

U. S. NUCLEAR REGULATORY COMMISSION

REGION V

Report Nos. 50-275/89-25 and 50-323/89-25

License Nos. DPR-80 and DPR-82

Licensee: Pacific Gas and Electric Company
77 Beale Street
Room 1451
San Francisco, California 94106

Facility Name: Diablo Canyon Power Plant, Units 1 and 2

Inspection at: Diablo Canyon Site, Seven miles north of Avila Beach,
California

Inspection conducted: October 25 through November 2, 1989, and telephone calls
of November 7-8, 1989

Inspected by:

W. K. TenBrook
W. K. TenBrook, Radiation Specialist

12-1-89
Date Signed

M. Callis
M. Callis, Senior Radiation Specialist

12/4/89
Date Signed

Approved by:

F. A. Wenslawski
F. A. Wenslawski, Chief
Facilities Radiological Protection Section

12/4/89
Date Signed

Summary:

Areas Inspected: Routine unannounced inspection covering follow-up of open items, occupational exposure during extended outages, follow-up of allegations, and facility tours. Inspection procedures 30703, 92701 and 83729 were addressed.

Results: The inspectors identified weaknesses in response to radiological alarms in the Fuel Handling Building, resulting in one violation (Section 3.H), and poor housekeeping in controlled areas (Section 5). Program strengths included the construction of a new containment access facility (Section 3.B), the High-Impact Team (HIT) concept (Section 3.C), and the administration of dose limits (Section 3.E). Two allegations were evaluated and closed (Section 4).



DETAILS

1. Persons Contacted

Licensee Personnel

J. D. Townsend, Plant Manager
*D. B. Miklush, Assistant Plant Manager
*R. P. Powers, Radiation Protection Manager
S. R. Fridley, Operations Manager
*W. J. Kelly, Regulatory Compliance Engineer
*J. V. Boots, Chemistry Manager
*R. Gray, Senior Radiation Protection Engineer
*D. A. Taggart, Director, Quality Support (QS)
*W. B. McLane, Outage Manager
*W. G. Crockett, Assistant Plant Manager, Support Services
*J. A. Hays, Radiation Protection, General Foreman
*R. P. Kohout, ESS Supervisor
*R. Flohaug, QS Supervisor
*J. E. Gardner, Senior Chemistry Engineer
G. S. Boiles, Dosimetry Foreman
L. T. Moretti, Radiation Protection Foreman
J. E. Knight, Radiation Protection Foreman
M. Bilicka, Acting Radiation Protection Foreman
M. L. Anderson, Security
D. B. Anderson, Security
A. I. Dame, Training Supervisor
A. J. Newell, Acting Training Supervisor
J. S. Bard, Shift Supervisor
R. Arroyo, Security

Contractor Personnel

R. Tinkel, Bechtel
W. Davis, Bechtel
C. Kennedy, Bechtel
R. Doran, Bechtel
R. Spencer, Bechtel
J. Chadwick, Delphi Group, Inc.
M. Shackelford, Bartlett Nuclear, Inc.

NRC

*P. Narbut, Senior Resident Inspector (SRI)
K. Johnston, Resident Inspector

*Denotes those individuals present at the exit interview conducted on November 2, 1989.

In addition discussions were held with other members of the licensee's staff and contractor personnel.



2. Follow-up of Open Items (92701)

Open Items 50-275/87-24-01 and 50-323/87-24-01 (Closed) These items concerned the lack of an explicit pipe repair and replacement criteria in the licensee's pipe erosion/corrosion surveillance program. Engineering Instruction I-67, issued March 30, 1989, contained specific criteria for decisions to leave eroded or corroded pipe in service until the next scheduled outage, or repair and replace such pipe. The methods used were consistent with NUMARC guidance for repair and replacement decisions per the licensee's reply to Generic Letter 89-08. This item is closed.

Open Item 50-275/87-30-04 (Closed) This item involved modifications to the liquid radwaste system intended to reduce alarms on the liquid radwaste effluent discharge monitor, RE-18. The licensee had completed installation of 5 micron filters upstream of RE-18 to capture entrained radioactive particulate material that could cause spurious RE-18 alarms. This item is closed.

Open Item 50-275/88-27-01 (Closed) This item concerned heightened levels of dissolved oxygen in condensate, and the actions taken to mitigate this condition. Periodic condenser cleaning had briefly decreased condensate oxygen to 3 ppb in 1989. Overall levels rose to 5-7 ppb after such cleaning. Other actions included improved sealing of feedwater pump turbine discharge to the condenser, increasing the size of cross-tie piping in condenser waterboxes, and recycling oxygenated demineralizer beds to the condenser rather than the condensate. The licensee's actions have observably improved secondary dissolved oxygen. This item is closed.

3. Occupational Exposure During Extended Outages (83729)

A. Audits and Appraisals

The inspectors examined audit and surveillance reports and checklists involving radiation protection. One Audit Report, entitled "Radiation Protection: Radioactive Materials Management," Audit 89815T, had been issued in October, 1989, following the last inspection, June, 1989. No audit findings were issued. The report recommended periodic training of warehouse personnel in the handling of radioactive material shipments. The audit scope and depth were satisfactory, incorporating document review, plant tours and surveillance of work practices.

The inspectors reviewed one approved Quality Support Surveillance of work in-progress involving radiation protection practices in the Unit 1 outage. Several remaining Surveillances of these areas were scheduled to be completed later in the outage.

Quality Assurance activities pertaining to Radiation Protection were satisfactory to the extent of their completion during the inspection.



B. Changes

The inspectors noted the construction of a permanent radiological access facility on the 140' level of the Turbine Building, adjoining the Unit 1 containment personnel hatch. The new facility provided easier access to radiologically controlled areas (RCAs) in containment during outages by relieving congestion at the containment access. The licensee planned to construct a similar facility to support Unit 2 outages after the next fuel cycle, early in 1990. The new facility included offices, dosimetry issue station, an area for personnel to don protective clothing prior to entering RCAs, a personnel frisking station, and an area for monitoring equipment to be removed from RCAs.

In addition, the inspectors noted major changes in the licensee's ALARA program implementing procedures. These changes are described in paragraph 3.C, below.

The changes to the licensee's radiological access facilities were beneficial. No detrimental or unreviewed changes were identified.

C. Outage Planning and Preparations/Maintaining Occupational Exposures ALARA

NRC concerns involving the licensee's ALARA program were discussed in Inspection Reports 50-275/89-03 and 50-323/89-03. The inspectors verified that ALARA implementing procedures had been completely revised to address the concerns discussed in the Inspection Reports. The procedures contained the recommendations of Regulatory Guide (R.G.) 8.8, "Information Relevant to Engineering That Occupational Exposures...Will Be As Low As Reasonably Achievable."

The inspectors also observed work practices and examined job specific ALARA goals, exposure data, work permits, work scheduling documents and ALARA reviews. The radiation protection staffing for the outage was also examined and found to be satisfactory. Contractor radiation protection personnel and other contractor radiation workers were interviewed during the inspection. All personnel interviewed were aware of the ALARA concept.

The inspector noted that the RPM and his staff conducted daily tours of the plant to identify and correct poor ALARA practices.

The ALARA procedures reviewed are as follows:

- o RCP D-205, "Performing ALARA Review"
- o AP C-200S2, "Implementation of the DCPD ALARA Program."

The review disclosed that DCPD Management has made a commitment for the implementation of a strong ALARA program. The licensee's staff used historical data from previous outages and information from other sources to establish their ALARA goals. Additionally the licensee



has established an ALARA Management Incentive Program whereby personnel are given awards for meeting or exceeding the ALARA goals.

The licensee had established an ALARA goal of 400 Man-rem for this outage. As of November 8, 1989, approximately 280 Man-rem of the 400 Man-rem had been expended. The RPM and his staff expressed some concern over the rate at which they were approaching the established ALARA goals. The staff reviewed the exposure data daily and compared it to previous refueling outages to determine a cause for the rapid increase. It was concluded that the critical work where high exposures could be expected had been scheduled during the initial phases of the outage. The staff expected that the Man-rem usage would eventually level off. The RPM informed the inspector that he and his staff would continue to closely monitor their Man-rem goals.

The ALARA group performs dose tracking by discipline and by job specific. The review of this data did not disclose any abnormal trends or conditions.

The ALARA organization possessed the depth in the radiological protection group that is normally necessary to maintain an effective ALARA program. A contractor and two shielding engineers were assigned to implement the program. Few radiation protection technicians involved in day-to-day activities were included in the planning and preparations for the outage. This observation was discussed with the RPM and at the exit interview. The RPM stated that the inspectors' observation would be considered as a possible improvement for the ALARA program.

Paragraph 3(c) of Inspection Report 50-275/89-18 and 50-323/89-18 describes the "High Impact Team" (HIT). The HIT Team was led by the radiological engineer responsible for ALARA. The HIT Team planned, prepared, scheduled and maintained surveillance in three major areas during the refueling outage; reactor disassembly/reassembly, refueling preparations/fuel off-load, and valve maintenance. This was a new concept which required approximately 15-20 different disciplines to work together to ensure all activities with the selected work activities are effectively accomplished. The inspectors reviewed the teams' effectiveness. The following observations were made:

- o The Team worked in one office area located on the Turbine Deck of Unit 1. The Team functioned as described in prior Inspection Reports. Shiftly planning meetings were conducted to discuss the status of work and to resolve any problems. All work was carefully planned.
- o HIT activities were well documented. The information was to be used as reference material for future outages.
- o The HIT worked closely with the ALARA group and other organizations involved in the refueling outage.



- o Man-rem exposures for two of the three jobs were less than expected. Exposures incurred during valve repair activities had been greater than expected. The HIT was developing methods to improve future valve repair work practices.

The HIT staff informed the inspectors that they were planning to expand their involvement during the next scheduled outage at Unit 2. The activity in this area fully supported the licensee's safety objectives and the concept of ALARA.

D. Training and Qualification of Personnel

The inspectors examined the licensee's General Employee Training (GET) program and the qualifications and training program established for Radiation Protection Technicians (RPT) and radiation workers hired for the outage.

The licensee used an acceptance test to help determine whether contractor RPTs are qualified. RPTs passing the test are provided with approximately one week of site specific training in radiation protection. The inspectors reviewed selected RPT resumes provided prior to employment and examinations upon completion of the training program. The RPTs selected for the outage met or exceeded the the qualifications prescribed in ANSI/ANS 3.1-1978, "American National Standard for Selection and Training of Nuclear Power Plant Personnel."

All workers assigned to work in radiologically controlled areas were required to attend the General Employees Training program and Practical Factors Training program. These two programs collectively met the requirements prescribed in 10 CFR 19.12, "Instruction to Workers."

Mock-up training was provided to workers involved in steam generator inspection and repair activities. Personnel attending the mock-up training felt that the quality of the training provided to them was good.

Workers required to wear respiratory protective equipment attended a training session on the use and control of such equipment. The workers must complete a medical and fit test before they are considered qualified to wear respirators. The inspectors verified that respirators had only been issued to individuals who met the qualifications.

The licensee's performance in this area appeared to be adequate to accomplish its safety objectives.

E. External Exposure Control

The inspectors reviewed dosimetry records and data for workers who had had their administrative dose limits increased to 1850 millirem



or more during the current calendar quarter. The inspectors verified Form 69-11579, "Additional Exposure Authorization," from procedure RCP G-110, "Personnel External Exposure Dosimetry and Control," had been properly reviewed and approved by Radiation Protection for each worker authorized to receive 1850 millirem or more during the current quarter. In some cases, Dosimetry and Radiation Protection only approved additional exposure to a lower administrative limit than that requested by the worker's supervisor, in order to conserve the worker's dose. NRC Form 4 was on file for each worker receiving authorization for exposure up to and exceeding 1850 millirem.

The inspectors obtained current exposure status-to-date from the Plant Information Management System for each worker authorized to receive 1850 millirem or more during the current quarter, and reviewed a current report of margin between dose received and the authorized administrative limit for each radiation worker. The inspectors verified that the workers' dose status was within both administrative and regulatory limits. Doses for several contractors involved in steam generator maintenance were approaching authorized administrative limits of 1250 and 1850 millirem, with work in the steam generator bowls completed. No exposures exceeding 1250 millirem were observed for individuals other than steam generator maintenance workers.

The licensee's program for external exposure dosimetry and control was satisfactory. The approval of Addition Exposure Authorizations at lower administrative limits than those requested demonstrated a conservative review of worker dose status.

F. Internal Exposure Control

The inspectors examined surveys of personnel contamination incidents involving facial contamination as recorded on Procedure RCP D-600, Form 69-9392, "Personnel Decontamination and Evaluation Reports." The inspectors verified that special whole body counts had been promptly performed for each facial contamination incident. The inspectors observed one report of contamination on a worker's chin where radiation protection personnel did not specifically document a recommendation for a whole body count, but a count was performed promptly nonetheless.

The inspectors examined Special Work Permit 264, "Disassemble and Check Valve 8948A-D and 8956A-D," and its associated instructions, logs and Airborne Entry Logs. The inspectors verified that breathing zone air samples were obtained and documented on October 28, 1989, during replacement of a check valve disc and reassembly of the valve. Airborne Entry Logs were also kept throughout work on SWP 264 for Maximum Permissible Concentration (MPC)-Hour tracking. The inspectors verified that High Efficiency Particulate Air (HEPA) filter units had been installed at the job location as engineering controls for airborne radioactive material.



The inspectors observed respiratory protection equipment issue at the 140' level of the containment building. Issuing personnel verified each worker's authorization to wear the particular respirator required for their job. Radiation Protection Technicians were stationed at the entrance of each level of containment to query workers as to their work area and, if an airborne area, verify that respirators had been properly issued to the workers.

The licensee's program to evaluate and control internal exposure during the outage was satisfactory.

G. Control of Radioactive Materials and Contamination, Surveys, and Monitoring

Prior to the inspection, the inspectors were informed of several occurrences related to control of radioactive effluent. These occurrences had been investigated by Chemistry and Radiation Protection. The inspectors reviewed preliminary reports on pressure transients observed in the Unit 1 waste gas decay tanks on October 7 and 8, 1989, and the release of millicurie amounts of fission product noble gases in the Auxiliary Building with a release path to the environment, also on October 7, 1989.

The pressure drops in the waste gas system were minor, and plant vent effluent monitor RE-14 did not indicate any release of effluent during the transients. However, the appearance of 3 MPC levels of noble gas at the 100' and 115' containment penetration areas shortly before one of the pressure transients caused concern over a possible gaseous radwaste system (GRS) leak. The noble gas leakage was released to the environment at the 140' roof area through a tear in the rubber seal between the containment wall and the 115' penetration area ceiling. The tear was subsequently repaired. The licensee evaluated the release and will include their evaluation in the semi-annual effluent release report.

The licensee's investigation determined that the gaseous radwaste system was not a credible source for the leakage, as there were no GRS components in the areas where airborne activity was detected. In addition, the expected pressure behavior of hot reactor coolant system offgas in the gas decay tanks was consistent with gas cooling.

The licensee's investigation had tentatively attributed the noble gas leakage to momentary leakage from valve packing in the Residual Heat Removal (RHR) system. The licensee proposed airborne surveys and contamination surveys of RHR valves and the surrounding areas upon actuation of the RHR system in Unit 2 to evaluate this explanation.

The inspectors inquired whether the leakage from the RHR valves, if substantiated, would indicate a problem with the valves performing their safety function. The Senior Chemical Engineer stated that he would inform Maintenance of the observed leakage and its probable source. The Chemistry staff also proposed to obtain accurate measurements of waste gas temperatures to confirm that the pressure



transients in the gas decay tanks are due to gas cooling and not leakage. The inspectors will follow-up on the licensee's evaluation of the cause of the noble gas leakage and the GRS pressure transients in a future inspection (50-275/89-25-01).

The inspectors examined post-decontamination surveys of steam generator bowls performed in support of maintenance and testing during the Unit 1 outage. The licensee employed Electric Power Research Institute (EPRI)/Westinghouse standardized survey methods covering ten locations each in the hot and cold leg channel heads, with beta and beta/gamma measurements at each point.

The licensee's surveys prior to steam generator maintenance were satisfactory. The pressure reduction of the gaseous radwaste system during RCS offgas and the sources of noble gas leakage upon shutdown both required further evaluation to confirm their root causes.

H. Response to Alarms

The Senior Resident Inspector informed the inspectors that he had received several telephone calls from workers who had expressed serious concerns that improper actions were taken in response to Fuel Handling Building (FHB) area radiation monitor (ARM) evacuation alarms which occurred during fuel removal activities during the period of October 15-18, 1989. The Resident Inspector discussed the calls with the licensee's staff, and further examination and inspection was conducted during the inspection. ARM RE-58 is the spent fuel pool ARM and RE-59 is the new fuel storage ARM.

The following licensee records and documents were reviewed:

- * ARM RE-58 Chart Recorder data for October 15-18, 1989.
- * Applicable licensee procedures.
- * General Employee Training (GET) related to plant alarm response and evacuation.
- * Documents collected by the licensee for their investigation of the matter.
- * Special Work Permit (SWP) 89-00305-00, "Fuel Transfer Activities in Fuel Handling Building," dated October 13, 1989.
- * Final Safety Analysis Report (FSAR) Section 11.4.2.3.

The applicable Technical Specifications, Regulatory Guides, and 10 CFR 19, were compared to licensee actions, and the FHB was toured. The matter was also discussed with personnel who were responsible for fuel off-loading activities.

10 CFR 19.12, "Instructions to Workers," states in part:



...working in or frequenting any portion of a
...shall be...instructed in the appropriate response
...in the event of any unusual occurrence or
...it may involve exposure to radiation or
...erial...."

...ion (TS) 6.11, "Radiation Protection Program,"

...personnel radiation protection shall be prepared
...the requirements of 10 CFR Part 20 and shall be
...ained and adhered to for all operations involving
...tion exposure."

...and Programs," states in part:

...procedures shall be established, implemented and
...ing the activities referenced below:..."

...ble procedures recommended in Appendix A of
...Guide (RG) 1.33, Revision 2, 1978."

...Appendix A, Section 5, recommends that abnormal,
...conditions should be covered by written

...e-6 establish the license conditions for
...59. The specified alarm setpoint is less than
...or both ARMs. ACTION statements 30 and 32
...ns to be taken when the alarm/trip setpoint is
...r monitor is inoperable.

...re, Window AR PK11-10, "FHB High Radiation,
...es in part that operator action includes
...of the evacuation horn, checking for actual
...and notifying radiation protection personnel.

...ining includes provision of the following

...your area, proceed immediately to Access
...rea of known low dose rate, unless instructed
...adiation Protection Staff, and inform the
...adiation Protection Staff."

...signed overall responsibility for refueling
...ing licensee procedures:

...Prerequisites"
...Loading Sequence"
...ing Sequence"
...ing Operating Instructions"



Additionally, OP B-8D requires that all critical personnel participating in core unloading be verified to have been adequately trained. OP B-8D S-1, sections 5.2.4, 5.2.5, and 6.1, state in part:

"If an evacuation alarm occurs, CORE ALTERATIONS shall be suspended immediately and all personnel shall assemble in the main airlock. The PPE (Nuclear) and Refueling SRO shall determine the cause of the alarms and the Refueling SRO will determine the response to be taken. If it is determined that no hazards to personnel exist, evacuation need not proceed any further..."

"If the Refueling SRO or Power Production Engineer (Nuclear) suspects that continued operation will involve undue risk to personnel or equipment or will compromise the T/S or license provisions, operations will be suspended pending resolution."

OP B-8D S-2, sections 5.3.5 and 6.1, state in part:

"If a Containment Evacuation alarm occurs, CORE ALTERATION shall be suspended immediately and all personnel in containment shall assemble in the main airlock. The Power Production Engineer (Nuclear) and Fuel Loading SRO shall determine the cause of the alarm and the SRO will determine the response to be taken. If it is determined that no hazards to personnel exist, evacuation need not proceed any further..."

"At the start of each refueling shift, the Refueling SRO shall establish communication with operators, observers and the control room and verify that all requirements of STP IIA are being met for Mode 6 operation and core alterations. A briefing should be conducted reviewing containment evacuation alarms and procedures."

OP B-8G states in part:

"The fuel handling SRO should conduct a tailboard prior to starting that shift's fuel handling activities to ensure each member's assignments are known and general turnover from previous shift's progress are discussed.

The fuel handling SRO should ensure all members in the crew are familiar with possible alarms such as containment evacuation alarm. He should also assure himself that each member understands his response upon activation of possible fuel handling related alarms."

SWP 89-00305-00 required continuous radiation protection surveillance during core-off-load operations. The SWP also required that a portable ARM be on the bridge crane during fuel movement.

The following observations were made regarding the above:



- * ARM RE-58 alarmed approximately 113 times between October 15, and October 18, 1989. Of that number, 111 actually occurred between 9:09 a.m., PDT, October 17, 1989, and 6:43 a.m., PDT, October 18, 1989.
- * Licensee procedures noted above included use of "permissive" terms and did not include any requirements for shift briefings of personnel working in the FHB during fuel removal activities. Personnel involved in fuel removal within the containment were briefed as indicated in those procedures. Personnel involved in fuel removal activities in the FHB stated they had not received any such briefings.
- * OP B-8D required only the Nuclear Engineering and Operations/Fuel Handling shift personnel be adequately trained for their part in fuel handling operations. Other personnel involved in fuel handling operations, such as Instrumentation and Controls (I&C), Radiation Protection (RP), Maintenance, and others, received no training pursuant to OP B-8D. The inspector noted that OP B-8D training consisted of reading core-off-load procedures.
- * The public address (PA) system was used several times (much less than 111 times) to inform personnel regarding the ARM RE-58 alarms.
- * No verifications of personnel evacuation pursuant to AR PK11-10 were made.
- * No unexpected radiation levels were detected in excess of 10 mr/hr, at which RE-59 was set. The alarm setpoints of RE-59, of the ARM on the FHB bridge crane, and on an air monitor "SPING," were never exceeded.

Personnel working in the FHB stated to the inspector that:

- * they were unsure regarding who was responsible for fuel handling activities in the FHB.
- * personnel calling the Control Room after RE-58 alarmed were instructed to evacuate until the alarm could be verified.
- * The I&C group verified that RE-58 was properly calibrated during October 15-18, 1989. The spent fuel pool surface cleaning tool, or "skimmer," was not in operation during fuel handling activities, as it caused a ripple on the pool surface which distorted the view of the fuel handling equipment and fuel within the pool.
- * At an undetermined time during October 17-18, 1989, Operations, RP, and I&C personnel reached agreement to consider RE-58 inoperable, and to enter the action statements of TS 3.3.3.1. However, the alarm was not disabled. RE-58 continued to alarm



at a rate of approximately 8 to 14 times per hour. Subsequently, the licensee's staff decided to evacuate personnel from the FHB if the ARM alarmed for over 30 seconds. However, this action was not communicated to at least six individuals who were involved in fuel handling activities.

At least four radiation protection technicians and two quality control inspectors who did not call the Control Room after RE-58 alarmed were, at various times, instructed either to ignore the alarm or to evacuate. The individuals providing such instructions were, variously, the Shift Foreman, RP personnel, and quality control personnel. These conflicting instructions caused confusion as to what action to take when RE-58 began alarming frequently on October 17 and 18, 1989, for example: Two statements from different individuals indicated that Control Room personnel had been contacted regarding the possibility of making a PA announcement. Both statements indicated that PA announcements would not be made for each RE-58 alarm, but that Control Room personnel informed them that personnel should evacuate any time the alarm sounded.

* RP personnel stated that RE-58 alarms appeared to occur in upward spikes with a background level near 6 to 10 mr/hr. A comparison in the area of the detector with an ion chamber survey instrument indicated a dose rate of approximately 2.5 mr/hr. The inspector noted that RE-58 had a logarithmic scale meter, which was difficult to read accurately. RP personnel further stated that the RE-58 alarms could be heard in the Unit 1 penetration area on the 115' elevation, that none of the workers there responded to the alarm, and that no PA announcements were made during that time to alert personnel regarding the alarms. Again, personnel contacting the Control Room were instructed to evacuate, while personnel who ignored the alarms were not challenged. A log entry for 7:10 a.m. on October 18, 1989, stated in part: "Continuous alarms are starting to be ignored completely. In 3 1/2 shifts approximately 30 alarms. No workers paid any attention. This seems to be a problem."

* On the morning of October 18, 1989, the RP Foreman informed Operations that FHB fuel handling activities were being suspended until response to RE-58 alarms was resolved. At that time, RE-58 was declared inoperable and the licensee formally entered the action statements of TS 3.3.3.1 and TS Table 3.3-6.

The above observations were discussed with the licensee's staff and at the exit interview. The inspectors informed the licensee that personnel were confused as to what action they should have taken during RE-58 alarms, that OP B-8G and AR PK11-10 were not adhered to, and that the other procedures noted above did not clearly address responses to FHB ARM alarms. The licensee acknowledged the observations and stated that corrective action had already been initiated, which would provide detailed instructions within those



procedures. The licensee further stated that a Design Change Package (DCP) and Design Change Notice (DCN) had been issued to correct the spiking on RE-58.

Subsequent discussion with the licensee on November 8, 1989, indicated that the DCP/DCN for RE-58 had not been fully effective in preventing spiking. The licensee stated that they were in the process of reviewing calibration methods for RE-58. They stated that they felt that the instrument was overly sensitive to low levels, due to the fact that the instrument is electronically calibrated on a logarithmic scale. The licensee stated that as further corrective action they were preparing a TS amendment request to allow the setpoint to be changed for RE-58.

Failure to adequately instruct personnel during the period when RE-58 was alarming appears to be a violation of 10 CFR 19.12 (50-275/89-25-02). The licensee acknowledged the apparent violation when informed by the inspector. The findings concerning the RE-58 alarms indicates a need for the licensee to strengthen his program in this area.

4. Allegations

A. RV-89-A-0056

An allegation was received in the Region V office from a licensee contractor whose services were terminated for cause. The contractor alleged:

- (1) No action was taken when the alleged and several co-workers passed through a portal monitor that alarmed. This concern had been brought to the attention of supervision.
- (2) There was a five day delay in obtaining a termination Whole Body Count.

An examination of the worker's concerns disclosed that he had been working inside a radiologically controlled area (RCA). Upon exiting the area for a break the worker performed a whole body survey with a PCM-1B personnel frisker. Radiation protection personnel at the RCA exit point notified the alleged's supervisor and Security that the alleged would not be allowed to return to the RCA because of a fitness for duty question. Security proceeded to escort the individual off-site.

Two security guards escorted the individual to the Security Building. At this point, all personnel exiting from the protected area must pass through a portal radiation monitor and a security badge detection monitor. The badge detection monitor had been set to alarm if an individual inadvertently exited the Security Building with his/her security badge.



The inspectors interviewed the Security Guards who escorted the contract worker outside the Security Building, the co-workers named by the individual and the individual's supervisors. The following information was disclosed:

- (1) An alarm occurred as one of the guards escorted the individual completely outside of the Security Building with the guards security badge on. The guard wanted to ensure that the individual was outside of the licensee's protected area boundaries. This observation was confirmed by the second security guard and another guard on duty at the security badge drop-off area. None of the security guards heard a portal radiation monitor alarm.
- (2) The co-workers named by the individual stated that they did not hear a portal radiation monitor alarm. Also, the co-workers did not exit the protected area at the same time that the individual was escorted outside the protected area.
- (3) The individual's supervisor stated that he had not been informed of a portal radiation monitor alarm on the night in question or on previous exits. The supervisor stated that he had met the individual and the security guard on the outside of the Security Building.
- (4) After exiting from the protected area the individual was escorted to his automobile. Consistent with licensee procedures, the individual was asked if he would consent to a search of his car. The individual refused. Security responded by confiscating his Car Pass and escorting him to the boundary of the owner controlled area. Prior to being released the individual was instructed to return the next day in order to complete the termination process and receive a whole body count as required by licensee procedures.
- (5) On the following day, October 5, 1989, the individual was delayed at the entrance to the owner-controlled area upon returning to complete the termination process. The individual left the site after waiting approximately two hours.
- (6) The individual was called on October 6, 1989, and was requested to return to the site to complete the termination process. The individual requested that his return be delayed until Monday, October 9, 1989.
- (7) The individual returned on October 9, 1989, received a whole body count and completed the termination process.

It should be noted that regulatory requirements do not specifically address the need for performing a whole body count upon termination of employment. Licensee procedures normally require whole body counts upon initial employment, annually thereafter or whenever an individual is suspected of inhaling/ingesting radioactive material,



and as quickly as possible upon termination of employment. Licensee procedures do not establish a specific time limit for performing the termination whole body count.

The inspectors concluded that any alarms heard by the individual were due to the security guards' security badges. The inspectors also concluded that the delays prior to the individual's termination whole body could have been prevented and/or reduced if the individual had waited longer on October 5, 1989, or had agreed to return on October 6, 1989.

The observations above were discussed with the Radiation Protection Manager (RPM) and at the exit interview. The RPM informed the inspectors that the lessons learned from his own personal involvement into this matter and the inspectors' observations would be evaluated to determine if any improvements could be made. No violations or deviations were identified. This matter is closed.

B. RV-89-A-0064

An allegation was received by the Region V office on October 27, 1989, from two contract workers who felt that they had been discriminated against for raising safety concerns to their supervision. The individuals stated that they had been terminated for refusing to perform their assigned duties inside an RCA until some concerns they raised were resolved.

The individuals stated that they had recently been hired as contract Electricians to support the refueling outage. They added that they had never worked in the nuclear industry before and felt some of the experiences gained from their initial entry into an RCA, specifically the containment building, did not appear to be consistent with what they had learned at the licensee's General Employees Training class which they had attended several weeks earlier.

The inspectors informed the Electricians to try to resolve their differences with their supervision and with the licensee. On the discrimination issue, the individuals were advised to file a complaint with the Department of Labor (DOL) and the licensee's "Hot Line" for safety concerns. Both individuals agreed to try to resolve their concerns through the channels recommended by the inspectors.

The Electricians had been assigned to work with two electrical engineers tasked with testing the Gamma-Metrics system inside the containment building. The Electricians' supervisor and the electrical engineers briefed the Electricians prior to entry into the work area. An electrical engineer stated that both individuals appeared to be very concerned about making their first entry into a controlled area. The engineer stated that it took about two to three hours to convince the individuals to make their first entry.

An examination of the concerns identified by the Electricians was conducted in parallel with an investigation conducted by the



Radiation Protection Manager (RPM), and the Electricians' supervisors. The Electricians also maintained a communication link with the inspectors, RPM and their supervision during the inspection.

The concerns raised by the Electricians, the inspection findings and resolutions to the finding are as follows:

Concern #1 The Special Work Permit (SWP) was a month old and the dose rates reflected on the SWP were not the same as they were led to believe during the pre-work briefings.

Finding #1 This concern was partially substantiated in that the SWP was issued approximately one month earlier. However, the SWP's expiration date was listed as December 31, 1989; therefore, it was still current at the time of the inspection. The SWP also authorized work to be performed in the refueling cavity as well as the Gamma-Metrics work assigned to the Electricians. The high refueling cavity dose rates described on the SWP were mistaken by the electricians for the dose rates involved in the Gamma-Metrics work. The Electricians also obtained dose rates from a co-worker rather than from radiation protection. The co-worker's dose rate information was inconsistent with that described in pre-work briefings.

Resolution The RPM stated that the SWP would be modified to separate the Gamma-Metrics work and the refueling cavity work. The RPM encouraged the Electricians to contact himself or his staff if they had any questions pertaining to radiation safety.

Concern #2 The electrical engineer had difficulty locating the work area. Also, they did not have the proper tools upon arriving at the work area.

Finding This concern was substantiated. The engineer stated that he got confused and took a wrong turn. The delay was minimal. The engineer stated after starting the job they ran into an unexpected interference which required a special tool.

Resolution None required.

Concern #3 There was some confusion as to what dosimetry was required for the work.

Finding This concern was substantiated. The dosimetry requirements for the Gamma-Metrics and the reactor cavity work (see concern 1 above) were not the same. This was reflected on the SWP. However, the radiation protection technician issuing the dosimetry became



confused for a moment until he was reminded of the differences by a worker who was a little more familiar with requirements prescribed on the SWP.

Resolution

The RPM directed his staff to be more observant of SWP requirements and assigned the Gamma-Metrics and refueling cavity work to separate SWPs (See item #1 above).

Concern #5

The Electricians observed some horse play between an individual who had partially removed anti-contamination clothing and a worker fully dressed in anti-contamination clothing. No undressing procedures were posted.

Finding

This incident was witnessed by another individual.

Resolution

The RPM discussed the concern with the Electricians and his staff. The RPM requested his staff assigned to the exit point to be more observant. The RPM commended the Electricians for reporting the observation, stating that with 1600 entries per day some improper conduct is missed by his staff. Undressing procedures were posted at the exit point.

Concern #6

One of the Electricians dropped his Thermoluminescent Dosimeter (TLD) in a contaminated area. It was re-assembled and reported to a radiation protection technician (RPT) who returned it to the electrician in a rude manner without surveying the TLD.

Finding

This concern could not be substantiated.

Resolution

The RPM did discuss the concern with his staff requesting that they be more sensitive to concerns expressed by workers.

Concern #7

The engineer elected not to request the presence of Quality Control (QC) to witness a test although the work package stipulated that QC witness the test. The engineer stated that QC's presence was unnecessary since he felt the test would fail.

Finding

This concern was substantiated.

Resolution

The engineer had discussed his intentions with QC prior to performing the test and agreed that it would not be consistent with the ALARA concept for QC to witness a test which would be likely to fail. The test subsequently failed. The inspectors verified that the work had not proceeded beyond the procedural QC "hold point."



Concern #8 A tool crib attendant located inside the containment building informed one of the Electricians that it was difficult to read the tool number/size. The electrician expressed this item as an ALARA concern.

Finding This concern was substantiated. Discussions were held with two tool crib attendants. Each stated that the lighting was marginally acceptable.

Resolution Several additional strings of lighting were installed in the tool crib.

Further discussions with all involved personnel disclosed that the Electricians were given the opportunity to discuss their concerns with a radiation protection representative prior to their dismissal. The Electricians' supervision informed the inspector that his staff had asked the Electricians to talk to the Radiation Protection Foreman on shift. The Electricians agreed. However, as they were walking to the Radiation Protection Foreman's office, the Electricians decided not to discuss their concerns with the Radiation Protection Foreman. The Electricians' Supervisor dismissed the Electricians upon learning that they were not willing to discuss their concerns.

The Electricians subsequently held a meeting with their supervision and the RPM during the inspection period. They were able to resolve their concerns and returned to work before the end of the inspection period.

The above observations were discussed with the RPM and at the exit interview. The RPM and management attending the exit interview stated that many of the electrician's concerns were valid and were considered to be unacceptable work practices. The RPM added that appropriate action will be taken to further evaluate and correct the weaknesses that were identified.

The inspector concluded that no violations or deviations had occurred. This matter is closed.

5. Facility Tours

Units 1 and 2 were toured extensively during the inspection. Independent radiation measurements were made using NRC ion chamber survey instrument Model R0-2, Serial #022906, due for calibration on March 16, 1990. The inspectors observed the following:

- a. Radiation monitoring equipment was in current calibration.
- b. Work practices were consistent with the ALARA concept.
- c. All personnel observed on tour were wearing proper dosimetry.



- d. Posting and labeling practice were consistent with 10 CFR 19.11 and 20.203.
- e. During a tour conducted on October 25, 1989, cleanliness in radiologically controlled areas of the Unit 1 Auxiliary and Spent Fuel Buildings was very poor. Items lying unattended in contaminated areas included plastic and oily paper refuse, used leather and rubber gloves, various chemicals, face shields and welders face shields, and tools.
- f. Various electrical cords, ventilation ducts and tygon tubing drain lines traversing both non-contaminated and contaminated areas were not secured in a manner to prevent contamination of the non-contaminated areas. Drain lines used for draining contaminated liquids were not consistently identified as containing radioactive material.
- g. Two fire exits were blocked off.
- h. Sparks resulting from welding were not adequately monitored by an assigned fire watch. The assigned fire watch was performing a grinding operation while the welding was in progress, and was out-of-view of the welding.
- i. A worker was wearing a plastic face shield in the "up" position while working on a contaminated RHR valve. A Radiation Protection Technician observing the operation took no action to instruct the worker to properly don the face shield until it was brought to his attention by the inspectors.
- j. Lighting was extremely poor in the Unit 1 primary sample room and completely absent in the boric acid evaporation room.
- k. Several liquid effluent drain line/vent lines connected to polyethylene bottles were found to be crimped. Some of the drain/vent lines serviced contaminated systems.
- l. An electrical cord was coiled in a stairway leading to the 1-2 RHR pump room. The cord created a serious tripping hazard. The inspectors noted that ample room was available to store the cord without creating the tripping hazard.

The above observations were immediately brought to the attention of the licensee's staff. The inspectors verified that the licensee took immediate action to address the inspectors' observations, with the exception of observations made near the completion of the inspection period.

The inspectors brought the above observations to the licensee's attention during the exit interview. The need for maintaining plant cleanliness and being sensitive to similar observations during tours conducted by the plant staff was emphasized. The licensee's performance in this area was adequate to meet regulatory and procedural requirements.



6. Exit Interview (30703)

The inspectors met with the licensee representatives denoted in paragraph one at the conclusion of the inspection on November 2, 1989. The scope and findings of the inspection were summarized. The licensee was informed of the apparent violation, discussed in paragraph 3.H, and of the observations made during facility tours, discussed in paragraph 5, above.

