

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

August 24, 1994

**MEMORANDUM:** G. W. Cunningham, Technical Director

**COPIES:** Board Members

**FROM:** J. W. Troan

**SUBJECT:** Report on the Radiation Protection Program at the Rocky Flats Environmental Technology Site

1. **Purpose:** This memorandum documents the Defense Nuclear Facilities Safety Board (DNFSB) technical staff and outside expert follow-up review of the Radiation Protection Program at the Rocky Flats Environmental Technology Site (RFETS). The review was - conducted May 4 through 6, 1994.
2. **Summary:** Elements of the radiation protection program at the RFETS were reviewed as a follow-up to a review conducted in August 1993. Highlights include:
  - a. EG&G is developing an internal surveillance program to assess Radiological Control Manual adherence based compliance. This should contribute to improving their program.
  2. Radiological Control Technician training will not be complete by December 1994, the DOE commitment date in the Recommendation 91-6 Implementation Plan.
  3. Bioassay delinquency may impact program effectiveness.
  4. The number of radioactive sources that have not been accounted for has been significantly reduced since the staffs visit in August 1993. Improvements in the accountability program are being instituted. However, comprehensive technical assessments and management follow through appeared to require improvement.
  5. Equipment used for monitoring air for radioactivity does not meet the Manual's sensitivity requirements, but short and long term improvement efforts are in progress.
  6. Radiation levels at dosimeter storage boards are being investigated following higher than expected readings. Results to-date do not indicate a problem, but the assessment is not complete and data collection continues.
3. **Background:** DOE Order 5480.11, *Radiation Protection for Occupational Workers*, DOE Notice 5480.6, *Radiological Control (Radiological Control Manual)*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, establish the

requirements for radiation protection for workers, the public and the environment, and provided the basis for the radiation protection review at the RFETS. The review was conducted by: James Troan DNFSB Staff; and Ted Quale, DNFSB Outside Expert.

#### 4. Discussion/Observations:

- a. **DOE Recommendation 91-6 Training** - In the DOE Implementation Plan (Rev 2) for Recommendation 91-6, DOE committed to complete General Employee Radiological Training, Radiation Worker I and II, and Radiological Control Technician Training for all affected workers using the standardized core training material by December 1994. However, it is the DNFSB staff's understanding that the contractor, EG&G, has not been tasked by the DOE Rocky Flats (DOE-RF) to accelerate the training from the originally planned completion date of September 1995.
- b. **DOE Recommendation 91-6 Radiological Control Manual Implementation** - In the DOE Implementation Plan (Rev 2) for Recommendation 91-6, the DOE committed to full implementation of the DOE Radiological Control Manual (Manual) at the RFETS by October 1997. However, the Board found this date unacceptable from a safety perspective, and expected that it be brought into conformity with the deadlines for the majority of other defense nuclear facilities. The Secretary of Energy reported in May 1994, that full implementation of the Manual at the RFETS is scheduled for December 1, 1996.

Implementation of the Manual was discussed during the review, and it appeared that implementation may be impacted without additional staffing. It is the DNFSB staffs understanding that this concern is due to a hiring freeze, and is further compounded by the administrative effort required to assess and implement 10 CFR 835. Both EG&G and DOE-RF personnel appeared to be working to resolve this issue.

An internal surveillance program to assess Manual adherence based compliance is being developed. This should lead to a data base that will provide up-to-date evidence and status of compliance.

- c. **Implementation of Radiological Control Requirements** - EG&G personnel reported that DOE Order 54X0.11, *Radiation Protection for Occupational Workers* and its adherence based compliance assessment was complete except for one Short Term Compliance Schedule that was superseded by the Manual's requirement. The DNFSB staff requested information to assess subcontractor(s) compliance, but data provided has not been adequate to assess compliance to DOE Order 5480.11.
- d. **Bioassay Program** - Elements of the Bioassay Program were reviewed. A Bioassay Accomplishment Tracking System was initiated in October 1993. The DNFSB staff believes that program performance is poor, and that the Tracking System had some shortfalls. For example, EG&G personnel identified that the bioassay delinquency rate is 10 to 12 percent, and that some delinquencies

durations are at a point where analysis sensitivity may be impacted. EG&G personnel noted that the program has not been fully effective because the procedure has only recently been promulgated. The DNFSB staff believes that these delinquencies may be undermining the effectiveness of the program, and dose may be missed. Additionally, it was not apparent to the DNFSB staff that the program encompasses all applicable personnel. For example, EG&G personnel described that the program's data base is derived from the list of personnel trained on site, and would not track visiting workers. In this case, EG&G personnel explained that it would be a sponsors responsibility to see that the bioassay had been accomplished.

EG&G has recently changed the program from fecal sampling for all employees to urine sampling for most employees, and fecal sampling only for personnel qualified as Radiological Workers II and Radiological Control Technicians. This change has resulted in a significant reduction in the internal dosimetry workload. The changes to the internal dosimetry technical basis document are not scheduled for issue until September 1994.

- e. **Source Accountability**- The number of unaccounted for radioactive sources have been significantly reduced since the staffs visit in August 1993. Currently, EG&G personnel report that there are fifteen unaccounted for radioactive sources. Program and training improvements have been, and are continuing to be put into place. However, it is the DNFSB staffs opinion that management of unaccounted for sources has not fully improved, since a follow-up report had not been made to a January 1994 Occurrence Report on the subject, and a clear radiological assessment was not presented.
- f. **Air Monitoring** - EG&G personnel described the Selective Alpha Air Monitors (SAAMs) currently in use as not capable of meeting the sensitivity requirements of the Manual (i.e., 8 DAC-hours under laboratory conditions). In the near term, EG&G is making improvements to the existing SAAMs (e.g., increase sensitivity to approximately 15 DAC-hours). Additionally, they have a long-term effort underway to procure a new monitor that meets the Manual's requirement. The original plans to have monitors delivered in mid-1996 have slipped into 1997, and further schedule delays may have an impact since the existing SAAMs no longer have repair part support and rely on a cannibalization program that is not expected to be viable past 1997. Technical justification of the existing system was not presented in the Manual compliance assessment, but EG&G personnel indicated that this information was available.
- g. **Radiation Monitoring** - During the August 1993 review, EG&G personnel noted that there was reason to believe that background radiation at a dosimeter storage board in Building 771 were higher than expected. Since then, gamma radiation levels have been measured at the dosimeter storage boards and in the vicinity of the adjacent Guard Station; and background dosimeter gamma radiation results have been trended. Additional measurement of neutron radiation at the storage boards is in progress. To date, gamma radiation results do not indicate higher than expected radiation levels. The issue of the use of personal dosimeters for

personnel who spend a majority of their time in the area (e.g., Guards) was addressed, and EG&G personnel stated that the dosimeter was considered to be part of the Guard's equipment and was worn when on watch. Data provided by EG&G personnel indicated that Guards wore dosimetry during the fourth quarter 1993, and the first quarter 1994.

5. **Future Staff Actions:**The DNFSB staff intends to continue to follow various aspects of the radiation protection program at the RFETS. These are expected to include:
  - a. Assessment of the Manual implementation process, and status of compliance.
  - b. Assessment of compliance to Radiological Control requirements at the subcontractor levels.
  - c. Assessment of bioassay program performance.
  - d. Monitoring management of locating radioactive sources that are unaccounted for.
  - e. Reviewing the progress made in the SAAM upgrade program, and assessment of the technical basis for the system.
  - f. Monitoring the results of background radiation level assessments at dosimeter storage boards, and verifying that Guards in Building 771 were wearing appropriate dosimetry in August 1993.