GDP-0522

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Carl Walter is Planning to Comment to D.J. Pace by 0900 on 4/26/90

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Carl → Pulley - got a copy
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I gave cy to allan J
nb

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TO Ron Taylor TEL NO. FTS 355-6279

OFFICE OR LOCATION Paducah

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FROM Michele Gordon TEL. NO. FTS 626-8801

COMMENTS: Submitted for 48 hour comment period. Report was given to DOE yesterday (24 April 1990), so comments are needed back to this office as soon as possible to meet the 48 hour deadline.

THIS TRANSMITTAL CONSISTS OF 5 UNCLASSIFIED PAGE(S) (EXCLUDING THIS LEAD SHEET).

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DOE/HQ/EH Inspection of the
Paducah Gaseous Diffusion Plant
W.T. Cooper, EH Resident Inspector
April 23, 1990

A routine safety inspection was conducted by the EH Resident Inspector (EHR) at the Paducah Gaseous Diffusion Plant (PGDP) during the week of 04/16-20/90. Inspection findings were discussed with the Plant Manager and his staff during an exit interview on 04/20/90.

General Comments

Recent changes in the organization of the site's Health Physics (HP) group appear to have had a very positive impact on conduct of the program. Although the experience level of the group is relatively low, the group appears aggressive in self-identifying and resolving issues as they arise. Issues which appear to significantly impact the HP program are assessments, reviews and visits by outside entities which pull the more experienced staff away from their required day to day duties.

EHR observations during facility tours indicated significant improvement in the conduct of frisks for contamination prior to personnel's exit from contaminated areas. The frisking observed by the EHR was consistently good and indicated that personnel were paying attention to this aspect of their work. While there was still the occasional individual who failed to frisk as required or frisked too fast, this was not the norm.

Improvement was noted in the Industrial Hygiene Department's hazard communication labeling program at the site. During facility tours, such labeling was prominent and consistently applied. It was evident that substantial effort had been expended in this area.

The site had established Building C-360 as the "Model Facility" for implementation of contamination control practices. The EHR toured the facility with health physics (HP) and building management personnel. Postings, boundary controls, and contamination controls were observed to be excellent. Additional initiatives are underway for the area, including the application of epoxy-based coatings on the floors, walls, etc., to aid in decontamination and cleaning operations.

Identification and Control of Transuranic Contamination

In response to a spill of waste liquids at the 746Q warehouse in March 1990, the site HP group identified a concern regarding the

presence of quantities of transuranic materials at the site. Materials encountered included Plutonium 239/240, Neptunium 237, and Americium 241. Attempts to quantify the problem within the operating buildings were underway during the inspection. Although it appeared PGDP management was aware transuranics had been fed into the cascade when reactor return materials were processed, it did not appear the potential impacts of that material on radiological work practices had been fully evaluated.

The basis for the concern over the apparent lack of control of transuranic contamination is the very low level of this material necessary to cause a personnel overexposure. The International Council on Radiation Protection (ICRP) defines a body burden of Neptunium (Np) 237 as an uptake of that material equal to 4 nanoCuries (nCi). One nCi equals 2.22 disintegrations per minute (dpm). Therefore, an overexposure to Np-237 equals an uptake equivalent to 8.88 dpm. It should be noted that this activity level is less than than the lower limit of detection for most contemporary health physics instrumentation.

Research of archived data by the site HP staff indicated that several evaluations of transuranic materials had been conducted in the 1960's, and 70's. The evaluations specifically discussed the influence of transuranic materials on radiological work and the potential health effects associated with exposure to such materials. However, it appeared this corporate knowledge had been lost during ensuing management changes at the facility.

The EHR reviewed the draft 1989 Environmental Report to determine if transuranics had been identified in releases to the environment. Observations in this area included:

(1) The significance of trace quantities of transuranics in the environment did not appear to have been fully evaluated. The report documented positive indication of both Np-237 and Plutonium (Pu) 239 at distances of 13 to 15 kilometers from the site. Analytical error bars were not provided to document the lower limit of detection for the measurement system in use to allow determination of counting error in these measurements. It is therefore assumed the measurements represent trace quantities of materials in the environment.

(2) Stack effluents, surface water, and ground water were not analyzed for the presence of transuranic activity even though positive indications of such contaminants were documented elsewhere in the report. The Union Carbide report, "Historical Impact of Reactor Tails on the Paducah Cascade," identified the likelihood that Np-237 had been released from the Building C-310 stacks. Currently, it is not known whether transuranic activity continues to be released from process stacks

as they are not monitored for these contaminants. With the lack of groundwater monitoring data, it cannot be determined whether the wells contaminated with trichloroethylene around the site are also contaminated with transuranics. During the EHR exit interview, PGDP management stated that one of the monitored wells containing trichloroethylene had shown high alpha activity, but the type of contaminant was not known.

(3) Trace quantities of Np-237 were also identified in deer: 0.041 picoCuries per gram (pCi/g); rabbit: 0.015 pCi/g; gray squirrel: 0.029 pCi/g; squirrel: 0.013 pCi/g; and apples: 0.026 pCi/g. No contamination by the Pu-239 isotope was identified in this portion of the report.

EHR Surveys of the Contaminated Scrap Yard

During the Cascade Improvement Program/Cascade Upgrade Program (CIP/CUP) in the 1970's, many pieces of highly contaminated equipment were removed from process buildings and stored in the site's contaminated scrap yard. High levels of alpha contamination were detected during a radiological survey performed by the EHR and site HP on 04/18/90. Alpha contamination levels up to 45,000 disintegrations per minute per probe (dpm/p) area were discovered on equipment in the yard. Contamination levels on soil surfaces in the yard up to 2,500 dpm/p were discovered during the survey. A survey for transferable contamination was conducted by the HP. However, the results were not available prior to the EHR exit interview on 04/20. Although such surveys were not conducted, it appeared that high beta/gamma radiation levels could also be expected due to the condition of the equipment surveyed, i.e., visible caked materials. Exposure of the equipment to the elements appeared allow a washing effect to occur, subsequently contaminating soils in the surrounding area. This appeared to be a pathway for introduction of transuranics into groundwater and surface water.

Biological Monitoring for Transuranics

Interviews with HP management regarding in-vivo and in-vitro radionuclide monitoring programs at the site indicated that the measurement systems currently in use were either not capable of measuring potential exposures to transuranics, or were not calibrated to the specific geometry required. Therefore, it was not possible for the contractor to evaluate potential exposures to transuranic materials. The site HP group had recognized this programmatic deficiency and initiatives were already underway to upgrade with whole body counting program. Additionally, it

appeared the site would contract with an outside DOELAP accredited laboratory for transuranic analysis of urine samples. During the exit interview, the EHR stated that the presence of transuranics at the site could have wide ranging programmatic impacts on control of radiological work, all aspects of the HP program, and the conduct of operations when systems were breached or maintenance performed. At the time of the inspection, the extent and severity of the contamination had not been quantified, although initial HP area sampling indicated transuranic isotopes were present. HP survey equipment did not appear of sufficient sensitivity to quantify the problem. In this regard, initiatives were made by site HP to other MMES facilities for technical and logistical support.

A major impact for the HP group was the slow turnaround time for sample analysis from the Radiochemistry Laboratory. The EHR stated that the time required for sample analysis appeared excessive, requiring days to complete. HP could not adequately evaluate levels of airborne or transferable transuranic radioactivity without timely and reliable radiochemical data to support their conclusions. However, it did appear that management had recognized this problem and corrective actions were being taken.

Prior to exiting the site, the EHR requested a copy of the action plan PGDP would use to address transuranic concerns. The plan was under development on Friday 04/20/90, and management personnel stated that a copy would be transmitted via facsimile to the EHR by Wednesday, 04/25/90.

Contamination Discovered Outside Regulated Areas

Following the recent contamination events at ORNL's HFIR facility, the Manager, Oak Ridge Operations Office, instructed all sites to evaluate the potential for contamination outside regulated areas. In response to this direction, PGDP had begun conducting a series of surveys in non-regulated areas of the facility to determine if contamination had been spread outside process buildings.

Initial HP survey results indicated that contamination had been spread to non-regulated areas within the plant, but there was no evidence that the contamination had been spread to offsite areas via personal clothing or vehicles. Prior to exiting the site, the EHR requested a summary of the areas found contaminated and the levels of radioactivity found. This information was not supplied during the site visit, but will be supplied to the EHR after the information has been compiled.

Health Physics Staffing

During the inspection, the EHR noted that many of the HP staff appeared to be experiencing fatigue. HP management stated that this was due to the overtime HPs were being asked to work in response to the myriad of issues currently being worked in the group. The EHR raised a concern during the exit interview regarding fatigue of the HP staff and the anticipated corresponding decrease in staff efficiency and vigilance. It was the EHR's understanding that this issue was taken under advisement for further review.

An additional concern currently under review by the contractor was the plant's ability to attract and hold qualified HP technician personnel due to low pay scales for that job classification. Discussions were underway within upper level contractor management to attempt to resolve this issue.