

## DEFENSE NUCLEAR FACILITIES SAFETY BOARD

December 1, 1993

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

**COPIES:** Board Members

**FROM:** J. W. Troan

**SUBJECT:** Report on the Radiation Protection Review at the Rocky Flats Plant

1. **Purpose:** This memorandum documents the Defense Nuclear Facilities Safety Board (DNFSB) technical staff and outside expert trip to the Rocky Flats Plant to review the Radiation Protection Program. The review was based on a visit to Rocky Flats on August 16-20, 1993.
2. **Summary:** The staff reviewed the Radiation Protection Program for consistency with Department of Energy (DOE) Order 5480.11, *Radiation Protection for Occupational Workers*, DOE Notice 5480.6, *Radiological Control*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment*.

The Rocky Flats Plant Radiation Protection Program was considered by the staff to be adequate. The following are the significant staff observations:

- a. The staff noted that the Managing and Operating (M&O) contractor (EG&G, Rocky Flats Inc.) was working towards implementing the DOE Radiological Protection requirements of DOE Order 5480.11 and the DOE Notice 5480.6. Full compliance with the Radiological Control Manual (RCM) was originally planned to be achieved by October 1997. However, EG&G personnel indicated a commitment to achieve full compliance with the RCM by 1996. Plans developed to date do not give enough detail to justify the extended length of time it takes to achieve compliance. In particular, a majority of RCM Chapter 6 training requirements will not be completed until the July to September 1995 time frame. The Rocky Flats Plant (RFP) plan to accomplish RCM training is not consistent with the DOE's Implementation Plan for DNFSB Recommendation 91-6, which committed to having General Employee Radiological Training, Radiation Worker I and II, and Radiological Control Technician training for all affected workers using the standardized core training material completed by December 1994.
- b. The staff noted that a potential existed for workers to be exposed to radiation without being monitored in accordance with the Radiological Control Manual (RCM) and DOE Order 5480.11. In discussions with Building 771 personnel, it was noted that the Thermoluminescent Dosimeter (TLD) badge storage rack was being evaluated to determine the amount of radiation the dosimeters were exposed to while hanging on the rack. This

evaluation was being accomplished as a result of RFP personnel noting that two TLDs that hung on the rack for six months had received approximately 300 mrem. The DNFSB staff questioned whether any unmonitored workers had spent a significant amount of the workday in the area. RFP personnel noted that a guard station was adjacent to the area, and that the guards were not required to wear dosimeters on a routine basis. The radiation level in the guard area was not known at the time of the review, and was to be determined. If the radiation level in the guard's post is similar to that at the TLD storage board, exposure of guards to ionizing radiation may exceed the 100 mrem per year limit for those who are not monitored.

- c. Subcontractors working at the plant did not appear to be totally integrated into some Radiation Protection Programs. Currently, their contracts do not require compliance with the RCM, but plans are to include this requirement at the next contract modification. The DNFSB staff did not find that the subcontractors were included in the plant's Radiation Protection As Low As Reasonably Achievable (ALARA) Program, and it was not clear that bioassays for subcontractors were thoroughly managed.
  - d. The plant's Radioactive Source Control Program has identified a number of sources that can- not be accounted for. There are 2,428 sources, and approximately 137 sources cannot be located. A semi-annual inspection was in progress at the time of the review. EG&G stated that many of these sources would have to be licensed under current Nuclear Regulatory Commission (NRC) regulation, if the NRC had jurisdiction.
3. **Background:** Department of Energy (DOE) Order 5480.11, *Radiation Protection for Occupational Workers*, DOE Notice 5480.6, *Radiological Control*, and DOE Order 5400.5, *Radiation Protection of the Public and the Environment* establishes the requirements for radiation protection for workers, the public and the environment, and provided the basis for the radiation protection review at the Rocky Flats Plant. These standards were used in the assessment of the program, work practices, training and knowledge level. Evaluation of the implementation of the Radiation Protection Program at Rocky Flats was achieved through review of the program at the Plant and Building levels, observations of practices in the field, and interviews with personnel. The following outlines the areas covered in the review:
- A. Radiation Protection Standards Implementation,
  - B. Radiological Health Operations,
  - C. Radiation Protection Training and Qualification,
  - D. Personnel Interviews, and
  - E. Building Tours.

The review was conducted by: Dan Burnfield, Jim Troan, DNFSB Staff members, and Ted Quale, Outside Expert.

4. **Discussion/Observations:** Observations and discussions are presented in the five categories relevant to the Radiation Protection Program.

a. Radiation Protection Standards Implementation

The state of the implementation of Radiation Protection Standards at the RFP varies among the buildings. Presently, there is an effort at the RFP to upgrade to the DOE Order 5480.11 standard, in advance of the RCM implementation.

There is one Compliance Schedule Approval (CSA) for relevant DOE Orders. Specifically, DOE Order 5480.11, *Radiation Protection for Occupational Workers* has one CSA, because EG&G Rocky Flats does not have a program for routine bioassay monitoring in place.

In the case of DOE Order 5400.5, *Radiation Protection of the Public and the Environment*, EG&G Rocky Flats personnel believe that EG&G Rocky Flats Inc. is in compliance, and Environmental Protection Agency (EPA) concurrence is expected for the compliance assessments that were submitted in December 1992.

Implementation of the requirements of the DOE Radiological Control Manual (DOE-RCM), that was promulgated by DOE Notice 5480.6, *Radiological Control* is in progress. The EG&G Project Manager responsible for the Radiological Control Manual (RCM) Implementation reported that the RFP was 43% administratively compliant with the DOE RCM, and that EG&G was working towards implementation. Compliance by subcontractors will be contractually invoked with the next modification to their contract.

DNFSB staff review of the RCM Implementation Plan<sup>1</sup> revealed that technical justification was not always given for compensatory actions, or in the case of no compensatory actions when there was a non-compliance. In some cases the Plan states: "No additional compensatory actions beyond continued compliance with DOE 5480.11 and 5400.5 and other appropriate Orders or Directives are warranted." Adequate basis for this argument has not been stated, given that DOE Order 5480.11 has not been fully implemented at the RFP. The Plan was fairly detailed at a macroscopic or programmatic level, but instances of incomplete corrective action plans and schedule inconsistencies were noted. The Plan's implementation schedule does not show full compliance with the RCM until February 1998. However, EG&G personnel indicated a commitment to achieve full compliance with the RCM by 1996. Not enough detail is provided to substantiate this extended length of time to reach compliance. RFP personnel explained that the RCM Implementation Phase(s) during 1994 would result in the development of detailed plans to achieve full compliance. Key issues identified by RFP personnel associated with the RCM Implementation at the RFP are given in Attachment (1). A separate DNFSB Outside Expert review of the RCM Implementation

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<sup>1</sup> Rocky Flats Site Radiological Control Manual Implementation Plan, Revision 01, dated April 1, 1993 (DNFSB Log#: 93:5016)

plan identified that of all DOE sites, RFP had the greatest number of Articles in a "not in full compliance" status. Attachment (2) provides RCM Implementation Plan highlights.

## b. Radiological Health Operations

### 1. DOE

The DOE Rocky Flats Office (DOE-RFO) Radiological Protection and Health Physics Branch consists of a staff of five, with a contractor support staff of seven.

### 2. Contractor

The Radiation Protection organization consists of approximately 500 personnel, of about 8000 personnel who work at the plant.

The RFP Radiation Protection Program implementation lacks consistency across the Plant. The Deputy Plant Manager stated that the Radiological Control Manual (RCM) implementation is the first step towards Radiation Protection standardization at the plant. However, the resource requirements that are currently defined may be underestimated. The Radiation Protection Director stated that although the plant has had funding cuts, none had been made in the area of Radiological Control implementation. Later in the review, EG&G personnel identified that the Radiation Assistance Program (RAP), a national DOE program had been defunded.

### 3. Performance Indicators

The Radiological Performance Indicators (PIs) showed a continued reduction in skin contaminations for 1991, 1992 and 1993. Examples of other PIs are given in Attachment (3). The performance indicators presented covered a majority of the suggested Radiological Performance Indicators topics that are identified by the RCM.

### 4. ALARA Implementation

#### (a) Plant Level

A program exists for maintaining radiation exposure As Low As Reasonably Achievable (ALARA) at the RFP. An ALARA Oversight Committee (AOC) has been established and advises the General Manager (GM) on the effectiveness of the ALARA effort and makes recommendations to strengthen the program. During the briefings by EG&G management, it was stated that the ALARA program had several areas of weaknesses. These include inadequate field implementation, inadequate training for management and radiological engineers and the failure to properly develop and communicate ALARA goals. Several observations made during the review strongly support this characterization. Attachment (4)

provides observations concerning the ALARA Program.

A DNFSB Staff review of the RFP ALARA program, performed from March 29 to April 2, 1993, identified similar problems. The review also noted that the DOE-RFO Radiation Protection and Health Physics Branch was in the process of performing a comprehensive review of the ALARA program. Although little progress has been made toward correcting the deficiencies identified in the earlier DNFSB staff review, the DOE-RFO surveillance was completed and identified several fundamental problems with the ALARA program. EG&G is developing corrective action plans to resolve the surveillance findings. These plans have not been finalized and are not assessed here.

#### (b) RFP Buildings

The DNFSB staff reviewed the ALARA Program at the building level for several buildings through discussion with personnel and observations. In general, the staff found that some building ALARA programs were not effectively implemented. As expected, the shortcomings observed mirrored those noted at the plant level. One particular deficiency is that the ALARA program does not totally integrate subcontractors. (See Attachment 4).

### 5. Dosimetry

**External Dosimetry Program** - RFP personnel noted that the Whole Body Dosimeter Program passed the DOE Laboratory Accreditation Program (DOELAP) in 1990, and that the accreditation certificate was received in October 1991. RFP noted that the program's algorithm has been changed since the last accreditation, and that a wrong correction factor may have been applied in the case of the K17 dosimeter chip. In accordance with the DOELAP procedure, accreditation occurs every two years, and is expected to be accomplished this fall.

RFP personnel recognized that DOELAP accreditation does not test the capability of the dosimeter to respond adequately to the plant's various neutron radiation fields. Because of neutron field measurement uncertainties, RFP plans a field characterization study next year. However, RFP personnel feel that the current system is adequate in the interim since it tends to over-estimate the neutron dose.

A comprehensive Technical Basis Document (TBD) for the External Dosimetry Program is currently being developed. The RFP has received no guidance from DOE-HQ on how to prepare that document. RFP personnel stated that they viewed the purpose of the TBD as a means to document the framework of the program, and to state policy. The TBD is expected to be final in January 1994.

Of the 8000 personnel on site, approximately 5000 receive dosimeters. The criteria for requiring dosimeters is defined in Procedure HSP 18.07, with the Radiation Engineering

Group making the determination of who to include.

RFP personnel stated that the Extremity (Wrist) Dosimetry Program was designed to meet the Draft DOELAP Extremity Dosimetry Program Standard. When asked who is required to wear extremity dosimeters, RFP personnel stated that the Radiological Building Engineer would be contacted and would make the decision. RFP personnel stated that there were no specific criteria, but that the question is asked during the Integrated Work Control Package (IWCP) process.

The Extremity (Finger) Dosimetry Program is under development. It is designed to meet the Draft Extremity Standard. Field testing is currently underway, and expected to be complete in mid FY 94.

The periodic turn-in of dosimeters for determining dose (dosimetry exchange) was discussed. A graph of dosimeter exchange versus date showed improvements over the last few months. These improvements were attributed to holding personnel accountable, and to new procedures that have enforcement measures.

**Internal Dosimetry Program** - The Internal Dosimetry Program was discussed with the manager of the RFP Internal Dosimetry Program. It was noted that there is a TBD for the Internal Dosimetry Program, and that it is a controlled document.

The Internal Dosimetry Program is in transition from a program requiring each person on-site to participate in fecal sampling to a program requiring periodic urine sampling and lung counting, with a fecal sampling required when other conditions indicate an uptake might have occurred. A new procedure is in draft (revised HSP 18.20), and the program change needs FY94 funding. EG&G plans to have the new program in place by the end of 1993. Currently only one lung counter is operational, with a second lung counter to be in operation in the near future. It was stated that the equipment is old, and that a capital equipment project to replace it is funded. In addition two identical wound counters are in use.

Management of the bioassay program did not appear to be fully developed. RFP personnel noted during briefings that the Radiation Work Permits (RWP) do not stipulate the requirements for bioassay. Review by the DNFSB staff revealed that RWPs did provide a checkpoint to identify if pre- or post- exposure bioassay were required. The discussions did not make clear how contractors are included in the bioassay program. For example, when asked about other subcontractors, RFP personnel indicated that contractors may come and go and not be bioassayed. A deliberate delinquency tracking system does not exist, but delinquencies are identified by other means. There are plans to use a computer system to track and schedule bioassays.

Recurring operational problems with the on-site analytical lab affecting the plant's bioassay program were noted by RFP personnel. Problems include resource allocation and Resource

Conservation Recovery Act (RCRA) issues. RFP management is currently establishing an off-site bioassay lab contingency, and interfacing with on-site labs to resolve problems and concerns.

## 6. Radiological Instrumentation and Equipment

**Radioactive Source Accountability** - DOE sites maintain radiation sources for the calibration of instruments and equipment, and to perform radiography. These sources frequently contain significant amounts of radioactivity. EG&G stated that many of these sources would have to be licensed under current NRC regulation, if the NRC had jurisdiction. RFP personnel reported that three to seven registered sources, and one-hundred-thirty accountable sources cannot be found at the plant. They plan to inventory database records against file records, cross check historical records against current records, archive all file records for sources that have been disposed of and create a mechanism to make contractors and subcontractors accountable for their sources. A semi-annual inspection is in progress. DOE Order 5000.3B, *Occurrence Reporting and Processing of Operations Information*, gives the requirement to report an "Unusual Occurrence" in the event of loss of accountability of a radioactive source which exceeds the lesser value of exempt quantities as specified in DOE Notice N5400.9 (Sealed Radioactive Source Accountability) or State standards/regulations. The applicability of these reporting requirements were not ascertained at the time of the review.

**Instrumentation** - The DNFSB staff observed that EG&G had developed and documented a process for defining requirements and acceptance criteria for instruments and using it to establish the technical basis for selection of Health Physics Instrumentation. This program appeared to be well constructed and likely to result in properly defined equipment specifications. This procedure was prepared for EG&G Corporate Government Contracted and Operated Facilities, and its use may extend beyond Rocky Flats (i.e., EG&G Mound, REECo Nevada Operations, Idaho National Engineering Laboratory).

**Workplace Air Monitoring** - RFP personnel described the Work Place Air Monitoring Program at the RFP as an integrated program consisting of seven elements ranging from Selected Alpha Air Monitors (SAAM) to bioassay. Air monitoring in the workplace at RFP is not in compliance with the requirements of the RCM. Specifically, the RCM Article 555, *Airborne Radioactivity Monitoring*, paragraph 5 requires that Continuous Air Monitors should be capable of measuring one (1) Derived Air Concentration (DAC) when averaged over eight (8) hours (8 DAC-hours) under laboratory conditions. SAAMs used at the RFP were stated by RFP personnel to have a sensitivity of approximately 42 DAC-hours. Improvements are planned and are expected to increase the SAAM sensitivity to approximately 8.5 DAC-hours. In support of this improvement effort, a pilot program has been completed in Building 707 Module J and Building 371. In addition to the sensitivity problem, SAAMs are no longer in production and the RFP relies on cannibalizing or replacing units from approximately 150 spare units held at the Plant. A Capital Project Air Monitoring Improvement Program is in place to support the air monitoring requirements for the future Decontamination and Decommissioning (D&D) work at the RFP. DNFSB staff review of the RFP RCM Implementation Plan identified that EG&G has not included the upgrade to meet the requirement in their Implementation Plan, but has taken an exception to RCM Article 555.

#### 7. Radiation Work Permits and Procedures

**Work Control and Planning** - As RFP described it, the RFP radiological work control and planning process does not include methods to prioritize their work. Currently, there is more work than Radiological Operations can support. The workload is handled by overtime requests in building work packages. A Plant Priority System is scheduled for implementation in FY 94. This problem is expected to be temporarily exacerbated by further reduction in Radiation Protection Technicians (RPT) availability, when increased training requirements reduce RPT availability below 1993 levels.

**Contamination Control** - Radiological Operations personnel discussed contamination control at the RFP, noting key issues, and indicating improvement. Attachment (5) provides highlights.

#### 8. Respiratory Protection

A briefing on the Respiratory Protection Program at the RFP was given by the Respiratory Protection Program Administrator (RPPA).

Training was discussed, and it was noted by the RPPA that: 1) training was in place for users of respiratory protection devices, 2) training has been developed for issuers of



respiratory protection devices but is not yet in place, and 3) there is no training for some of the respiratory protection decision makers (i.e., the Radiological Building Engineers or Radiation Protection Technicians).

Although the RFP has a documented Respiratory Protection Program in place, it did not appear that the program was in complete accord with the RCM Chapter 5, Part 3 *Respiratory Protection Program*. The RFP RCM Implementation Plan identifies that the program elements within the requirements are not fully implemented, and schedules compliance with the RCM requirements (Articles 531 through 535) in March 1994. This completion date is not coordinated with specific corrective action plans. Specifically, a new Respiratory Protection Program is identified as a corrective action and is projected to take 720 days to complete, and training requirements are projected to take 365 days. Why so much time is required to achieve compliance is not apparent.

### c. Radiation Protection Training and Qualification

The DNFSB staff reviewed the Radiological Training Program for Radiation Workers, Radiological Protection Technicians and their supervisors. The program was in the process of being revised to meet the requirements of the RCM. It was noted that the modified training would require additional manpower.

General Employee Radiological Training (GERT), Radiation Worker Training (RWT) and Radiation Protection Technician (RPT) Training was noted by EG&G personnel as in compliance with DOE Order 5480.11. The Radiation Safety orientation module of the initial General Employee Training (GET) includes the RCM GERT material but tests are not tracked separately. GET Radiation Safety Modules for subcontractors and requalification, and RWT courses do not include the RCM core training materials. The RPT requalification course is being taught by using the Core modules. Radiation Protection Supervisors are required to attend RPT training and the Supervisors Academy. However, they are not required to receive additional technical training or demonstrate knowledge above the RPT level.

DNFSB staff review of the RCM Implementation Plan revealed that a majority of the RCM Chapter 6 training requirements will not be completed until July to September 1995. The RFP plan to accomplish RCM training is not consistent with the DOE's Implementation Plan for DNFSB Recommendation 91-6, which committed DOE to having General Employee Radiological Training, Radiation Worker I and II Training, and Radiological Protection Technician training for all affected workers using the standardized core training material completed by December 1994.

The following highlights from discussion with EG&G and observations are provided:

- Forty percent of the Radiological Operations Section Managers and foremen (supervisors) have attended the Supervisors Academy.
- EG&G is anticipating that approximately 40% of RPTs will fail the RCM Training. Currently, the training work package budget considers 40% remedial training.
- Building Radiological Engineers do not have position descriptions.
- The glovebox training course provided to RPTs has not been reviewed or approved by radiological controls personnel. This course was prepared and is presented by personnel from the Job Specific Training Section of the Performance Based Training Organization.
- RPTs are encouraged to pursue registration by the National Registry of Radiation Protection Technologist (NRRPT).

In light of the fact that RFP Radiological Protection Program training is not meeting the DOE Implementation Plan for Recommendation 91-6, the DNFSB staff considers RFP Radiological Training Program progress unacceptable.

d. Personnel Interviews

Personnel interviews to discuss radiation protection were conducted by DNFSB Staff. Employees interviewed were from the following categories: 1) Radiation Workers, 2) Radiological Control Technicians and 3) Radiological Controls Supervisor.

In general, employees were confident and knowledgeable about radiation protection commensurate with their position. Response to questions indicated that the radiation program discussed in the briefings was in place, or was in the process of being implemented.

e. Building Tours

Buildings 707, 771, and 881 were toured by DNFSB staff with RFP personnel. EG&G line personnel conducted the tour, made observations and compiled notes. Excerpts from the tours are provided in Attachment (6).

## 5. DNFSB Staff Follow-up

- a. Follow progress made towards achieving RCM compliance.
- b. Follow implementation of the computerized tracking and scheduling program for bioassay. Verify that it includes subcontractors who work at the plant.
- c. Follow the progress made in resolving deficiencies associated with radioactive source accountability.
- d. Examine the details and status of the RCM Article 555 exception.
- e. Review the progress of the RFP implementation of the SAAM Improvements and the Capital Project Air Monitoring Improvement Program.
- f. Review the results of the Building 771 radiation survey taken in the vicinity of the Ladies Locker Room, Guard Post and TLD Storage Rack.

**ATTACHMENT (1) ROCKY FLATS PLANT  
KEY ISSUES FOR RADIOLOGICAL CONTROL MANUAL IMPLANTATION**

Key issues associated with the implementation of the are:

1. Integration of Radiation Worker and RPTs will require a significant development effort, and student training times will increase. For example, RPTs initial training will increase from 8 weeks to 26 weeks, and requalification will increase from 2 weeks to 12 weeks.
2. Physical Facility Modifications will be required because the proximity of dress out and removal facilities to RCA entrance does not exist in most facilities, and step-off-pad arrangements are not readily supported with existing accommodations. In addition, current laundry capacity may not be capable of supporting layered clothing.
3. Capital Equipment funds are extremely limited, and compliance with other requirements (RCRA) has higher priority in allocation of available funds.
4. Conversion of historical exposure data to Committed Effective Dose Equivalent (CEDE) requires a significant effort (10 person-years). The conversion process will be complicated since depositions were originally quantified in terms of activity (% organ or % body burdens), and by the fact that dose information from other sites is not in the system.
5. Change in the Radiological Operations culture will include: 1) conversion to "Safety" over "Production," 2) individual worker and line management acceptance of responsibility for radiological control, 3) confusion and/or complacency in workers because of rapid and extensive change in requirements, and 4) development of credibility of Radiation Protection with external groups and workers.
6. Schedule - Full compliance by 1996 is considered extremely challenging. The down-sizing of the site as part of mission change creates significant competition for resources. Significant additional upgrades are required. Training must incorporate requalification requirement.
7. Staffing - Reduction in force requires maximized utilization of displaced resources to fill staff openings. Existing resources have a limit with respect to being matched to resource needs, and the schedule does not facilitate retraining.

## ATTACHMENT (2) - RCM IMPLEMENTATION PLAN HIGHLIGHTS

The Rocky Flats Plant (RFP) Radiological Control Manual (RCM) Implementation Plan was reviewed and the following highlights are provided:

### A. RCM Compliance Status:

- In compliance with 45 items (22.4%).
- Non-compliant with 156 items (77.6%).
- No items were identified as Not-Applicable.

Note: Items include Articles (with numbers), Text sections which follow a chapter part but precede a numbered article and Tables which contain requirement statements. Requirement statements are specific and implied "shall" and "should" statements.

### B. Exceptions:

Article 521, Internal Dosimetry  
Article 555, Airborne Radioactivity Monitoring

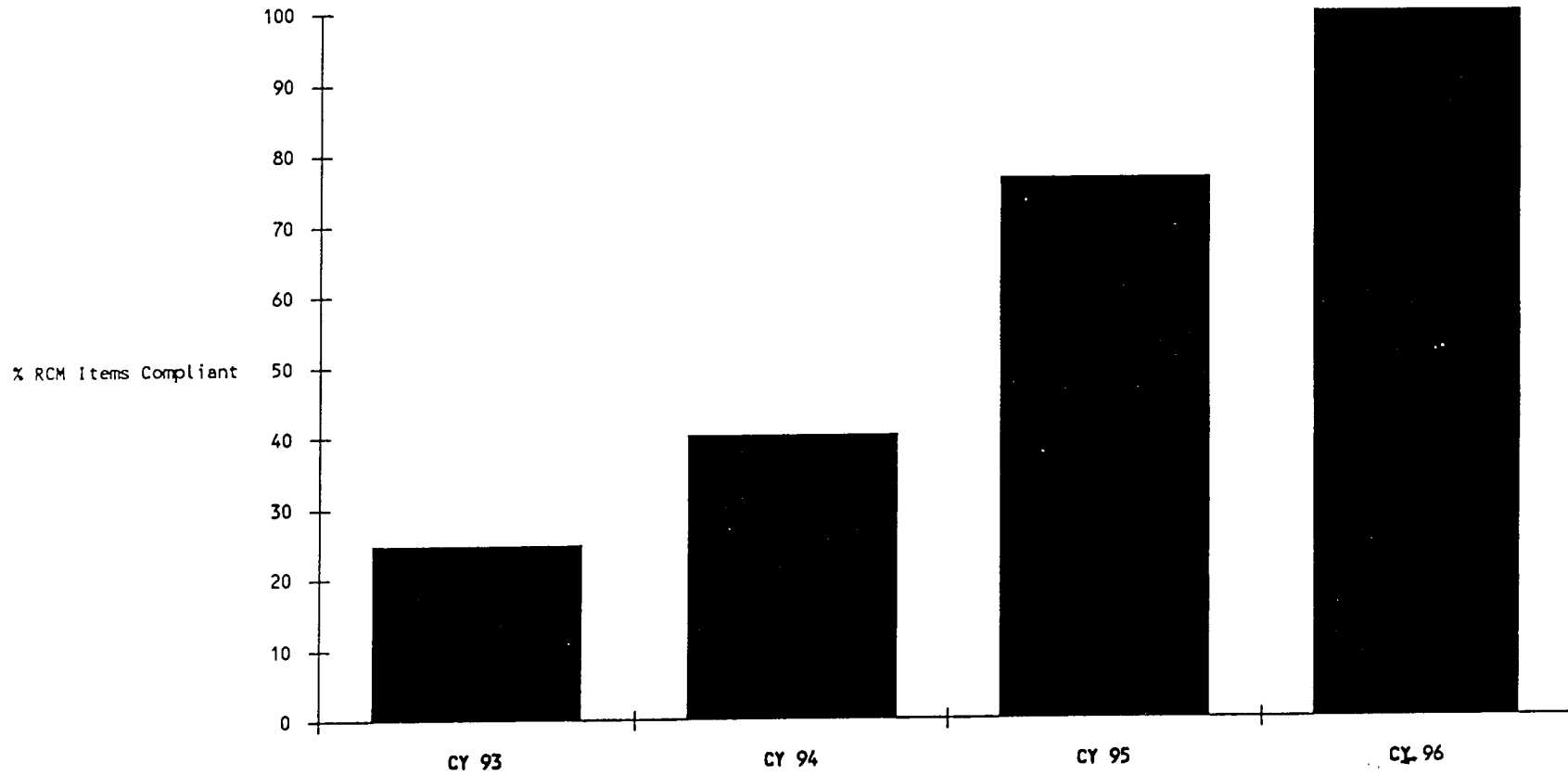
### C. Approval Status:

Implementation Plan noted by EG&G as approved by DOE with comments.

### D. Compliance Schedule:

Refer to the following page(s).

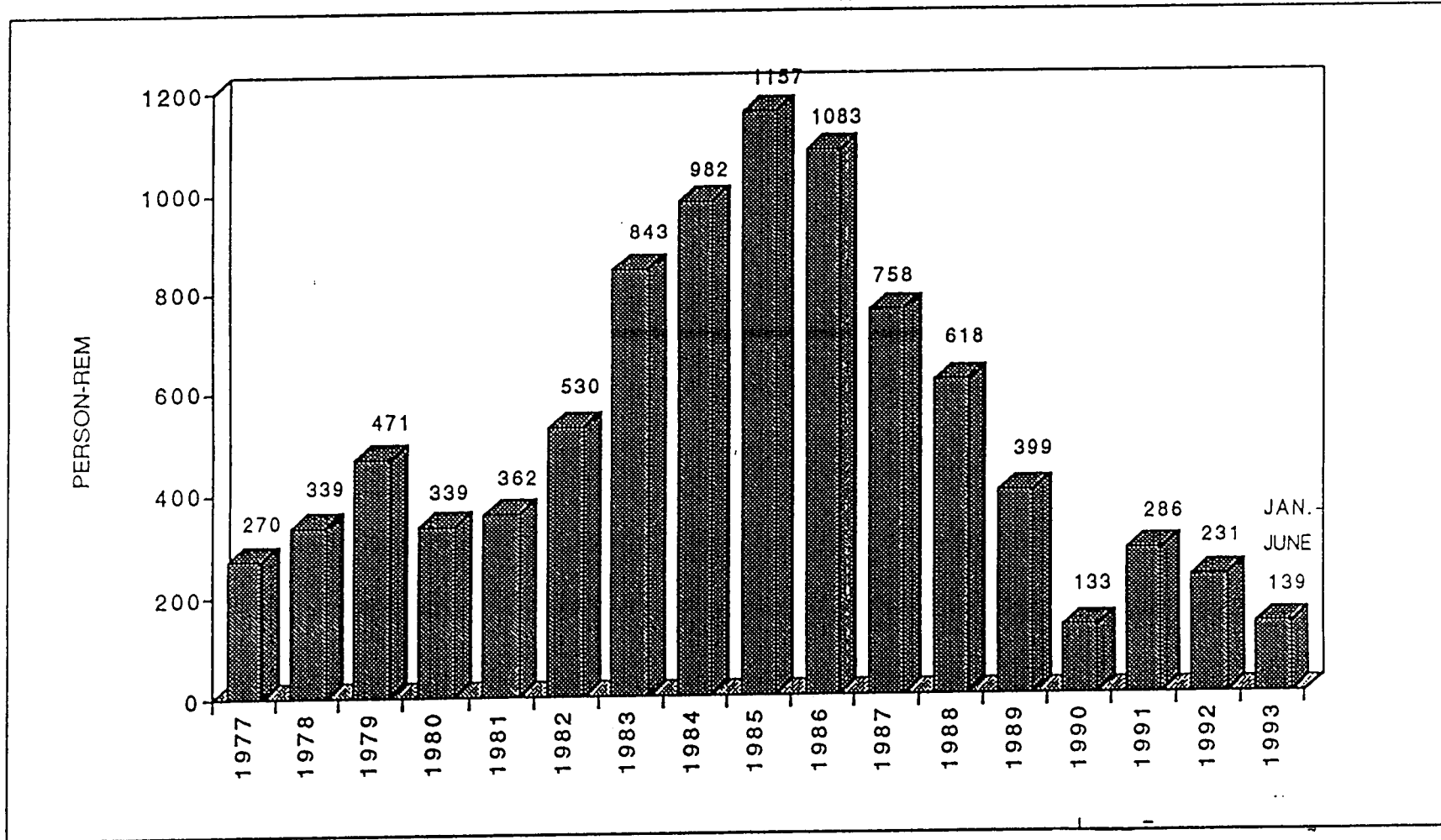
RCM Implementation at the RFP  
Per Cent Compliant at End of Year



Note: Graph was based on the Implementation Plan Summary, and does not reflect the information provided by the Implementation Plan Schedule which shows some activities with completion dates in 1997 and 1998.

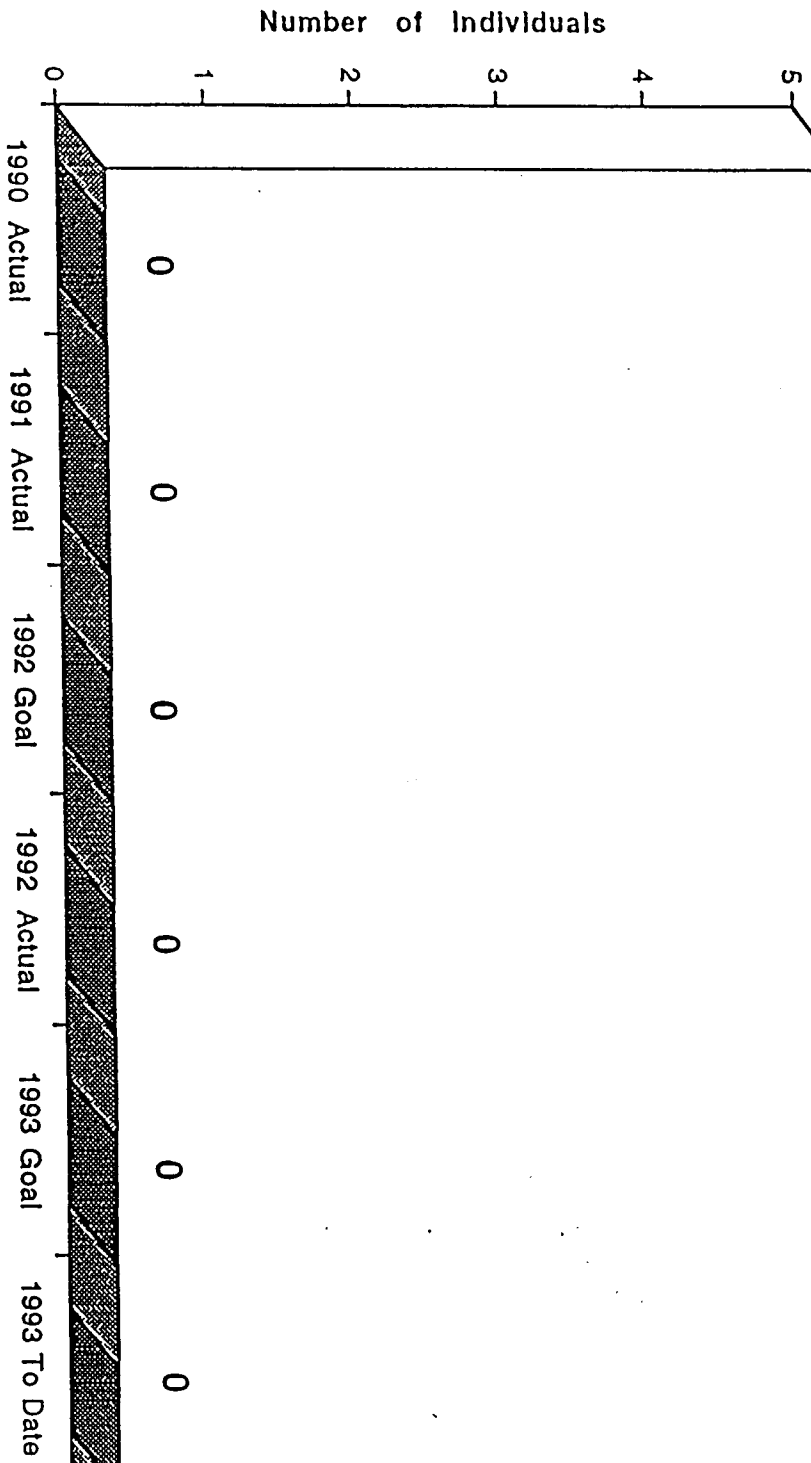
**ATTACHMENT (3) - PERFORMANCE INDICATORS**

# Personnel Cumulative Radiation Exposure



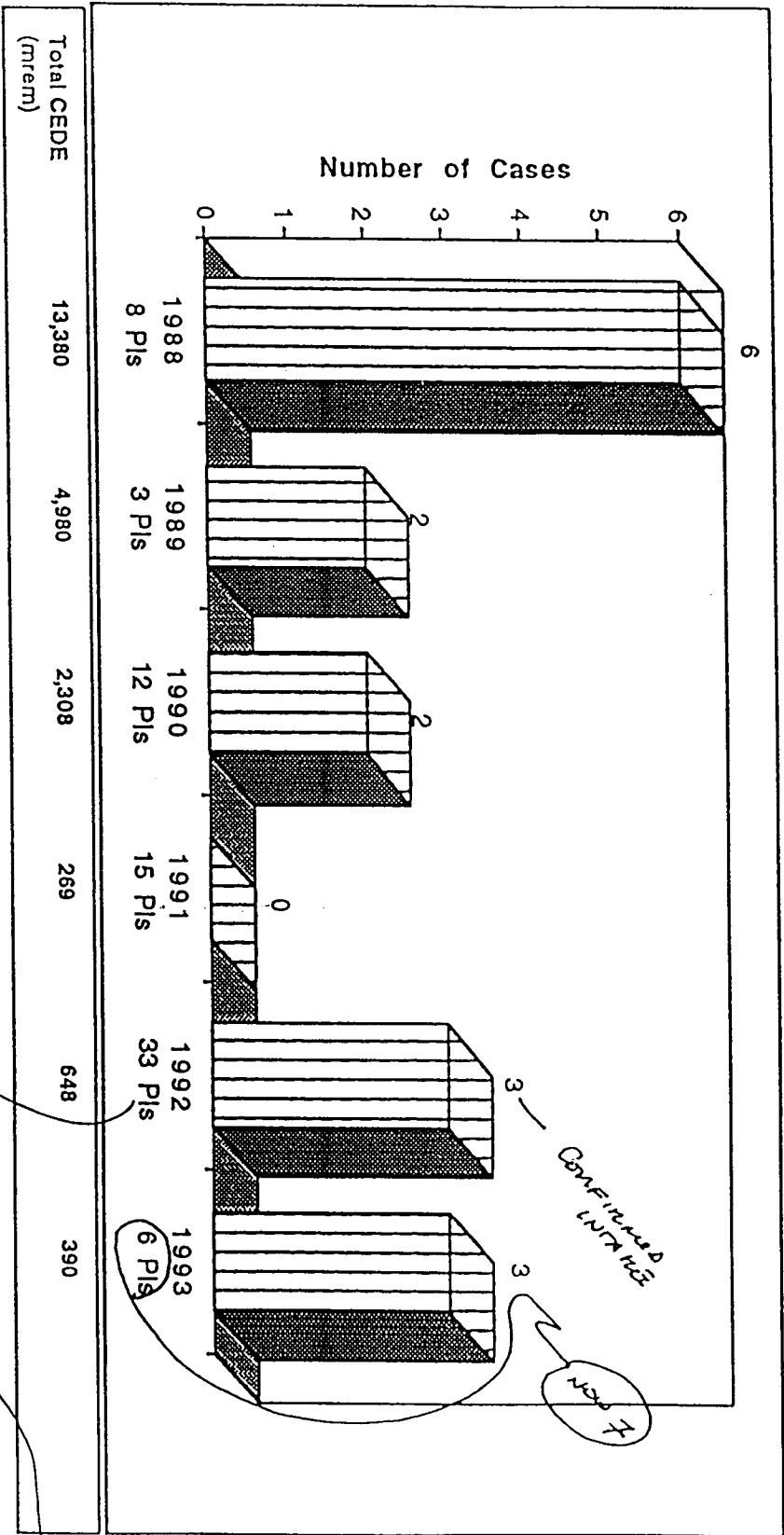


# ALARA Goals and Performance # of Individuals Exceeding ADG

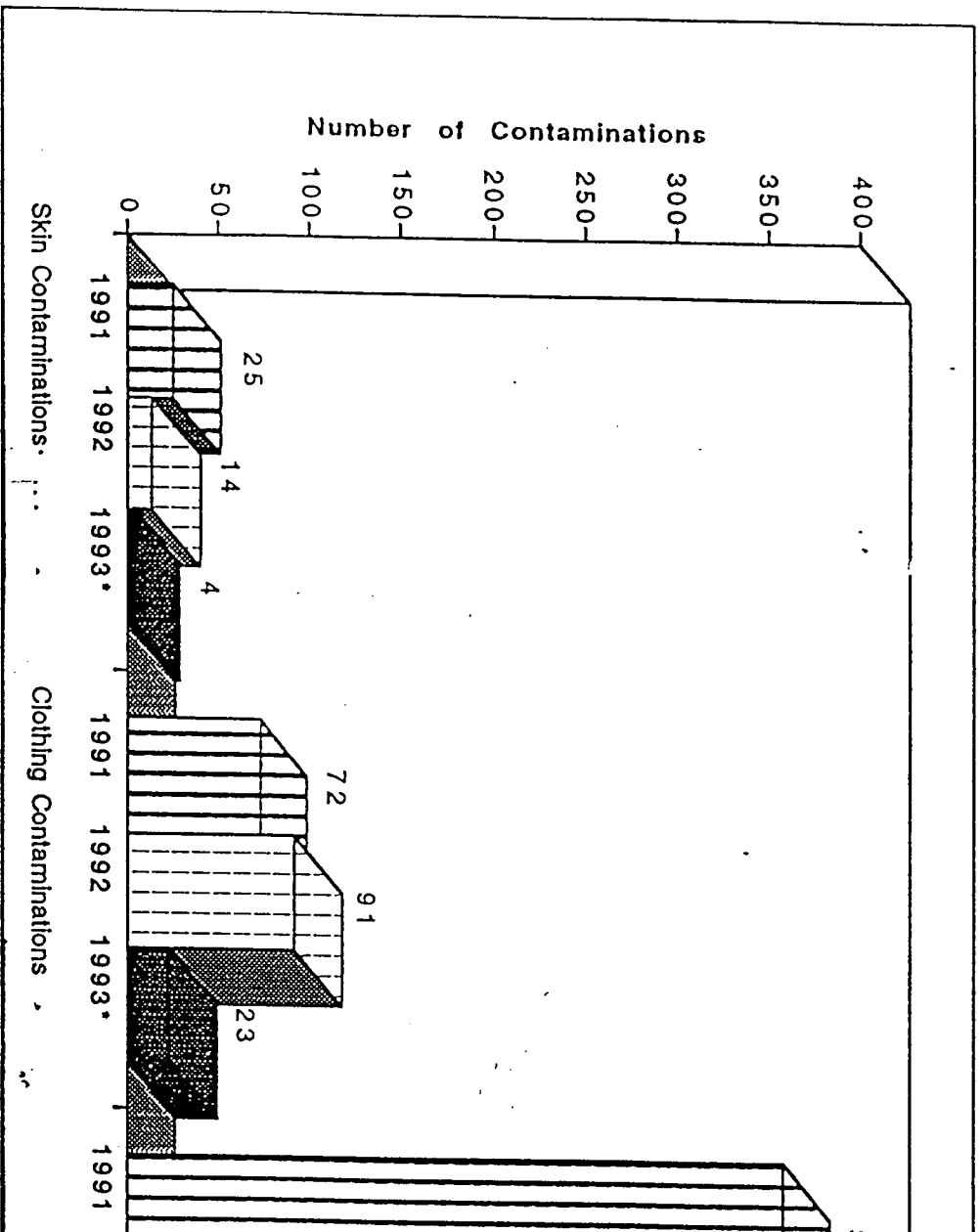


# Radiation Protection

Confirmed Intakes  
> 100 mrem CEDE



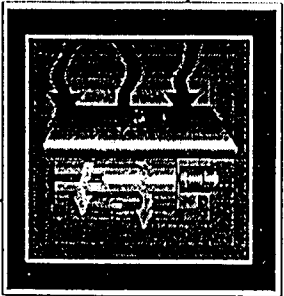
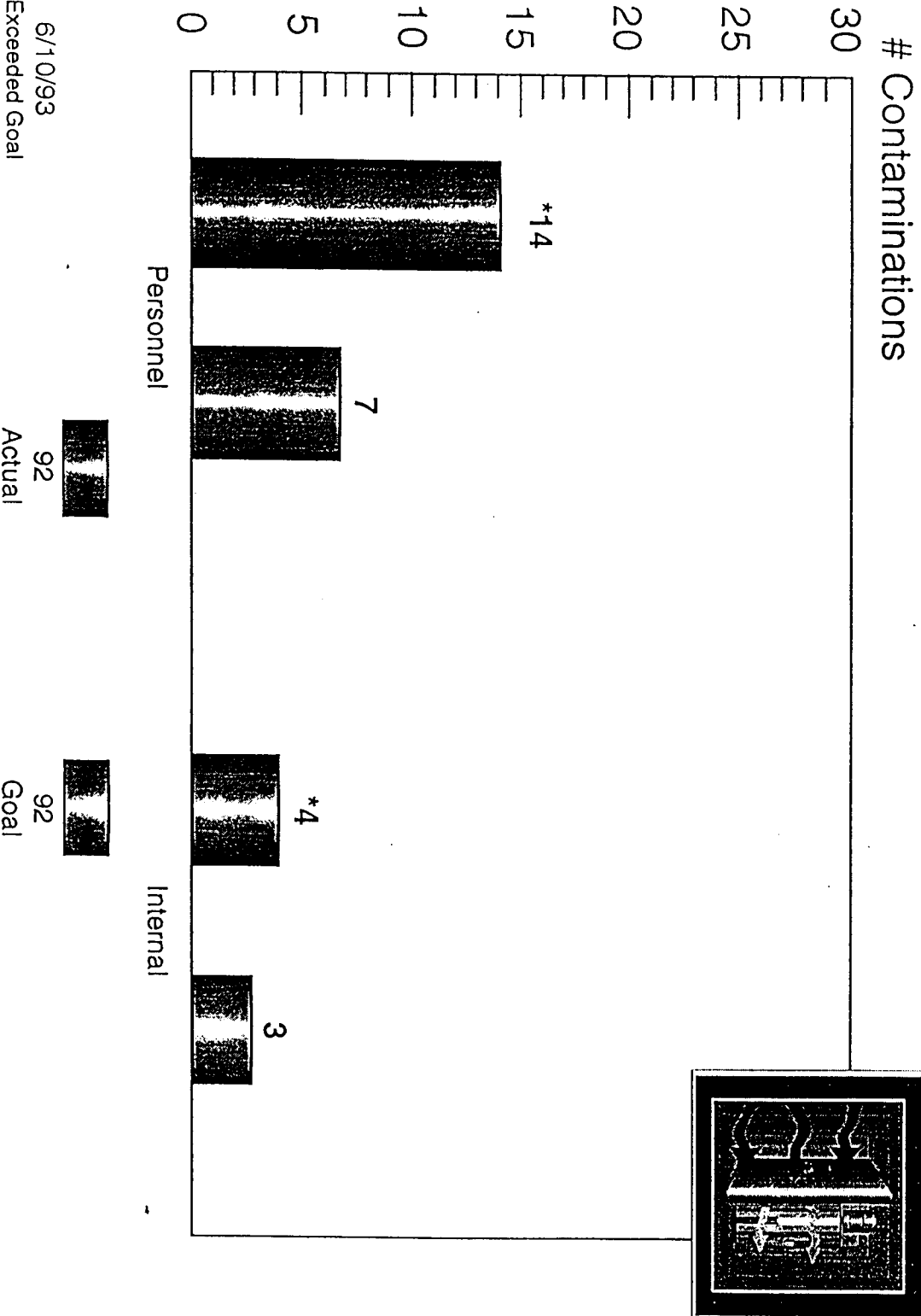
# Skin/Clothing and Area Contamination



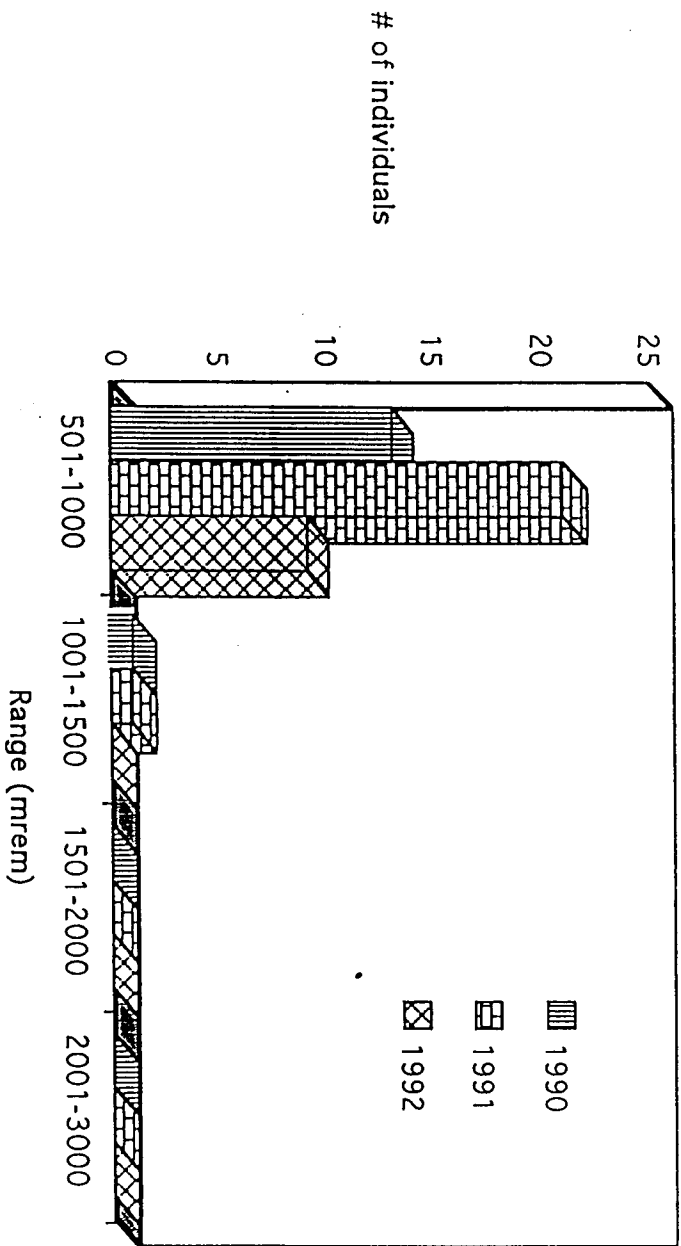
# 1992 ALARA Goals Summary

## EG&G Rocky Flats

### Personnel/Internal Contamination Totals



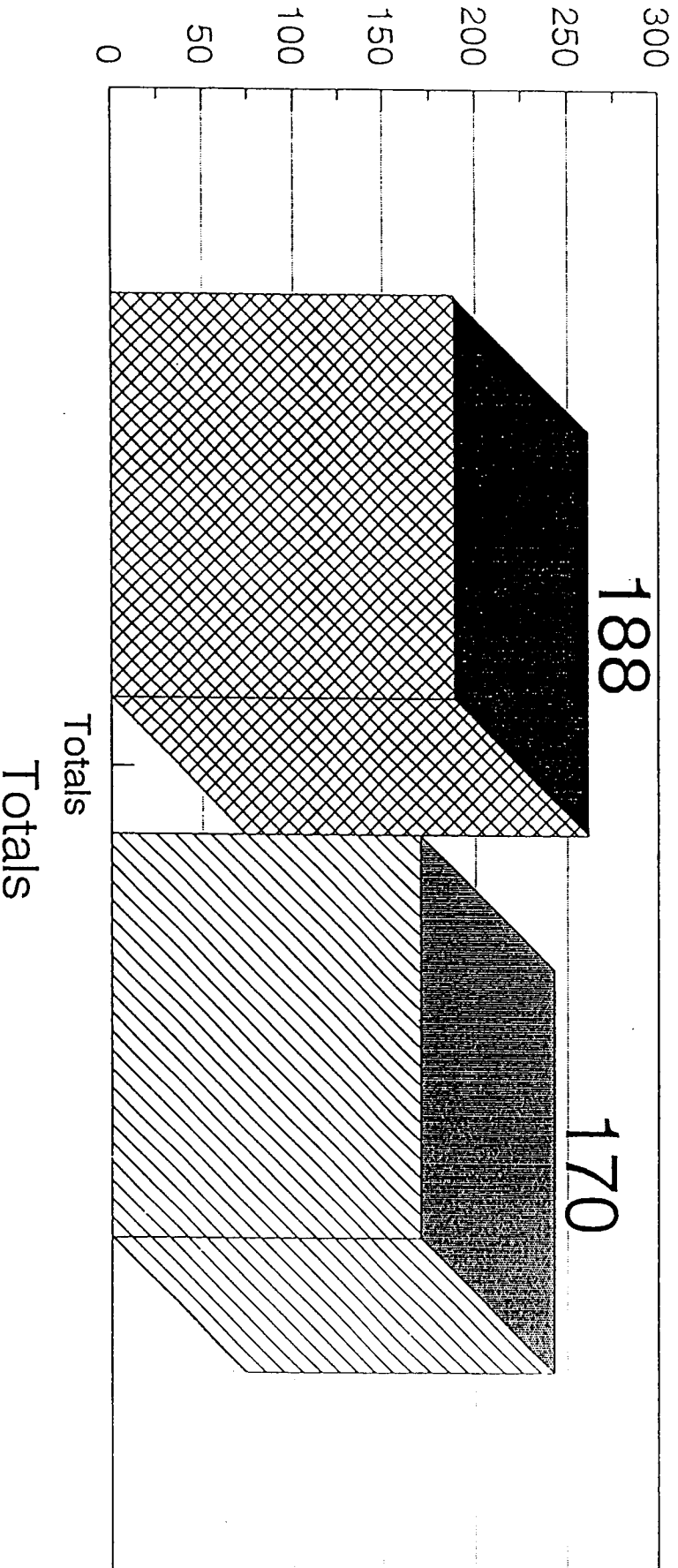
# RFP Dose History



# 1992 ALARA Goals Summary

## EG&G Rocky Flats Personnel Dose Totals

Person-Rem



91 Estimate



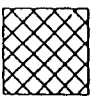
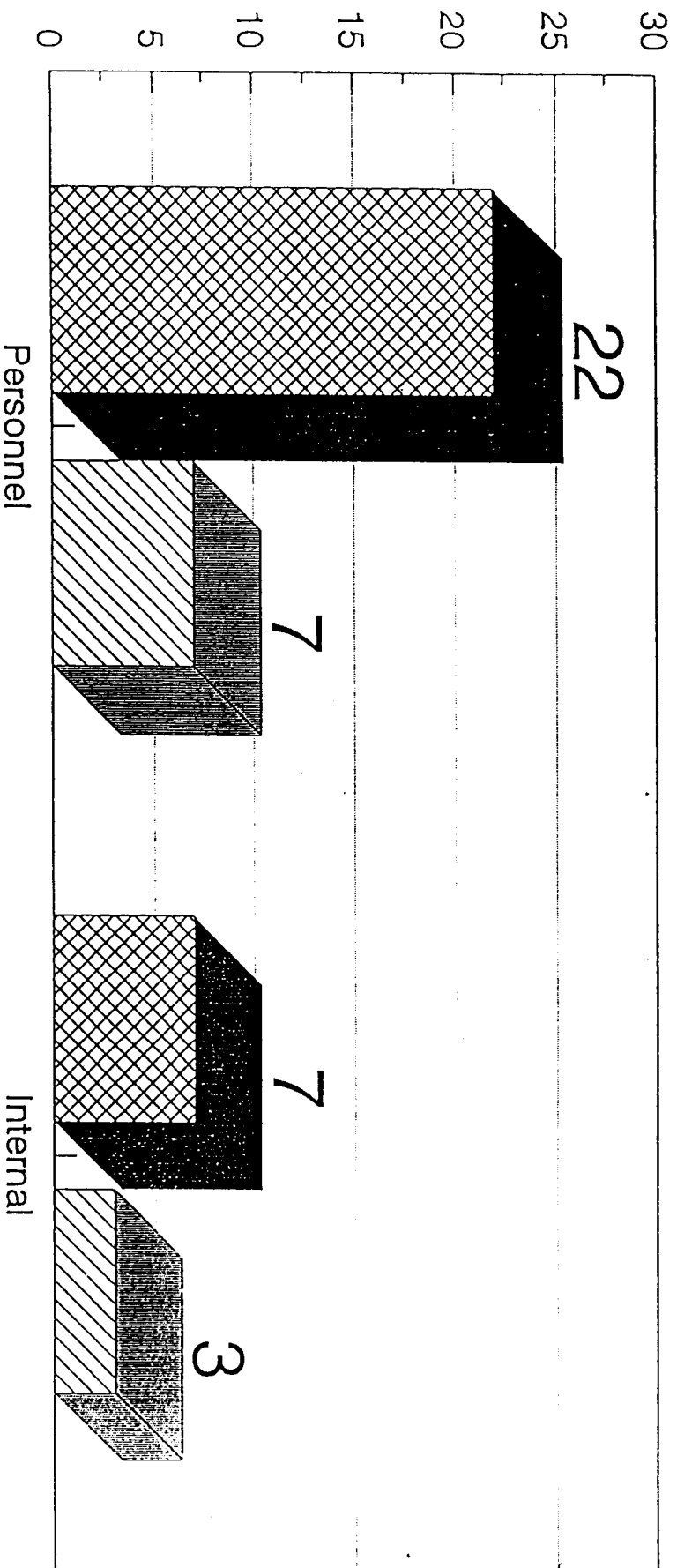
92 Goal

# 1992 ALARA Goals Summary

## EG&G Rocky Flats

### Personnel/Internal Contamination Totals

# Contaminations



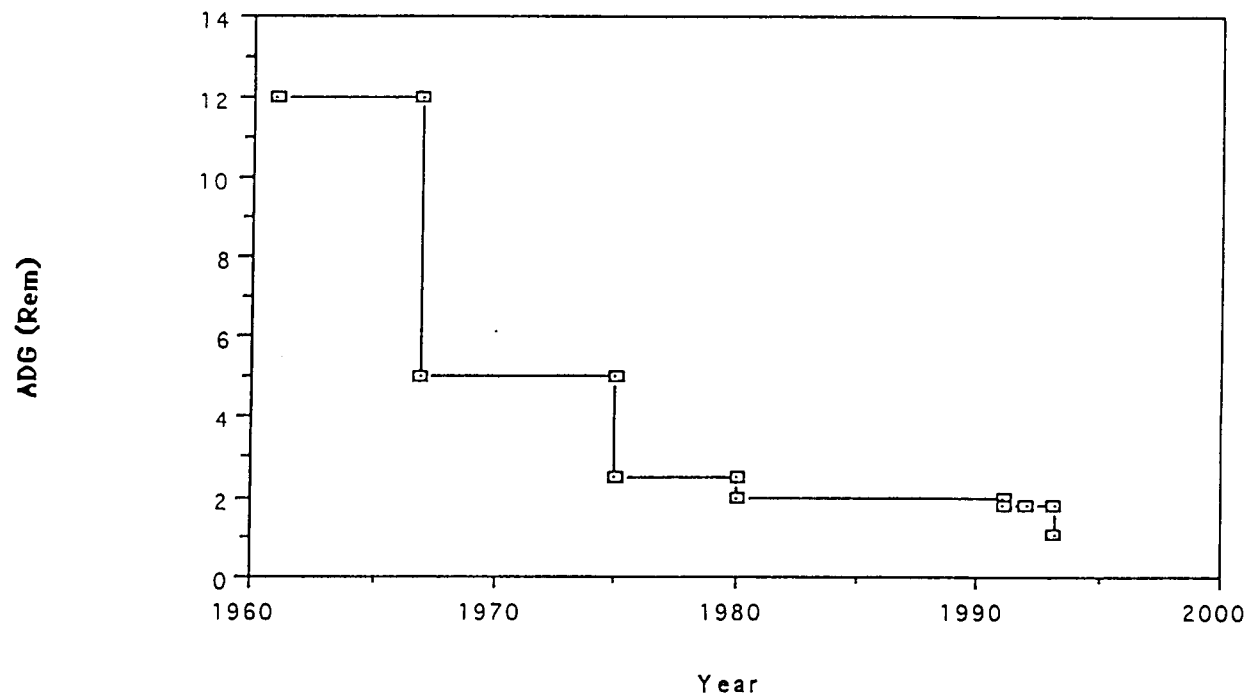
91 Estimate



92 Goal

# Rocky Flats ADG History

History of RFP Administrative Dose Guides (ADG's)





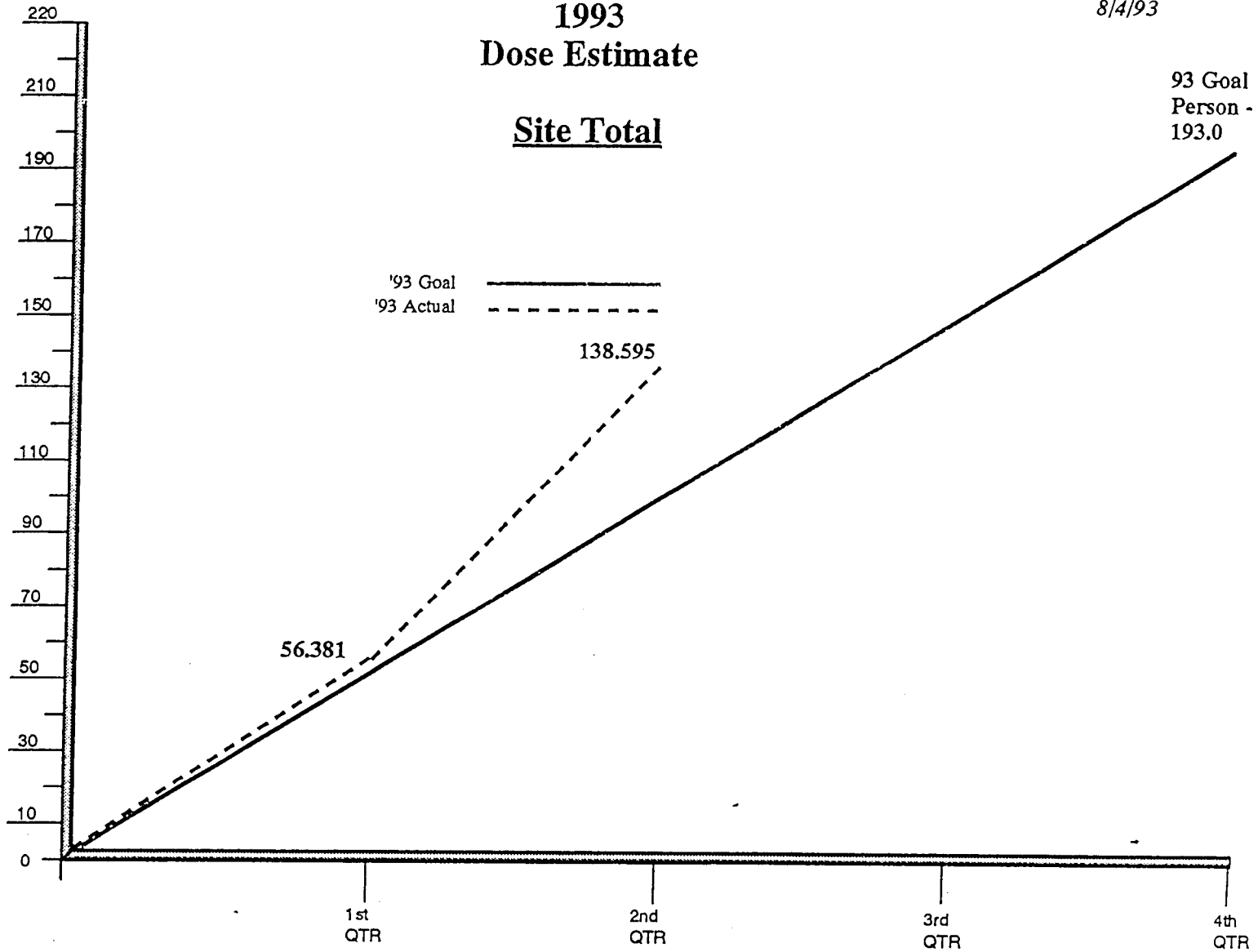
Person - rem

# EG&G Person - rem 1993 Dose Estimate

8/4/93

## Site Total

93 Goal  
Person - rem  
193.0



EG&G Person - rem  
1992  
Dose Estimate

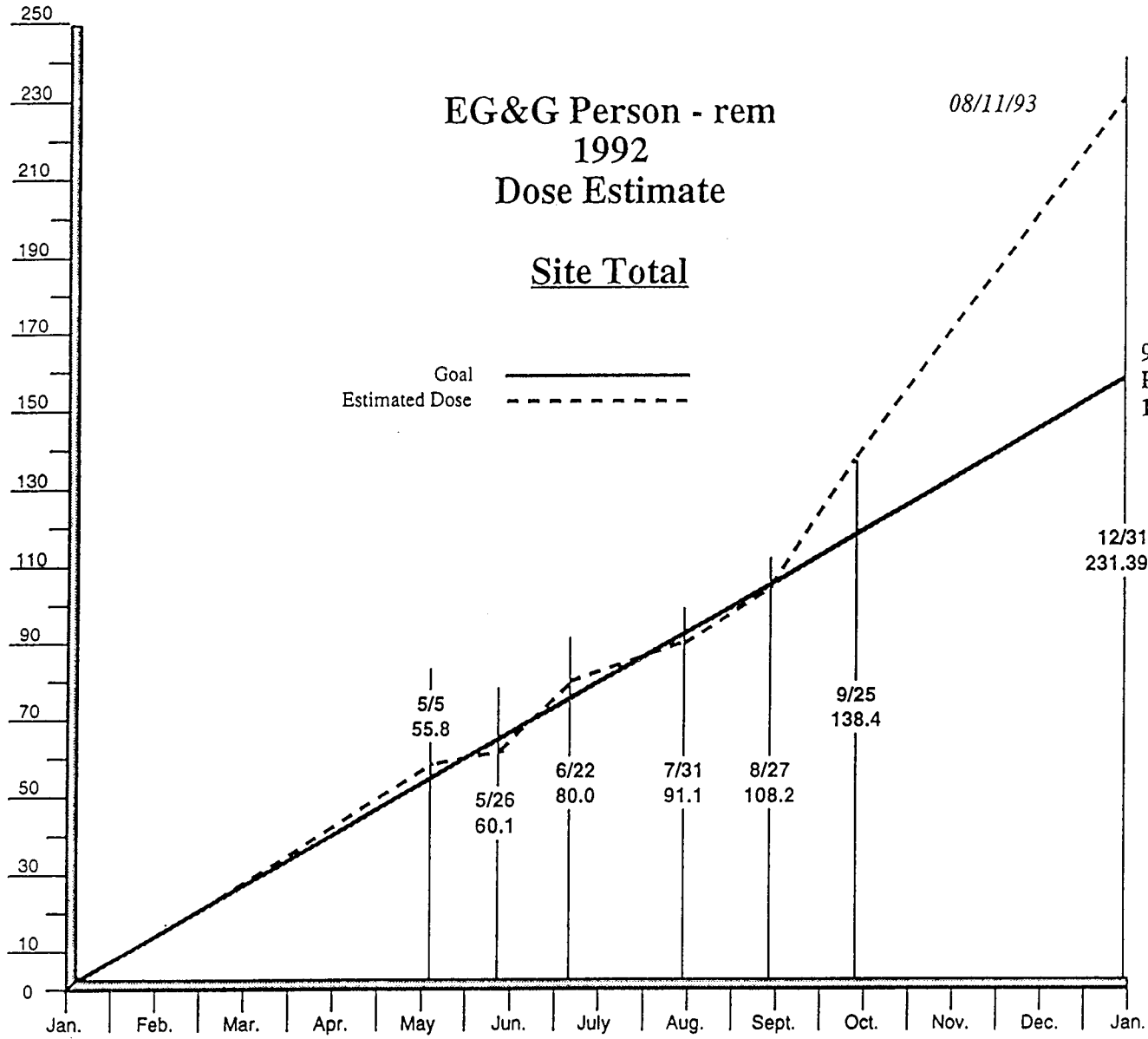
Site Total

08/11/93

Goal ———  
Estimated Dose - - - -

92 Goal  
Person - rem  
157.0

Person - rem



## ATTACHMENT (4) - RFP ALARA PROGRAM

ALARA Program Performance Indicators were presented in the following areas: 1) Personnel Cumulative Radiation Exposure, 2) Confirmed Intakes greater than 100 mrem CEDE, 3) Skin/Clothing and Area Contaminations and 4) Number of Individuals Exceeding Administrative Dose Guidelines (ADG). The following observations were made during the review:

1. The Operations Management for one building was not able to recall either the five categories of ALARA goals or what the specific goals were for their building for 1993.
2. Although the liquid waste treatment facility is operating essentially at capacity, little if any successful effort has been initiated to reduce the generation rate. This situation is not being addressed as one of the ALARA program goals.
3. Despite the fact that subcontractors do a significant amount of radiological work, they are not totally included in the site's ALARA program.
4. During tours of various facilities it was noted that ALARA information posted on bulletin boards was not current, and in some cases, was incomplete.
5. The method used for development of ALARA external exposure is without a strong foundation. Typically, the estimate of the previous year's external exposure total is simply factored down by 10 %. Allowances are not made for changes in work load or personnel staffing from year to year. Major changes in work assignments can significantly affect a groups external radiation exposure for a year. However, provisions apparently do not exist to adjust a goal during the year to account for these changes. These issues limit the usefulness of the goals as a management tool.

The EG&G collective dose for 1st and 2nd quarter 1993 was equal to 56 and 82 person-rem respectively, and exceeds the EG&G cumulative dose goal of 100.

The EG&G collective dose 1992 total was 231 person-rem, and the 1992 goal was 157. EG&G is working to determine the reasons for the difference. During briefings, EG&G personnel gave four reasons for last quarter CY 92 increase above goal. These were:

- 1) material moves in Bldg 991;
- 2) on-line work in Bldg 707;
- 3) dose reconstruction for 1992; and
- 4) data base programming problem.

## **ATTACHMENT (5) - CONTAMINATION CONTROL IMPROVEMENTS**

1. Past practice was to shut down buildings without lay-up, but currently a Transition Program has been implemented in Building 865.
2. Implementation of engineering controls was described as "in infancy." Engineering controls, such as glovebags on ventilation plenums, are being used in Building 707.
3. In the past there was a lack of timely closure of Radiological Deficiency Reports (RDRs). Some RDRs have remained opened for up to 2.5 years. Recently, the data entry backlog has been eliminated, the number of outstanding RDRs have been reduced by 10% over previous years, and further improvements are planned.
4. Radiation Work Permit compliance lacks positive control from non-Integrated Work Control Procedure, and lacks control of external dose. RFP personnel plan to move the RWP Issue Point to Radiological Control Area (RCA) step-off pads, revise procedures to minimize redundancy, purchase computerized access control programs (pending funding), and implement the use of direct reading dosimeters.
5. Radiological Building Engineers were noted as needing additional training in the conduct of ALARA Reviews, and action plans have been developed to provide specific training in ALARA Reviews.

## ATTACHMENT (6) - BUILDING TOUR COMMENTS

Buildings 707, 771, and 881 were toured by DNFSB staff with RFP personnel. EG&G line personnel conducted the tour, made observations and compiled notes. Excerpts from the tours are provided below:

### **Building 707**

A large number of radiological deficiencies were identified during the tour. This was especially surprising as EG&G personnel had inspected the building in preparation for not only this tour, but for a preceding tour by members of the DOE Office of Nuclear Safety (ONS) Team.

Several of the deficiencies noted in the August 1993 tour were observed again in September 1993 during a return visit by the DNFSB OE.

Examples of deficiencies observed in August 1993 included:

1. Radiation areas were not shown on survey maps posted at the entrance to modules within the building.
2. Contamination areas were not shown on survey maps posted at the entrance to modules within the building.
3. Differences were noted between radiation levels recorded on survey maps posted at the entrance to modules and those posted on radiation area signs within the module.
4. Radiation survey data was not available for the area of a glove port with the shield open.
5. The contamination containment wrapping on one large contaminated item was not completely taped in place and therefore was not sealed.
6. A Radiation Area sign in the J-Module referred to a radiation area in the overhead. It could not be determined from the sign where in the overhead the Radiation Area was. Scaffolding in the area allowed access to the actual Radiation Area without passing the sign, and effectively rendered the Radiation Area un-posted.
7. Not all information required to be provided on a survey map was filled in.

Attachment (6)

### **Building 771**

1. The Building ALARA Program does not include subcontractors (i.e., J. A. Jones).

2. Higher than usual radiation exposure was noted by RFP personnel for people who store their TLDs at the TLD Board near the Ladies Locker Room. Radiation levels were estimated at approximately 300 milli-rem over a 6 month period. During discussions it was noted that Wackenhut Security Guards in an adjacent vestibule were not required to wear TLDs. EG&G personnel stated that they plan to study radiation levels in these areas.
3. A Radiation Protection Technician (RPT) was observed working at an entrance to Airborne Radioactivity Area. No step off pads were used at entry/exit point, as required by RCM Art. 335.4.
4. Storage of chemicals appeared to be uncontrolled. The following are examples: H<sub>2</sub>SO<sub>4</sub> was stored apparently for use for a system that was out-of-use, a container (drum) of paint thinner appeared to be waste, and a Chemical Storage Cabinet was in need of an inventory.
5. Vacuum cleaners that were located in the RCA were not outfitted or marked in accordance with the RCM requirements (Art. 464).
6. Fire extinguisher throughout the building were overdue for periodic inspections.
7. Announcements made on the building's Public Address System were sometimes inaudible.
8. Frisking at exit from the RCA was rapid (typically less than 2 minutes), and did not conform to the requirements of the RCM requirements (RCM, Appendix 3D).
- 9 . Radiological control requirements varied within the RCA. The tour group was required to wear protective gloves, while personnel in a Control Room (without frisking equipment at the entry/exit point) wore no protective gloves.

### **Building 881**

1. The DNFSB staff had no comments.

Attachment (6)