U. S. NUCLEAR REGULATORY COMMISSION

REGION III

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Licensee:	AlliedSignal, Inc.
Facility:	Metropolis Works
Location:	P.O. Box 430 Metropolis, IL 62960
Dates:	October 21-25, 1996
Inspectors:	J. Jacobson, Fuel Facility Inspector R. Krsek, Fuel Facility Inspector
Approved by:	G. Shear, Chief, Fuel Cycle Branch Division of Nuclear Materials Safety

EXECUTIVE SUMMARY

AlliedSignal, Inc., Metropolis Works
NRC Inspection Report 040-03392/96005(DNMS)

This inspection involved review and observation of selected aspects of licensee operations, maintenance and surveillance, and radiation protection programs.

Operations Review (IP 88020)

- Operations observed by the inspectors were conducted in accordance with applicable written procedures. The inspectors were concerned, however, that laboratory technicians performing UF_6 sampling in the Feeds Material Building (FMB) were not utilizing copies of the current procedure (job safety analysis).

Maintenance and Surveillance Activities (IP 88025)

- The licensee's preventive maintenance program conformed with the requirements specified in the license. A maintenance procedure review periodicity was not specified in the licensee's Procedure Control Policy. As a result, the procedure controlling inspection of the UF_6 cylinder crane had not been reviewed or revised since 1972.

- Preventive maintenance and equipment inspection activities were performed for items on the Critical Equipment List as specified under the plant reliability program. The licensee had an effort underway to improve the quality of the Critical Equipment List to ensure all equipment relied upon for safety was included.

- Tracking required inspections and preventive maintenance was difficult because not all of the records were readily available and the licensee's tracking list was not current.

- Poor material condition resulted in an increase in spills and airborne radioactivity concentrations and an increase in minor uptakes of uranium by licensee personnel.

Radiation Protection (IP 83822)

- The licensee's As Low As Is Reasonably Achievable (ALARA) program identified a significant trend of increased airborne uranium concentration levels due to an expanded number of process leaks. Management acted to identify and track repair of the leaks. A corresponding reduction in airborne concentration levels, respirator use, and minor uptakes by workers was noted.

PARTIAL LIST OF PERSONS CONTACTED

*P. Gasperini, Production Manager
M. Kosmider, Plant Manager
H. Roberts, Supervisor, Safety and Health Physics
S. Stewart-Powers, Supervisor of Health Physics Technicians
T. Story, Reliability Engineer
K. Wilkins, Health Physics Specialist

*Senior licensee official at the exit meeting on October 25, 1996.

Other licensee personnel were contacted as part of the routine inspection.

Report Details

1. Operations Review (88020)

a. Conduct of Operations

Scope

The inspectors observed operations in the Feed Materials Building, the Sampling Plant, the Bed Materials/Filter Fines Facility, and other areas of the plant. In particular, the inspectors observed the following activities:

- control room operations for distillation and fluorination
- sub-sampling of UF_6 continuous sampler
- cylinder disconnect, weighing, and storage
- sampling of ore concentrates

The inspectors compared observations of activities in progress during facility tours with selected written procedures from the Distillation Manual and written job safety analyses for laboratory activities.

Observations and Findings

The inspectors noted that activities observed were generally conducted in accordance with applicable procedures, permits, and postings, and that operators used appropriate protective clothing and equipment. However, during discussions with a laboratory technician who transfers UF_6 from the continuous sampler to a 2S sample cylinder, the inspectors noted that the technician was not aware that the procedure (or job safety analysis [JSA]) was revised in 1995. The technician originally provided the inspectors with a version of the applicable JSA dated January 1, 1991. Although the actions performed by the technician in the field corresponded with the operations specified in the written JSA, the inspectors were concerned that the technician had not reviewed the most current version of the procedure applicable to the task. The inspectors also noted that the licensee's document control system allowed two revisions of a written JSA to be available, which may have led to the confusion as to the current revision of this procedure.

Finally, the inspectors noted during a tour that a technician did not wear a face shield when pouring liquid nitrogen into a dewar, used to cool UF_6 being drawn from the sampling manifold into a sample cylinder. The "Employee Safety Handbook" requires, on page 150, that a face shield be worn during handling of liquid nitrogen. This was highlighted to plant management during the exit meeting.

Conclusion

Operations observed throughout the inspection conformed with written procedures. However, a technician's inability to locate the current revision of a written JSA indicated the technician relied primarily upon on-the-job training for performance of work.

b. Housekeeping

During facility tours, the inspectors observed housekeeping practices. The inspectors noted that attention to housekeeping throughout various areas of the facility varied. In particular, the inspectors identified some broken pallets supporting stacked 55-gallon drums of ore concentrates in the ore concentrates storage yard which were broken and could pose a fall hazard.

The inspectors observed the licensee's progress for remediating the storage area in back of the Bed Materials/Filter Fines facility. The licensee had repackaged all of the deteriorated drums containing contaminated filter fines and shipped the contents to a mill for reprocessing. The old drums were then compacted for shipment to a licensed disposal facility. The licensee continued to move deteriorated drums of uranium-containing potassium-hydroxide muds into the licensee's storage facility for repackaging. The licensee continued to have drums, some of which were leaking, exposed to the external environment. The licensee indicated that they were attempting to finalize plans to ship these materials to a mill for uranium recovery.

2. Maintenance and Surveillance Testing (88025)

a. Maintenance Procedures

Scope

The inspectors reviewed selected procedures of the licensee's maintenance program for items important to safety.

Observations and Findings

Requests for preventive maintenance, inspections, and calibrations were generated by the licensee's Maintenance Management System. Preventive maintenance activities were generally performed by maintenance mechanics using instruction sheets or cards. Replacement or repair of components was noted on the sheet or card which was subsequently signed or initialed by the mechanic. The inspectors noted that the procedure for periodic inspection of the UF_6 cylinder handling crane in the distillation plant was dated February 3, 1972. The procedure referred the mechanic performing the inspection to the crane inspection check card for actual

performance of the inspection, but did not provide any specific guidance on the conduct of the inspection or acceptance criteria for items inspected.

The inspectors reviewed the licensee's "Procedure Control Policy" to determine whether or not a periodic review of procedures was required. The policy did not contain any requirements for periodic review of procedures to verify their continued adequacy. The licensee indicated that plant operating manuals are reviewed on an annual basis, but procedures for other functions, such as maintenance, would likely not be reviewed unless a problem occurred or a specific change to equipment was identified. The inspectors noted that mechanics relied upon skill of the craft and the list of items on checksheets or maintenance requests to perform preventive maintenance and inspection activities.

Conclusion

The licensee relied primarily upon maintenance skill of the craft for performing preventive maintenance, calibration, and inspection activities. Check sheets or cards were used to indicate the scope of work. Lack of guidance for the conduct of the periodic inspection of the UF_6 handling crane and lack of acceptance criteria for the items inspected highlighted previous NRC identified weaknesses in the licensee's procedure program. The procedures program did not specify any periodic review frequency for maintenance procedures or check sheets.

b. Surveillance Testing and Calibrations

Scope

The inspectors reviewed the licensee's program for performing periodic inspections and surveillance tests of equipment important to safety as identified on the "1096 Critical Equipment Safety - Health Inspection Check List."

Observations and Findings

The list provided the inspection/surveillance/preventive maintenance frequencies for items such as the UF_6 cylinder crane, control room alarm panels, load cell instrument loops, hydrogen analyzers, etc. The licensee maintained the records documenting performance of required inspections, calibrations, and maintenance in a central location. Initial review of the files and the checklist maintained by the Reliability group indicated that not all the inspections/surveillances had been accomplished within the specified frequencies. However, in followup discussions with the responsible maintenance personnel, the missing documentation was located in other areas of the plant. The inspectors were concerned, however, that all of the documentation for required inspections and maintenance was not available in the licensee's

central document files or annotated on the master inspection check list. There appeared to be a potential for missing required surveillances since the licensee's central files and tracking list were not up to date.

A significant increase in airborne radioactivity concentrations and spills was identified early in 1996 by the licensee (Section 3.c.). The noted increases were found to be the result of leaks in process equipment. Leaks were found in packing glands of mechanical screws used for transferring materials from one part of the process to another and also at other seals and flanges in the process. In addition, a number of the elevators which carry material from one floor to another of the FMB were also leaking. In all, 31 items were identified for repair indicating a concern over poor material condition of process equipment. Subsequent to the identification of the leaks, as of October 1996 the licensee had repaired all but five of the items identified for repair.

The reliability engineer informed the inspectors that a plant-wide effort to revise and upgrade the licensee's preventive maintenance program was underway. The effort involved reviewing the acceptability of the preventive maintenance activities and schedules for the entire plant. The effort focused on identifying which equipment should be placed on a Critical Equipment List based on its safety significance, regulatory significance, or production/quality significance. The scheduled completion date for this effort was 1997.

Conclusion

The licensee conducted equipment inspections, calibrations, and preventive maintenance in accordance with its current reliability program. Traceability of documentation and tracking scheduled tasks was difficult because not all records were placed in the central files. Poor material condition resulted in an increase in spills and airborne radioactivity concentrations, and an incease in minor uranium uptakes by licensee personnel in early 1996.

3. Radiation Protection (83822)

a. Radiation Protection Procedures

Scope

The inspectors reviewed selected health physics procedures for consistency with regulations and license requirements.

Observations and Findings

The licensee recently revised and issued the "Health Physics Procedures Manual" in October 1996. The inspectors reviewed a subset of the procedures for tank entries and surveys in the

manual against the requirements in the license and 10 CFR 20. No conflicts were noted between the written procedures and the regulatory requirements.

Conclusions

No discrepancies between written procedures and the regulatory requirements were noted during a selective review of the revised "Health Physics Procedures Manual."

b. Exposure Results

Scope

The inspectors reviewed the uranium bioassay (urine samples) results for the second and third quarters of 1996, and the external exposure results for 1996 through September.

Observations and Findings

The bioassay results for the third quarter indicated a significant decrease in the number of followup bioassays. The licensee required workers to provide a followup urine sample for any result above a concentration of 15 micrograms of uranium per liter of urine. During the second quarter, 25 followup bioassays were required, whereas only 2 were required during the third quarter. This trend indicated a reduction in minor uptakes of uranium by workers in the plant. These results appeared to coincide with the licensee's effort to reduce the airborne exposure hazard as described in Section 4.c.

The external exposure results for the 1996 year through September indicated a slightly reduced dose for the most exposed workers onsite from 1995. Typically, workers in the ore concentrates storage yard and sampling plant receive the largest external exposure due to the higher background levels of penetrating radiation from the large quantity of 55-gallon drums of ore concentrates. In 1995, the maximum external dose for a worker was 1.4 rem. For the 1996 monitoring year through September, all workers were below 750 millirem.

c. As Low As Is Reasonably Achievable (ALARA) Program

Scope

The inspectors reviewed the ALARA committee meeting minutes for the first three quarters of 1996 and discussed the ALARA program with some of the managers and supervisors involved.

Observations and Findings

In the spring of 1996, the licensee identified a significant increase in airborne radioactivity concentrations and spills due to leaks in process equipment, particularly in the ore preparation process in the Feed Materials Building (FMB). In all, the licensee identified 31 items or leaks which needed to be repaired in an attempt to reduce the airborne concentrations in the building, the number of spills, and the amount of time respirators were required for workers on various floors.

The licensee took action to accomplish the repairs by developing a list of action items and a tracking log. The licensee shut down the ore preparation process during the week of July 10, 1996, to accomplish repair of some 20 process leaks. As of October 1996, all but five of the action items were complete, with those remaining items involving primarily redesign or installation of equipment. As noted above in Section 4.b., a decrease in the number of repeat urine samples apparently resulted from these activities. Also, the number of respirator hours (because of high airborne concentrations in the FMB) decreased in the third quarter. Based on these results, the inspectors concluded that the licensee's ALARA program had identified a significant problem, even though no releases or exposure above regulatory limits were identified, and responded appropriately.

Conclusions

The licensee's radiation protection program continued to protect workers in accordance with license requirements for control of internal and external exposures. The licensee's ALARA committee identified a significant problem with process leaks and drastically reduced the number of them with a corresponding reduction in the general airborne activity in the FMB and minor uptakes by workers.

4. Management Meeting

The inspectors presented the inspection results to members of licensee management and others at the conclusion of the inspection on October 25, 1996. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the findings presented.

The licensee did not identify any of the information discussed at the meeting as proprietary.