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Westinghouse Hanford Company Health and Safety Performance Report

First Quarter Calendar Year 1994

Safety
Health Physics

Date Published
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Assistant Secretary for Environment,
Safety and Health

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MANAGEMENT SUMMARY

On March 31, WHC submitted to DOE-RL, a formal application for "Merit" worksite recognition under the DOE Voluntary Protection Program. The process and time-table are detailed on page 2-1.

Safety training programs for the employee, manager, and safety observer are undergoing refinements in response to employee suggestions as well as to promote the interactions necessary to the success of the Voluntary Protection Program. Adjustments to these programs are described on pages 2-1 and 2-2.

Significant events, which carry lessons we must learn in order to reduce injury potential, are summarized on pages 2-2 and 2-3. The events highlighted this quarter involve indoor air quality and unexpected weather changes which can impact outdoor work activities.

Our analysis of injuries occurring this reporting period continues to feature the simple-task injuries which reflect on awareness levels and culture strength. In addition to injuries arising from simple, everyday tasks, a significant number of injuries were caused by objects in "blind spots." These are items placed out of view where an employee can contact them by reaching in to a drawer (staples, exacto blades, etc.), or by bumping/brushing against (wall hangings, sharp furniture edges).

Efforts to achieve the fiscal year lost/restricted workday rate reduction are statistically assessed on page 2-8. The overall company rate is below the goal rate through the first quarter.

Department-specific trending is undertaken to show where reductions and increases which impact the overall record are taking place. Each department's record is broken down into three sub-groups of injury type. This allows a clearer picture of where programmatic focus will accomplish the best results. The injury groupings isolated are muscle strain, cumulative trauma disorder, and other general types (2-14 through 2-28).

The ALARA Program Office realignment from the Safety Function to the Health Physics Function has been completed. Included in the realignment is the integration of the Contamination Control Improvement Project (CCIP) within the ALARA Program. The CCIP is now incorporated as part of the ALARA Program to strengthen both ALARA and CCIP field implementation.

No reportable intakes of radioactive material were confirmed, and no unplanned exposures resulting in a dose greater than the administrative control level occurred during this quarter.

There were ten skin contaminations and 15 clothing contaminations reported during the first calendar quarter in WHC-managed facilities/operations per WHC procedure as compared to six skin contaminations and 23 clothing contaminations during the same period in 1993 (Page 3-13).

MANAGEMENT SUMMARY (Continued)

The total number of RPRs written during the first quarter of 1994 was 320, the same as the number written during the first quarter of 1993 and 46 fewer than in 1992. One reason for this decrease continues to be an increasingly cooperative effort between Health Physics and the actionees to avoid radiological problems through a proactive approach (ALARA) (Page 3-18).

Refer to Section 3.7, page 3-28, for facility-specific radiological information.

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1.0 ALARA

As Low As Reasonably Achievable (ALARA) is an approach to radiation and hazard protection that manages and controls exposures (both individual and collective) to the work force and to the general public to levels ALARA. This is accomplished while taking into account social, technical, economic, practical, and public policy considerations. It should be clarified that ALARA is not a dose limit, but a process with the objective of attaining and maintaining exposures as far below the applicable limits as is reasonably achievable.

Achieving a successful ALARA Program requires that all personnel be cognizant of and committed to the ALARA principles and goals. Only through a sincere management commitment and the transfer of that commitment to each employee can the ALARA concept be effectively realized. Radiation protection, operations, and safety organizations are fundamental in carrying out the radiological and environmental protection functions. Included in these primary functions are the measurement and control of both radiological and nonradiological exposures and hazards.

1.1 ALARA PROGRAM RESTRUCTURED

The ALARA Program Office realignment from the Safety Function to the Health Physics Function has been completed. Included in the realignment is the integration of the Contamination Control Improvement Project (CCIP) within the ALARA Program. The CCIP is now incorporated as part of the ALARA Program to strengthen both ALARA and CCIP field implementation. The two programs are colocated to improve interface, communication, and administration.

The CCIP provides a centralized focal point to assist facilities/programs in the sitewide effort to improve the contamination control practices at Hanford. The CCIP charter includes the tracking of radiological contamination sitewide, development of associated performance indicators, planning and technical support of contaminated area reduction, and the performance of assessments with respect to work practices. The goal of CCIP is to maintain a safe workplace by minimizing the occupational risks that result from the interaction between people and contamination. ALARA and CCIP goals and missions contain many of the same elements and purposes, therefore, the joining of these two groups appears to be a natural fit.

The biggest assets of the ALARA Program are the facility and organizational ALARA Committees. During the first quarter of 1994 there were 11 established facility/organizational ALARA committees across the site. The ALARA Committees are created at the facility/organizational level to assist in the implementation of the ALARA Program elements and processes. The facility/organizational ALARA Committees establish administrative procedures which outline responsibilities and requirements for implementing the ALARA Program at the specific facility or organization. Membership is comprised of line management, workers, and technical support personnel. The committee implements, monitors and evaluates production, operations, maintenance, remediation, and construction to ensure compliance with ALARA principles. These committees report directly to their specific facility/organizational sponsors.

Another resource is the WHC ALARA Council. The council is made up of the ALARA Committee chairpersons, managers, and technical support personnel. The primary charter of the council is to meet at least monthly to discuss Hanford Site ALARA issues, share ALARA techniques being applied as recommended by the committees, and communicate ALARA Program implementation activities consistently across the site. The ALARA Program Office chairs this council and acts as the coordinator for updating the chairpersons on new developments in DOE orders, industry standards, and headquarters guidance relative to ALARA initiatives and activities.

1.2 CALENDAR YEAR (CY) 1994 WHC ALARA GOALS

In principle, ALARA is the goal and other goals should not be necessary. In practice, however, other goals are required to assist in assuring that the primary goal, ALARA, is achieved. Goals for the ALARA Program are established at the outset of the ALARA Program and reestablished periodically thereafter. The goals are related to specific characteristics of operations or programs and correspond to real problems. Setting practical ALARA goals depends on how well the ALARA Program is understood and supported by facility/organizational management.

It should be mentioned that the goal process is a vital part of promoting the success of the ALARA Program. The entire goals process has been emphasized during interface meetings with U.S. Department of Energy - Richland Field Office (DOE-RL). The emphasis placed on this process, by DOE-RL, should not be overlooked. As such, ALARA Committee chairpersons have been requested to status facility-specific goals as they become due. The ALARA Program Office is statusing the ALARA sitewide goals on a monthly basis through the Site Management System. This allows for the timely statusing, tracking, and distribution of goal-related information.

1.2.1 CY 1994 SITEWIDE ALARA GOALS

The ALARA Council and ALARA Program Office develop annual sitewide goals to focus and direct the attention of all levels of management and workers toward areas of performance requiring improvement. Sitewide goals reflect a commitment to a company-wide ALARA Program, driven by an emphasis on safety, the health of workers, and the protection of the environment. The application and status of the 1994 sitewide goals are reviewed by the ALARA Council at each monthly meeting, reported quarterly to the DOE, and updated in Table 1-1. ALARA sitewide goals are established annually and are specific, measurable, and not easily attainable. The CCIP goals have been established by each applicable ALARA Committee and are an integral part of the CY 1994 sitewide goal process.

Table 1-1. CY 1994 ALARA Sitewide Goals		
No.	Goal	ECD
1	Evaluate and revise where necessary the WHC-CM-4-11, <u>ALARA Program Manual</u> , to reflect the enhanced ALARA philosophy of including nonradiological and radiological issues in the ALARA process. Ensure compliance with DOE policies, standards and guidelines that pertain to ALARA, health, and safety requirements. <u>Actionee</u> : ALARA Program Office <u>Analysis of Performance</u> : The ALARA Program Office is in the process of performing a complete rewrite and design of WHC-CM-4-11, <u>ALARA Program Manual</u> . The rewrite is being completed with the focus on 10 CFR 835, "Implementation Guide for Occupational ALARA Programs." The scoping document and notice of intent have been issued and draft sections are currently at Management Standards for review.	10/31/94 OPEN
2	The ALARA Program Office will provide quarterly ALARA training, utilizing the hands-on instruction approach, as applicable, for ALARA Council and ALARA Committee members. This training will focus on radiological and nonradiological ALARA issues in an effort to expand the awareness of WHC employees to ALARA principles. <u>Actionee</u> : ALARA Program Office <u>Analysis of Performance</u> : The course, "Hazardous Chemistry for the Non-Chemist," was conducted on March 29-30 as first quarter ALARA training. This training was developed for individuals working with, or having the responsibility for, compliance with hazardous waste regulations or health and safety standards. A total of 38 employees attended this hands-on training session.	12/31/94 OPEN

Table 1-1. CY 1994 ALARA Sitewide Goals

No.	Goal	ECD
3	Implement an electronic database system to document and compile examples of corrective actions and lessons learned utilizing ALARA Program documentation. This database will be available to share between WHC organizations in order to assist in ALARA reviews and work-plan preparation. <u>Actionee</u> : ALARA Program Office and ALARA Council <u>Analysis of Performance</u> : In 1993, the ALARA Program Office performed an evaluation and identified the Search Hanford Accessible Reports Electronically (SHARE) database to accomplish the task of distributing completed job information. During the first quarter of 1994, users were identified and the process of providing access to the network has been initiated. Identified ALARA users are currently being scheduled for SHARE system training.	08/31/94 OPEN
4	Develop a course to instruct cognizant engineer, persons-in-charge (PIC), planners, schedulers, and/or personnel completing ALARA documentation in applications of ALARA methodology. <u>Actionee</u> : ALARA Program Office and Technical Training <u>Analysis of Performance</u> : The ALARA Program Office and Technical Training held a meeting to discuss the necessary curriculum for this course. C. L. Caldwell has agreed to take the lead in this project, and is currently evaluating the curriculum with other DOE sites and training resources and data exchange representatives.	12/31/94 OPEN
5	Evaluate the feasibility of integrating the ALARA Program with other existing safety programs: i.e; Accident Prevention Council, Safety Observer, Waste Minimization. Conduct meetings with each applicable facility/organization to review and evaluate the utilization of this integrated approach. <u>Actionee</u> : ALARA Program Office and CCIP. <u>Analysis of Performance</u> : During the first quarter, a meeting was held to discuss the feasibility of integrating the ALARA Program with Pollution Prevention. Although total integration does not appear feasible, there have been areas identified where a joint effort will provide a better product.	06/30/94 OPEN
6	Redesign the ALARA recognition program to provide accomplishment awards for exceptional ALARA performance by personnel, organizations, and/or committees. Integrate this revision, as applicable into the WHC-CM-4-11, <u>ALARA Program Manual</u> rewrite. <u>Actionee</u> : ALARA Program Office and ALARA Council <u>Analysis of Performance</u> : A task team was formed and a draft of the ALARA Recognition Program has been prepared and is in the review process.	06/30/94 OPEN
7	Perform, complete, and compile biannual ALARA Self-Assessments. Evaluate nonradiological and radiological issues during the assessment cycle. These assessments will be completed and the results published in the first and third quarter WHC Health & Safety Performance Report. <u>Actionee</u> : ALARA Program Office and ALARA Council <u>Analysis of Performance</u> : Radiological Engineering and ALARA conducted assessments of the ALARA Committees during the first quarter of CY 1994. For more detailed information regarding these assessments see Section 1.4.	10/31/94 OPEN
8	Promote the reduction of radiological areas at WHC by 4,280,000 square feet in support of CCIP. <u>Actionee</u> : ALARA Program Office and CCIP <u>Revised</u> : Promote the reduction of radiological areas at WHC by 8,736,000 square feet in support of the CCIP. <u>Analysis of Performance</u> : Currently, there have been reductions in surface contamination areas of 10,000 square feet indoor and 38,000 square feet of operating outdoor areas within WHC-managed areas/facilities during CY 1994.	12/31/94 OPEN
9	Develop functions, qualification standards, and training requirements for ALARA Committee chairpersons. <u>Actionee</u> : ALARA Program Office <u>Analysis of Performance</u> : There has been a scoping document completed for this goal. The baseline for this goal has been identified in 10 CFR 835 and DOE Order 5480.6, and will be incorporated into WHC-CM-4-11 revisions.	06/30/94 OPEN

Table 1-1. CY 1994 ALARA Site-wide Goals

No.	Goal	ECD
10	<p>Prepare and issue a sitewide listing of tools developed and used to implement the ALARA Program at WHC. This listing shall include, but not be limited to, items such as signs, training aids, postings, equipment, etc.). <u>Actionee:</u> ALARA Program Office and ALARA Facility/Organizational Committees</p> <p><u>Analysis of Performance:</u> The ALARA Program Office has been compiling an active listing of the ALARA tools being utilized in the workplace.</p>	09/30/94 OPEN
11	<p>Promote the completion of "Facility Condition Update Reports" to support compiling asbestos inventories per the Hanford Site Asbestos Abatement Plan (WHC-EP-0390, Rev.1) through the use of facility-specific ALARA Committees. Status accomplishment in the Health & Safety Performance Report quarterly.</p> <p><u>Actionee:</u> ALARA Program Office and B. S. Mewes</p> <p><u>Revised:</u> Promote the completion of "Facility Condition Update Report" to support compiling asbestos inventories per the Hanford Site Asbestos Abatement Plan (WHC-EP-0390 Rev.1) through the use of facility-specific ALARA Committees. Status the accomplishments in the Fourth Quarter Health & Safety Performance Report.</p> <p><u>Analysis of Performance:</u> This goal was revised due to the reporting schedules of the Hanford Site Asbestos Abatement Program. B. S. Mewes made a presentation detailing the Sitewide Asbestos Abatement Plan during the March ALARA Council meeting. A Facility/Organization contact matrix was distributed, identifying the ALARA and Asbestos points of contact for each affected facility.</p>	12/31/94 OPEN
12	<p>Provide monthly "ALARA Accomplishment" articles to the Hanford Reach promoting nonradiological and radiological elements of the ALARA Program. The ALARA Program Office will compile examples submitted by the committees and select appropriate topics to be submitted to the Hanford Reach. <u>Actionee:</u> ALARA Program Office and ALARA Council</p> <p><u>Analysis of Performance:</u> During 1994, there have been 10 ALARA sponsored articles published in the Hanford Reach. These articles promoted management and control of exposures through applied ALARA principles and practices across the site. These articles included material on Plutonium Finishing Plant (PFP) Plastic Shop evolutions, the reduction of exposure complacency and risk to pregnant workers at PUREX, as well as information on ALARA-sponsored vendor demonstrations.</p>	12/31/94 OPEN
13	<p>Demonstrate that WHC is actively managing personnel radiological exposure by formally documenting the results of exposure investigations from the "ALARA Tracking and Management System" section in the WHC Quarterly Health & Safety Performance Report.</p> <p><u>Actionee:</u> ALARA Program Office</p> <p><u>Analysis of Performance:</u> Refer to Section 1.7 for detailed information on this goal.</p>	12/31/94 OPEN
14	<p>Establish, status, and communicate timely completions of company-level and facility/organizational CY 1994 ALARA goals. Performance indicators relative to these goals will be published quarterly in the ALARA section of the Quarterly Health & Safety Performance Report. <u>Actionee:</u> ALARA Program Office and ALARA Committees.</p> <p><u>Analysis of Performance:</u> Refer to section 1.2.1 for details relating to this goal.</p>	12/31/94 OPEN
15	<p>Provide "ALARA Accomplishment" information for distribution on the Health & Safety Bulletin Board on a quarterly basis. <u>Actionee:</u> ALARA Program Office</p> <p><u>Analysis of Performance:</u> Currently, updated information is being submitted to the Health & Safety Bulletin Board on a monthly basis. It is anticipated that this will be the common practice based on the amount of information relating to the Health Physics organization being generated from the ALARA Program.</p>	12/31/94 OPEN

Table 1-1. CY 1994 ALARA Sitewide Goals

No.	Goal	ECD
16	<p>Compile and issue to DOE-RL fiscal year (FY) 1994 ALARA Goals Report. <u>Actionee:</u> ALARA Program Office.</p> <p><u>Analysis of Performance:</u> It should be noted that the ALARA Program Office is currently revising the goal process in an effort to incorporate the planning of ALARA goal into the fiscal year budget process.</p>	10/31/94 OPEN
17	<p><u>New:</u> Maintain the number of skin contamination at 0 significant, and not more than 28 cumulative skin contaminations occurring in WHC-managed facilities/operations.</p> <p><u>Analysis of Performance:</u> Through the first quarter of CY 1994 there were 0 significant and 10 cumulative skin contaminations that occurred in WHC-managed facilities/operations.</p>	12/31/94 OPEN
18	<p><u>New:</u> Maintain the CY 1994 annual cumulative radiological exposure goal for radiation workers (monitored with a multipurpose dosimeter) in WHC-managed facilities/operations at less than 140 person-rem.</p> <p><u>Analysis of Performance:</u> First Quarter personnel exposure information was not available at the publication of this report.</p>	12/31/94 OPEN
19	<p><u>New:</u> Maintain the number of personal clothing contaminations occurring in WHC-managed facilities/operations for CY 1994 at less than 73.</p> <p><u>Analysis of Performance:</u> Through the first quarter of CY 1994, there were 15 personal clothing contaminations that occurred in WHC-managed facilities/operations.</p>	12/31/94 OPEN

1.2.2 Facility/Organization ALARA Goal Performance

Progress on the implementation of the ALARA Program at WHC is evidenced in part by the development and achievement of ALARA goals by the facility/organization ALARA Committees. The CY 1994 facility-specific goals have been established to effectively implement exposure reduction activities as well as to provide the incentive to implement ALARA and to be used as a measure of the achievement of ALARA. All ALARA facilities/organizations committees have developed goals for CY 1994, however, implementation of the program has not been uniform across the company.

The Committees develop ALARA goals with the respective line management based on operational history and the expected operation, production, maintenance, and remediation. The ALARA Program Office reports the status and progress towards achieving these goals to upper management and DOE-RL through this report. In addition, an annual WHC ALARA Goals Report is published which contains the specific facility/organizational ALARA goals and site WHC ALARA goals.

Initial indications show that 20 of the 26 (76.9%) goals scheduled for completion during the first quarter of CY 1994, have been completed on or ahead of schedule. The breakdown of the six goals not completed include: Two were revised and one canceled due to reorganization; one is in progress but delayed due to damaged parts from shipping, and; two are in progress but delayed due to reorganization. Currently, it appears that 25 of the 26 (96.2%) goals scheduled for completion during the first quarter of 1994 will be completed during CY 1994.

Senior management of a facility must support the development of, and efforts to meet, ALARA goals in order to be effective. The ALARA staff needs to be provided the necessary resources in order to achieve the stated goals.

1.3 CCIP (Contamination Control Improvement Project)

The CCIP encourages reduction of radioactive surface contamination in operating areas and the environment of the Hanford Site. Reducing the number of contaminated areas and the severity of

contamination will reduce the risk of skin contaminations and internal depositions, minimize personnel exposure, increase site productivity, and improve protection of the environment.

The CCIP meets the intent of environmental restoration and waste reduction and prepares the site for Environmental Restoration Management Contractor (ERMC) decommissioning activities by the identification of surface contamination areas (SCA), and the categorization and quantification of areas controlled for radiological reasons. It also tracks, separately from SCAs, airborne radioactivity areas (ARA). The project identifies, tracks, and encourages the reduction of radioactive surface contamination and the number of radiologically controlled areas (RCA). It addresses ARAs in indoor areas and SCAs and RCAs in indoor and outdoor operating areas. It also tracks SCAs and RCAs in inactive outdoor areas.

1.3.1 Airborne Radioactivity Areas

Airborne radioactivity areas are tracked separately from SCAs because of the inherent increased risk to the occupational worker. As Figure 1-1 shows, the size of ARAs has been generally stable since 1990. Generally, ARAs are not as easy to decrease as SCAs because they are related to the process and are engineered areas. They are decreased as the underlying process is changed or discontinued and the area is decontaminated.

Figure 1-1. Airborne Radioactivity Areas

The number (as well as the total size) of ARAs established by facility group for the first quarter of 1994 is listed in Table 1-2. It should be noted that the number of ARAs may be arbitrary, in that one facility may elect to group all their ARAs together (for CCIP reporting purposes), while another may report each individual ARA separately.

Table 1-2. Airborne Radioactivity Areas by Facility Group

Facility	No. of ARAs	ARAs in Square Feet	Facility	No. of ARAs	ARAs in Square Feet
B Plant	20	226,323	PUREX/UO3	21	51,052
Fast Flux Test Facility (FFTF)	1	450	Solid Waste	4	15,249
Labs	6	1,758	Surplus Facilities	2	61,100
N Reactor	16	179,294	T Plant	7	44,749
PFP	5	13,194	Tank Farms	10	30,290

1.3.2 Indoor And Outdoor SCA

Most facilities have been reducing the amount of posted indoor SCAs. During the first quarter of 1994, progress was made in the reduction of SCAs within PFP, with more than 8,000 square feet of SCA downposted to RCA. Figure 1-2 depicts the percentage of indoor facility radiologically posted area that is posted as SCA as it changes over time. In outdoor operating areas, during the same time period, the following facilities reported changes: At B Plant, 16,000 square feet of SCA were released from radiological controls and 14,000 square feet of SCA was downposted to RCA; at the PUREX and UO₃ facilities, 7,500 square feet of SCA was downposted to RCA. Figure 1-3 depicts the percentage of outdoor operating facility radiologically posted area that is posted as SCA as it changes over time.

Figure 1-2. Percentage of Facility Indoor Radiological Areas Posted as SCA

Figure 1-3. Percentage of Facility Outdoor Radiological Areas Posted as SCA

Overall, the amount of indoor posted SCA has been decreasing (Figure 1-4). However, since the end of CY 1992, the total outdoor area posted SCA has been slowly increasing (Figure 1-5). Outdoor areas are separated into two categories for tracking purposes; areas associated with operating facilities and those that are not. During the first quarter of 1994, there were increases in SCA reported to CCIP in inactive outdoor areas of nearly three acres.

Figure 1-4. Indoor SCA **Figure 1-5. Outdoor SCA**

1.3.3 SCA Reduction - Indoor and Outdoor Areas

The CCIP tracks reduction efforts separately from the overall total posted areas and tracks and trends the total area reduced by facility on a quarterly basis. During the first quarter of 1994, an approximate total of 49,000 square feet was released from SCA posting. Specific reductions by facility per quarter are found in Figure 1-6.

1.4 ALARA PROGRAM ASSESSMENT

Internal assessments of the ALARA Program are conducted biannually and comply with the requirements set forth in DOE Order 5480.11. The ALARA Program Office conducts biannual facility/organizational ALARA self assessments during the first and third quarters each year. These assessments assist in measuring the degree of compliance in relation to the outlined ALARA responsibilities.

An ALARA Practices Self-Assessment Plan was developed to assess the field implementation of radiological ALARA practices. This self-assessment was initiated in November 1993, and was completed in March 1994. The assessment was divided into seven different phases. Each phase focused on individual facilities under the cognizance of seven Health Physics Area Managers. This assessment process was accomplished as a joint effort by Operational ALARA Engineering, ALARA Program Office, and facility/organizational representation. However, Larry O. Waggoner should be recognized for his major contribution in coordinating and performing these assessments. A summary of the major findings from the assessments is included in the following.

- **Use of Engineered Controls:** The use of engineered controls to reduce the spread of radioactive contamination and reduce radiation exposure, needs to be expanded.
- **Need for Better Briefing/Debriefing:** The assessment identified areas for improvement in the prejob and postjob briefings. It has been noted that a larger emphasis needs to be placed on techniques used to reduce exposure and contaminations.

- **Improvement in Radiological Work Packages (RWP):** As the use of engineered controls are expanded on site, workers need to be trained on techniques to reduce the spread of contamination. Personnel who write work procedures/RWPs need to be trained to specify more detailed radiological controls in those documents.
- **Expanded Use of Temporary Shielding:** Recently, a new implementing guide was established that outlines how a temporary shielding program should be implemented at each facility. This needs to be incorporated in the field activities.
- **Improvement in Air Sampling:** At each facility there was a problem with air sampling during temperature inversions. Most facilities do not have a quick method for determining if the high reading is due to radon or radioisotopes.
- **Need for Primary Radiological Report/Waste Disposal Facility:** As the site starts to dismantle equipment and components from different facilities, we will need a place to repair, segregate, or cut up items for disposal. Rather than have each facility establish its own containments to accomplish this work, it is suggested that one central place be established where most of the equipment could be sent for disposal.
- **Additional Training Needed to Improve ALARA Practice Use:** Planners and personnel who write work procedures need training on use of engineered controls for radiological work. Specifically, they need to understand when glovebags/greenhouses are required, how to use high-efficiency-particulate-air (HEPA) filtered ventilation, and what actions are necessary to shield, flush, isolate, or remove highly radioactive or contaminated components and equipment.

For more detailed information on any of the assessment elements, see References, letter number 9452148, or contact L. O. Waggoner at 376-0818, or the ALARA Program Office at 376-9005.

1.5 ALARA PROGRAM IMPLEMENTATION, PROGRESS, AND ACHIEVEMENTS

The ALARA Program Office believes it is important to promote the contributions and accomplishments of the WHC ALARA Program by communicating the progress and achievements that have been made in implementation of the WHC ALARA Program. The following is a list of some of the contributions and accomplishments achieved in the first quarter of CY 1994.

- The SHARE database was identified to accomplish the task of distributing completed job information. During the first quarter, users were identified and the process of providing access to the network has been initiated. Identified ALARA users are currently being scheduled for SHARE system training.
- Operational ALARA Engineering assessments were initiated during the fourth, CY 1993, quarter and finalized during the first quarter of CY 1994. This self-assessment will provide a tool that can be used to evaluate the facility ALARA work practices and determine if ALARA principles are being incorporated into radiological work. One of the initial assessments discovered the availability of some camera equipment that could be utilized for remote applications. Further details on this achievement may be found in Section 1.4 of this publication.
- Three onsite vendor demonstrations were sponsored during this reporting period. These demonstrations displayed new technologies in the areas of HEPA ventilation systems, waste sludge removal, and decontamination techniques. Due to the increased awareness of new technologies, two of the three demonstrations resulted in the utilization and application of technologies at Hanford. There was a good turnout of representatives from various Hanford facilities and organizations with combined attendance exceeding 300 employees.
- T Plant, with support from the ALARA Program Office, has initiated a process of combining several safety committees and councils together to form one ALARA Committee. The T-Plant ALARA Committee and overall safety representation will be enhanced by integrating facility representatives from ALARA,

Pollution Prevention, Accident Prevention Council, and CCIP. The focus of this transition is to improve the communications between these groups, while streamlining the amount of time and personnel necessary to perform these functions.

- An ALARA training session was conducted on February 10, 1994, at the PUREX/UC facilities. Eighteen PUREX/UC employees attended this training designed to provide training in the special skills necessary to complete ALARA documentation and implement ALARA practices.

1.6 ALARA PROGRAM LESSONS LEARNED THROUGH POST ALARA REVIEWS

Since January of 1993, the ALARA Program Office has been working on establishing a mechanism to redeploy ALARA Protective Measures (APM) and lessons learned from work being performed onsite. Throughout the year, the ALARA Program Office has been involved in the development and modification phases and are now in the testing cycle. The data base will soon be released to WHC. When available, the system will make computerized Post ALARA Review (PAR) documents available for review, retrieval, and use by planners, PICs, engineers, ALARA personnel, etc. The futuristic scope for this system is to have the completed copies of ALARA Management Worksheets, ALARA Checklists and Cost Benefit Analysis available for utilization by facility ALARA personnel.

Improvement has been shown in the completion of the PAR process during CY 1994. The PAR process is proving to be a vital tool in helping to prevent complacency, reduce exposure, and incorporate lessons learned from completed tasks. The PAR documents the final assessment of the job. Included in this assessment are lessons learned while doing the job and any additional ALARA measures, modifications, or changes implemented during the job. These lessons learned help to evaluate the effectiveness of the exposure controls that were implemented, and reduce future exposures by applying these experiences. There is some early evidence that acceptance and ownership of the PAR process is beginning to be significantly enhanced. The ALARA Program Office compiled results from completed PARs and incorporated those results for this report.

- PFP identified a need for increased protective clothing requirements due to the presence of nitric acid and nitrate crystals in a work area requiring entrance. The facility lacks a variety of adequate personal protective equipment (PPE) for encountering these hazards. Although the best PPE was not available, suitable PPE was developed using onsite silver shield sleeved aprons and acid suits. PFP Industrial Hygiene and the Accident Prevention Council is meeting with vendors to order a larger variety of PPE for use within the facility.
- PUREX personnel utilized good preplanning in reducing the number of entries necessary to clean up 242A, Pot & Pump Room. This effort reduced the amount of radiation exposure to personnel.
- PFP operators and Health Physics Technicians (HPT) performing a tank integrity assessment were not informed about the purpose or reason for canceling a portion of the job. It is noted, by PFP, that management should involve workers in the scheduling, planning, developing, and completion of special activities to ensure that a high performance, task team approach is taken. This should include clear communications of the purpose of the task as well as reasons for changes in the mission.
- PUREX personnel, while performing a cleanout of H-cell calciner, identified that the calciner edges used for access to work were narrow and proved difficult and hazardous for work requirements. It was suggested that a scaffold be erected for any future work in this area.
- Environmental Restoration Operations (ERO) noted that by identifying the contents placed in drums, prior to shipment, additional exposure and time necessary to reinventory the contents would be eliminated.
- PFP reemphasized an existing problem with the coordination of cleanup and preparation from one shift to another. One oncoming shift had to clean up extensively in order to continue operations. A timeline of performance will be established identifying what each shift is responsible for achieving.

- PUREX identified some potential problems while changing HEPA filters in building 202A. It was noted that the greenhouse was too small for proper work atmosphere. It was suggested that during the prejob planning all crafts should identify their specific needs and the greenhouse should be designed to meet those needs. During the same job, personnel ran out of leather gloves and the necessary equipment to perform the task was not prestaged (which slowed job performance). The PAR indicated that these problems could have been eliminated with more thorough prejob planning.
- PFP generated unnecessary transuranic (TRU) waste due to a complication with handling waste on the off-shift. Often, waste was mixed in with low-level or nonradioactive wastes in order to place everything into one container and get it out of the airlock area. By setting up designated waste containers for the separation of all waste at the job site and requesting assistance from Solid Waste Operations prior to generation of the waste, this situation will be addressed.
- FTF, in an effort to provide more effective communications during jobs performed in Cell 227, installed a phone in the cell area.

Further information on completed PARs may be obtained from the ALARA Program Office, or by reviewing previous issues of this publication.

1.7 ALARA TRACKING AND MANAGEMENT SYSTEM

In order to identify, track, and manage personnel exposure within the responsible facility/organization, the ALARA Tracking and Management System (ATAMS) was developed. The program was originally established to assist the ALARA Program Office and ALARA Committee chairpersons in tracking the exposure levels of personnel under their jurisdiction and investigating any anomaly. The ATAMS has further served to heighten exposure awareness levels of personnel and, with each investigation performed, it encourages managers to consider the ALARA approach to exposure. The program selects individual and organizational anomalies identified within the following set of parameters and criteria:

- The top one percent of the monthly/quarterly TLDs processed;
- Extrapolated exposures through year end that will exceed a WHC worker's administrative guideline level;
- Individuals with significantly higher whole body dose than peers within their craft;
- Individuals identified as being having finger rings high versus deep dose;
- Unusual TLD results identified during this processing period (i.e., shallow less than deep exposure);
- Individuals identified as having high neutron dose.

Investigative reports are required for identified individuals during the processing period to document an explanation of the anomaly, including the ALARA protective measures that are in place or were considered for implementation.

1.7.1 ALARA Tracking and Management System Investigation Results and Protective Measures

Investigations of anomalies, completed during the first quarter of CY 1994, reveal concentrated efforts to maintain radiation exposure in the workplace ALARA. Certain trends may be identified but this has a direct relationship to areas where exposure-producing operations and activities are occurring within WHC. Although anomalies are noted, they result in exposures well below the administrative guidelines established by WHC. The anomalies, discussions, and ALARA Protective Measures (APM) included here are results of the investigations and are incorporated unedited in this report.

- **Anomaly:** Four PFP material specialists received exposure in the top 1% of the monthly/quarterly thermoluminescent dosimeters (TLD) processed.
- **Discussion:** The inquiry into the anomaly indicated that these employees routinely perform inventories of controlled vaults.

- APM:** In an effort to reduce personnel exposure, PFP has requested a reduction in the vault inventories. Currently, PFP is utilizing remote inventory systems and controlling vault entries. Material specialist are wearing personal protective lead aprons and eyeglasses, as applicable, to help reduce exposure.
- **Anomaly:** A Processing & Analytical Laboratories (PAL) employee was identified as receiving unusual TLD results during this processing period.
Discussion: During this time frame, the employee was preparing 105 KE Basin Filter Backwash Pit samples for analysis. Corrected dose rates on samples ranged from 20 - 1500 mrem/hr. This employee does not routinely receive elevated dosimetry readings due to job assignments. Employee was asked to perform analysis due to vast experience.
APM: Employee used shielded tongs, leaded glass plates and lead shielding to control exposures. Due to APMs utilized dose rates were maintained at less than 10 mrem/hr at hood front.
 - **Anomaly:** PFP investigated exposure of three electricians who received high exposure identified as high within their craft.
Discussion: The primary work shop for these individuals is located over high-dose sources.
APM: ALARA awareness signs and exposure control measures are in place to increase awareness of dose and reduce exposure.
 - **Anomaly:** A PAL employee was identified as receiving exposure that was significantly higher compared to peers of the same craft within the company.
Discussion: This employee had not received an elevated exposure reading since May of 1992. No hands-on work was performed during this time frame.
APM: A home survey of employee's residence in during the first quarter of 1994 revealed a compass with an elevated reading near the location where the employee stored his dosimeter. It is expected that this is the cause of the abnormal dosimeter readings. The employee's badge will be sent in for special processing over the next several months to closely monitor exposure trends.
 - **Anomaly:** One radiation worker at PFP, with an annual frequency dosimeter, received exposure that was identified as high within their craft.
Discussion: This exposure is believed to have been received as a result of occupying a higher background neutron area during the first six months of CY 1993.
APM: This individual, and others in the same group, were relocated to no-dose office areas. An occupancy study and office relocation program was completed in the latter part of 1993. This will help reduce the exposure previously received by planners and schedulers.
 - **Anomaly:** Three material specialists and six operators were identified at PFP as receiving exposure in the top 1 % of the monthly/quarterly TLDs processed and high finger rings versus deep dose respectively.
Disc: The inquiry into the anomaly indicated that these employees routinely perform inventories of controlled vaults.
APM: In an effort to reduce personnel exposure, PFP has requested a reduction in the vault inventories. Currently, PFP is utilizing remote inventory systems and controlling vault entries. Material specialist are wearing personal protective lead aprons and eyeglasses, as applicable, to help reduce exposure.
 - **Anomaly:** One HPT at PFP was identified as receiving exposure higher than peers of the same craft within the company.
Discussion: This HPT was assigned to various tasks as a training program assistant, and therefore received higher-than-average exposure for the group.
APM: Management has evaluated the individual's exposure record with the employee and efforts will be made to reduce further exposure.

- **Anomaly:** An operator and two HPTs at PFP were identified as receiving exposure that was significantly higher than peers of the same craft.
- Discussion:** These employees were assigned to various tasks in a training program, and therefore received higher than normal exposure for their groups.
- APM:** Exposure was commensurate with responsibilities. Management has evaluated the individuals' exposure records with the employee and efforts will be made to reduce further exposure.

Further information on investigations, performed prior to the first quarter of 1994, may be obtained by contacting the WHC ALARA Program Office at 376-9035

1.8 ALARA TRAINING/AWARENESS ACTIVITIES

Effective and successful implementation of any ALARA program requires knowledge and understanding of the ALARA concepts. Consequently, training of personnel in ALARA, safety, and radiation principles is one of the most important elements in any effective ALARA program.

The majority of ALARA training at WHC is incorporated in other training packages as a basic theme that is reinforced throughout the training session. This reduces the number of ALARA-specific courses and ensures that consistent emphasis is placed on ALARA policy and philosophy. For example, Hanford General Employee Training (HGET) for CY 1994 has been upgraded to include a dedicated ALARA module to ensure the consistent support of ALARA practices and principles. This updated HGET/ALARA version was completed, reviewed, and approved for implementation January 3, 1994, and is currently being taught.

During the first quarter, Technical Training conducted 616 training sessions, that included the ALARA theme throughout, with 3,940 students completing the training. Some of the subjects covered in these training sessions included: Criticality Safety, Job Control Systems, and Hazardous Waste Materials Handling. In addition, there is a specific emphasis placed on classic ALARA (radiological) in all courses relating to radiological training.

Efforts to raise the ALARA awareness of Hanford employees has and will continue during CY 1994. Training and ALARA Awareness activities conducted by the ALARA Program Office during the first quarter is itemized below.

- A first-quarter sitewide ALARA goal was completed by conducting training for ALARA Council and Committee members on March 29-30. "Hazardous Materials Chemistry for the Non-Chemist" was provided to 38 participants at the Columbia Basin Community College Science Laboratory. This "active demonstration" training course provided information for an effective understanding of chemicals and their effects on health and the environment. It focused on individuals working with, or having responsibility for, compliance with Occupational Safety and Health Administration (OSHA) health and safety standards relating to hazardous waste regulations. This course heightens hazard recognition, laboratory safety and chemical spill response, and promotes the "24-hour safety" profile. The course was brought back because it was such success last year during third quarter ALARA training.
- Ten articles were published in the Hanford Reach promoting management and control of exposures through applied ALARA principles and practices across the site. Included in these articles was material on PFP Plastic Shop evolutions, the reduction of exposure complacency, and risk to pregnant workers at PUREX, as well as information on ALARA sponsored vendor demonstrations.
- An ALARA training session was conducted on February 10, 1994, for PUREX and UO₂ facilities. Eighteen employees attended this course which was designed to provide training in special skills necessary to complete ALARA documentation and implement ALARA practices.
- Efforts were coordinated with Technical Training to supply the new hands-on Practical Training Room with an ALARA information display module. This Practical Training Room is being used to supply

employees attending "Radiological Worker Training" with simulated, in-field work experience. In addition, the ALARA Program Office provided information to a separate exhibit designed to promote the CCIP/ALARA integration.

Posters and handouts, focusing on individual worker's responsibilities to be ALARA conscious, have been distributed throughout the site during the first quarter. Efforts to combine current safety issues with ALARA awareness activities have continued during this time. For more information relating to Training and/or ALARA awareness activities, see Section 1.5 or contact the ALARA Program Office at 376-8997.

1.9 ALARA COUNCIL/COMMITTEES

In an effort to improve clarity for users, the ALARA Program Office has renamed representatives associated with the ALARA Program to coincide with DOE N 5480.6, Radiological Control Manual. The ALARA Committee will now be called the ALARA Council and facility-specific ALARA teams will now be called ALARA Committees.

The ALARA Council includes the ALARA Program Coordinator, ALARA Administrator(s), CCIP Project Manager, each plant/facility or organizational ALARA Committee chairperson, and representatives from support and technical organizations within engineering, health and safety, industrial safety, and waste minimization. First quarter showed a decline in activities at many of the facilities. This decline is directly related to the reorganization of the ALARA Committees at many of the facilities.

There are four major areas reflecting a substantial commitment to the implementation of ALARA Programs. Organization/facility committees are credited one point for participation in each of the four areas each month, as given below with accompanying graphs. The four areas are:

1. Committee chair or representatives attendance at the ALARA Council meeting (Figure 1-7);

Figure 1-7. ALARA Committee Representative Attendance at Council Meetings

2. Conduct of monthly committee meetings and provide the meeting minutes to the ALARA Program Office (Figure 1-8);

Figure 1-8. ALARA Committee Conducts Monthly Meetings & Meeting Minutes Provided to ALARA Program Office

3. Timely completion and statusing of exposure investigations, as applicable (Figure 1-9);

Figure 1-9. ALARA Committee Timely Completion and Statusing of Exposure Investigations

4. Timely statusing (monthly/quarterly) of facility-specific ALARA goals, as applicable (Figure 1-10).

Figure 1-10. ALARA Committee Timely Completion & Statusing of Facility Goals

1.9.1 ALARA Points-of Contact

The ALARA Points-of-Contact listing identifies the current ALARA Committee Chairperson designated by division, department, or facility management to coordinate the administration of the individual facility ALARA Program. Support personnel representing engineering, health and safety, industrial safety, and waste minimization are also listed in Table 1-3.

Table 1-3. ALARA Council Members

ALARA PROGRAM OFFICE

Acting ALARA Program Manager	M. E. Havland	2-2942
ALARA Program Coordinator	T. W. Hogg	6-9005
ALARA Program Administrator	O. D. Berglund	6-9035
ALARA Program Awareness Administrator	D. A. Hammond	6-8997
ALARA Contamination Control Improvement Project	R. R. Loeffler	3-0211

FACILITY SPECIFIC ALARA COMMITTEES

B Plant/Waste Encapsulation and Storage Facility	H. G. Oglesbee	2-0080
Facility Operations/PUREX/UO ₂	D. E. Kammenzind	3-5608
Facility Operations/Plutonium Finishing Plant	L. J. Estey	3-3387
Fast Flux Test Facility	W. H. Taylor	6-0905
K-Basins Operations	K. W. Davis Jr.	3-3143
Processing and Analytical Laboratories	M. D. Nuzum	3-5966
Solid Waste Disposal/T-Plant	F. A. Hewitt	3-1323
306E Laboratories	J. B. Gunter	6-5013

ORGANIZATIONAL ALARA COMMITTEES

Environmental Restoration Programs	W. M. Bricker	3-1755
Kaiser Operations		
Central Maintenance	J. B. Giesa	3-1713
Transportation	R. A. Evanoff	6-6680
Utilities	S. E. Albin	3-2794
Solid Waste Management	F. D. Schlien	3-4499
Tank Waste Remediation Systems	J. L. Shelor	3-4277

ALARA COUNCIL SUPPORT PERSONNEL

Corps of Engineers	D. L. Stanton	6-9635
Dosimetry	W. A. Decker	2-2881
Dosimetry	T. J. Kelly	3-1707
Industrial Safety	D. S. Penfield	2-3291
Radiological Engineering & ALARA	L. O. Waggoner	6-0818
Presidents Accident Prevention Council	J. F. Dickman	6-9149
Protective Clothing Committee	R. H. Shanks	3-2089
Pollution Prevention	J. A. Engel	6-8737

2.0 INDUSTRIAL SAFETY AND HYGIENE

2.1 INTRODUCTION

The purpose of the Industrial Safety and Hygiene section is to provide a perspective on performance related to occupational injuries/illnesses, government vehicle accidents, property damage, and fire losses. Additionally, this section attempts to paint the overall picture of WHC industrial safety and industrial hygiene activities through narrative that identifies and statuses goals and initiatives, program development, as well as standards and training courses anticipated or completed for use.

The occupational injury/illness and recordable vehicle accident statistics used in this section include WHC and BCSR accident data. Only Table 2-3 and Appendix A-2 reflect statistics provided by ICF KH.

2.2 VOLUNTARY PROTECTION PROGRAM

On March 31, 1994, WHC submitted to DOE-RL, a formal application for "Merit" worksite recognition under the DOE Voluntary Protection Program (DOE-VPP). The formal application review process consists of the following:

- The DOE-RL point-of-contact is the Quality, Safety, and Health Programs Division. The division is tasked with performing a field level review of the application, and obtaining additional information from WHC (as applicable). The division will then transmit the document to the DOE-HQ Operations Office, along with a signed recommendation on whether an onsite review should be conducted. This phase will be completed by DOE-RL within 40 working days from receipt of the application.
- The DOE-VPP points-of-contact will review the document and provide recommendations to the DOE-VPP coordinator (HQ) on whether an onsite review should be conducted. The DOE points-of-contact represent the DOE-HQ Operations Office, Cognizant Secretarial Office (CSO), and the Environment, Safety and Health (EH-30) application reviewer. This phase will be completed within 40 working days from receipt of the application by the Operations Office.
- When the DOE-VPP coordinator has established the date of the onsite review (in conjunction with DOE-RL and WHC), the DOE Area and Operations Office managers are notified for onsite review arrangements. This pre-approval review will be carried out by a small team comprised of DOE-HQ, DOE-RL, and expert consultants.

Management will be kept informed of all preparation and planning efforts as the company progresses through the entire application process.

2.2.1 Safety and Health Training

2.2.1.1 Behavioral-Based Safety Training (BBST).

"Behavioral-Based Safety" training stresses the importance of trust and teamwork within the safety program. This training is a cornerstone of our efforts to achieve a true culture change at Hanford. All employees of Westinghouse Hanford Company will receive the initial training by the end of CY 1994.

This training is currently being enhanced as a result of comments received from those employees attending sessions during the past three months. A reduction in the length and size of the classes will be made to better focus the behavioral-based message. Revised classroom exercises and dedicated instructors are additional enhancements being made.

2.2.1.2 Managers' Safety Training.

The second phase of "Managers' Safety" training continues to evolve with nearly 400 managers being trained during the first quarter. The training focuses on the prime elements of the VPP guidelines. "Behavioral-Based Safety" training is emphasized throughout all sections given, with specific emphasis on management's role and employee involvement.

This training gives additional emphasis to basic safety administration such as accident investigation, hazard prevention and control, and injury case management. Accident investigation and case management are covered by use of an actual case scenario. The "Managers' Safety" training follows the BBST approach, which seeks to broaden management commitment and employee involvement in all aspects of the safety program.

2.2.1.3 Safety Observer Training.

Safety Observer training is broadening it's focus to include more of the behavioral-based concept. Efforts are currently underway to effectively link the Voluntary Protection Program, Safety Observer program, and the Behavioral-Based Safety training.

The base of these efforts will be local management/employee teams of personnel who are trained as safety observers and knowledgeable of the BBST "Do-Rite" process.

2.3 SIGNIFICANT EVENTS

2.3.1 Significant Event - Industrial Safety

Thus far in 1994, two significant injuries have been reported which were caused by sudden, unexpected gusts of wind. Wind is a constant companion to those of us who work at Hanford. Such injury descriptions do not surprise us, but still these and other similar injuries occur.

The first case occurred when a driver removed a back panel from his truck. The broad wooden surface was hit by high wind as the employee held it in both hands. The wind was of sufficient velocity to push one side of the panel back and cause back strain due to twisting of the body.

The other injury happened as a door was blown into an employee who was attempting to exit a building. In this case, the wind force was sufficient to knock the employee down and cause arm, shoulder, and leg injuries.

Another case where wind is potentially dangerous is when plywood sheets are used to facilitate work on structurally suspect roofs. We must remember to plan this and similar work to take place when calm conditions are assured.

2.3.2 Significant Event - Industrial Health

Several office workers made precautionary visits to the Health Service Center after being exposed to fumes from a roof tarring job. The fumes were introduced into the building where the employees worked via the ventilation system. This occurred when work was taking place proximate to the intake.

Although this exposure resulted in no employee illnesses, the incident points to the need to be conscious of how harmful contaminants can be drawn into work spaces.

A similar situation developed several months ago where sprinkler water was allowed to puddle near an office building air intake vent. The stagnating water vapor was drawn to an enclosed office space producing a strong and putrid odor.

Building Administrators and those who direct work likely to produce harmful fumes must maintain a high sense of awareness to avoid indoor air quality problems.

2.4 INITIATIVES AND GOALS

2.4.1 Corporate Nonfinancial Objectives

The two FY 1994 nonfinancial objectives established by WHC to Westinghouse Electric Corporation are shown and stated below.

- Implement the recommendations developed by the Westinghouse Electric Corporation Hanford Safety Review Team. The recommendations have been included in the VPP improvement process.
- Demonstrate that safety is our highest priority by reducing the FY 1994 lost/restricted workday case incidence rate by 50% from the FY 1993 rate.
 - The WHC cumulative FY 1994 lost/restricted workday case incidence rate through March is 0.79. This rate is 14 percent from the FY 1994 Nonfinancial Objective (0.69). The 0.79 rate is 53 percent below the Company FY 1993 rate through March (1.68), and 47 percent below the DOE CY 1993 rate (1.50) (Figure 2-1).

The control chart plots the CY 1990 through CYTD 1994 monthly lost/restricted workday case incidence rates. The control lines are established using CY 1990 and CY 1991 monthly rates. There are currently eleven data points below the average, which indicates a valid downward trend (Figure 2-2).

The main reason for the success in reducing lost/restricted workday case rates seems attributable to better case management. This can be seen statistically in the departmental breakdowns (Tables 2-4 through 2-17) where first aid case reductions are exceeded on a percentage basis by reductions in the lost/restricted workday category.

**Figure 2-1. WHC Lost/Restricted Workday Cases
Cumulative Incidence Rate - FY 1994
(FY 1993 & FY 1994 Rates do not include ICF KH Operations)**

**Figure 2-2. WHC Lost/Restricted Workday Case Monthly Incidence Rates
CY 1990 - CYTD 1994**

Control Lines Established Using Monthly CY 1990 through CY 1993 Data - 3 Standard Deviations
CY 1990 - CY 1993 Monthly Rates include groups that transferred to ICF-KH Operations on 01/01/94)

2.5 TOPICS OF INTEREST

2.5.1 Industrial Safety Standards

2.5.1.1 Electrical Safety Practices.

Standard E-2 of the Industrial Safety Manual (WHC-CM-4-3) has been revised effective February 28, 1994. The revision was made to clarify the applicability of the standard and specify the governing code for where the standard does not apply. A clarification was also added to define what is meant by a "nonconducting" helmet (an American National Standards Institute - ANSI 89.1 Class B helmet). The other changes are as follows:

1. Exempts communications and telecommunications system work and vehicles other than mobile homes and recreational vehicles.
2. Adds a voltage lower limit (50 volts) to the requirements for special training for personnel who are at greater risk of contacting energized equipment.
3. Adds a lower limit for voltage (50 volts) and current capacity to the requirement to deenergize electrical equipment before working on it.
4. Includes requirements to discharge, relieve, or block all forms of energy in electrical equipment that is to be worked on.
5. Adds a lower limit for voltage and current capacity for requiring a justification in the work package for working on energized equipment.
6. Adds the voltage/current capacity limits to the requirements for protective clothing for working on energized gear; adds a note to clarify that gloves are not required if the worker's hand does not enter the equipment (break the plane of the entrance panel).
7. Raised the voltage at which an electrical safety checklist is required from 50 to 150 volts and added the current capacity limit (1 milliamp) to the requirement for a checklist.
8. Permits facilities to substitute customized electrical safety checklists that provide equivalent protection.
9. The electrical safety checklist is modified to require Class 0 gloves and voltage-rated tools when working on energized gear with voltage 50 - 1000 volts and current capacity of 1 milliamp or more. (Allows substituting Class 00 gloves for the Class 0 gloves for applications up to 500 volts.)
10. Deleted the requirement for calibrated test equipment.

2.5.1.2 Controlling Access to Unoccupied Facilities.

Standard G-10 was revised with an effective date of March 28, 1994. A minor change was made to correct an error in the graphics control number for the unoccupied facilities posting.

2.5.1.3 Work Hour Control.

Standard G-15 was revised with an effective date of March 28, 1994. A minor change was made to clarify how "dead" and "delay time" are counted for railroad workers.

2.5.2 Safety Resource Center

During the first quarter of CY 1994, approximately 550 safety videos were reserved through the Safety Resource Center. Table 2-1 identifies the titles of videos that have been added to the Center during the reporting period.

Table 2-1. Safety Resource Center Videos - New Releases

Subject	Title
ERGONOMICS	Back Safety Back to Ergonomics Right Moves II - Ergonomics in the Workplace
GENERAL SAFETY	Conduct of Operations: Wouldn't it be Nice Cruel Spirits: Alcohol & Violence Death Trap: Permit-Required Spaces Fire Extinguishers Flammable Liquids Hazard Alert: Laboratory Spills Heat Stress High on the Job Housekeeping Noise Not by Chance Protect your Hearing Safety: Take it Home (Off the Job Safety) Slips, Trips & Falls Thermal Burns
TRAFFIC SAFETY	Drive for Life
INDUSTRIAL SAFETY	Forklifts & Pedestrians Grinding Ladders & Scaffolds: It's up to You Lockout/Tagout Machine Guarding Material Safety Data Sheet (MSDS) Nipping-Learn to Identify Common Nip Points, Understand their Hazards, and Respect for Machine Guarding Portable Power Tools - Volume I Portable Power Tools - Volume II Portable Power Tools - Volume III Portable Power Tools - Volume IV Pressure Valves Table & Radial Armsaw Safety Working Safely with Lead

During the last week of February and the first week of March, the Safety Resource Center was closed for inventory purposes, which would account for the reduction of videos which were checked out. There is considerable increase by organizations utilizing the center for their safety meetings, the guest speakers, and monthly lesson plans that are provided via Hanford Information on the Hanford Local Area Network (HLAN).

Safety Awareness and Performance has made safety meeting literature available via Hanford Information as a way to heighten safety awareness, encourage employee involvement, and make group safety meetings sizzle. Particular safety topics, with two to four lesson plans, are provided each month. Handouts are included with some of the lesson plans. Topics selected for Hanford Information during the first quarter of 1994, included:

<u>January 1994</u>	<u>February 1994</u>	<u>March 1994</u>
Electrical	Machine Guarding	Hard Hats
Stress	Slips, Trips, Falls	Wellness
Lifting and Carrying	Attitude	
Ergonomics		

Many resources are available through the Safety Resource Center to assist individuals with conducting effective safety meetings, and to provide information on safety and health topics. Employees are encouraged to share these resources with their families and friends. Resources available include films, videos, literature, and support with individual safety programs. For assistance, contact the Safety Resource Center on 376-9059.

2.6 COMPANY-WIDE AND DEPARTMENT-LEVEL TRENDING AND ANALYSIS

The purpose of this section is to provide management with a perspective on performance related to occupational injuries/illnesses, government vehicle accidents, property damage, and fire losses. This is accomplished through the compilation of charts, trending information, and recommendations for improvement which follow. The data has been tabulated and analyzed on a company-wide level and for each department.

Our analysis of injuries occurring during the first quarter of 1994 continues to feature the "simple task" injuries which reflect on awareness levels and culture strength. In addition to injuries arising from simple, everyday tasks, a significant number of injuries were caused by objects in "blind spots." These are items placed out of view where an employee can contact them by reaching into a drawer (staples, exacto blades, etc.), or by bumping/brushing against (wall hangings, sharp furniture edges).

Each group should be aware that many combinations of objects and actions contributed to laceration injuries over the first quarter. Similarly, several different ergonomic and personal factors resulted in strain injury. The challenge in all cases is to raise awareness by correctly matching the safety message to the root cause of the accident.

The cumulative trauma disorder (CTD) rates are broken out for each group. These cases are primarily reported through a proactive and continuing joint effort of WHC and HEHF, and are affected by the schedules and stages of that effort. By setting CTD rates apart, we hope to identify the most effective use of our safety resources.

This quarterly breakdown of group injury experience will review the "hidden object" and "simple task" injuries, along with other causal data within each section.

2.6.1 Department Total Recordable Case and Lost/Restricted Workday Case Information

Each month, senior management is provided with WHC and ICF KH tables that summarize the number of lost/restricted workday cases and the incidence rates by department for FY 1994, as compared to the FY 1994 nonfinancial goals. The goals were based on a 50% reduction from FY 1993 lost/restricted workday case incidence rates (Tables 2-2 and 2-3).

- Operations Support Services Department (OSS) rates for FY 1993 have been included as part of the ICF KH data, in order to provide the goal necessary for FY 1994 comparison. However, for WHC CY 1993 information, the OSS Department data has remained, as the department was a part of WHC through the end of CY 1993.
- The information for FY 1993 includes Safeguards and Security, Emergency Preparedness, and the Hanford Fire Department as part of the Emergency, Safety, and Quality Assurance Department (ESQ).

Table 2-2. WHC FY 1993 & FY1994 LOST/RESTRICTED WORKDAY CASE/RATES GOAL - 50 PERCENT REDUCTION FROM FY 1993 TO FY 1994					
Division	FY 1993 LWD/RWD Case Rate	# Cases	FY 1994 LWD/RWD Case Rate Through 3/31	# Cases	RATE TO ACHIEVE GOAL
01x President	3.73	1	0	0	1.87
02x - COM	0	0	0	0	0
04x - GCO	0	0	0	0	0
05x - CON	0.49	1	0	0	0.25
06x - TTQ	0	0	0	0	0
0A - PSI	0	0	0	0	0
1x - OPS	1.44	29	1.15	11	0.72
2x - EA	0.62	7	0.22	1	0.31
3x - ESQ	1.90	32	0.61	5	0.95
4x - HRA	1.07	6	0.64	2	0.54
6x - IRM	1.01	11	1.31	7	0.51
7x- TWR	1.98	23	0.62	4	0.99
8x - RR	1.45	18	0.93	6	0.73
Subcontractors	1.06	2	1.83	1	0.53
WHC - Overall	1.38	130	0.79	37	0.69

Table 2-3. ICF KH FY 1993 & FY1994 LOST/RESTRICTED WORKDAY CASE/RATES
GOAL - 50 PERCENT REDUCTION FROM FY 1993 TO FY 1994

<u>Division</u>	FY 1993 LWD/RWD Case Rate	# Cases	FY 1994 LWD/RWD Case Rate Through 3/94	# Cases	RATE TO ACHIEVE GOAL
KEH Construction	4.96	51	3.52	19	2.48
KEH - Operations	3.73	55	3.02	23	1.86
KEH Engineering	0	0	1.14	2	0
KEH - Contracts	7.41	13	16.93	23	3.71
KEH - Overall	4.03	119	4.16	67	2.02

All WHC/BCSR occupational injury/illness information is available via Soft Reporting on the Hanford Local Area Network (HLAN). This report is updated each Thursday. In addition to providing the number of accidents for each group, the report gives a description of each accident, including location, job-type, and cause of injury. This provides each manager with a means to focus on what types of accidents are occurring (for trending purposes), and ways to prevent recurrence.

The following information is provided in the Appendices section of this report:

- Appendices A-1 and A-2 provide the WHC and ICF KH tables summarizing the past week's occupational injuries/illnesses, as well as a FYTD 1994 comparison to FY 1993 of the number of recordable cases and lost/restricted workday cases. The table also provides the date of the last lost/restricted workday case for each department, with the number of days since that case occurred.
- Appendix A-3 provides a list of resources and services available to assist management with injury prevention, accident investigation, and safety awareness efforts.

2.6.2 Incidence Rate Comparison Including State and Nationwide Rates

Figures 2-3. and 2-4. compare recordable and lost/restricted case incidence rates across a broad range of collective organizations. These include the nation and Washington state rates for waste management activities comparable to much of the work now being performed at Hanford.

Figure 2-3. Total Recordable Case Incidence Rate Comparisons

CY 1991	8.4	15.3		3.11	1.71	3.9	3.95
CY 1992			20.3	3.54	1.74	3.8	3.84
CY 1993				3.49	2.1	3.5	4.47
CYTD 1994					1.4		3.02

Figure 2-4. Lost/Restricted Workday Case Incidence Rate Comparisons

CY 1991	3.9	7.9		1.5	0.89	1.9	2.09
CY 1992			15.8	1.64	0.89	1.8	1.86
CY 1993				1.55	0.8	1.5	1.54
CYTD 1994					0.4		0.77

Data Title Definitions:

All General Industry - No CY 1992 or CY 1993 Data Available
 All General Industry-SIC Code 495-Waste Management - No CY 1992 or CY 1993 Data Available
 State of Washington-SIC Code 495-Waste Management - No CY 1991 or CY 1993 Data Available
 Total Westinghouse Corporate - CY 1993 rate is through the month of December
 Total Westinghouse GOCO - CY 1994 rate is through the month of February (rates exclude Fernald)
 Total DOE - CY 1993 rate is through the month of December
 Total WHC - CY 1994 rate is through the month of March

2.6.3 WHC Lost/Restricted Workday Incidence Rates Number of Days Lost/Restricted - By Department

Figures 2-5 and 2-6 provide CY 1994 breakdowns by department of the lost/restricted workday incidence rates, and the total number of days lost/restricted by employees who suffered an occupational injury/illness. Three departments are above the company CY 1994 rate, but two departments plus WHC daily supervised subcontractors have incurred no lost/restricted workday cases.

**Figure 2-5. WHC Lost/Restricted Workday Incidence Rates
By Department - CYTD 1994 Through March**

CY 1993 Rate	0	46.6	9.05	43.95	40.53	43.26	52.14	26.21	63.73
CY 1994 Rate	0	20.94	0	2.22	30.84	47.63	4.35	2.33	0

**Figure 2-6. Number of Lost/Restricted Workdays
By Department - CYTD 1994 Through March**

Days Lost	0	14	0	4	55	92	0	6	0
Days Restricted	0	96	0	6	0	40	16	2	0
Cases	0	6	0	3	2	5	1	3	0
Avg. No. Employees	736	2,420	1,003	1,932	873	1,540	1,748	1,581	108

2.6.4 WHC Recordable Case Incidence Rates

The first quarter cumulative CY 1994 recordable case incidence rate of 3.02 is 55 percent below the company CY 1993 rate through March (6.67). The March cumulative rate (3.02) is 32 percent below the company CY 1993 rate through December (4.47), and 14% below the DOE CY 1993 rate of 3.50. (Figure 2-7)

The control chart plots the CY 1990 through CY 1994 monthly recordable case incidence rates. The control lines are established using CY 1990 through CY 1993 monthly rates (Figure 2-8). There are currently nine consecutive data points below the average, which indicates a continued downward trend.

Reductions in recordable rates are largely attributable to completion of carpal tunnel screening within groups of high exposure to this disorder.

**Figure 2-7. WHC Cumulative Recordable Case Incidence Rates
CYTD 1994 Through March**

Figure 2-8. WHC Monthly Recordable Case Incidence Rates

CY 1990 - CYTD 1994 - Through March
Control Lines Established Using Monthly CY 1990 through CY 1993 Data - 3 Standard Deviations
CY 1990 - CY 1993 Monthly Rates include groups that transferred to ICF KH Operations on 01/01/94)

2.6.5 WHC Occupational Injuries/Illnesses - Monthly Case Incident Rate Trends

When strain injuries are charted against other causal categories, there is often an indication of where safety emphasis may be most called for.

Figure 2-9 shows a general parallel of causal factors with some divergence beginning in October of 1993.

Reduced "strain/sprain" monthly injury/illness rates may be the first indicator that wellness and awareness programs are returning dividends.

Divergence of strain and other causal lines may also reflect some reporting reticence on the part of injured workers who are more compelled to seek treatment for lacerations and fractures than for strain/sprain injuries.

Each group should carefully assess the direction of trends and determine why changes are occurring.

**Figure 2-9. WHC Occupational Injuries/Illnesses
Monthly Case Incidence Rates
CY 1993 - CYTD 1994 Through March**

2.6.6 Facility Operations Department (OPS)

The numbers in Table 2-4 reflect the job-related injuries/illnesses reported by OPS personnel during CY 1994 through March. For comparison, CY 1993 numbers are also shown.

Table 2-4. OPS-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Only Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	239	12.26	85	4.36	26	1.33
CY 1994 - 1st Qtr.	59	11.23	19	3.62	6	1.14
Percent Difference		8% Decrease		17% Decrease		14% Decrease
Through the first quarter of 1994, the longest period of time achieved by OPS personnel without a lost workday injury/illness (days away) was 69 days (October 26, 1993 through January 3, 1994).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-5. OPS-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	64	3.28	13	0.67
CY 1994 - 1st Qtr.	14	2.67	3	0.57
Cumulative Trauma Disorder				
CY 1993	8	0.41	4	0.21
CY 1994 - 1st Qtr.	2	0.38	0	0.00
All Other Occupational Injuries/Illnesses				
CY 1993	252	12.93	9	0.46
CY 1994 - 1st Qtr.	62	11.80	3	0.57

The Facility Operations Department successfully reduced case rates in each of the highlighted categories. This indicates a sound and pertinent program is taking hold.

In the category of "all other" injuries/illnesses, a significant share continue to come from simple, non-industrial tasks.

The combination of simple, non industrial tasks and "blind spot" hazards accounted for more than 50 percent of all first quarter injuries within Facility Operations. Additionally, three employees were injured playing basketball during their lunch break. Together these factors indicate that injuries can be reduced by raising the awareness level within the group.

Safety Awareness offers a safety meeting which speaks to these needs. More information can be gained by calling 376-2166

2.6.7 Engineered Applications Department (EA)

The numbers in Table 2-6 reflect the job-related injuries/illnesses reported by EA personnel during CY 1994 through March. For comparison, CY 1993 numbers are also shown.

Table 2-6. EA-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Only Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	34	3.21	57	5.37	6	0.57
CY 1994 - 1st Qtr.	9	3.93	4	1.75	0	0.00
Percent Difference		22% Increase		67% Decrease		Decrease
Through the first quarter of 1994, the longest period of time achieved by EA personnel without a lost workday injury/illness (days away) was 242 days (January 29 through September 27, 1993).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-7 EA-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	9	0.85	4	0.38
CY 1994 - 1st Qtr.	3	1.31	0	0.00
Cumulative Trauma Disorder				
CY 1993	41	3.87	0	0.00
CY 1994 - 1st Qtr.	1	0.44	0	0.00
All Other Occupational Injuries/Illnesses				
CY 1993	41	3.87	2	0.19
CY 1994 - 1st Qtr.	9	3.93	0	0.00

Engineered Applications had no injuries due to "simple task" or "blind spot" hazards during the first quarter. Coupled with the fact that of six non-strain cases, three were from transient sources (wind, second party vehicle), the indication here is that the safety program is being administered soundly.

The significant overall reduction in serious injury rate, however, rests entirely in the category of cumulative trauma disorder.

2.6.8 Emergency, Safety, and Quality Assurance Department (ESQ).

The numbers in Table 2-8 reflect the job-related injuries/illnesses reported by ESQ personnel during CY 1994 through March. For comparison, CY 1993 numbers are also shown. (The information for CY 1993 includes Safeguards and Security, Emergency Preparedness, and Hanford Fire Department, that were previously included as a part of Operations Support Services Department).

Table 2-8. ESQ-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Only Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	173	10.53	66	4.02	31	1.89
CY 1994 - 1st Qtr.	43	9.55	18	4.00	3	0.67
Percent Difference		9% Decrease		0.5% Decrease		65% Decrease
Through the first quarter of 1994, the longest period of time achieved by ESQ personnel without a lost workday injury/illness (days away) was 98 days (December 9, 1993 through March 16, 1994).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-9 ESQ-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday <u>Case</u> Incidence Rate
Strain/Sprain				
CY 1993	96	5.84	22	1.34
CY 1994 - 1st Qtr.	16	3.55	2	0.44
Cumulative Trauma Disorder				
CY 1993	4	0.24	0	0.00
CY 1994 - 1st Qtr.	5	1.11	1	0.22
All Other Occupational Injuries/Illnesses				
CY 1993	139	8.46	9	0.55
CY 1994 - 1st Qtr.	40	8.89	0	0.00

One in every three ESQ injuries were muscle strain caused by something other than lifting. Half of these strain injuries occurred as the employee was walking and not being sufficiently conscious of objects or changes in the path of travel. The resulting slip or trip resulted in a twist of the body which caused the strain.

Uniform lost workday case reductions are indication of more successful case management. This bears out especially in the category of cases not related to strains. Here we see the elimination of lost/restricted cases even as the rate for all such injuries increased.

About one in every five ESQ injuries were lacerations or abrasions caused by "hidden" hazards.

2.6.9 Human Resources & Administration Department (HRA).

The numbers in Table 2-10 reflect the job-related injuries/illnesses reported by HRA personnel during CY 1994 through March. For comparison, CY 1993 numbers are also shown.

Table 2-10. HRA-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Only Aid Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	13	2.34	27	4.86	5	0.90
CY 1994 - 1st Qtr.	7	3.93	5	2.80	2	1.12
Percent Difference		68% Increase		42% Decrease		24% Increase
Through the first quarter of 1994, the longest period of time achieved by HRA without a lost workday injury/illness (days away) was 112 days (December 17, 1992, through April 8, 1993).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-11. HRA-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	12	2.16	4	0.72
CY 1994 - 1st Qtr.	3	1.68	1	0.56
Cumulative Trauma Disorder				
CY 1993	5	0.90	0	0.00
CY 1994 - 1st Qtr.	2	1.12	1	0.56
All Other Occupational Injuries/Illnesses				
CY 1993	23	4.14	1	0.18
CY 1994 - 1st Qtr.	7	3.93	0	0.00

A reduction in the overall injury rate and absence of "simple task" cases are positive indicators that HRA is maintaining a good safety effort. A slight increase in the lost/restricted workday rate is in part due to a CTD case. Such cases are relatively rare in this category.

2.6.10 Information Resource Management Department (IRM).

Job-related injuries/illnesses reported by IRM personnel during CY 1994 through March are shown in Table 2-12. Numbers for CY 1993 are also shown for comparison.

Table 2-12. IRM-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Only Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	78	7.35	29	2.73	9	0.85
CY 1994 - 1st Qtr.	25	8.48	13	4.41	5	1.70
Percent Difference		15% Increase		62% Increase		100% Increase
Through the first quarter of 1994, the longest period of time achieved by IRM personnel without a lost workday injury/illness (days away) was 193 days (March 5, 1993 through September 13, 1993).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-13. IRM-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	23	2.17	4	0.38
CY 1994 - 1st Qtr.	3	1.02	2	0.68
Cumulative Trauma Disorder				
CY 1993	11	1.04	3	0.28
CY 1994 - 1st Qtr.	8	2.71	2	0.68
All Other Occupational Injuries/Illnesses				
CY 1993	73	6.88	2	0.19
CY 1994 - 1st Qtr.	27	9.16	1	0.34

The reduction in strain injury rates is remarkable given significant increases in both CTD and "all other" type categories.

Additionally, the basic "simple task" injury rate for IRM is well below what it was in 1993.

Two of every five injuries were lacerations, primarily to the hands and fingers. Several of these were caused by objects hidden from view which the employee contacted while walking by or when reaching into desks or cabinets.

2.6.11 Tank Waste Remediation System Department (TWRS).

The numbers in Table 2-14 reflect the job-related injuries/illnesses reported by TWRS personnel during CY 1994 through March. For comparison, CY 1993 numbers are also shown.

Table 2-14. TWRS-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Only Cases	First Aid Only Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	100	8.58	45	3.86	23	1.97
CY 1994 - 1st Qtr.	21	5.71	8	2.17	1	0.27
Percent Difference		33% Decrease		44% Decrease		86% Decrease
Through the first quarter of 1994, the longest period of time achieved by TWRS personnel without a lost workday injury/illness (days away) was 73 days (December 29, 1993 through March 31, 1994).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-15. TWRS-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	39	3.34	12	1.03
CY 1994 - 1st Qtr.	6	1.63	0	0.00
Cumulative Trauma Disorder				
CY 1993	10	0.86	3	0.26
CY 1994 - 1st Qtr.	0	0.00	0	0.00
All Other Occupational Injuries/Illnesses				
CY 1993	96	8.23	8	0.69
CY 1994 - 1st Qtr.	23	6.25	1	0.27

The reduction in injury rates for TWRS through the first quarter is consistent throughout the three highlighted categories. This is indication of a successfully administered program.

It is of note that one in every five injuries in this group were the result of slips and trips as the employee was walking. We should stress that it only requires a person in motion to create the potential for an injury.

2.6.12 Restoration and Remediation Department (R&R)

Job-related injuries/illnesses reported by R&R employees during CY 1994 through March are reflected in Table 2-16. For comparison, CY 1993 numbers are also shown.

Table 2-16. R&R-Dept. Occupational Injury/Illness CY 1993 - CY 1994 through March Statistics Comparison						
Time Period	Total First Aid Cases	First Aid Case Rate	Cases Resulting in Recordable Classification	Recordable Case Incidence Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
CY 1993	68	5.42	39	3.11	17	1.35
CY 1994 - 1st Qtr.	14	4.08	8	2.33	3	0.87
Percent Difference		25% Decrease		25% Decrease		36% Decrease
Through the first quarter of 1994, the longest period of time achieved by R&R personnel without a lost workday injury/illness (days away) was 130 days (March 15, 1993 through July 22, 1993).						

NOTE: For a description of all cases for your organization, refer to the soft report on HLAN titled, "Occupational Injuries/Illnesses."

See Appendix A-3 for further information on assistance or services available.

Table 2-17. R&R-Dept. Occupational Injury/Illness History				
Period	Total All Cases (First Aid/Recordable/Lost/Restricted)	All Case Rate	Recordable Cases Resulting in Lost or Restricted Workdays	Lost or Restricted Workday Case Incidence Rate
Strain/Sprain				
CY 1993	31	2.47	9	0.72
CY 1994 - 1st Qtr.	3	0.87	0	0.00
Cumulative Trauma Disorder				
CY 1993	7	0.56	2	0.16
CY 1994 - 1st Qtr.	1	0.29	0	0.00
All Other Occupational Injuries/Illnesses				
CY 1993	69	5.50	6	0.48
CY 1994 - 1st Qtr.	18	5.24	3	0.87

The R&R department has experience "across-the-board" reductions in overall injury rates. These reductions are most notable in the strain/sprain and CTD categories.

There were no "hidden hazard" or "simple task" caused injuries. This reflects a strong awareness level as the group enters 1994.

Twenty-five percent of R&R's first quarter injuries resulted from manual material handling activities. A review of proper lifting methods, matching the worker to the job, and PPE for hands/fingers would aid in reducing these injuries.

2.6.13 WHC Recordable Government Motor Vehicle Accidents

There were 3 recordable government vehicle accidents (those resulting in \$500 damage or greater) reported by WHC employees during the first quarter of CY 1994. The WHC CY 1994 through March recordable government vehicle accident rate is 1.80, as compared to the company CY 1993 through March rate of 7.84. The CY 1994 rate (1.80) is 25 percent below the DOE CY 1993 rate of 2.40.

The WHC CY 1993 through March recordable government vehicle dollar loss rate (from the recordable vehicle accidents) is 2.48, as compared to the company CY 1993 through March rate of 12.14. The CY 1994 rate (2.48) is 35 percent below DOE CY 1993 rate of 3.80.

Tables 2-18, and 2-19 provide a breakdown of the recordable government vehicle accidents by organization, and type of accident. Refer to Appendix A-4 for complete descriptions of the first quarter losses.

Table 2-18. WHC CY 1994 Through March - Recordable Vehicle Accidents By Department

ORGANIZATION CODE	ORGANIZATION	NUMBER OF LOSSES	TOTAL DOLLAR LOSS
02	Communications	1	\$ 2,177
33	Health Physics	2	\$ 1,939
WESTINGHOUSE HANFORD TOTAL		3	\$ 4,116

Table 2-19. WHC CY 1994 Through March - Recordable Vehicle Accidents By Cause of Accident

Cause of Accident	NUMBER OF LOSSES	TOTAL DOLLAR LOSS
OPERATOR ERROR-BACKING	2	\$ 1,939
OPERATOR ERROR-OTHER	1	\$ 2,177
WHC TOTAL	3	\$ 4,116

2.6.14 WHC Recordable Property Damage - Non-Fire Losses CYTD 1994 Through March

There was one recordable non-fire property damage loss reported during first quarter 1994 (Figure 2-10). On 01/17/94, near MO405/200E Area, an electrical transformer sustained damage-\$12,015 total accident damage (Figure 2-10).

The recordable non-fire loss rate (0.016) is below the company CY 1993 rate (0.27), and also below the DOE CY 1993 rate (0.20) (Figure 2-11).

**Figure 2-10. WHC Cumulative Dollars Lost
Recordable Property Damage - Non-Fire**

Figure 2-11. WHC Recordable Non-Fire Loss Rate

2.6.15 WHC Recordable Property Damage - Fire Losses - CYTD 1994 Through March

There were no recordable fire property damage losses reported during first quarter 1994 (Figure 2-12).

The WHC CY 1994 cumulative fire loss rate is 0.00. This rate is below the Company CY 1993 rate of 0.027, and also below the DOE CY 1993 rate of 0.01 (Figure 2-13).

**Figure 2-12. WHC Cumulative Dollars Lost
Recordable Property Damage - Fire**

Figure 2-13. WHC Recordable Fire Loss Rate

3.0 RADIOLOGICAL SAFETY

The radiological safety of WHC and ICF KH employees, and overall effectiveness of the Radiological Control Program, are monitored per WHC-CM-1-6, WHC Radiological Control Manual, and statistics and trends analyzed. Information is made available to assist management in maintaining radiation dose ALARA.

3.1 RADIOLOGICAL CONTROL PROGRAM PERFORMANCE

In this section, key performance trends and program issues are discussed. Radiological Control Program accomplishments during the first quarter of CY 1994 are listed in section 3.8, "Facility Radiological Control Performance," by facility. Accomplishments not associated with the specific facilities in that section, will be listed under Section 3.8.10, "All Other."

3.1.1 Key Performance Trends

The radiological control program manager assessment indicates that overall, the radiological control program is currently satisfactory, with an improved outlook for future performance. Cost control remains assessed as good. Radiological Safety Training is assessed again as generally outstanding, although they have slipped from good to satisfactory in schedule. The overall outlook for the radiological control program is for continued improvement in all areas (Table 3-1).

Table 3-1. Radiological Control Program Manager Assessment

WBS	Program Element	ES&H Compliance	Customer	Technical	Schedule	Cost	Comments
6.7.2.1.4	Radiological Control	◇	◇ ↑	◇ ↑	◇ ↑	□	Rad Con Manual implementation continues to be a major challenge. Rad. events due to losses of contamination control and inadequate discipline in the conduct of radiological work are of concern.
6.7.2.1.4.1	Management & Administration	◇	◇ ↑	+ □	○	□	
6.7.2.1.4.2	Radiological Control Technical Services	◇ ↑	◇ ↑	□	+ ◇	- ◇ ↑	
6.7.2.1.4.3	Radiological Safety Training	■	◇	■	◇	■	
6.7.2.1.4.4	Field Services	◇	□	□	□	□	
■ Outstanding □ Good ◇ Satisfactory ○ Marginal ● Unsatisfactory + Improved from Last Month - Worsened from Last Month ↑ Improved Future Outlook ↓ Worsened Future Outlook							

3.1.2 Program Assessment Detail

The following self-assessment by the radiological control manager indicates a general overall improvement from the previous quarter. The program is assessed as satisfactory with an improved future outlook in the areas of customer relations, technical improvements and commitment schedules, good in cost and satisfactory in ES&H compliance. Table 3-2 contains the rating explanations.

Table 3-2. Program Assessment Detail

WBS Radiological Control 6.7.2.1.4			
Category	Last Month	This Month	Rating Explanation
ES&H Compliance	◇	◇	Efforts to upgrade discipline in the conduct of radiological operations, both by the line and Health Physics organizations are continuing throughout the site, with a particular focus on Tank Farms. Compliance issues associated with DOE's complex requirements for control of radioactive and contaminated materials continue to be encountered, and are complicated by the moratorium waste problem and conflicting State of Washington hazardous waste regulations.
Customer	◇	◇ ↑	Notable improvements in many areas of the radiological protection program, as evidenced by internal and external assessments, continue to be offset by significant customer concerns about the adequacy of HPT support to some facilities, delays caused by WRAM, and the DOE-directed implementation of the new Hanford Site Rad. Control Manual prior to the application of disciplined change control. Aggressive action plans are in place for each concern. We are optimistic that improvements will be reflected in improved customer satisfaction over the next 60-90 days.
Technical	◇	◇ ↑	We continue to experience technical problems in radiological control/unconditional release due to a lack of clear, consistent criteria and expectations from DOE. Upgraded procedures & training, as well as improved discipline in the conduct of release surveys, has dramatically reduced the frequency of improperly released items. This, together with recent activity on the moratorium waste and contaminated soil disposal issues, merit an improving forecast.
Schedule	◇ ↑	◇ ↑	A renewed emphasis on disciplined commitment management is showing results, with all RL Site Management System milestones on schedule and no QUEST delinquencies. Health Physics performance in completing UO ₃ Plant, PRF and 242-A Evaporator restart commitments has been excellent. Training of HPT candidates through the mission retraining program is continuing, with verification of most of the candidates expected by the end of June.
Cost	+ ■	- □	Financial resources & cost control are excellent in nearly all areas. Funding for the mission retraining HPT class has been received.

3.1.3 Key Program Issues

The status of the issues listed below reflects progress towards resolving them as of March 31, 1994.

Issue: Effective 5/25/93, DOE withheld approval for job shopper requests (both new positions and extensions).

Status: HP Training presented an action plan to phase out contract positions over the next 18 months. We are in the process of hiring qualified permanent staff, however, it is taking longer than expected. This issue is closed.

Issue: Health Physics practices are viewed as inconsistent.

Status: HPT Training/Rad Engineering meetings were established; two meetings have been held. Formal minutes were utilized and discussion topics established. Additionally, the WesTIP on HP manuals resulted in recommendations for improvement.

Issue: Radiological work is often constrained by HPT availability.

Status: Improved work control and a greater level of joint forecasting and planning of work with operations is reducing the recurring nature of this issue. Assignment of HPTs from the recent class has lessened the impacts. An additional class will begin in April and graduate in July. The HPT supplemental support team is also providing some relief.

Issue: Source control and ALARA programs are viewed by DOE-RL as inadequate.

Status: The recent reorganization of the ALARA program back to Health Physics was made to improve management attention. ALARA program reviews and reporting have been restructured to improve visibility of accomplishments and enhance the utilization of ALARA tools.

An audit of the Source Control Program has been performed by the Internal Audit Section of the President's Office. The audit showed that the Source Control Program meets current DOE requirements; however, instances of inconsistent or incomplete programs implementations were identified. Specific recommendations for reutilization or timely disposal of sources were provided. A physical inventory of all radioactive sources is about 41 percent completed. Excess sources are being disposed of.

Quarterly Self-Assessments of the source control program are being reported to RL. Physical inventories of all radioactive sources are being conducted.

Issue: Radioactive contamination is frequently discovered outside surface contamination areas.

Status: C-Farm has been posted. Efforts are underway to decontaminate the road and adjacent areas. Line management performance in this area is showing a gradually improving trend, but rate of improvement is too slow. Line management is emphasizing improved housekeeping of areas to identify many of the items which may be preexisting.

Issue: Radiological areas and work are not generally perceived as well planned, disciplined operations.

Status: The refocusing of priorities continues to enhance achievement of common expectations. Planning and interorganizational communications is key to the success of this effort. Work groups and management teams continue to acknowledge ownership of work areas and radiological control responsibilities.

- Issue:** Offsite radiation dose for new hires is not currently documented prior to hiring.
Status: Internal issues continue to be worked. WHC management wants to include all current year off-site dose in administrative control applications.
- Issue:** No standards exist at the this time to release Hanford real property for unrestricted use.
Status: Several meetings have been held with DOE, WHC, WDOE, and ACOE over this topic. It appears that USEPA will sign to release area. Work still needs to be done and WHC is deeply involved with all parties over this issue.
- Issue:** In some job areas the KEH workforce has a lower level of reading ability than WHC personnel. Typically, KEH instructors have read Radiation Worker exams to these people.
Status: No indications of increased failure rate. Remediation procedure returned from legal, going through final typing and review. This issue is closed.
- Issue:** Effective implementation of the HSRCM has been slow in some areas.
Status: Commitment management improving. Coordination problem between program and field. The TWRS level I plan has been issued. TWRS has developed the radiological control implementation plan and is working towards the scheduled completion date of 12/31/94.
- Issue:** Two annual dosimeters reflected unexpectedly high dose for 1993.
Status: Investigations completed. WDOH exposure resolved; source of exposure was Fiesta Ware. The investigation of the other high reading found the source to be an old compass stored in a drawer where the dosimeter was kept at the employee's home.
- Issue:** WHC ALARA Goal development process currently does not coincide with Fiscal Year Work Planning.
Status: Reviews are underway to re-align the ALARA goal process with Fiscal Year Work Planning. Revisions to the ALARA Program Manual will reflect this change.
- Issue:** Out of calibration radiological monitoring equipment.
Status: A MOU between PNL and WHC has been prepared to improve communication and resolve issues concerning Health Physics instrumentation services. This will promote the accuracy of overdue notices and decrease instruments overdue for calibration. A standardized process adopted earlier has lessened inaccuracies and late distribution of notices. There has been approximately a 50 percent reduction in delinquencies.
- Issue:** The announcement of Bechtel Corporation to become Environmental Restoration Contractor.
Status: ERC Transition is continuing. Exempt and Non-Exempt staff have had orientation sessions with BHI. Bargaining Unit personnel still to be identified. WHC, BHI and Human Resources are working on this issue with HAMTC. Department overhead and site pool funded employee impacts are being evaluated.
- Issue:** The Fiscal Year Work Plan no longer accurately reflects work in progress, schedules, organizational structure, budgeting and milestones.
Status: Draft FYWP in review cycle. Class I changes to be submitted by April 30, 1994.
- Issue:** Problems with REX implementation.
Status: WHC Dosimetry slipped schedule on reconciling MAPPER data. A hard copy of the data has been completed to allow MAPPER termination May 2, 1994.

Issue: Delinquent Radiological Problem Reports.

Status: The closure rate of RPRs continues to improve. The average closure rate of RPRs prior to the Admin. Hold was 12/month. The rate is now 19.5/month.

Issue: Perception that too many of the procedures were deleted from the HP Procedure Manual.

Status: As a result of evaluating all 84 suggestions, 10 resulted in the need for new procedures to the 0718 manual, 46 suggestions were deemed as covered in other procedures. All suggestions with resolution have been returned to senders. The major issue is the ability to find necessary information. The WestTIP action plan will resolve this issue.

Issue: Radioactive symbols and stickers and articles of SWP Clothing have been turning up inside of non-regulated waste containers.

Status: Health Physics is now performing daily checks on plant waste dumpsters and load luggers.

Issue: 222S Personnel entering SCAs are not tracked through WRAM system.

Status: Barcode readers have been ordered at PFP, 222S is still exploring options.

Issue: PFP personnel at 2736-ZB are not wearing partial body dosimetry as required.

Status: Dose study is currently being done to determine if there is a 50% difference between what the badge sees and what the head receives.

Issue: Current feedback shows a need to improve some areas of the Radworker II Initial classroom training.

Status: Instructional staff 90% complete on update of class materials. Staff interfacing with Area HP managers to revise practical to more closely match field practices.

Issue: WHC-CM-1-6 training requirements challenge on-site commercial radiography operations.

Status: Health Physics authorized commercial on-site radiography operation assuring compliance with existing state and federal radiography safety requirements.

Issue: There is an increasing number of oversight surveillances, inspections, tours & audits being performed on the Radiological Control program.

Status: Those being performed at present include

- DNFSB Conduct of Operations assessment
- OPA Conduct of Operations assessment
- WHC Integrated Audit Team Conduct of Operations assessment
- DOE-RL Conduct of Operations assessment
- Upcoming Nuclear Safety audit.

3.2 EXTERNAL DOSIMETRY

The protection of worker health and safety is of paramount concern within WHC. Since the Hanford Site is one of the largest nuclear sites in the nation, radiation safety is a key element in the protection program. The measurement of accumulated annual dose provides an indicator of the effectiveness of WHC radiation work practices and the ALARA Program with consideration given to fluctuating operating activities.

3.2.1 Occupational Collective Dose

Record dose reflected in this report is for period ending March 31, 1994. Numbers reflect data available from the Radiological Exposure (REX) system on April 26, 1994.

3.2.1.1 Cumulative Annual Occupational Collective Dose. The Figure 3-1 chart data includes WHC, BCSR, and ICF KH employee exposure. The results represent the exposure of 2,827 quarterly-badged employees and an average of 1,223 monthly-badged employees over the first three months of CY 1994.

The Figure 3-2 control chart presents the monthly employee exposure since the last major process change onsite, the stabilization of N Reactor prior to April 1990. The cluster of data points above the mean in mid-1991 reflects the performance of special work: Nonroutine packaging of material at PFP, encapsulating of material in the KE Basin, and Tank Farm work to meet TPA milestones. The March results continue to be below the average but are within the expected variability of the dosimetry system.

Figure 3-2. Monthly Exchange Dosimeter Results

3.2.1.2 Individual Radiation Dose. Figure 3-3 depicts the cumulative average dose in mrem for monthly badged personnel for CY 1987 through CYTD 1994.

**Figure 3-3. Average Cumulative Radiation Dose
1987 Through CYTD 1994 - Monthly Badged Employees**

3.2.1.3 High Whole Body Dose Evaluation. Table 3-3 lists workers having the highest whole-body doses received onsite, during the first quarter of 1994, for monthly and quarterly frequency badged employees. Figure 3-4 illustrates whole body dose distribution, received onsite, among all monthly frequency badged employees.

The ALARA Tracking and Management System program selects individuals and organizational anomalies identified within a set of parameters and criteria for investigation. Refer to Section 1.7, "ALARA Tracking and Management System," for a description of the process.

During the first quarter of CY 1994, there were no unplanned exposures, resulting in a dose greater than the administrative control level of 500 mrem/year.

Table 3-3. Highest Whole Body Dose Employees
Includes external dose received onsite by monthly and quarterly frequency badged employees.

Craft	Whole Body (mrem)	Organization Code	Craft	Whole Body (mrem)	Organization Code
Operator	240	11700	Operator	170	11700
Operator	190	11700	Science Technician	170	8E730
Manager/Administrator	190	7C610	Electrician	160	14740
Health Physics Technician	180	33311	Operator	160	11700
Operator	180	15340	Manager/Administrator	160	7C610
Engineering Technician	180	8E120	Operator	150	11700
Engineering Technician	180	15370	Operator	140	11700
Operator	170	11700	Engineering Technician	140	15370
Engineer	170	8E120	Operator	140	15340

3.2.1.4 High Neutron Dose. Figure 3-5 provides a 12-month rolling window of the highest neutron doses received onsite.

Figure 3-5. Highest Neutron Dose

3.2.2 Cumulative Radiation Dose by Department

Facility Operations and Environment, Safety, and Quality Assurance Departments receive the most dose at Hanford due to the nature of their work. Detailed facility dose and record of contamination incidents can be found in Section 3.7. Engineered Applications, Information Resource Management, and Human Resources Administration Departments are not graphed because of their low exposure.

**Figure 3-6. Department Dose by Frequency (Rem)
CYTD 1994 (Period Ending 3/31/94)**

3.3 INTERNAL DOSIMETRY

Health Physics is responsible for internal dosimetry emergency response following radiological events and for providing an internal dosimetry advisor to interface between: WHC workers, DOE, PNL Internal Dosimetry, WHC Dosimetry, HEHF, HP management and staff, and WHC communications following events of positive routine bioassay examinations.

3.3.1 Internal Depositions

Beginning in CY 1993, the DOE Radiological Control Manual required the dose from internal depositions be calculated as the 50-year Committed Effective Dose Equivalent (CEDE). Also in this year, DOE Order 5000.3B established reporting criteria for internal depositions as ≥ 100 mrem CEDE.

No intakes of radioactive material, either by inhalation or by wound, with assessed committed CEDE ≥ 100 mrem were confirmed during the first quarter CY 1994.

3.3.2 Internal Dose Incident Follow-Up

There were four instances of loss of contamination control during the calendar quarter involving four workers where follow-up bioassays or counts were performed as a precautionary measure. In one additional case, follow-up bioassays were performed due to an identified worker concern. No intakes of radioactive material were found and no internal dose was assessed for any of these cases.

- On 1/24/94, a worker received a puncture wound to the hand while changing out a high efficiency particulate air (HEPA) filter at PUREX. The HEPA filter showed beta/gamma contamination but there was no observed skin contamination. No blood smear was available for analysis. Wound counting found no detectable activity.
- Follow-up bioassays for a potential intake of plutonium were initiated on 1/20/94 as a result of a worker concern. A worker reported that due to an error in his mask fit record he had been issued the incorrect mask size to perform work in the PFP facility. Follow-up bioassays found no detectable contamination.
- On 2/20/94 a worker punctured his hand on a lathe guide in the 313 building, an old fuels fabrication building. Alpha contamination (uranium) was measured on the lathe point but no blood smears were available. Wound counting found no detectable activity.
- On 2/17/94 a worker was contaminated while working at the K-East spent fuel storage basin. Nasal smears were positive but follow-up whole body counts found no detectable activity.
- On 3/14/94 a Kaiser worker received a puncture wound to his hand through his anti-contamination clothing while removing a tank from a hot cell in the 325 building, a PNL 300 area facility. The tank and other equipment were cut and removed from the hot cell. The hot cell contained mixed fission product and transuranic contamination. Follow-up wound counting found no detectable activity.

**Figure 3-7. 1994 Evaluations of In Vitro and In Vivo Measurements
WHC and ICF KH Employees**

- (1) Number of evaluations in progress.
 (2) Number of workers added for evaluation during quarter as a result of a routine bioassay.
 (3) Number of workers added for evaluation during quarter as the result of an incident.
 (4) Confirmed intakes greater than or equal to 100 mrem committed effective dose equivalent.
 (5) Number of valid urine samples reported during quarter (Y2 Axis).

3.3.3 Direct (in vivo) and Indirect (in vitro) Measurement

The statistics for total number of urine samples is based on the total number sampled. In vitro measurement statistics are presented in Figure 3-8 for CY 1993. Statistics are also included for failure to complete a sample:

- No sample - Workers did not provide a sample for a delivered container
- Lost containers - Workers did not return the containers to the analytical laboratory, or as in the first quarter, the containers were deficient
- Insufficient volumes - Workers did not provide an acceptable amount of urine for analysis
- Lost in laboratory - The analytical laboratory lost the worker's sample during the processing.

Note that beginning the first quarter of 1994 statistics for Kaiser Engineers Hanford are also included in this report.

Figure 3-8. Indirect (In Vitro) Measurements

WHC No Sample	24	8	8	0	0	0	0	0	0	0	0	0
ICF KH No Sample	5	4	0									
WHC Lost Container	28	35	11									
ICF KH Lost Container	10	8	3									
WHC Insuff. Vol.	16	10	4									
ICF KH Insuff. Vol.	2	2	3									
WHC Lost in Lab	8	8	2									
ICF KH Lost in Lab	8	9	1									
WHC Valid Sample	481	447	278									
ICF KH Valid Sample	159	65	67									

In vivo measurements are accumulated by measurement type: Whole body, chest (lung), and head. All other types of measurements performed (e.g., wound, thyroid) are contained in the "Other" category. The no-show category contains the number of chest measurements in which scheduled workers did not report at the PNL In Vivo Radioassay and Research Facility (Figure 3-9)

Figure 3-9. Direct (In Vivo) Measurements

WHC Whole Body	501	451	477	0	0	0	0	0	0	0	0	0
ICF KH Whole Body	140	145	254									
WHC Chest	106	113	203									
ICF KH Chest	31	62	88									
WHC No Shows	20	23	36									
ICF KH No Shows	7	1	9									
WHC Head	1	10	8									
ICF KH Head	0	0	0									
WHC Other	2	0	6									
ICF KH Other	0	2	1									

3.4 SKIN AND CLOTHING CONTAMINATIONS

Skin contaminations are of little consequence to employee health and safety, unless they result in significant radiation dose or internal depositions. Each skin contamination incident, however, does represent the potential for a more serious occurrence.

The procedure for reporting skin and clothing contamination events is published in WHC-CM-4-16, Dosimetry and Medical Services Manual, Section 1.2. The procedure scope is written 2.0: "This procedure applies to all personnel skin contaminations which are detectable above background with instrumentation authorized for use to perform the final release survey of personnel."

3.4.1 Cumulative Skin Contaminations and Clothing Contaminations

There were ten skin contaminations and 15 clothing contaminations reported during the first calendar quarter in WHC-managed facilities/operations per WHC procedure as compared to six skin contaminations and 23 clothing contaminations during the same period in 1993. When combined and considered as incidents caused by loss of contamination control, 1994 with 25 incidents compares favorably with the 29 reported in 1993. However, skin contaminations have a greater potential of adversely affecting the health of the employee and should be given precedence when comparing performance.

An increased amount of surface contamination area work, numbers of new contractors, and new employees onsite emphasizes the need for effective facility orientation and prejob planning to maintain skin and clothing contaminations ALARA in WHC-managed areas.

Figure 3-10. 1994 Skin and Clothing Contaminations

3.4.2 Historical Skin Contaminations

Tracking the total number of skin contaminations provides an indication of the effectiveness of contamination control measures and ALARA programs.

3.4.2.1 Skin Contamination Control Chart. Skin contaminations at WHC-managed facilities have been reduced steadily since 1984. The Figure 3-11 control chart indicates performance is at the average.

3.4.2.2 Significant Skin Contaminations. Significant skin contaminations are defined as a skin contamination resulting in a skin dose greater than or equal to one percent of the DOE dose limit, and are an indicator of the effectiveness of WHC radiation work practices and the efficiency of protective equipment.

Table 3-5. Significant Skin Contaminations

Type	CY 1987	CY 1988	CY 1989	CY 1990	CY 1991	CY 1992	CY 1993	CYTD 1994
Non-WHC Significant Skin Contaminations	0	1	0	0	0	0	0	0
WHC Significant Skin Contaminations	4	0	0	0	0	0	0	0
Total	4	1	0	0	0	0	0	0

3.4.2.3 Ten-Year Skin Contamination Comparison. The downward trend in skin contaminations continues through CYTD 1994 (Figure 3-12).

Figure 3-12. Ten-Year Skin Contamination Comparison

3.4.2.4 Skin Contamination Severity Levels. The severity percentage is not significantly different from 1993 (Figure 3-13).

Figure 3-13. Historical Skin Contamination Severity Levels

Table 3-6. Skin Contamination Severity Code Levels

Severity Code Level	Level Description	Type	Amount
10	Very Low	Beta-Gamma	<20,000 dpm
		Alpha	<1,000 dpm
20	Low	Beta-Gamma	≥20,000 dpm but <100,000 dpm
		Alpha	≥1,000 dpm but <40,000 dpm
30	Moderate	Beta-Gamma	≥100,000 dpm
			≥40,000
40	Significant	>1% D	>1% DOE Standard for Skin Dose

3.4.3 Skin Contamination Trends

Data base files of all skin contamination cases have been maintained since 1987. Information included on the Individual Skin Contamination Data form is entered into the data base and is retrieved for tracking and trending purposes.

3.4.3.1 Initial Detection Methods. More skin contaminations were detected by HPTs, over the last year, than by any other method which indicates a high degree of HPT involvement in day-to-day activities involving radiological work (Figure 3-14).

Figure 3-14. Initial Detection Methods of Skin Contamination

3.4.3.2 Skin Contamination by Craft. A wide variety of crafts received skin contaminations this quarter making it difficult to establish definite trends (Figure 3-15).

Figure 3-15. Skin Contaminations by Craft

3.4.3.3 Facial Contaminations. Facial contaminations hold the potential for inhalation of radioactive material resulting in an internal deposition. The probable causes of the three facial contamination incidents, during this quarter, are given below and depicted in Figure 3-16.

- An operator received 1,000 dpm beta/gamma while pumping sludge in the 105KE Basin. Probable cause: Chin touched the outer layer of protective clothing when the worker looked down.
- A pipefitter received 2,500 dpm beta/gamma and 350 dpm alpha contamination on the chin. Probable cause: The worker adjusted safety glasses and hood while working in an SCA.
- An HPT received 2,000 dpm beta/gamma contamination to the face. Probable cause: A contaminated hood slipped up over the worker's chin.

**Figure 3-16. Facial Contaminations
Received in WHC-Managed Facilities**

3.5 RADIOLOGICAL PROBLEM REPORTS

Radiological Problem Reports (RPR) are issued to responsible managers as a method to communicate problems needing correction. Tracking the number of issued reports provides an indication of the adequacy of documentation of these problems by Health Physics and the number of problems needing attention. Tracking the number of open reports provides an indication of the responsiveness of line management in resolving problems of a radiological nature. Tracking the length of time needed to close an RPR is an indicator of the cooperative efforts expended by Health Physics personnel and the line management with whom they deal in resolving these problems.

The deficiencies noted by the RPR system are coded by type and cause. This information allows extraction of the data for analysis of the types of deficiencies which are occurring, the causes of those deficiencies, and the length of time necessary to accomplish resolution. Refer to the Appendix for cause code and type code descriptions.

3.5.1 RPRs Issued

A monthly average of 108 RPRs was issued during CY 1993 for a total issuance of 1,292 RPRs. The monthly average to date is 107 for CY 1994 (Figure 3-17).

The total number of RPRs written during the first quarter of 1994 was 320, the same as the number written during the first quarter of 1993 and 46 fewer than in 1992. One reason for this decrease continues to be an increasingly cooperative effort between Health Physics and the actionees to avoid radiological problems through a proactive approach (ALARA).

Figure 3-17. Cumulative Radiological Problem Reports Issued

3.F.1.1 Number of RPRs Written - First Quarter CY 1991 to First Quarter CY 1994 Comparison.

The majority of RPRs are written by the combined facilities (PUREX, UO3, PFP/222S Laboratories, 100N). Production has decreased in these areas, and the number of RPRs written in the facilities has decreased by 41% since 1991, although an increase in reporting since 1993 (38%) is noted. Overall, totals show that there were 22% fewer RPRs written in 1994 than in 1991, with a to-date increase of 17% over the 1993 totals.

3.5.1.2 Factors Influencing the Number of RPRs Written

- The general decrease in numbers of RPRs written from 1991 to 1993 reflected the continued down-sizing of production at the Hanford facilities in addition to an increased awareness of radiological issues. The administrative hold at Tank Farms is indicative of management support for this program of awareness, and was a causal factor in the fewer numbers of RPRs written in those areas.
- Increasing awareness of ALARA principles and application to performance accounts for some of the decrease in reporting of deficiencies. Cooperative efforts between Health Physics and its customers has brought more attention to ALARA as a continual approach to hazard management and safe job performance.

Figure 3-18. Number of RPRs Written
First Quarter 1991 to First Quarter 1994 Comparison

NOTE: This chart is a measurement of the area office efforts only and does not include all RPRs written. The purpose of this evaluation is to establish trends and numbers by area.

3.5.1.3 Facilities Issued RPRs. Projected figures, based on first quarter reports, indicate that PUREX/VO₃ will have a total of 240 RPRs by the end of the year if the trend continues. That would be an increase of 155% over the number reported in 1993. The 100K Basins reports to date, if numbers hold, project an 89% increase over last year. Increased activity in that area may account for the numbers. Projections for Waste Tank Farms and T Plant show approximately the same numbers as those reported in 1992 and 1993. The PFP continues a decrease in problems reported, and if the trend continues, 100N will have a decrease projected to 65%. Activity decreases and the steady decommissioning of areas will account for some changes. However, the most desirable decreases will be effected by proactive efforts between Health Physics and the facilities, even if activities in those areas increase.

It remains noteworthy that most areas continue to utilize the capabilities of the RPR tracking system in conjunction with the site corrective action management tracking system (QUEST) in order to manage deficiencies, trend problem areas, and promote preventative efforts.

Figure 3-19. RPRs Issued to Facilities

3.5.2 RPR Trends

The deficiencies noted by the RPR system are coded by type, cause, and severity. This information allows extraction of the data for analysis of the types of deficiencies which are occurring, the cause and severity of those deficiencies, and the length of time necessary to accomplish resolution.

3.5.2.1 RPRs by Priority Planning Grid (PPG). The Hanford Site is now in full compliance with DOE requirements to change the weighting system of radiological and safety deficiencies to the PPG system (Table 3-8). This system has strengthened the evaluative efforts of the actionees and the originators of the RPRs when applying causal definitions to each deficiency.

The actionee is responsible for determining the priority and weight of each deficiency. Once this has been determined and concurrence with the originator reached, assigned values will make the evaluation of the urgency of completion more readily understandable. For further information, refer to WHC-CM-1-4, Corrective Action Management Manual, Sections 2.0 and 3.0.

Since the program was initiated, 785 of the RPRs have been graded using the PPG system. Of those, 576 (73%) have been weighted at under 6: "Routine response -- no root cause analysis required, no lessons learned, no follow up and close out by actionee manager." One hundred eighty-four are weighted at ≥ 6 and < 11 , 24 at ≥ 11 and < 25 , and one > 25 .

Of the RPRs which have not been assigned PPG values, most closed with rapid corrective actions within 30 days, as a continuing cooperative effort on the part of HP and its' customers, to maintain the site ALARA. Many of these RPRs, issued for information purposes, record issues already being tracked by the facilities as occurrence reports, and these RPRs therefore carry the same PPG weight as the occurrence.

3.5.2.2 RPRs by Type and Cause. A total of 320 RPRs have been written on radiological deficiencies this year to date, and of those written, 195 were reported for various radiation contamination situations (EV - Event), which is 61% of the total written. Of those issued for Events, 106 (54%) were listed as unknown causes for the source of the radiological contamination, and personnel error accounted for 28% of the total. Of all deficiencies, 46 were specifically correlated with radiological contamination control. Those 46 are 14% of the total reported (Figure 3-20).

Of all RPRs written, Other continues to be listed as the primary cause (132 - 41%), with personnel issues (126 - 29%) second. It is easier to work with the personnel issues since they are very specific and can be detailed. Within the framework of the Other categories, those issues with unknown causes can only be trended by area/location and watched for recurrence. Natural phenomena can only be controlled to a certain extent -- tumbleweeds gathered and destroyed, areas blocked from animal intrusion. Those unknown causes, as they recur, need to be revisited and trended closely.

Of the RPRs listed with PPGs greater than or equal to 6 and less than 11, the majority are type coded as Event (84) and then Administrative (53). Causes in this area are listed as Other (88) with Personnel Error listed as a cause for 35 of the issues. In the Other category, 65 (74%) list an unknown cause.

The 25 RPRs listed with a PPG of greater than or equal to 11 list Event as the primary type (20) and Other as the primary cause (10). Personnel errors account for eight of these. The two RPRs with ratings of 17.0 and 45.0 PPG list equipment problems and failures as causal factors.

Radiological Problem Reports are written to document radiological problems. The majority of them will therefore list radiological events (EV) as primary types. Causal factors need to be identified and investigated. Personnel errors, administrative issues, procedural and training issues must be observed and monitored. The correlation of causal factors must be done at each field office, recurrences taken into account, and trends established. The primary trend seen sitewide, since the initiation of the program, finds causes listed as unknown and personnel errors. The field must make a conscious effort to discern between the generic issues and the specific issues.

Table 3-7. Graded Approach to Deficiency Tracking and Corrective Action

Priority Planning Grid Value	Priority Actions	Enter Into HSADB	Corrective Action ¹					Reporting
			Root Cause Analysis		Lessons Learned	Close-Out	Follow-Up	Status of Corrective Action
			Minimum ² Training Req'm'ts	Procedure Documentation Requirements	Evaluation If Conditions Exist Elsewhere	Verification that Action was Completed as Specified By: _____	Verification of Corrective Action Effectiveness	
PPG ≥ 25	Immediate Action consider Stop Work and Stabilization of Operations Activity. Notify RL PGM Mgr/PGM Office	Yes	At Least One Person in Group Must Have Had 1 Week Formal Training in Root Cause Analysis	Formal Proc. Supported by Detailed Documentation of Methodology Analysis and Results	Review of Site-wide Activities as Applicable	DOE-RL	Yes, by Contractor on Sampling Basis During Scheduled Audits and Surveillances	As Requested by RL Program Office
<25 & ≥ 11	Prompt Action; Evaluate Acceptability of Continuing Work/Activity	Yes	At Least One Person Must Have Had 1 Day Orientation Course in Root Cause analysis Techs.	Formal Proc. or Reference to Generally Accepted Methodology; Documentation of Conclusions	Review of Affected Plant or Program, as Applicable	Contractor Oversight Organization ⁵	None Required ⁶	Monthly Status Update in HSADB
<11 & ≥ 6	Routine Action and Response	No. Entered into RL and/or Contractor Central Database	No Formal Training Req'd. Will Normally be Accomplished Using Simple Methodology & Use of Check List/Logic Tree, as Approp.	If Required by ³ Governing Document, or at Discretion of Cognizant Mgr.	None Required	Actionee Manager, Oversight Organization on Sample Basis	None Required	As Required by Actionee Organization
PPG < 6	Routine Action and Response	No. Tracked by Actionee Manager	None Required	None Required	None Required	Actionee Manager	None Required	As Required by Actionee Organization

¹ Action to correct underlying cause and prevent recurrence² Accident investigator (A1) must be employed if required by DOE Order³ Some governing documents; e.g., DOE Order 50000.3B, for off-normal occurrences, require a degree of evaluation to determine cause and define corrective action⁴ All conditions are to be entered into a trending database⁵ For DOE-RL initiated items, close out will be by originating organization⁶ A consideration for contractor oversight planning

Figure 3-20. RPRs by Type

Figure 3-21. RPRs by Cause

3.5.2.3 Contamination Events. The total number of contamination events reported continues to show some increase, and the number reported for March increased from 58 to 63 (about 9%). Some areas, such as Tank Farms, Restoration and Remediation, and Environmental Restoration, have consistently higher numbers of events reported. Causes listed for all events include weather and wind (12%), equipment, material, hardware and process (10%), and personnel errors (22%). Administrative controls, communication problems, change management and management methods account for 53% of the personnel designated causes, and these numbers are 12% of the overall total. In order to effect positive change, these issues must be looked at closely.

The largest number of causes assigned to the Events reported are in the Other category. The category of "unknown" accounts for 52% of the Other causes. Trending of the location and frequency of these incidents will allow Health Physics to proactively seek solutions to the problems. Of designate categories, personnel issues account for 22% of the events listed. These and the equipment, material, hardware and processes are situations which can be remedied and controlled.

Figure 3-22. RPR Contamination Events
Actionee Organizations (12 Month Cycles)

Figure 3-23. RPR Contamination Events
Reported Causes

Period	Other	Personnel	Equip., Mat'l., Hardware	Procedure
2/93-2/94	519	165	75	3
3/94-3/94	522	167	74	3

3.5.3 Average Time to Close an RPR

The number of RPRs closed during the first quarter of 1993 was 257, compared to the 302 closed during the first quarter of 1994 – an increase of 18% in closure activity. However, the trends are the same: Most RPRs are closed during the 0 to 30-day time frame (59% in 1993 and 60% in 1994) with the balance following closure through two years. Most RPRs are closed within the first six months (90% in 1993; 86% in 1994), indicating a balanced effort to not only identify problems, but to resolve them in a timely manner. Those that have been open longer than a year have stated problems such as manpower shortages and lack of necessary equipment or funding. Efforts remain underway to resolve these issues and allow closure of the RPRs (Figure 3-24).

Figure 3-24. Age of RPRs Closing During First Quarter of 1994 - All Organizations

3.5.3.1 Open RPRs. There were 298 RPRs open at the end of March 1994; an increase of 12% over the February total. The average closing time for RPRs remains at about 60% within the first 30 days, and those remaining open are generally closed out within the first 180 days. The total open RPRs is about 4% of the total issued, and on an annual basis, about 6% of open RPRs have been open longer than six months. The TWRS organization has the largest number of RPRs open (106) which is approximately 11% of the total issues to them since the program began. Most RPRs have a low priority range on the grid, and this may account for delays in resolution.

Figure 3-25. Open RPRs
Actionee Organizations - Total Open at End of Month

3.5.3.2 RPR Average Days Open. Health Physics continues to work with the actionees to close out the older RPRs. The average length of time open for RPRs remains stable with some obvious changes. Overall, the effort to resolve the problems seems to remain consistent with priorities and goals.

Figure 3-26. Open RPRs - Average Days Open
Actionee Organizations - Total at End of Month

3.6 DOSIMETRY

The WHC Dosimetry organization administers the dosimetry system that measures and records various types of external and internal radiation exposures occurring in WHC-managed facilities. All record and supplemental dosimeters for WHC, BCSR, ICF KH, and DOE, all of their visitors, subcontractors, vendors and tour participants are issued and processed by the Dosimetry Administration Group. The data from these dosimeters is recorded and reported as required.

The Radiation Exposure (REX) system is basically debugged. Dosimetry continues to work closely with PNL Dosimetry Records and IRM to investigate new and different methods to input and retrieve data efficiently.

The Dosimetry organization is responsible for tracking and monitoring declared pregnant workers, conducting monthly dosimeter audits and status reports, and in vivo and in vitro scheduling and reporting. To ensure exposures are kept ALARA, the Dosimetry Administration Group performs daily exposure checks and audits, provides the ALARA Program Office with daily input on exposures, and provides an ongoing history for tracking employees from date of hire to date of termination.

Additional dosimetry costs can be avoided by increased awareness and monitoring of forgotten badges and failures to return dosimeters on time. During this report period, 318 badges were forgotten and work restrictions were issued due to failure to return 185 dosimeters and 53 pairs of finger rings.

At the end of March, Dosimetry was monitoring 12 pregnant workers; three weekly and nine monthly. The highest dose of 30 mrem was investigated and discussed with the employee.

Estimates and investigations of dosimeter results are performed when Dosimetry is notified of a lost or damaged dosimeter. The results of these investigations are sent to PNL to be included in the employee's record radiation exposure file (Figure 3-27).

Figure 3-27. Dose Assessments Performed for Lost or Damaged Dosimeters
(Does not include assessments performed to close work restrictions issued for late dosimeter returns.)

3.7 FACILITY RADIOLOGICAL CONTROL PERFORMANCE

Radiological Control Program accomplishments are listed by facility or Area with the general accomplishments listed at the end of this section. Organization codes listed for each of the Areas/facilities are those determined to be facility specific; i.e., organizations comprised of employees receiving exposure exclusively within the location described. The realignment and reorganization of the company has necessitated numerous organization code changes during this reporting quarter. If you have questions regarding the codes listed for any facility please contact Safety Awareness and Performance.

3.7.1 308 Building, FFTF, MASF, FMEF

Accomplishments.

- The Fast Flux Test Facility (FFTF) has been issued a permanent shutdown order. 400 Area Health Physics reorganized HPT shift operations and is adding one additional HPT to address accelerated decommissioning activities. The Fiscal Year Work plan has been revised to include Health Physics support to the three planned work phases for FY 1994.
- CO₂ decontamination process applications Material and Storage Facility (MASF) is taking advantage of the trial period for utilizing the CO₂ decontamination process which is presently being used at B-Plant. This process will eliminate the use of liquid as a decontaminant which would become radioactive waste. All waste would be in the form of gas which is exhausted HEPA filters into the MASF exhaust plenum.
- The computer based RWP distribution and reference system that was developed by FFTF HPT and technical staff, has been expanded for use in 100K and 300 Areas Health Physics.
- The 308 Building glovebox cleaning and facility equipment and material redeployment/excessing on schedule to meet March 31, 1994 DOE-HQ milestone. Facility HPT resources increased to assure customer success.
- Health Physics Technology has made a detailed evaluation of the 333 Fuel Production Facility in response to an employee concern regarding the ventilation configuration in the building to control airborne radioactivity and contamination. A detailed plan of compensatory measures that are cost effective and provide radiological control has been completed and submitted to the HPT area manager. Briefings have also been provided the employee, maintenance and fuel production management, the 300 Area HPT manager, and a representative from the Employee Concern Program. Plans are being made to provide this information to all employees working in the 333 Building.

Table 3-8. 308 Building, FFTF, MASF and FMEF Radiological Exposure by Dosimeter Exchange Frequency/Type

Organization Code	Whole body deep exposure is listed for Monthly (M) & Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
06550	-	-	3	0	-	-
144xx	4	0	54	20	-	-
18xxx	1	0	87	100	3	30

195xx	1	0	-	-	-	-
22350	9	0	2	0	-	-
22370	5	0	5	10	-	-
229xx	3	0	18	10	-	-
3B220	-	-	6	30	-	-
33120	-	-	8	30	1	0
38550	-	-	5	0	-	-
5271x	-	-	14	0	-	-
52720	-	-	18	30	-	-

Radiological incidents occurring or reports issued in the 309 Building, FFTF, FMEF, and MASF during CYTD 1994 included:

0 - Internal contaminations > 100 mrem confirmed	1 - Clothing contaminations
1 - Skin contaminations	5 - Radiological Problem Reports

3.7.2 100 Areas

Accomplishments.

- The double Ion Exchange Module change-out was completed.
- The resolution of the Unresolved Safety Question on 105KE North Loadout Pit is complete.
- The installation of air cooled chillers is complete.
- A physical inventory of all accessible sources at 100N has been completed and discrepancies in the radioactive source database corrected. Approximately 180 sources are awaiting disposal. Custody of remaining sources have been reassigned from Maintenance to Health Physics.

The Source Control Office has developed and issued new forms to improve the quality of documentation within the Source Control Program. The new forms, to be available on "Jet-Form" for easy access, include Radioactive Source Inventory and Integrity Test Record and Source Checkout Log Sheet. The Source Control Office also issued the first "Source Control Bulletin" to quickly disseminate information on source control issues to all source custodians.

- All major actions required to transfer N Reactor decommissioning to Environmental Health Physics are complete. Radioactive source custodianship and property inventory custodianship have been established for N Reactor and the K Basins. All N-Reactor-specific records, files, and manuals have been transferred to the appropriate exempt personnel. Distribution of personnel survey devices has been established, and a new PNL loan pool instrument drop station is established for N Reactor.
- An independent surveillance against DOE 5400.5, "Radiation Protection for the Public and the Environment," was performed by RL at the 105K Basin. No noncompliant conditions were noted and only one recommendation was made regarding records quality.

- 100 Areas FHP has completed nine of eleven action items considered critical path for encapsulation readiness. The remaining two items (RWP preparation and containment training) are scheduled for completion by May 20, 1994.
- Work has been completed on the repair of the 105-F roof, (this roof failed causing one worker to fall to his death). The work was completed without any additional industrial or radiological safety concerns. Workers are now moving to 105-H to do similar repairs.
- Facility Operations has reviewed the requirement to wear safety glasses in the 105 KE/KW fuel storage basins. The requirement was removed based on a risk assessment. There are no major eye hazards in the fuel storage basins which drive a need for safety glasses. However, persons wearing safety glasses sometimes tend to adjust their glasses while working in SCAs, presenting a skin contamination hazard.
- The WHC-CM-1-6 Compliance Review for the K Basins was revised. Originally, the compliance review was performed for N Reactor and the K Basins. Due to the recent Health Physics reorganization, it was necessary to revisit the compliance review and tailor it to the K Basins. One hundred two (102) noncompliant items were identified and communicated to facility management for compliance plan development and resolution. This resulted in 32 Radiological Problem Reports.
- A new system of assessing RWPs for use in the field, work packages, or just reference is operational and is ready to be implemented to individual users. 100 Areas Facilities Health Physics, with assistance from Information Resource Management, has created a common drive which is accessible to everyone in the 100 Area. This common drive contains all the current 100K Basins RWPs (WordPerfect macro driven). The macro provides the RWP index from which any RWP can be printed for use in the field. When the system is fully operational, photocopies of the RWPs will no longer be issued; all RWPs will be obtained from the common drive. The easier network access does not change how RWPs are to be controlled and posted.
- Recommendations were provided to K Basin Operations on reducing the number of TLD changes required for their personnel. The recommendations could save approximately 788 TLD changes a year. This could help eliminate their late-return rate and provide assistance to Dosimetry in reducing the monthly number of TLDs they have to process.

Table 3-9. 100 Areas Radiological Exposure by Dosimeter Exchange Frequency/Type

Organization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
11xxx(all)	67	2460	25	110	5	390
110xx	-	-	2	0	-	-
111xx	-	-	14	30	-	-
115xx	21	160	5	80	-	-
117xx	43	2300	3	0	5	390
12140	-	-	1	10	-	-
147xx	34	730	11	80	6	650
19800	-	-	6	0	-	-

3391x	45	1200	8	100	1	60
38560	1	0	6	0	-	-
521xx	5	0	-	-	2	130
856xx	20	350	8	20	-	-
857xx	2	0	3	30	-	-

Radiological incidents occurring or reports issued in the 100 Areas during CYTD 1994 included:

- 0 - Internal contaminations > 100 mrem confirmed
- 2 - Skin contaminations
- 2 - Clothing contaminations
- 54 - Radiological Problem Reports - 100K
- 9 - Radiological Problem Reports - 100N

3.7.3 Plutonium Finishing Plant

Major tasks performed during the calendar quarter include:

- Completion of Filter Box 20/22 cutup -- a major ALARA accomplishment;
- Project C-031: Began tying into the main drain lines;
- 227 Decontamination: Beginning to remove all lead glass on the hood face and looking for the source of contamination;
- The 310 Support Facility is changing out 125 filters in filter room 310.

Accomplishments.

- PFP personnel are not required to report at the WRAM station unless the RWP requires issuance of a direct reading dosimeter (pencil). Training is monitored on a weekly basis and alpha-numeric access badges are pulled if training currency expires. This will allow PFP to eventually reduce the number of HPTs manning the WRAM station from two to one.
- On January 31st, all CAMs located in RCAs were deenergized as part of the Workplace Air Sampling Study. Meetings were held to address concerns. This will reduce maintenance and Health Physics manpower requirements. An ECCEL proposal is being submitted. Selected SCA CAMs are scheduled to be deenergized in June. Ninety CAMs were eliminated, creating a large ECCEL potential.
- After accumulating five years of data on CAM performance, PFP reduced the frequency of non-OSR CAM checks from daily to weekly. This results in a significant savings in time and cost required by HPTs and managers.
- Zone Reduction - 19,000 square feet total.
 - Tunnels #3 and #4, and Vault 225 were reduced from an SCA to an RCA at PFP. This was a 3,214 square feet reduction.

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- A detailed survey and decontamination has resulted in the down-grading of the 105-H D-elevator and stairwell from surface contamination to RCA. The change in posting will allow KEH to remove the roof panels without the need for anticontamination clothing. This should improve the efficiency of the workers.
- Zone reduction has progressed steadily in the duct level at PFP. To date, 4,170 square feet of SCA has been reduced to RCA.

Table 3-10. Plutonium Finishing Plant Radiological Exposure
by Dosimeter Exchange Frequency/Type

Organi- zation Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
12120	8	510	3	80	7	1,400
142xx*	104	1,430	16	130	30	1,150
15xxx	192	4,950	149	1,170	112	8,480
3392x*	52	1,640	7	40	6	60
38530	-	-	8	10	-	-

* 222S organizations 14233 and 33921 exposure is not included in these totals.

Radiological incidents occurring or reports issued in the Plutonium Finishing Plant during CYTD 1994 included:

- 0 - Internal contaminations >100 mrem confirmed
- 1 - Skin contaminations
- 1 - Clothing contaminations
- 25 - Radiological Problem Reports.

3.7.4 PUREX/UO₃

Accomplishments.

- The PUREX Self Survey Task Team, comprised of personnel from every discipline in the facility has agreed on a plan to allow operations personnel to conditionally release surveillance datasheets when exiting a radiologically controlled area. Personnel will, however, be required to have all equipment and datasheets surveyed for final release by a qualified Health Physics Technician upon completion of surveillances. Similar arrangements were previously implemented at PFP.
- UO₃ has completed powder removal from all 6 calciners without radiological incident. Cleanup of the powder handling system is underway and expected to be complete by the end of February.
- Zone Reduction.
 - UO₃ released 4,100 square feet of radiation area in February.

Table 3-11. PUREX/VO₂ Radiological Exposure by Dosimeter Exchange Frequency/Type

Organization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLDs Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
143xx	-	-	6	0	-	-
17xxx	3	10	41	60	2	10
33931	-	-	23	80	11	20
57610	-	-	1	0	-	-

Radiological incidents occurring or reports issued in PUREX/VO₂ during CYTD 1994 included:

0 - Internal contaminations > 100 mrem confirmed	3 - Clothing contaminations
2 - Skin contaminations	60 - Radiological Problem Reports.

3.7.5 Tank Farms

Major tasks performed during the calendar quarter by location include:

- East Tank Farm Operations and Maintenance
 - Completed all Health Physics requirements in support of 242A Evaporator startup.
- West Tank Farm Operations and Maintenance
 - Completed mockup training for 103SY camera installation.
 - Completed 111T in tank photo work.
- Saltwell Work and Waste Handling
 - Covered troubleshooting efforts for the saltwell pump in BX Farm.
 - Covered the cleaning of the grout mixer module in preparation for decommissioning.
 - Consolidated long-term waste storage areas to 209E.
 - Covered the general housekeeping work at 209E.
- Sampling Crew - Covered sampling of the following areas:
 - 102SY supernate and sludge sampling
 - 111T supernate sampling
 - 103C vapor space sampling
 - 104C vapor space sampling
 - 106C vapor space sampling.
- Routines Program
 - Wrote and implemented 60 new required tasks.
 - Implemented the use of new maps for tank farm areas.

Accomplishments.

- An analysis of RPRs has revealed significant improvements in response by both Tank Farm Operations and Health Physics personnel. Contamination found during surveillances has generally been deconned upon discovery, resulting in "information only" RPRs rather than posting new areas and outstanding actions for future decontamination.
- A comprehensive review of TWRS compliance to the Radiation Control Manual has been completed by the Standards Records Identification Documentation team. The information is being utilized to develop a comprehensive compliance plan for TWRS facilities/operations.
- Waste Receiving and Processing excavation began March 23, 1994, for an electrical trench. Ground breaking and major excavation are to begin in April. Health Physics is on distribution for review of all WRAP documentation. Health Physics has negotiated to hire a Health Physics manager for WRAP at the beginning of FY 1995 in order to facilitate development of the Radiological Protection Program.
- Since the administrative hold in Tank Farms, there have been over 16,275 entries into TWRS SCAs with no skin contaminations.
- Zone Reductions:
 - All five levels of the 242-A Evaporator Condenser Room were released from SCA to RCA status, which represents approximately 3,100 square feet. Decontamination is continuing adjacent to the C-farm fence/road. TWRHP and Tank Farm Operations are also finalizing a Tank Farms contamination control strategy and clean-up plan.
 - Decontamination/stabilization of the 216-A-40 Retention Basin has begun. The plan was modified to use contaminated soil from the large area south of C-Farm as filler. This will decontaminate/stabilize two outdoor contamination problems in the Tank Farms.
 - 242-A Operations and TWRHP personnel, led by the Evaporation Operations manager, are developing the decontamination plan for AW-Farm to downgrade it from SCA to RCA status. Walkdowns of the farm have already taken place providing specific actions and details.
 - West Tank Farms has decontamination efforts ongoing around the perimeters of Tank Farms.
 - The sitewide contaminated area reduction effort, via the facility ALARA teams, now has a CY 1994 goal of >8,735,000 square feet. All of the facility teams, with the exception of Waste Tank Operations, have contributed to the effort. TWRSHF and CCIP are working to establish the Waste Tank Operations goal for roll-up into the sitewide effort.
 - TWRHP and Tank Waste Operations are developing a comprehensive contamination control strategy and clean-up plan. The plan will include an emergency spill response guide.

Table 3-12. Tank Farms Radiological Exposure by Dosimeter Exchange Frequency/Type

Organ- ization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
3331x	5	60	34	450	1	10
3332x	5	70	12	100	3	70
382xx	-	-	11	20	-	-
52230	10	180	-	-	3	60
52240	11	310	-	-	-	-
7xxxx	323	2,120	343	850	34	1,630

Radiological incidents occurring or reports issued in the Tank Farms during CYTD 1994 included:

- 0 - Internal contaminations > 100 mrem confirmed 3 - Clothing Contaminations
- 0 - Skin contaminations 53 - Radiological Problem Reports - T Plant

3.7.6 T Plant/Solid Waste Disposal

Accomplishments.

- T Plant has completed the repackaging and sampling of Tank Farms Unknown Waste (58 boxes and 200 55-gallon drums) without radiological incident. This was a WHC priority that could not have been accomplished without team work from everybody involved.
- T Plant has installed a new control point trailer at the railroad tunnel and is currently installing a new control point at 2706 T. Solid Waste is currently installing two control-point trailers. These trailers are located at the CWC facility and Trusaf. These control points will contain Portable Containment Monitors, overall status boards, and possibly WRAM stations.
- To reduce confusion and ensure each radiological area is properly identified, T Plant Health Physics has developed a "phased" plan to repost the T Plant facility. The phased plan identifies the classification of radiological areas and a schedule to repost the areas concurrently.
- Zone Reduction: T Plant reduced 648 square feet of SCA to RCA.

Table 3-13. T Plant/Solid Waste Disposal Radiological Exposure by Dosimeter Exchange Frequency/Type

Organ- ization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
33541	116	150	1	0	6	300
33542	9	10	2	0	-	-
872xx	-	-	61	380	2	50
874xx	48	370	48	10	11	450

Radiological incidents occurring or reports issued in T Plant/Solid Waste Disposal during CYTD 1994 included:

- 0 - Internal contaminations > 100 mrem confirmed 50 - Radiological Problem Reports - T Plant
1 - Skin contaminations 10 - Radiological Problem Reports - SWM
0 - Clothing contaminations

3.7.7 Restoration and Remediation

Table 3-14. Restoration and Remediation Radiological Exposure by Dosimeter Exchange Frequency/Type

Organ- ization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
81xxx	3	0	165	1,480	-	-
85xxx	92	970	86	200	3	40

Restoration and Remediation was issued 32 Radiological Problem Reports during CYTD 1994.

3.7.8 Processing and Analytical Laboratories

Major tasks performed during the calendar quarter include:

- **Ventilation upgrade (entire 222S)**
- **219F and Hot Cell tie-in**
- **Tunnel piping removal**
- **Zone reduction of 400 square feet.**

Table 3-15. Processing and Analytical Laboratories Radiological Exposure by Dosimeter Exchange Frequency/Type

Organ- ization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
12xxx	54	870	203	920	133	7,150
14233	-	-	19	0	-	-
33921	1	0	22	660	17	520

Radiological incidents occurring or reports issued in Processing and Analytical Laboratories.

- 0 - Internal contaminations > 100 mrem confirmed
- 2 - Skin contaminations
- 2 - Clothing contaminations
- 2 - Radiological Problem Reports.

3.7.9 B Plant/WESF

Accomplishments.

- A detailed program of measuring and evaluating radon levels in B Plant was completed in response to an employee concern. All radon levels were found to be about one quarter the level established by the Environmental Protection Agency for remedial action. However, gallery fans have been rewired for manual operation instead of thermostat control, and may be operated whenever Health Physics identifies that elevated levels are present. Training in the prevalence and significance of radon in B Plant has been provided to all electricians, planners, and schedulers.
- Zone Reductions.
 - B Plant released 10,890 square feet of surface contamination area during February.
 - Cleanup of the KEH E12 Hot Yard south of B Plant has been completed.

Table 3-16. B Plant/WESF Radiological Exposure by Dosimeter Exchange Frequency/Type

Organ- ization Code	Whole body deep exposure is listed for Monthly (M) and Quarterly (Q) TLD totals. Extremity exposure is listed for Ring totals.					
	M		Q		Ring	
	Employees	mrem	Employees	mrem	Employees	mrem
145xx	38	160	8	0	-	-
16xxx	110	780	43	10	-	-
33940	18	330	2	0	1	0

Radiological incidents occurring or reports issued in B Plant/WESF during CYTD 1994 included:

- 0 - Internal contaminations > 100 mrem confirmed
- 1 - Skin contaminations
- 3 - Clothing contaminations
- 24 - Radiological Problem Reports.

3.7.10 General Health Physics Accomplishments

- Cumulative time since last lost workday case:
 - 400 Area Health Physics 4 years
 - 100 Areas Facilities Health Physics Over 6 years
 - Environmental Restoration Health Physics 448 days
 - PUREX/UO₂ Health Physics 1.8 years
 - B Plant Health Physics 2.6 years
 - Tank Waste Remediation Health Physics 110 days
 - Solid Waste Disposal Health Physics 355 days
 - PFP Health Physics 348 days
 - 22S Laboratories 323 days
 - Program Control and Integration 3 years
 - Health Physics Training 2 years.

- Quality performance by the Interstate Nuclear Services (INS) anti-contamination clothing laundry is significantly exceeding that previously achieved by the former Hanford Laundry. To date, there have been only four items identified with activity greater than INS release limits. Three of these were identified prior to use in the field through WHC Health Physics scheduled survey program.
- 10 CFR 835 implementation planning is progressing on schedule. Implementation Guides have been routed for review and comment, with comments due to DOE by March 20, 1994. Line and HP management staff presentations at all areas are 80% complete. Key implementation issues are being identified and brought to management attention.

Program Control and Integration is developing a matrix which evaluates the requirements of 10 CFR 835 to DOE N5480.6, HSRCM (Hanford Site Radiological Control Manual) and WHC-CM-1-6, identifying any differences and characterizing those differences as being less restrictive, more restrictive, or having a different meaning. The Draft DOE Standards and Implementation Guides will be referenced to 10 CFR 835 requirements and included in the matrix. To date, the initial comparison matrix of HSRCM versus WHC-CM-1-6 is 90% complete.

- Updated Radiological Control Manual compliance plans were developed and distributed to all managers with actions. Detailed action plans to accomplish the compliance plans have been requested. In addition, a field-level compliance matrix is being developed to assist the Area HP Managers in assessing their compliance with the manual.
- Cooperative efforts between Health Physics and other organizations is increasing the reporting effectiveness and the timely closure of Health Physics corrective Actions on this system. Additionally, continual monitoring of the QUEST (Quality, Environment, and Safety Tracking) system allows Health Physics to ensure that items are not added without our knowledge, and to resolve those that are. Health Physics is pursuing an aggressive program to close out its action items prior to committed completion dates.
- A conference was held in Salt Lake City, Utah on January 17 and 18, to develop the first draft of a pocket guide to the Radiological Control Manual. Radiological control experts representing Westinghouse Idaho Nuclear Company, Waste Isolation Pilot Project, West Valley, Savannah River and Hanford sites collaborated in this effort. A final draft for review by management is scheduled to be complete in March.
- The Transuranic-Retrieval Operational Readiness Review Evaluation has been initiated by DOE.
- The 200 Area Liquid Effluent Facility preliminary routine task description program is complete. Currently, the facility-specific RWP Program is being established. The final Safety Analysis Report is being reviewed.
- Cost Savings:
 - WHC received \$5,297,780 in soft dollar credit in the ECCEL (Employing Consolidation and Cost Effective Leadership) program for the use of the MSCM-II (Mobile Surface Contamination Monitor II) versus manual surveys via "walking stick". \$793,815 in hard dollar ECCEL savings was approved by the WHC Board for the KEH positions integration into WHC HP.
 - Ten excess portable instrument check sources were redistributed to Tank Farms and Plutonium Finishing Plant/222-S Laboratory Health Physics. This saved \$9,600 in procurement by these organizations.

- Workers with previous training in radiological safety are utilizing the Radworker II Accelerated Program to save time and money. Radiological Safety Training receives about 30 to 40 requests each month to use this accelerated version of Radiological Worker II Initial Program. The accelerated version meets all DOE training requirements. A \$750,000 soft-dollar savings has been approved.
 - The Westinghouse Government-Owned Contractor-Operated Radiation Protection committee initiated an effort to share Technical Equivalency Documents from N5480.6 compliance actions. Our TEDs were mailed on March 29, 1994. This savings through sharing initiative may help us determine better ways to approach requirements of the manual by evaluating what other sites have done when they have run up against the same problems.
 - An evaluation was completed of the requirements for fire protection for Health Physics Records. Currently, the Rad Con Manual requires one and one half hour fire proof storage of the records. Health Physics has only one hour fire proof cabinets. A review of additional requirements has found basis for the one hour storage, but no basis for the one and one half hour requirement. PCI will prepare an exception request for this requirement for HQ approval. If approved, this will result in a \$235,000 soft dollar Employing Consolidation & Cost Effective Leadership savings.
-
- HPT support expectations are being met on all projects, as reported by the Projects department. No unsatisfactory areas were reported and "outstanding" assessments were reported on 16 individual projects. B-Plant and 300 Area Facilities Health Physics were specifically recognized by the Projects Department Manager.
 - The Site Surveillance HPT Supplemental Team continues to provide needed assistance for peak demands throughout the site. Demand has risen, and the team has been increased to 5 personnel.
 - A WestIP analysis of the present HP manuals has been completed, along with a cost-time analysis of the field change request process used to update these manuals. The analysis resulted in 41 recommendations for improvement, which are being incorporated into a Health Physics implementation plan.
 - During the February 21, 1994 sludge relocation efforts, the job coverage HPT noticed that the inlet connection to the sludge pump was loose and was generating air bubbles. Recognizing the potential for a radioactive airborne condition, the HPT immediately exercised stop work authority and notified Health Physics management and the Operations Shift Manager. The Shift Manager supported the stop work decision, and rapidly worked to assemble the resources to fix the connection. The connection was repaired, and sludge relocation activities were restarted the following shift.
 - A report on dosimetry chain of custody practices at Hanford and other DOE sites has been completed. The report recommends several changes for Hanford, but found no major flaws and very little in the way of regulatory guidance. The report is being transmitted to DOE via external letter.
 - A memorandum of understanding has been formalized between Pacific Northwest Laboratories and WHC. The MOU defines the role of each organization in providing calibration and maintenance services for Health Physics instrumentation and the interface for resolving issues. This represents a very positive change in our relationship with PNL as a supplier of services. This MOU was performed as an RL Fiscal Year 94 milestone and documentation for closure has been submitted to RL. This completes RL Milestone RAD-94-002.

- Radiological Engineering completed the review of the HPT request for additions into WHC-IP-0718 Manual. The results are that 10 additional procedures or practices will need to be issued. There were 84 requests total; 46 of the 84 (54.6 percent) were already contained in other Internal Publications or CMs Controlled Manuals.
- A plan to upgrade Health Physics survey instrumentation to meet requirements supporting decontaminating and decommissioning work has been completed. Development of this plan was performed as an RL Fiscal Year 94 milestone, and documentation for closure of this milestone has been submitted to RL. Representatives of Health Physics work groups from WHC, PNL, and ICF KH participated in development of this plan.
- HPTs supporting Diane Clark gave a demonstration for Women's Career Day at Washington State University, Tri Cities. This presentation was aimed at showing women career opportunities in the Health Physics field.
- Health Physics is currently evaluating the concept of identifying certain radiologically uncontrolled facilities on site that require materials and equipment to receive a radiological release survey prior to being removed from the facility. The basis for this evaluation is the definition of a Controlled Facility which included the "potential" for contamination. By requiring a radiological release, WHC has identified a "potential" for contamination, and therefore the facility should be controlled with release requirements stated in the facility Radiological Work Permit.
- Health Physics assisted the Emergency Response organization and the International Environmental Institute with a class in Advanced Emergency Response Training. The class included representatives from the Yakima Indian Nation, Yakima county firefighters, Oregon firefighters, and Washington State Patrol. The class was a great success and we were pleased to help in this important effort.
- The quarterly report of WHC status of implementation of the Rad Con Manual was delivered to DOE-RL on March 31, 1994. This report summarizes our current performance toward gaining full compliance with 5480.6 requirements. Improvements were identified in the areas of management oversight and ownership, tracking of actions, accountability for success, and development of tools for use in assessing performance. Areas identified for future improvement were commitment management and poor initial commitment planning.
- Support Services Health Physics is working with Fleet Management to develop a Vehicle Fleet Management database for tracking the radiological status of regulated vehicles. The primary function of the VFM is to track maintenance schedules of DOE owned vehicles. A sub-directory for the VFM has been developed solely for the tracking of regulated vehicles.
- Training
 - Radiological Safety Training is working to complete preparations for outsourcing most academic radiation safety training.
 - The first draft lesson plan for Article 661, Plutonium Facilities, has been completed. The committee will meet in Oak Ridge during the last week of February to finalize the lesson prior to the pilot class that is projected for March.
 - The continuing training program for Front Line Health Physics Managers has been initiated, with completion of the first phase on February 10, 1994. Milestone RAD-94-071 was completed ahead of schedule.

- Article 651 training began on March 15, 1994. People invited to the initial class included Health Physics management, training management and some operations management. Several classes have since been conducted, and the results are positive. Plans to retro-train T Plant managers for other Article 651 training already received are underway.
- Zone Reductions - Miscellaneous:
 - A special survey was conducted around the 211-U Area resulting in the down-posting of 1,600 square feet.

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- DOL, *Standard Industrial Classification Code Manual*, SIC Code 4953, Bureau of Labor Statistics.
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- WHC, 1987, *Industrial Safety Manual*, WHC-CM-4-3, Westinghouse Hanford Company, Richland, Washington.
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- WHC, 1988, *Management Requirements and Procedures*, WHC-CM-1-3, Westinghouse Hanford Company, Richland, Washington.
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Appendix A-1 Summary of Westinghouse Hanford Injury Reporting Thru March 29, 1994										
Org. Code	Manager	No. of Employees	Possible Recordable						No. of Days Since Last Lost Workday Case	Date of Last Lost or Restricted Workday Case
			Recordable (R + L)			Lost Workday Case (L)				
			03/23/94-03/29/94	FYTD 1994	FY 1993	03/23/94-03/29/94	FYTD 1994	FY 1993		
01x	A. L. Trego	26	0	0	1	0	0	1	329	05/07/93
02x	J. G. Burk, Jr.	42	0	0	0	0	0	0	1224	11/06/90
04x	S. R. Moreno	20	0	0	0	0	0	0	None Since Origin	--
05x	E. P. Vodney	197	0	4	5	0	0	1	515	10/30/92
06x	R. G. Slocum	306	0	1	0	0	0	0	None Since Origin	--
0Ax	K. R. Jordan	93	0	0	0	0	0	0	None Since Origin	--
1x	R. J. Bliss	2053	2	29	100	2	12	29	0	03/29/94
2x	R. M. Suyama	932	1	8	57	0	1	7	173	10/07/93
3x	D. J. Swaim	1661	2	24	76	1	4	32	0	03/25/93
4x	J. G. Cassidy	916	0	17	17	0	1	6	76	01/12/94
6x	T. Elsethagen	1251	0	18	30	0	6	11	47	02/10/94
7x	W. T. Alumkal	1495	0	12	48	0	4	23	21	03/08/93
8x	H. E. McGuire	1389	0	16	37	0	6	18	14	03/15/94
SUBCO			0	1	3	0	1	2	147	11/02/93
WHC TOTAL		10,381	5	130	374	3	35	130	0	03/29/94

* SUBCONTRACTORS have been placed in separate category to correspond w/ Table: "OSHA-Recordable Injury Incidence Rates for CYTD" and CAIRS (Computerized Accident/Incident Report System) reporting to DOE and Idaho Falls. These subcontractors are those who Westinghouse Hanford daily supervises and for whom WHC Recordkeepers maintain the OSHA Log.

Note: Please see "Status Changes to the Occupational Injury/Illness (OII) Database" table for explanation of cases from prior reporting weeks that affect the CYTD totals because of a change in classification.

Appendix A-2 Summary of Kaiser Engineering Injury Reporting Thru March 30, 1994									
Reporting Division	Average No. of Employees In Feb. 1994	Possible Recordable						No. of Days Since Last Lost Workday Case	Date of Last Lost or Restricted Workday Case
		Recordable (R + L)			Lost Workday Case (L + R)				
		03/23/94-03/29/94	FYTD 1994	FY 1993	03/23/94-03/29/94	FYTD 1994	FY 1993		
Construction	1012	0	32	125	0	19	52	15	03/07/94
Operations	2266	0	44	123	0	23	55	6	03/21/94
Engineering	393	0	4	1	0	2	0	48	02/01/94
Contracts	269	1	49	47	1	22	15	1	03/28/94
KEH TOTAL	2,928	1	129	296	1	66	122	1	03/28/94

A description of changes made to cases that occurred prior to the reporting week was not provided.

APPENDIX A-3

RESOURCES

Listed below are a variety of resources available to assist in the injury/illness prevention effort.

WHC Field Safety Offices - Staff members are available to assist the manager and Safety Awareness and Performance accident investigators with occupational injury/illness investigations. The staff members will also assist with hazard evaluations, review of work practices, and safety meetings. To request assistance, contact one of the following field safety points-of-contact.

- 300/1100/South Area Safety Office - 376-8774
- 400 Area Safety Office - 376-4013
- 100 Area Safety Office - 373-1399
- 200E/200W/North Area Safety Office - 372-2598
- Waste Tank Safety Support - 372-2481
- Restoration and Remediation Safety - 372-3102
- Health and Safety Technical Services - 373-3761

WHC Safety Awareness and Performance (SA&P) Group - This organization can provide the following:

- **Occupational Injury/Illness Investigations** - Accident Investigators are available to assist with investigation and OSHA recordability determination. To request assistance, contact 376-9146, 376-2354, or 376-9003.
- **Occupational Injury/Illness Information** - To receive more information on the following, contact 376-9141, 376-9091, or 373-0567.
 - **WHC Occupational Injury/Illness Report** - A report that is provided weekly on Soft Reporting which is sorted by organization code or facility.
 - **Daily Report of WHC Occupational Injuries/Illnesses** via cc:mail.
 - **President's Accident Prevention Committee (PAPC)** - Information that is provided to the PAPC.
- **Safety Meeting Materials** - Many resources are available through the Safety Resource Center to assist individuals with conducting their safety meetings effectively and to provide information on safety and health topics. Resources available include films, videos, literature, and assistance with individual safety programs. For information on these resources, contact the Safety Resource Center, 376-9059.
- **Safety Awareness Programs** - For information regarding company wide health and safety awareness programs that have been implemented for prevention of occupational injuries, illnesses and accidents, contact 376-9050.

ALARA - ALARA support is provided for goal development, training and awareness activities. For more information, contact 376-9005, 376-8997, or 376-9035.

APPENDIX A-3 (Continued)

Ergonomics Evaluation - To arrange for an ergonomics evaluation by Hanford Environmental Health Foundation (HEHF) specialists, contact WHC Safety on 376-0194 or 372-2427. Once a diagnosis has been made of the employee's physical problem and the specialist has evaluated the employee's worksite, the specialist will recommend ergonomic equipment to modify the work area to provide relief of symptoms. Approximately 4-6 weeks later, a reevaluation is made to determine that treatments are beneficial.

Behavioral-Based Safety Training Course is a behavior based approach to safety. The course allows participants to identify barriers to safety, discuss the three elements of a Total Safety Culture, and learn how they can implement seven fundamental principles of the safety process.

To schedule training, send your request by cc:mail to the Training Registration mailbox. In the cc:mail message, include employee name, payroll #, charge code, name of class, and course code number if known. Also, if there is a date the employee is not available, include this information in order to avoid rescheduling of the class. Refer Hanford Training Center (376-6736) if they have questions on how to use the cc:mailbox.

Safety Observer Process - This program is designed to assist in training employees in the recognition of the basic causes of accidents in the workplace (unsafe acts and unsafe conditions). The program provides a total of twenty-eight hours of instruction, eight hours initially and two hours monthly. For more information, call 376-8888, or 376-0817.

Manager's Safety Training II Course #004005 - This second Manager Safety course will focus on the prime elements of Behavioral-Based Safety training and the Voluntary Protection (VPP) program guidelines.

- Behavioral-Based Safety training will be emphasized throughout all sections given, with specific emphasis on management's role in the Safety Observer process. An overview of the DO-RITE continuous improvement process will be given. The four elements of VPP guidelines will be discussed. Accident investigation and case management will be covered by actual scenario workshop.

The course is designed to be a hands-on practical application format rather than just more information. The class will participate in deciding where we are, where we are going, and how do we get there.

To schedule training, send your request by cc:mail to the Training Registration mailbox. In the cc:mail message, include employee name, payroll #, charge code, name of class, and course code number if known. Also, if there is a date the employee is not available, include this information in order to avoid rescheduling of the class. Refer Hanford Training Center (376-6736) if they have questions on how to use the cc:mailbox.

Root Cause Analysis - Attendees of this course develop an understanding of several analysis methods for use in accident investigations. For information on this course, contact DOE-RL Quality Training and Resource Center (QTRC) on 376-7117.

Back Injury Prevention Program - The purpose of this program is to provide employees with the knowledge of proper body mechanics, correct posture, and the importance of maintaining good physical condition to prevent back injury. The reasons for common back injury are discussed, as well as the proper posture and body mechanics. A portion of this program is devoted to a

APPENDIX A-3 (Continued)

stretching and strengthening session. The requestor has an option of requesting a 15 minute video that emphasizes the above objectives. For information call Health Promotion Services Department, HEHF (376-0655).

Your Healthy Back - This is a four hour course that is offered by QTRC. This class also provides employees with information on what are the common reasons for back injury, and ways to prevent back injuries. A portion of this program is devoted to a stretching and strengthening session. For more information, contact 376-7117.

Supervising to Prevent Back Injuries - This is a five hour course that provides supervisors with information pertaining to the prevention of back injuries in the work place. For more information, contact QTRC (376-7117).

Hearing Conservation - This one hour course provides an explanation of the physiology of the ear, the effects of noise, the hearing conservation program, and information about hearing protection. This information is followed by an overview of each Hanford Contractor's Hearing Prevention program. For more information, contact QTRC (376-7117).

Wellness Seminars - Wellness seminars are available by HEHF Occupational Health professionals for delivery at the Hanford site on a request basis to groups of 12 or more employees. These presentations have been designed to promote employee health and safety, increase productivity and well-being, as well as reduce absenteeism. Below you will find a brief description of the seminars.

To schedule a particular seminar, managers and supervisors may cc:Mail HEHF Health Promotions mailbox or call HEHF Health Promotion Services at 376-0655. Please schedule your presentations at least three weeks in advance.

- **Adjusting Your Hardware, Maintaining Your Software (60 minutes)**

It isn't just the heavy lifters who are suffering from the day's work; millions of office workers are victims of aches and pains caused by the stress of sitting down - too long, too awkwardly - and more work days are lost from back pain than from any other cause.

This Ergonomics program teaches good posture and optimum comfort at the workstation. Making the proper adjustments at the VDT/computer terminal and learning stretching and relaxation exercises that relieve eye and muscle strain will reduce fatigue, stress, long term injuries and strains and increase comfort and productivity.

Practical and attractive reference materials will be distributed to all participants.

- **Battling Bug Bites (30 minutes)**

This is a presentation on prevention and treatment of insect bites.

- **BackUp (2 hours)**

Every job has the potential for creating back problems--even sitting at a desk or driving a car. This session, which is targeted toward the office worker, will provide the essentials for understanding and managing back injuries in the workplace. Participants will gain an

APPENDIX A-3 (Continued)

understanding of the common causes of back pain and injury, anatomy and physiology of the back, proper body mechanics and back self care. BackUp will instruct employees how to properly perform exercises that can be implemented at the worksite to reduce risk of injury and time loss in the workplace. This presentation is a "hands on" demonstration. Employees will be encouraged to establish a routine exercise plan which will be tracked by the BackUp facilitator. Program participants will ultimately measure the effects of the exercise program pertaining to muscular strength, endurance and flexibility through self-assessments. This is comprehensive and on-going program which will promote a more healthy and productive employee with fewer incidents of back injuries.

- **Cheers to Your Health (30 minutes)**

The holiday season is for most, the biggest partying time of the year. For many, this involves an increase in alcohol consumption and a greater chance of being involved in an alcohol related accident. "Cheers" is a 30-minute safety program offered between Thanksgiving and the New Year, which promotes safe and sober driving. Participants are 1) presented information on the consequences of drinking and driving, 2) taught how alcohol impacts the body and the mind, 3) educated on how much one can drink and still be a "safe" driver, 4) provided tips on how to drive defensively, and 5) given creative ways to be a responsible party host or hostess. Alcohol-free beverages are made and sampled by participants during the program.

- **HIV and Hepatitis B Awareness (30 minutes)**

- **Understanding and Preventing Heat Stress (60 minutes)**

Under certain conditions, the body may have trouble regulating its temperature. As a result, the body can overheat and suffer from some degree of heat stress. Whether mild, moderate, or severe, heat stress can come on suddenly and be dangerous to your health. This presentation focuses on understanding what heat stress is and what precautions employees can take to avoid the adverse health and safety effects of heat stress.

- **Walking Your Way To Fitness (45 minutes)**

Walking is considered by many as the best overall fitness exercise. It requires no cost and can be done at any time, anywhere. This presentation is terrific for walkers and non-walkers alike. The seminar is designed to assist employees to understand the basic fundamentals for a successful fitness program, how to design an individualized walking program, as well as, developing proper walking mechanics. The WalkLife program will be introduced and membership information will be available. (WalkLife is an incentive based walking program designed to enhance employee health and wellness through fitness walking.)

- **Be a Better Butter Burner (70 minutes)**

In this easy to understand and humorous video, Covert Bailey explains how aerobic exercise burns fat. His discussions include why, out of shape people have a difficult time losing "fat" and why they gain weight so easily. Solid nutrition principles are taught as he talks about how muscles use sugar and fat molecules for energy. Covert provides practical suggestions for optimal nutrition and weight management. If you need motivation to help you get back on the fitness or healthy eating track, and could benefit from a good laugh while learning, this video

APPENDIX A-3 (Continued)

would be time well spent. For groups requesting bodyfat analysis during this seminar and/or to allow employees to view the video screen, group size is limited to 20 employees.

- **Energizing Your Metabolism (70 minutes)**

The only true magic pill for long term weight loss and successful weight maintenance: energizing your metabolism. This presentation considers the ways in which eating behavior, nutrition, and physical activity interface for successful weight control.

- **Humor, Risk and Change (60 minutes)**

Is stress taking its toll on your life? Stress doesn't only worsen illness, it can also increase one's chance for illness. There are many ways to keep the effects of different stressors to a minimum. This videotape presentation Humor, Risk and Change, has many virtues, humor among them, but its goal is to help employees excel in a changing and risk-filled world. Employees will be informed on how laughter can be a secret ingredient to help manage stress in the workplace and to handle the curveballs life will inevitably throw one's way.

- **Low Fat Feasting (45 minutes)**

If you're in need of losing unwanted pounds or wish to improve the health status of your heart, then living a low fat lifestyle is the answer. This isn't a diet or deprivation seminar, but rather one which encourages eating real food that is both delicious and healthy. During this 45 minutes talk, we'll discuss why fats make us fat, learn how fats affect our health, and discover the difference between a "good" fat and a "bad" fat. Employees will receive tips to help cook and shop the low fat, high taste way and help in setting "heart-smart" goals, which embrace improved health through low fat feasting.

- **Seasonal Self Care (30 minutes)**

One of the greatest causes of poor health in this nation is that most Americans neglect and surrender to others the responsibility of their own health. Although self care is our oldest form of medicine, many self care remedies in the past were based on superstition and folklore. Fortunately, today we have a better understanding of what's going on inside the body. Modern self care approaches can offer relief from symptom discomfort while supporting the body's efforts to heal itself. This presentation focuses on teaching simple, effective self-care techniques and assist employees in feeling more confident about how they are helping their bodies feel better and heal more quickly.

- **Stick-To-It Program (30 minutes)**

The Sagebrush Games promote health awareness by encouraging individuals to practice healthy lifestyles through participation in over 40 fitness and recreational events. The Stick-To-It program is a key event of the Sagebrush Games which encourages employee's and their families to engage in a healthy lifestyle change.

The Stick-To-It book is an educational and awareness tool that will help employees begin practicing a lifestyle change such as weight management, activity, smoking cessation or health and safety awareness (with stress management) and to better understand the benefits received from living a healthy lifestyle.

APPENDIX A-4
WMC CY 1994 RECORDABLE VEHICLE ACCIDENTS - 1ST QUARTER

CASE NUMBER	DATE	LOCATION	ORG. CODE	CAUSE	DESCRIPTION	\$ LOSS	SUPERVISOR
R-03-94-A	01/28/94	1100 JADWIN PARKING 1100	02300	OPERATOR ERROR-OTHER	VEH. 1 MADE RIGHT TURN OUT OF PARKING LANE AS VEH. 2 WAS COMING FROM RIGHT PARKING LANE IN A STRAIGHT PATH. FRONT BUMPER OF BOTH VEHICLES MADE CONTACT.	2177	PHELPS P
R-04-94-A	02/22/94	16TH STREET 200W	33531	OPERATOR ERROR-BACKING	EMPLOYEE LOOKED OVER SHOULDER WHILE BACKING VEHICLE. THE SUN WAS IN EMPLOYEE'S EYES. THE VEHICLE STRUCK A WELL HEAD AT THE WELL SITE.	1412	LAFRENIERE TL
R-06-94-A	03/18/94	305 PARKING LOT 300	33110	OPERATOR ERROR-BACKING	BACKING GOVERNMENT VEHICLE OUT OF PARKING STALL. DRIVER TURNED TO LOOK OUT REAR WINDOW TO CHECK FOR TRAFFIC WHILE VEHICLE WAS STILL MOVING. THE DRIVER TURNED VEHICLE TOO SHARP AND STRUCK PARKING POLE. DRIVER HAD PERFORMED 360 DEGREE WALKAROUND.	527	EKSTROM DR
*** Total ***						4116	

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WMC-SP-0684-33

**APPENDIX B-1
SKIN CONTAMINATIONS
OCCURRING IN WMC-MANAGED FACILITIES DURING CY 1994**

Date Time	Org. Code	Facility & Building	Craft	Maximum Activity		First Detected	Body Location	Defined Cause	Comments
=====	=====	=====	=====	=====	=====	=====	=====	=====	=====
9401111525	W14360	U03 224-U	MILLWRIGHT	9000	DPM BG	PCM-1B	HAND	OTHER, UNKNOWN, MISC.	NO PERFORATION FOUND IN GLOVES POSSIBLY CAUSED BY CONT. LAUNDRY.
9401101340	W33541	T-PLANT 221-T	HPT	40000	DPM BG	HPT	HAND	PROTECTIVE CLOTHING FAILURE	HANDS CONT. WHEN GLOVE BROKE, HEAD & BODY CONT. BY EXCESSIVE SWEAT.
9401132245	16910	B-PLANT 221-B	NUCL OPER	1000	DPM BG	HPT	LEGS	PC NOT ADEQUATE	CLOTHING DID NOT PROTECT FROM CONT. LAUNDRY WORKER REMOVED FROM CANYON
9402161530	53280	222-S 222-S	PIPEFITTER	10000	DPM BG	H/F	HAND	TOUCHING SKIN	WORKER TOUCHED CONTAMINATED DOSIMETER
9402171126	11700	100K 105KE	RX OPERATOR	10000	DPM BG	PCM-1B	FACE	UNKNOWN, OTHER, MISC.	TOUCHED OUTER PC'S WITH CHIN WHEN LOOKING DOWN INTO BASIN
9402181100	52740	300 AREA 333	PIPEFITTER	2500	DPM BG	HPT	FACE	TOUCHING SKIN	WORKER PERIODICALLY ADJUSTED SAFETY GLASSES & HOOD CONTAMINATING FACE
9402231020	3C640	PUREX 202-A	FIREMAN	1500	DPM BG	PCM	HAND	OTHER, UNKNOWN, MISC.	WORKER CLEARED 1ST SURVEY CONT. DETECTED AT PCM
9403011120	124A0	222-S 222-S	CHEM TECH	2100	DPM A	HPT	BODY	TOUCHING SKIN	WORKER'S CONTAMINATED DOSIMETER TOUCHED SWEATER AND SKIN
9403211120	W85400	100N 105N	D&D WORKER	2000	DPM BG	PCM-1B	FACE	PC NOT WORN AS PRESCRIBED	CONTAMINATED HOOD SLIPPED OVER CHIN
9403301050	33920	PFP 201-Z	HPT	750	DPM A	SELF	HAND	INADEQUATE PROCEDURE/METHOD	SURVEYING OUT EQUIP. FROM SCA. FUTURE SURVEY WORK WILL REQUIRE PC'S.

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APPENDIX B-2

CLOTHING CONTAMINATIONS OCCURRING IN WHC-MANAGED FACILITIES DURING CY 1994

Date Time =====	Org. Code =====	Facility & Building =====	Craft =====	Maximum Activity =====	Clothing Contaminated =====	Comments =====
9402271840	7C563	TANK FARM AY TF	NUCL OPER	10000 DPM BG	RT CALF COVERALLS	NO DETECTABLE CONT. IN CHANGE TRAILER, ON ANTI-C'S, OR SOP AREA
9403011120	124A0	222-S 222-S	CHEM TECH	14000 DPM A	SWEATER MIDDLE FRONT	LIKELY SOURCE IS PLACING CONTAMINATED HAND INTO JACKET
9404151630	124A0	222-S 222-S	SCIENTIST	2800 DPM A	RT PANTS POCKET	ASSESSMENT INDICATES PROTECTIVE CLOTHING AS SOURCE
9403211310	85620	100N 105N	ENGINEER	25000 DPM BG	LEFT SHOE SOLE	SURVEYED ALL AREAS VISITED BY EMPLOYEE AND FOUND NO OTHER CONT.
9403231000	7C620	TANK FARMS C FARM	NUCL OPER	15000 DPM BG	L UPPER SLEEVE FRONT	NO CONT. FOUND IN TRAILER, CHANGE ROOM OR LOCKER - SOURCE UNKNOWN

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WHC-SP-0564-33

APPENDIX B-2
CLOTHING CONTAMINATIONS
OCCURRING IN WNC-MANAGED FACILITIES DURING CY 1994

Date Time =====	Org. Code =====	Facility & Building =====	Craft =====	Maximum Activity =====	Clothing Contaminated =====	Comments =====
9401042245	16620	B-PLANT 221-B	OPERATOR	4500 DPM BG	LEFT SHOE SOLE	NONE GIVEN
9401051575	124E0	PUREX 202-A	SCIENTIST	20000 DPM BG	LEFT SHOULDER BLADE	SPECK OF CONT. REMOVED AND SENT FOR ANALYSES
9401132215	14540	B-PLANT 221-B	ELECTRICIAN	2500 DPM BG	BOTTOM RT SHORT LEG	POSSIBLE CONTAMINATION FRM PROTECTIVE CLOTHING
9401132230	33932	B-PLANT 221-B	HPT	4500 DPM BG	LEFT SHOE SOLE	CONT. FOUND WHEN EXITING CANYON
9401191130	7C550	TANK FARM MO822	NUCL OPER	8000 DPM BG	RT COVERALL SLEEVE	INITIAL SURVEY WAS DONE ON OUTSIDE OF SLEEVE DURING DECON ON INSIDE
9401211030	124P0	PUREX 202-A	CHEM TECH	2500 DPM BG	LEFT SHOE SOLE	WATER WAS ABSORBED THRU ANIT-C BOOTS AND MAY HAVE ABSORBED INTO RUBBER
9402022100	14200	PFP 234-5	ELECTRICIAN	1100 DPM A	RIGHT SHOE SOLE	CLOTH SHOE COVERS WERE USED AND WORKER STEPPED IN LIQUID
9402031415	33130	400 AREA 437	HPT	25000 DPM BG	RIGHT SHOE SOLE	REMOVED SPECK OF CONT. WITH TAPE
9402071045	11700	100K 105KE	RX OPERATOR	10000 DPM BG	MODESTY SHIRT FRONT	CUT SHIRT OFF AND REPLACED WITH NEW ONE
9302181015	17300	UO3 224-U	OPERATOR	15000 DPM BG	MODESTY SHIRT BACK	SUSPECT CONTAMINATED LAUNDRY

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WNC-SP-0564-33

APPENDIX C-1

TYPE CODE INFORMATION FOR RPRs

The information in this appendix is a list of the various types of areas and situations in which radiological deficiencies are found, and these types of problems are stated on the RPR for the purposes of defining the type of problem(s) encountered. These items are individually numbered for the purpose of facilitating tracking and trending through the use of the RPR database.

1. HARDWARE (HW)

Includes the following subject matter:

- Piping
- Electrical
- HVAC
- Civil
- Structural
- Fire/Industrial Equipment
- Supports
- MTE & I (OSR Equipment and Instrumentation)
- Welds
- Heavy Equipment
- Pumps
- Valves
- Motors
- Generator
- Vessels
- Containment
- Fuel Elements/Assembly
- Gloveboxes
- Material
- Safety Equipment
- Lock and Tag
- Improved Risk (Property Prot. Value/Program)
- Computer
- Special Tools
- Refueling Equipment
- Compressor
- Sampling Equipment
- Concentrator
- Aqueous Makeup
- Radiation Monitoring (CAM, Liquid Eff. Monit., Area Rad Monit.)
- Trains and Railroads

2. SOFTWARE

Includes the following subject matter:

- Documentation
- Drawings
- Specifications
- Records
- Logs
- Computer Programs
- Job Control System

APPENDIX C-1 (Continued)

3. ADMINISTRATIVE

Includes the following subject matter:

- Procurement
- Contractor
- Planning
- Procedures
- Configuration Control
- Personnel
- Housekeeping
- Environmental
- Supplier
- Training
- Technical Review
- Life Safety Code
- Controls
- Document Release

4. EVENT

Includes the following subject matter:

- Fire
- Contamination (Air, Personnel, Material, Cont. control)
- Exposure
- Vehicle Accident
- Firearm Discharge
- Reactor Scram
- Hazardous Material
- Security
- Roads
- Dosimetry
- Radioactive Source

5. PROCESS

Includes the following subject matter:

- Fabrication/Install
- Testing/Monitoring
- Inspection
- Design
- Material Transfer
- Maintenance
- Chemistry
- Handling/Shipping
- Storage
- Nondestructive Exam
- Surveillance
- Product
- Scheduled Routines

**APPENDIX C-2
ROOT CAUSE DETERMINATION MATRIX FOR RPRs**

The information in this appendix is a list of the various causes of situations in which radiological deficiencies are found, and these types of problems are stated on the RPR for the purposes of defining the root cause of the problem(s) encountered. These items are individually numbered for the purpose of facilitating tracking and trending through the use of the RPR database.

1. EQUIPMENT

Includes the following subjects:

- Design
- Installation
- Manufacturing
- Maintenance
- Electrical Power Outage
- Plant/System Contamination
- Man-Machine Interface
- Non-Fault Tolerant
- Weld Failure
- Equipment Satisfactory
- Detailed Investigation Unjustified

2. MATERIAL

3. PROCEDURE

Includes the following subjects:

- Procedure Nonexistent
- Procedure Incomplete/LTA
- Procedure Incorrect
- Procedure Not a Problem

4. PERSONNEL

Includes the following subjects:

- Training
- Procedure Not Followed
- Lack Attn/Concentration
- Miscommunication
- LTA/No Communication
- Administrative Controls LTA
- Change Management
- Resource Allocation
- Management Methods
- Personnel Not a Problem

5. OTHER

Includes the following subjects:

- Natural Phenomenon
- Sabotage
- External
- Technical Error
- Aquifer
- Work Environment
- Unknown

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GLOSSARY**ABBREVIATIONS, ACRONYMS, AND INITIALISMS**

APM	ALARA Protective Measures
APO	ALARA Program Office
ARA	Airborne Radioactivity Area
AMW	ALARA Management Worksheet
ANSI	American National Standards Institute
ATAMS	ALARA Tracking and Management System
BBST	Behavioral-Based Safety Training
BLS	Bureau of Labor Statistics
CAM	Continuous Air Monitor
CAS	Central Alarm System
CCIP	Contamination Control Improvement Project
CSO	Cognizant Secretarial Office
CY	Calendar Year
CYTD	Calendar Year to Date
D&D	Decontamination and Decommissioning
DTPA	Diethylenetriaminepentaacetate
DOE	U. S. Department of Energy
DOE-HQ	U. S. Department of Energy - Headquarters
DOE-RL	U. S. Department of Energy - Richland Operations Office
DOP	Disocetyl Phthalate
DPETS	Daily Personnel Exposure Tracking System
EA	Engineered Applications Department
EAPT	Effective ALARA Programs Training
ECD	Estimated Completion Date
EH	Environment, Safety and Health
ERMC	Environmental Restoration Management Contractor
ERO	Environmental Restoration Operations
ESQ	Emergency, Safety, and Quality Assurance Department
FFTF	Fast Flux Test Facility
FMEF	Fuels and Materials Examination Facility
GERT	General Employee Radiological Training
GOCO	Government Owned, Contractor Operated
Grout	Grout Facility
HAMTC	Hanford Atomic Metal Trades Council
HEHF	Hanford Environmental Health Foundation
HEPA	High Efficiency Particulate Air (filter)
HGET	Hanford General Employee Training
HLAN	Hanford Local Area Network
HPT	Health Physics Technician
HRA	Human Resources and Administration Department
HRO	Hanford Restoration Operations
IRM	Information Resource Management Department
JSA	Job Safety Analysis
LWC	Lost Workday Case
LWD	Lost Workday
MSDS	Material Safety Data Sheet
NESO	New Employee Safety Orientation
OHS	Occupational Health and Safety
OPS	Facility Operations Department
OSHA	Occupational Safety and Health Administration
OSS	Operations Support Services Department

GLOSSARY (Continued)

PAL	Processing and Analytical Laboratories
PAPC	President's Accident Prevention Council
PAR	Post ALARA Review
PFP	Plutonium Finishing Plant
PIC	Person In Charge
PNL	Pacific Northwest Laboratory
PPE	Personal Protective Equipment
PPG	Priority Planning Grid
PRF	Plutonium Reclamation Facility
PTA	Patrol Training Academy
PUREX	Plutonium-Uranium Extraction (Facility at Hanford Site)
QUEST	Quality, Environmental, Safety Tracking
RCA	Radiologically Controlled Area
Rec.	Recordable Injury
RL	Richland Operations Office
RMC	Remote Mechanical "C"
R&R	Restoration and Remediation
RPR	Radiological Problem Report
RWD	Restricted Workday
RWP	Radiation Work Permit
SCA	Surface Contamination Area
SHARE	Search Hanford Accessible Reports Electronically
SIC	Standard Industrial Classification
SPRP	Safe Performance Recognition Program
SRT	Special Response Team
SWM	Solid Waste Management
SWP	Special Work Permit (clothing)
TLD	Thermoluminescent Dosimeter
TWR	Tank Waste Remediation System
TRU	Transuranic
UPS	Uninterruptable Power Source
VPP	Voluntary Protection Program
WEMCO	Westinghouse Environmental Management Co. of Ohio (Fernald, OH)
Westinghouse Hanford	Westinghouse Hanford Company (Richland, WA)
WesTIP	Westinghouse Task Improvement Plan
WHC	Westinghouse Hanford Company (Richland, WA)
WID	Waste Isolation Division (Carlsbad, NM)
WINCO	Westinghouse Idaho Nuclear Company (Idaho Falls, ID)
WRAM	
WSRC	Westinghouse Savannah River Company (Aiken, SC)
WVNS	West Valley Nuclear Services Company (West Valley, NY)

DEFINITIONS OF TERMS

Days Away From Work (LWD). Unable to be present in the work environment during the normal work shift as a result of a job-related injury/illness.

First Aid. A nonrecordable occupational injury/illness involving one-time treatment and/or subsequent observation, not ordinarily requiring medical care, even though treatment may be provided by a physician or medically trained person.

Insufficient Volumes. Workers did not provide an acceptable amount of urine for the requested analysis.

Lost containers. Workers did not return the urine sample containers to the analytical laboratory, or the containers were deficient.

GLOSSARY (Continued)

Lost in Laboratory. The analytical laboratory lost the urine sample during the processing.

Lost Workday. A recordable case where the employee cannot perform any or all of normal job duties. Lost workdays include both days away from work and/or days with restricted work activity as defined under "Restricted Workday."

No Sample. Workers did not provide a urine sample for a delivered container.

No Show. Worker did not appear for a scheduled medical or test appointment.

Organization Code. The organization to which the employee was officially reporting at the time of the report.

Recordable Injury. An occupational injury/illness resulting in one or more of the following: a fatality, lost workdays, loss of consciousness, restricted work or motion, bone fracture, medical treatment beyond first-aid, transfer to another job, termination of employment, or any illness diagnosed by a physician as work related.

Restricted Workday (RWD). Physically or mentally unable to perform all or any part of normal work assignment during all or any part of the normal workday or shift. These are cases where the employee was: 1) Assigned another job on a temporary basis; 2) Worked at a permanent job less than full time; or 3) Worked at permanently assigned job but could not perform all duties normally connected with it.

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