work Order TW9801 (hereafter "Work Order") which had been written to perform chemical decontamination of the RWCU System during the 1995 refueling outage (hereafter "R-10"). The Work Order had been divided into several ALARA tasks. Each task had a separate dose estimate and all tasks were assigned to the RWP. Task TW9801 05 (hereafter "Task 05") had been written for changing the spent chemical decontamination filters and transporting the filters to Radioactive Waste for temporary storage. Task 05 had also been initiated on April 28, 1995. No specific time for the chemical decontamination task had been established; however, due to ALARA considerations, radioactive waste shipping requirements, and filter efficiency considerations, the filters were to be removed when the contact dose rate on the filter housing reached 10 rem/hr. A separate ALARA task was not written to govern the transport of the filters following removal from the filter housing.

In anticipation of the Filter Removal and transfer efforts RWCU Filter Removal was scheduled for the day shift on May 13, 1995. Following removal, the spent filters were to be temporarily stored in the 471 foot elevation Reactor Building Valve Room. Two transfer containers were prepared by wrapping lead shielding around 55-gallon drums and placing the drums on carts. The carts had two fixed wheels and two swivel type wheels. The carts were controlled by a removable handle which was placed over the fixed wheels. The carts were delivered to the 471 foot elevation of the Reactor Building and staged near the decontamination skid. A second layer of lead shielding was added to the drums after the carts were staged near the skid.

On May 13, 1995, at approximately 0900, the Reactor Building Coordinator reported that the Valve Room might be unsuitable for temporary storage due to operational needs. The unavailability of the Valve Room was confirmed at approximately 1600. The 437 foot elevation of the Radioactive Waste Building was selected as the most appropriate alternate temporary storage location.

On May 13, 1995, at approximately 1730, the RWCU Filter Removal task was turned over to the night shift for completion. It is not unusual for tasks not completed during the day shift to be turned over to the following shift for completion. At approximately 0330 on May 14, 1995, a pre-job briefing was conducted by the night shift Lead HP assigned to the chemical decontamination task. The Lead HP had participated in filter removal activities during R-7 (1992) that were similar to the R-10 Filter Removal. The pre-job briefing was attended by four

laborers, a Shift Radioactive Waste Supervisor and one other HP Technician. Another HP Technician and a VECTRA (contractor) Chemist were briefed separately.

The pre-job briefing addressed the transfer route, actions to be taken if individual bags of filters exceeded the 50 rem/hr at contact hold point (the expected filter contact dose rates were 40-60 rem/hr), and how bags were to be packaged. The need to have Security present at the airlock to assist in the transfer through the airlock was discussed but determined not to be necessary due to the workers' previous use of the transport path.

Interviews with the Lead HP and the laborers involved in the barrel transport confirmed that the transfer route was discussed but no walk-down of that route occurred. The laborers involved in the transport indicated that the proposed route was commonly used for radioactive waste transfers. The laborers further indicated that they were familiar with the airlock and the uneven surfaces associated with entering and exiting the airlock. The route was not however, commonly used for transfers of highly radioactive or heavily weighted material.

Before initiating Filter Removal, the Main Control Room provided public address (hereafter "PA") notification that a high radiation transfer would take place and warned workers to stay clear of the affected areas. The involved workers and their respective stations prior to the commencement of work was as follows:

A. Inside the RWCU decontamination skid area --

- Lead HP and the Vectra Chemist.

B. Immediately outside the RWCU decontamination skid area --

- One HP Technician, one laborer.

C. Outside the RWCU decontamination skid area behind lead shielding --

- Two transport laborers and one HP Technician.

D. Southwest elevator door on the 471 Reactor Building foot elevation --

- One laborer.

E. Elevator door on the 441 foot elevation of the Radioactive Waste Building --

- One laborer.

F. Northeast Elevator --

- Decontamination Test Coordinator, RWCU Oversight Manager, and the Reactor Building Coordinator (to prevent unauthorized access).

During interviews, the Lead HP indicated a pre-task awareness that actual radiological conditions during Filter Removal would be greater than those stated in the RWP. The Lead HP's understanding of the radiological conditions was based upon the Lead HP's knowledge of the R-7 filter decontamination and transfer, and information within Radiological Surveys 5-1138-95 and 5-1148-95, dated May 13, 1995.

Based upon the radiological information known to the Lead HP, the Lead HP changed the electronic dosimetry alarm set points for the Lead HP and the others involved in the filter removal operation. Specifically, the Lead HP's revised electronic dosimetry alarm set points were 5,000 mrem/hr dose rate and 150 mrem accumulated dose. The VECTRA Chemist's alarm set points were revised to 5,000 mrem/hr dose rate and 300 mrem accumulated dose. Finally, the alarm set point for the one laborer scheduled to support the Filter Removal was revised to 4,000 mrem/hr dose rate and 200 mrem accumulated dose. The electronic dosimetry alarm set point for the laborers responsible for transporting the packaged barrel were set in accordance with the limits contained in the RWP (1,000 mrem/hr dose rate and 100 mrem accumulated dose).

As indicated above, the Lead HP specifically briefed the VECTRA Chemist and the laborer supporting the filter removal on the expected dose rates. These workers were also told that their alarm set points had been raised and that further review of the set point would occur if their alarms sounded.

The Lead HP clearly recognized the inadequacy of the RWP and took action to adjust the electronic dosimetry alarms to be consistent with the expected radiological conditions. The revisions made by the Lead HP were not consistent with best industry practice. Further, the Lead HP failed to correct the RWP to ensure that it reflected actual radiological conditions. Some reasonable latitude to adjust electronic dosimetry is appropriate, however, current station policy does not establish bounds on the use of such judgement by a HP Technician in the field. The failure to revise the RWP was not consistent with management expectations.

Filter Removal began at approximately 0445 on May 14. The Lead HP provided continuous health physics coverage inside the area where the filter change would occur. A separate HP Technician provided coverage outside the contaminated area, and a third HP Technician was standing by to provide continuous health physics coverage for the two laborers during filter transport. The VECTRA Chemist removed the filters and placed them in plastic bags inside the transfer container. A laborer outside the RWCU decontamination skid area closed the bags.

During Filter Removal and bagging, the electronic dosimeters of the VECTRA Chemist and the laborer closing the filters in the plastic bags entered the high dose rate alarm mode and then the accumulated dose alarm mode. The HP Technician outside the RWCU decontamination skid area instructed the laborer to leave the area. The laborer had received 406 mrem with an alarm set point of 200 mrem. The difference between the alarm set point and the dose received should have prompted the Lead HP to stop work. The failure to stop work did not meet management expectations.

Contact dose rates of 50 rem/hr on one bag and 80 rem/hr on another were measured prior to preparing the filters for transport. Despite reaching the hold (stop work) point, the VECTRA Chemist was allowed to complete the filter removal. The failure to stop work when the hold point was reached constitutes a violation of Technical Specification 6.8.1.a. This violation was not identified in Inspection Report 95-16. The Lead HP's decision to allow the worker to complete the task was inconsistent with management expectations.

The drum lid was placed on top of the bagged filters but could not be secured to the barrel due to absorbent material which had been placed in the bottom of the barrel to collect moisture in case the bag was torn during loading. The bagged filters protruded approximately 1 to 2 inches above the lip of the barrel. In order to assure adequate shielding during transport, six lead blankets were placed over the barrel lid.

With the shielding completed, transport of the container began. The two laborers responsible for the transport were stationed one in front and one behind the cart. Interviews with these individuals noted that their dose rate alarms would sound periodically depending upon their proximity to the barrel during transport. Except for the time when continuous health physics coverage was lost, the dose rate alarm was monitored by an HP Technician who allowed the barrel transportation work to continue.

The transport route was from the Filter Removal area to the elevator being held at the 471 foot elevation. The elevator was set to take the cart from the 471 foot elevation to the 441 foot elevation. The cart was placed on the elevator and sent to the 441 foot elevation of the Reactor Building. The two laborers that were pushing the cart and the HP Technician went down the stairs and met the elevator on the 441 foot elevation.

The laborers rolled the cart from the elevator into the airlock. The HP Technician escort did not accompany the laborers into the airlock. As the laborers attempted to exit the airlock, the swiveling front wheels on the cart struck the sill of the outside doorway. The cart tipped up and the drum containing the filters slid forward off the cart. The laborers briefly and unsuccessfully attempted to set the drum upright. The laborers exited the area when one of the laborers accumulated dose alarm began to sound and called the Main Control Room for assistance. In response to the laborers call for assistance, the Main Control Room made a public address

announcement that a man was down in the airlock. (This announcement was subsequently corrected to indicate that a high radiation source had tipped over.)

The HP Technician escort initially waited for an opportunity to follow the barrel through the airlock. Following a short wait, the HP Technician escort went up the Reactor Building southwest stairway to the 471 foot elevation, across to the 471 elevation northwest stairway and proceeded back down to the 441 foot elevation hallway between the alternate and primary access points. While taking this alternate route, (timed during the preparation of this response at roughly three minutes) the HP Technician heard the man down PA announcement. The HP Technician escort met the laborers outside the 441 foot elevation airlock where the drum had fallen off the cart and secured the area while a recovery plan was formulated. A series of meetings were held and mock-up training was conducted prior to righting the barrel and completing the transfer to the Radioactive Waste Building. By 1100 on May 14, the transfer of the drum in accordance with the recovery plan was complete.

Interviews with the laborers involved in the barrel transport indicate that the ramps available in the airlock would not have facilitated the barrel transport through the airlock. The exit portion of the airlock sill slopes out. The ramps that were available would have created a gap between the ramp and interior airlock sill. Previous radioactive waste transfers were of a configuration which permitted the cart to be lifted over the sill. As noted earlier, the cart used swivel type wheels which were in the front of the cart. Given the weight of the barrel and the size of the cart, the cart should have had the fixed wheels in the front of the cart. Had the transport path been mocked up and walked down prior to the start of work, the need for arrangements at the airlock would have been identified, provided for, and covered during the pre-job briefing.

Interviews with the Lead HP and other involved workers indicate that the workers were not informed during the pre-job brief of actions or precautions to take in the event of a mishap. However, workers are informed during General Employee Training of the proper response to electronic dosimeter alarms when Health Physics is not present. The Supply System notes that the involved workers responded in an appropriate fashion when the barrel tipped over.

Giving credit for the timed walk down, and allowing the HP Technician one minute to realize that he could not pass through the airlock, continuous health physics coverage of the evolution had been lost for between four and six minutes. The HP Technician involved in this event was a temporary contract employee and the laborers were regular Supply System employees. The workers' actions did not conform to management's expectations with regard to assuring continuous health physics coverage.

III. DISCUSSION

A. APPARENT VIOLATION NO. 1:

FAILURE TO MAINTAIN CONTINUOUS HEALTH PHYSICS OVERSIGHT OF WORK ACTIVITIES IN A HIGH RADIATION AREA.

NRC FINDINGS:

(a) The laborers in the airlock area were not provided a radiation monitoring device which continuously indicates the radiation dose [rate].

(b) The dose rates in the airlock area after the barrel tipped over were not known.

(c) Continuous health physics coverage was not provided.

SUPPLY SYSTEM ASSESSMENT

The filter transport constituted either a high radiation area or a high high radiation area as those terms are used in Technical Specification 6.12. The Technical Specification allows one of three alternate methods to be utilized when work is conducted within a high or high high radiation area. As explicitly stated in the RWP, compliance with the Technical Specification would be achieved through the use of continuous health physics coverage. The RWP did not contemplate alternate compliance measures, such as those permitted by subsections (a) or (b). The NRC Inspection Report suggests, however, that subsections (a) and (b) of the Technical Specification were violated during this evolution. The Supply System agrees that Technical Specification 6.12.1 was violated when the two laborers were in the airlock physically separated from the HP Technician providing continuous health physics coverage.

ROOT CAUSE

The involved workers were aware of the continuous health physics coverage requirement. The spur of the moment decision of the HP Technician to separate from the workers at the airlock was an error in judgement that was not consistent with management expectations or station practice with regard to other radioactive material transfers through this airlock. The failure to plan the implementation of the transfer process caused the lack of continuous health physics coverage in this instance.

The planning that occurred in support of the initial destination was not replicated when the destination was changed to the Radioactive Waste Building on the 437 foot elevation. A walk-

down of the newly proposed route, with or without a mock-up of the cart and barrel was not conducted. Had this occurred, the difficulties encountered in the airlock likely would have been identified so that appropriate action could have been taken to avoid the mishap.

Contributing causes are the failure to have policies or procedures in place to ensure effective planning for radioactive material transfers, the absence instructions relating to cart use, and the failure of the involved workers to exercise a questioning attitude and perform self-checking.

SAFETY SIGNIFICANCE

There was minimal actual safety significance associated with this event. The dose received by the two laborers was 97 and 101 mrem which was within the estimated dose for the task. In addition, after the barrel tipped over and one laborer's accumulated dose alarm sounded, the laborers recognized that they should forego an attempt to right the barrel and promptly exit the area. Further, continuous health physics coverage was lost for between four and six minutes and immediate follow-up action to secure the area effectively prevented unplanned exposure to other workers. Even though continuous health physics coverage was lost for a short period of time, we believe that the use of audible electronic dosimetry and the training received by all Supply System radiation workers combined to minimize any real opportunity for an unplanned exposure.

Despite the minimal safety significance, management expectations were not implemented in the planning for this evolution. Our internal planning process as reflected in the RWP did not establish a checkpoint sufficient to assure that continuous health physics control was maintained during filter transport. While interviews disclosed worker knowledge and awareness of the continuous coverage requirement, the workers failed to exercise an appropriate questioning attitude during task performance to assure continuous health physics coverage.

B. APPARENT VIOLATION NO. 2:

FAILURE TO PROVIDE PROPER INSTRUCTIONS TO RADIATION WORKERS.

The following block paragraphs are paraphrased from the text on page 11 of NRC IR 50-397/95-16. Each finding was offered in support of the NRC's conclusion that an apparent Technical Specification violation occurred. Findings 'a' and 'b' relate to the Filter Removal and packaging portion of the event. Findings 'b' through 'e' relate to the failure to provide information to the workers responsible for conducting the transport of the packaged barrel. Following a discussion of each finding, an assessment of root cause and safety significance is presented.

NRC FINDINGS:

(a) The actual radiological conditions in the area prior to the task being started were not included on the radiation work permit.

(b) Additional radiological requirements, instructions or precautions such as the securing of the barrel to the cart and the expected dose rate from the filters were not identified on the radiation work permit.

(c) A documented ALARA pre-job briefing in the Total Exposure System was not performed pertaining to the changing and transport of the chemical decontamination filters.

(d) A walk-down of the travel route was not performed by the individuals assigned the task of transporting the barrel to identify potential problem areas that might be encountered.

(e) Workers were not instructed in the appropriate response to warnings made in the event of any unusual occurrence that may involve exposure to radiation.

SUPPLY SYSTEM ASSESSMENT

(a) The actual radiological conditions in the area prior to the task being started were not included on the radiation work permit.

The NRC reviewed two radiological surveys (5-1138-95 and 5-1148-95) dated May 13, 1995. The surveys were taken at different times and read as follows:

5-1138-95 (0220 hours)		5-1148-95 (1330 hours)
13,000 mrem/hr	Contact	10,000 mrem/hr
2,800 mrem/hr	General Area	1,600 mrem/hr

The general area radiation levels noted on the RWP were 20 to 500 mrem/hr. The RWP indicated that the general area levels had last been updated on May 13, 1995; however, neither of the surveys mentioned above were referenced in the RWP and the RWP did not cross reference the source of the updated general rates.

The Supply System relied on historical data for an estimate of radiological conditions to write the RWP. Based on the historical data, electronic dosimetry alarm set points were identified in

the RWP. Those limits for all workers were 1000 mrem/hr dose rate and 100 mrem accumulated dose. The survey data referenced above should have been used to define the actual radiological conditions for the RWCU Filter Removal Task 05 but it was not incorporated into the RWP during day shift on May 13, 1995.

A second opportunity to remedy the situation occurred when the task was turned over to the Lead HP at approximately 1730 on May 13. The Lead HP discovered that the RWP did not reflect actual radiological conditions at or about the time the pre-job briefing was conducted, or approximately 0330 on May 14. The Lead HP, however, did not revise the RWP to take into account the expected radiological conditions.

The failure to include the actual radiological conditions expected prior to and during Filter Removal and transport on the RWP was a violation of Technical Specification 6.8.1.a.

(b) Additional radiological requirements, instructions or precautions such as the securing of the barrel to the cart and the expected dose rate from the filters were not identified on the radiation work permit.

Consistent with management expectations, a pre-job briefing was conducted by the Lead HP. As noted in the factual portion of this response, the Lead HP discussed with the workers the fact that the filters contact dose rates were between 40-60 rem/hr. Other items discussed during the pre-job briefing included the transfer route, actions to be taken if individual bags of filters exceeded the 50 rem/hr hold point and how bags were to be packaged. The need to have Security present at the airlock and the weight of the shielded drum were topics also discussed.

However, as noted in 'a' above, the RWP did not accurately describe the actual radiological conditions that would affect the work environment once the filters were removed from the RWCU chemical decontamination filter housing. The Supply System believes this violation is appropriately included within section 'a'.

The failure to stop work at the 50 rem/hr hold point is considered a violation of Technical Specification 6.8.1.a. Even though the Lead HP informed the workers of the hold point, the Lead HP allowed work to continue after that hold point was reached. The Lead HP's decision to allow work to continue was based on the fact that twenty of the twenty-two filters had been removed from the filter housing. Stopping work at this point could have resulted in greater total exposure when the work was completed later. The shielded barrel dose rates were below the hold point (20 rem/hr on contact) and the step off area was in close proximity to the packaged barrel. Despite this rationale, Supply System management expects workers to observe radiological hold points. At the very least work should have been stopped prior to transporting the barrel.

As a final note, the Supply System has concluded that securing the barrel to the cart would not have avoided the tipping of the barrel. Due to the size of the cart, the weight of the barrel, and the location of the swivel wheels in the front of the cart, it is likely that both the barrel and the cart would have been up-ended. However, we concur that the planning process should have included consideration of securing the barrel to the cart. The Supply System concluded that either an acceptable ramp or a properly configured transfer cart was needed.

(c) *A documented ALARA pre-job briefing in the Total Exposure System was not performed pertaining to the changing and transport of the chemical decontamination filters.*

An ALARA pre-job briefing was required for the removal and transportation of the chemical decontamination filters. The names of the individuals who participated in the pre-job briefing were recorded in the Total Exposure System. Some briefing topics were located within TES, and other topics that should have been in TES were located in the HP Logbook. The failure to document all the ALARA pre-job briefing topics in TES was inconsistent with our procedures and did not meet management's expectations.

(d) *A walk-down of the travel route was not performed by the individuals assigned the task of transporting the barrel to identify potential problem areas that might be encountered.*

The individuals involved in transporting the barrel did not conduct a walk-down of the travel route. The laborers involved in the transport indicated that the proposed route was commonly used for radioactive waste transfers. The laborers further indicated that they were familiar with the airlock and the surfaces associated with entering and exiting the airlock. The laborer's previous use of the transfer route, however, did not involve transfers of highly radioactive material in the configuration involved in this task. The failure to conduct a walk-down of the proposed route with the configuration of the transfer cask in mind contributed to the loss of continuous health physics coverage and did not meet management's expectations.

(e) *Workers were not instructed in the appropriate response to warnings made in the event of any unusual occurrence that may involve exposure to radiation.*

Interviews with the Lead HP and other workers involved indicate that the workers were not specifically informed during the pre-job briefing of actions or precautions to take in the event of a mishap. Workers are informed during General Employee Training of the proper responsive actions to employ during a radiological events, industrial accidents and similar occurrences. The Supply System notes that the involved workers responded consistent with their training when the barrel tipped over and one worker's accumulated dose rate alarm sounded.

ROOT CAUSE

The RWCU decontamination Filter Removal was not planned at the task level. As a result, the RWP was performing more as an administrative tool to move work orders from one status (i.e., planning) to another (ready for work) than as a vehicle to inform workers of radiological conditions for a specific task.

The HP Technician that assigned Task 05 to the RWP did not ensure that the radiological conditions in the RWP reflected the actual task to be performed. An opportunity to correct this failure was missed by the Lead HP when the Lead HP recognized that recent survey data had not been incorporated into the RWP. Upon reviewing the RWP and noting that the RWP did not reflect actual radiological conditions, the Lead HP should have gone beyond changing the electronic alarm set points and taken appropriate action to update the RWP.

The perception that the task should be completed prior to shift turnover was a contributing factor to the failure to properly plan the evolution in advance of starting work. The Lead HP's previous association with this work during the R-7 refueling outage, and the routine nature of radioactive material transfers, led the workers to push toward completion of the task without giving appropriate regard to the need for planning.

Because the violations resulted from a single evolution, the root cause also is that planning for removing the filters was less than adequate. A contributing cause is the failure to utilize a questioning attitude during the evolution by the involved workers.

SAFETY SIGNIFICANCE

The safety significance of the circumstances associated with the barrel transport is discussed in the section dealing with the first apparent violation. There was minimal actual safety significance associated with this event. The dose received by the Lead HP was 180 mrem. The dose received by the VECTRA Chemist was 341 mrem. The dose received by the laborer was 406 mrem. The doses received, although higher than the alarm set points, were monitored and controlled throughout the evolution. The laborer's exposure, while markedly in excess of the expected dose resulted in his removal from further work activities. The presence of continuous health physics coverage with one short exception provided assurance that an unplanned exposure would not occur.

C. CORRECTIVE ACTIONS

1. Immediate Corrective Actions:

After the laborers cleared the area, work was stopped. Documented surveys of dose rates around the barrel were performed.

A series of meetings were held and mock-up training was conducted prior to righting the barrel and completing the transfer to the Radioactive Waste Building.

The Radiation Protection Manager (RPM) has directed that non-routine high radiation area entries greater than 50 mrem per task are required to utilize the additional exposure controls contained in Attachment 3 of PPM 11.2.2.5. (ALARA Job Planning and Reviews). A significant feature of Attachment 3 is the Person in Charge (PIC) concept which, among other matters, identifies the person responsible for tracking job status against anticipated exposure.

Previously any qualified HP Technician could initiate an RWP. To improve RWP consistency and quality, we have now identified eight specific individuals to write RWPs. In addition, these individuals have been directed to write more task specific RWPs. Task specific RWPs provide additional assurance that planning is appropriate for tasks assigned to the RWP.

Health Physics management has completed an assessment of the RWP program and has obtained approval to implement identified program improvements. The main thrust of the improvements is to hold task specific RWP's in inactive status until work is ready to be performed. Health physics supervision will ensure radiological data reflects actual conditions and the RWP is applicable to the task to be performed prior to activation.

The RPM held a series of meetings to emphasize the significance of the event with Health Physics and Laborer staff. The RPM specifically emphasized management's expectation for the conduct of work. The RPM discussed the barriers contained in the root cause analysis. Barriers were identified as opportunities to avoid mistakes and direction was given to utilize the barriers to stop work and obtain additional data prior to exceeding established barriers.

The RPM issued an Inter-Office Memorandum to all Health Physics personnel reemphasizing management's expectations with regard to:

(1) Procedural compliance.

(2) RWP compliance.

(3) Stop work authority and personal responsibility to stop work where the job proceeds in a manner not described in the pre-job briefing or where the task is not in procedural compliance.

In accordance with Supply System policy, appropriate disciplinary action has been taken with the individuals involved in this evolution.

2. Planned Corrective Actions:

For non-routine high radiation area entries Health Physics supervisory approval will be required prior to adding tasks to an active RWP. Actions to implement this corrective action have begun and are ongoing.

Revise procedures to reflect immediate corrective actions. Affected procedures include PPM 11.2.2.5 (ALARA Job Planning and Reviews), 11.2.9.31 (Operation of the MG DMC-100 Electronic Dosimeter), and 1.11.8 (Radiation Work Permits). This action will be completed by September 30, 1995.

Develop and provide ALARA pre-job briefing training for Plant staff including Health Physics personnel. This training will increase involvement of work group supervision in the pre-job briefing process which will enable affected personnel to discharge their ownership responsibility including managing the work and dose control. This action will be completed by the first quarter of 1996.

A generic high radiation material transfer instruction will be developed for all transfers of highly radioactive material at WNP-2. A Training task for HP Technicians will be developed to generate high radiation transfer plans by October 31, 1995. Preparation of transfer plans will be limited to appropriately trained individuals to ensure consistency and quality. This action will be completed by August 30, 1995.

HP Technician training tasks for writing RWP's will be reviewed and revised if required by December 31, 1995.

Training will be changed, if required, to incorporate into initial and continuing HP Technician training any new management controls deemed necessary to guide the exercise of HP Technician judgement in the field by October 31, 1995.

The work management team concept will be assessed for incorporation into ALARA planning. This assessment will be completed by August 31, 1995.

Instructions on the best use of transfer carts will be provided to appropriate station personnel by August 31, 1995.

This incident will be included in the fourth quarter industry events training for laborers, HP Technicians, mechanics, engineering, and those individuals qualified to serve as PIC's. This will be completed by December 31, 1995.

D. CONCLUSION

The Supply System takes this matter very seriously. We are mindful that every violation can have regulatory significance beyond the actual consequences associated with the event. We believe in this instance, however, that the violations are not indicative of our overall Radiation Protection Program and further that there was limited opportunity for an unplanned exposure.

In addition, we note that the violations had minimal actual safety or health significance with regard to the involved workers. The violations had no actual consequence or implication with regard to public health or safety. The violations had no actual consequence or implication with regard to the environment.

During the filter transport one laborer exceeded his electronic dosimeter accumulated dose alarm set point by 1 mrem. Both laborers properly exited the area after the barrel slid off the cart. The area was subsequently secured by health physics personnel. The Supply System is confident that other radiation workers would have similarly fulfilled management's expectations by exiting the area under similar circumstances.

Finally, as detailed above, our approach to developing immediate and long-term corrective actions reflects a comprehensive systematic approach to assuring similar events will not occur. The lack of an appropriate questioning attitude and the failure to self-check are addressed through the procedural revisions planned and implemented in addition to management oversight.

The NRC has recognized the radiological challenges that the Supply System faces and has commented that the Radiation Protection Program has been improving during the last two years. While continued attention to improvement is required, our improving trend reflects management's expectation that the Supply System should meet or set the standard for the best nuclear industry Health Physics standards. We believe the corrective actions planned and implemented as a result of this occurrence will bring us closer to achieving these expectations.

APPENDIX B

FACTUAL CLARIFICATIONS

This appendix reflects those areas of Inspection Report 95-16 where the Supply System believes that clarification would be beneficial.

1. Page 7, first paragraph, states: "Dosimetry requirements were also changed to include finger dosimetry as was the type of health physics coverage (continuous coverage was added)."

   Supply System comment: RWP 95000076 was initiated on April 28, 1995, and WOT TW9801 05 filter change-out was also assigned on April 28. Three revisions to the RWP were made during the course of the work. Revision 02 was written on May 13, 1995, to require finger rings for the filter change. Special task level instruction for filter change were also added on this date.

   Continuous health physics coverage had been specified on the RWP since its initiation on April 28, 1995.

2. Page 7, third paragraph, states: "The licensee's HP Technician informed the inspectors that the alarm set points on the electronic dosimetry were set at 1000 mrem dose rate and 100 mrem dose accumulated for all workers involved in the task, except for the contractor RWCU individual pulling the filters which was set at 3000 mrem dose rate and 300 dose accumulated."

   Supply System comment: The electronic dosimeter dose rate alarm set point for the contractor RWCU individual pulling the filters was set at 5000 mrem/hr.

3. Page 8, second paragraph, states: "The task involved placing approximately 22 filters in two plastic bags, that due to the filter's length (30 inches) and the absorbent material in the bottom of the 55-gallon barrel, did not fit in the barrel completely (the filters were about 6 inches above the lip of the barrel) which precluded a lid from being placed on top."

   Supply System comment: The filters were about one or two inches above the lip of the 55-gallon barrel.

4. Page 8, second paragraph, states: "A lead blanket was placed on top of the filters to reduce the dose rate."

   Supply System comment: Six lead blankets were placed on top of the filters to reduce the dose rate.

5. Page 8, fourth paragraph, states: "As the laborer pushed the cart towards the outer airlock door, the cart stopped when the wheels hit the 4-inch inner lip of the airlock and the barrel containing two bags of highly radioactive (80 rem/hr) filters tipped over."

   Supply System comment: The height of the inner lip of the airlock is 1-3/8 inches.

6. Page 9, last block paragraph states: "1.455 mrem was expended during this task."

   Supply System comment: 1.455 person-rem was expended for task TW9801 05. Within this total is .316 person-rem to upright the barrel and complete the transport on the next shift.

7. Page 10, last block paragraph states: "These particular laborers made the decision to leave the airlock when the barrel tipped over; however, the same decision may not have been made by other less experienced laborers."

   Supply System comment: There is no empirical evidence supporting this comment. The workers made the correct and appropriate decision to leave the area when one of the workers accumulated dose alarm sounded.

   We believe that the Supply System's training programs, and task specific briefings, provide assurance that any similarly situated radiation worker would have made the same appropriate decision to leave the area.