[DNSFB LETTERHEAD]

May 18, 1993

Mr. Everet H. Beckner
Acting Assistant Secretary for
Defense Programs
U.S. Department of Energy
Washington, D.C. 20585

Dear Mr. Beckner:

The Board understands that DOE-Rocky Flats Office is in the process of conducting an in-depth evaluation of the ALARA (As Low As Reasonably Achievable) Program at the Rocky Flats Plant.

Enclosed are a number of observations concerning the ALARA program and review of occurrence reports related to radiological controls at the Rocky Flats Plant. These observations were developed by the Defense Nuclear Facilities Safety Board staff and an outside expert. These observations are based on reviews of available documents, and discussions with DOE-Rocky Flats Office staff and contractor personnel at Rocky Flats from March 29 to April 2, 1993. These observations may be of potential assistance in the on-going reviews at the Rocky Flats Plant.

If you need further information, please let me know.

Sincerely,

John T. Conway
Chairman

Enclosure:

(1) DNFSB Staff Memorandum "Rocky Flats Plant - Review of the ALARA Program and Radiological Occurrence Report" with attached reports, dated April 22,1993

c:
V. Stello, DP-6
M. Whitaker, Acting DR-1
P. Grimm, Acting EM-1

DEFENSE NUCLEAR FACILITIES SAFETY BOARD

April 22, 1993

MEMORANDUM FOR: Technical Director

COPY TO: Board Members

FROM: R. E. Kasdorf

SUBJECT: Rocky Flats Plant - Review of the ALARA Program and Radiological Occurrence Reports

1. Purpose: This memorandum forwards two reports of reviews conducted by outside expert (T. Quale) during March 29,1993 to April 2,1993, at the Rocky Flats Plant (RFP). These reviews covered the ALARA (As Low As Reasonably Achievable) Program and recent radiological occurrence reports at the RFP.

2. Summary: The conclusions of the attached reports are:

   a. The programmatic aspects of the RFP ALARA program are based on applicable industry standards. However, implementation of the program is not up to nuclear industry practices. ALARA design reviews generally do not appear to provide benefit either in the area of exposure reduction or cost savings. No effective training is provided to site management and supervision concerning how to effectively manage aspects of the ALARA program in their areas of responsibility.

   b. Review of the radiological occurrence reports led to the following observations:

      (1) The occurrence reporting system is not being utilized to its full potential, for example:

         (a) Final reports are not being issued in a timely manner.

         (b) Root causes and corrective actions are not always being documented in occurrence reports.

         (c) There is apparently no effective tracking or trending of occurrences to identify areas where further corrective or preventive actions are necessary.

      (2) Many of the contamination problems are being attributed to "past practices and processes." There is apparently no effective program to characterize the contamination existing in work areas such as in Buildings 371 and 771 so they can be decontaminated. Contamination in the work areas is being

found during routine or pre-job surveys.

c. The DOE-RFO Radiological Protection Branch has started an in-depth evaluation of the RFP ALARA program - Initial findings indicate that DOE-RFO is discovering problems similar to those noted by the DNFSB outside expert's review.

3. Future Action: A staff review of the RFP radiation protection program, including a follow-up to this ALARA review and a review of the results of the DOE-RFO ALARA program) review, has been tentatively scheduled for August, 1993.

Attachments:

1. Memorandum from T. Quale, "Review of ALARA Program at the Rocky Flats Plant," dated April 12, 1993.

2. Memorandum from T. Quale, "Review of Occurrence Reports Related to Radiological Controls," dated April 12, 1993 (without Attachment l).

Distribution:

A.G.Stadnik
J.P. Davis
D.F. Owen

Attachment 1

MEMORANDUM

April l2, 1993

FROM: T.J. Quale Jr. - Outside Expert

TO: Roy Kasdorf - DNFSB Staff

SUBJECT: Review of ALARA Program at the Rocky Flats Plant

1. As requested, during the period from 29 March to 2 April 1993, a review of the ALARA Program at the Rocky Flats Plant (RFP) was performed. The detailed observations of the review are contained in the attachment to this memorandum.

2. The review exammed the programmatic aspects of the ALARA program and included an assessment of the extent of implementation of program requirements. In addition, the extent of ALARA program oversight performed by the Department of Energy's Rocky Flats Office (DOE-RFO) was assessed.

3. In general, the programmatic aspects (i.e. in-place programs and procedures) of the RFP ALARA program appear sound. Appropriate use has been made of applicable industry standards in the development of the program. The program standards at RFP are comparable in content to others in the industry. Implementation of the program, however, is not up to industry practices. Three of five site wide goals established for 1992 were exceeded. Goals exceeded included personnel radiation exposure and personnel contamination (internal and external). No appreciable progress was made in 1992 in reducing the amount of contaminated areas at RFP, another program goal. ALARA design reviews are generally not up to industry practices and do not appear to provide benefit either in the area of exposure reduction or cost savings. No effective training is provided to site management and supervision concerning how to effectively manage aspects of the ALARA program in the areas of responsibility.

4. The DOE-RFO Radiological Protection Branch is in the process of conducting an in-depth evaluation of the RFP ALARA program. The evaluation format is comprehensive and the initial results indicate DOE-RFO findings are similar to the findings of this review. The DOE-RFO evaluation is in the early stages. It is, therefore, difficult to predict the final outcome and how the results will be provided to the M&O Contractor, EG&G.

cc: John Drain - SPC
J .DeLoach-COTR

DETAILED COMMENTS ON THE
ROCKY FLATS PLANT ALARA PROGRAM

1. A review of the ALARA Program Manual reveals that it is well-based in industry standards and includes the attributes necessary to manage a successful program. The site ALARA program Manual is based primarily on the Pacific Northwest Laboratory publication PNL-6577, "Health Physics Manual of Good Practices for Reducing Radiation Exposure to Levels that are As Low As Reasonably Achievable (ALARA)" 6/88. Use of other guidance such as INPO standards is also evident. The RFP Site Policy concerning the ALARA Program is sound and in place. Implementing procedures HSP-1.02, "Program Document for As Low As Reasonably Achievable (ALARA)" and various Radiological Engineering procedures provide an adequate foundation for conducting an ALARA program.

2. A review of 1992 ALARA goals found that many of the goals were not achieved. Goals for personnel radiation exposure, external personnel contamination and internal personnel contamination were exceeded.

   a. The 1992 goal for personnel radiation exposure was 157 person-rem. The projected actual exposure total for 1992 is 189 person-rem or 20% over the goal. The personnel radiation exposure goal for 1993 has been set at 193 person-rem, an increase of 23% over the 1992 goal. No specific rationale can be cited by the EG&G Coordinator for this increase beyond a general statement that work load is increasing. Further, the estimates are developed on a "did cost" basis rather than a "should cost" basis. That is, the actual exposure for a given job is not adjusted to account for unnecessary exposure. Therefore, those unnecessary exposures become additive and inflate future estimates. This is due in part to the dose accounting methods in use at RFP. Specifically, dose received cannot be related to a particular activity or to activities within a specific building. According to the ALARA Engineering Manager, RFP is considering implementation of a secondary dosimetry system to allow for more specific dose accounting. Little if any progress has been made on this plan. In fact, the ALARA Coordinator was not aware of its existence until this review.

   b. Skin and internal contaminations have also exceeded the 1992 ALARA goals but by smaller amounts. However, the rate of skin contaminations increased dramatically at the end of 1992. About half of the incidents occurred in the last 3-4 months. As in the case of personnel exposure, ALARA management at RFP was not able to identify specific reasons for this increase.

   c. Another specific goal of the ALARA program at RFP is to reduce the amount of contaminated areas on site. This goal is based on reducing contaminated areas that are not considered normal work areas. However, gloveboxes are not included in the process of developing the estimate. No appreciable progress has been made toward reducing the contaminated gloveboxes. The EG&G Corporate OPR Team

for Building 7O7 found that action was needed to reduce the amount of contaminated areas in the building. An action plan was developed to accomplish the reduction. However, when problems concerning decontamination methods developed, progress on the plan was stopped. No revised plan was developed to account for the problem until the DNFSB staff questioned the inactivity during a review of corporate ORR closure packages. Finally, the basis of the goal does not include a reduction in the amount of normal work space that is contaminated. Inclusion of this aspect for establishing the basis of the goal is not under consideration by RFP.

3. The RFP ALARA program cites trend analysis and lessons learned as key aspects of the program. While some trend analysis is performed by the ALARA Coordinator, little benefit is apparent. The results are provided to responsible management but beyond that little action appears to be taken. According to the ALARA Coordinator, the general site lessons learned program is the vehicle used for the ALARA Program. The ALARA Coordinator could provide no details concerning what tangible benefits were received while also stating that was not his program. This aspect of the ALARA program appears to be nothing more than an rnefficient accounting process which produces no program benefit.

4. The Site ALARA Program Manual states in section 3.1.4.6 that "Management training shall be provided with emphasis on demonstrating the importance of each groups activities in establishing and managing ALARA program goals. A thorough understanding of the Rocky Flats ALARA commitment and each employee's specific responsibilities is required of all management employees." This training consists of an eleven minute video tape that has been shown to all management personnel at RFP. This video is only an overview of the ALARA program that is introduced by the EG&G General Manager who states a strong commitment to the program. The EG&G ALARA Coordinator characterized the video as a "pep talk" and conceded that it provides no specific training to management personnel. It does not describe the management tools available or inform personnel of methods to effectively use these tools to achieve ALARA goals.

5. ALARA design and procedure reviews are well characterized in site procedures. Two Radiological Engineering procedures, RE-l001 - ALARA Design Review and RE-1002 -ALARA Job Review, provide adequate direction for performance of these functions. The results do not reflect proper utilization of these procedures to achieve a reduction in personnel radiation exposure. For example, an ALARA review of the SARF Operation previously reviewed by the DNFSB staff was based on a two year old dose estimate that over estimated the current work scope by an order of magnitude and was conservative in predicting the doses to which personnel would be exposed. The result was a review that did not accurately characterize the expected personnel exposure and in fact predicted personnel exposures that were high by a factor of at least four. This fact was brought to the attention of EG&G and DOE-RFO management by the DNFSB staff in February

l993. EG&G concluded that the review should be revised. At the time of this review, EG&G had just submitted the revised report to DOE-RFO. DOE-RFO was still completing their review of the report, and it was not assessed during this review.

6. The minutes of several of the ALARA Action Committee Meetings were reviewed. The minutes were not in the format recommended in the ALARA Program Manual and contained little, if any, specific information relative to actions under way to reduce exposure. The minutes do not reflect detailed actions to follow-up on previous activities. Given their current form and content, it does not appear that these committees are resulting in any "value added."

7. The ALARA Coordinator stated that ALARA criteria have recently been added to management performance evaluations. Specifically, the evaluation is tied to the managers' performance against ALARA goals in their area of responsibility. This is a positive step, however, it is not clear how such an evaluation can be made given the lack of detailed tracking and trending information discussed above.

8. The site ALARA Program Manual requires in section 3.1.5 that internal audits of the ALARA program be conducted at least every three years by personnel outside of ALARA Engineering. The ALARA Coordinator stated that some reviews had been conducted by the EG&G Audit and Appraisal Group, but he was not able to discuss the specifics of their findings.

9. The DOE-RFO Radiological Protection Branch has initiated a review of the EG&G ALARA Program. The review consists of a serious of detailed surveillances of the specific aspects of the ALARA Program. According to the DOE-RFO Radiological Protection Branch Chief, the initial results indicated that the program was sound programmatically but very weak in implementation. He also stated that two of the initial surveillances had been judged to be unsatisfactory.

Attachment 2

MEMORANDUM

April 12, 1993

FROM: T. J. Quale Jr. - Outside Expert

TO: Roy Kasdorf - DNFSB Staff

SUBJECT: Review of Occurrence Reports Related to Radiological Controls

1. As requested, during the period from March 29 to April 2, 1993, a review of Rocky Flats Plant (RFP) occurrence reports related to radiological controls was performed.

2. Using a search of the ORPS System (attachment one), a sample of 63 occurrence reports related to radiological controls that occurred from October 1, 1992 to March 29, 1993 was selected. A summary of these reports is included as attachment two. Occurrence reports related to selective alpha air monitors (SAAMs) were excluded from the sample based on DNFSB staff guidance. Attachment three is a table summarizing the occurrence reports by type and related facility.

3. The occurrence reports analyzed primarily involve radiological contamination (Attachment 3). The following observations were drawn from this analysis:

    a. Final reports are not being issued in a timely fashion. Only one of the reports has been issued as a final report as defined by DOE Order 5000.3A, "Occurrence Reporting and Processing of Operations Information." As a result, much of the information necessary to thoroughly understand the causes and develop corrective actions is not available. DOE-RFO (Hicks for Ruscitto) indicated that they intend to require EG&G to finalize outstanding reports within a six month period and maintain subsequent reports current within the guidelines of the recent revision to the DOE Order (5000.3B) which contains requirements for issuance of a final report.

    b. The review of the individual reports indicates that many of the contamination problems are being attributed to "past work practices and processes." It is not apparent from the reports that RFP personnel are developing a process to characterize the contamination existing in work areas such as Buildings 371 and 771 where a majority of the problems have occurred. Such efforts have been undertaken in Buildings 559 and 707 and have been effective in identifying problem areas so they can be decontaminated.

    c. DOE-RFO (Hicks) indicated that he does not currently conduct tracking and trending reviews of occurrence reports nor is he aware of such reviews being

conducted by EG&G. Industry practice has identified such tracking and trending as valuable management tools for identifying areas where corrective and or preventive actions are necessary.

d. In several cases, the root cause of the occurrence has not been determined. This not only prevents management from taking corrective action but also can lead to recurring problems due to failure to correct the underlying problem.

e. Two reports from Building 771 imply that the design of some criticality drains may be contributing to the spread of contamination outside of gloveboxes. There is no indication of actions to resolve this potential design problem.

f. Twelve reports indicate that an evaluation of the occurrence is ongoing. In seven of the reports an expected completion date was established. None of these seven dates appear to have been met.

g. At least ten of the reports specifically state that contamination was found during routine or pre-job surveys. This shows that these surveys are improving but implies that work areas are not fully characterized as to extent of contamination.

4. DOE-RFO (Hicks) stated that RFO will be utilizing a new contractor to further analyze these reports in the near future. Industry practice has shown that this type of effort, if made an ongoing practice by DOE-RFO and EG&G, can benefit the overall ALARA effort at Rocky Flats.

cc:
John Drain - SPC
J. DeLoach - COTR

SUMMARY OF RFP OCCURRENCE REPORTS
RELATED TO RADIOLOGICAL CONTROLS
(EXCLUDING SAAM PROBLEMS)
FROM 10-1-92 TO 3-29-93

NUMBER	CATEGORY	DESCRIPTION	CAUSE
1992-0079	1-T/10-92/O	Contamination under G/B 37, routine survey	Leaking G/B gasket
1992-0085	1-T/lO-92/O	Contamination under G/B 36, pre-job survey	Leaking G/B seal
1992-0086	1-F/10-92/U	Contamination under G/B 37, routine survey	Leaking from paint
1992-0096	5-T/11-92/O	RWP violation, orange vs white coveralls to expedite job, no lockers were available	Knew rqmts, wore orange
1993-0004	1-T/1-93/U	Contamination under G/B 47, routine survey stating that there was contamination on the vent line, no action to determine where it came from.	not addressed beyond
1993-0006	1-T/1-93/O	Contamination on G/B glove from hole	Hole in glove determined to be due to normal use, glove in service about six years.
1993-0007	5-T/2-93/O	Person in RCA w/o resp card, no fit test	Personnel error
1993-0015	2-T/2-93/O	C wound due to nail puncture	Personnel error in getting the wound. No action to find the source of the C. Decon in progress.
1993-0016	5-T/2-93/U	Two w/o resp prot as rqd by posting	Personnel error.

Attachment 2 DRAFT l

NUMBER	CATEGORY	DESCRIPTION	CAUSE
1993-0020	4-T/3/93/O	C on respirator filter	C due to radon buildup in the area.
1992-0090	3-T/10-92/O	C boots due to loose C on floor	Loose C on floor of 3 rooms, 750-4200 dpm, no source found investigation ongoing.
1992-0091	l-T/10-92/O	C on crit drains G/B's 3 (rm149) & 42(rm 114)	OR says cause either design of drain or evaporation of liquid in drain to an unacceptable level.
1992-0092	4-T/10-92/O	Low level C H corridor (150-100, f1-2000)	Attributed to residual fixed but one section says loose due to paint chipping off the floor, another says floor tiles will be replaced. Floor tiles are not normally painted.
1992-0094	1-T/10-92/O	C on crit drains 4 & 8 G/B 53 Rm 153	OR says cause either design of drain or evaporation of drain to an unacceptable level. Has a specific cause been identified?
1992-0095	1-T/10-92/O	C on flange under G/B 2, rm 180D	Reported to be residual contamination on the gasket from "... past work practice and processes. . .".
1992-0096	3-T/10-92/U	Clothing C due to LC in work area	Report cited loose C in area due to past