SMUD
SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

February 12, 1981

Mr. R. H. Engelken, Director
Region V Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
1990 North California Boulevard
Walnut Creek Plaza, Suite 202
Walnut Creek, CA 94936

Re: NRC Inspection 80-32
Operating License DPR-54
Docket No. 50-312

Dear Mr. Engelken:

As a result of the special appraisal of the health physics program at the Rancho Seco Nuclear Generating Station conducted during the period of September 22 through October 3, 1980, several significant appraisal findings were identified.

Your letter of January 16, 1981 requested a response to those items listed in Appendix A of your report.

Appendix A, Item 1

Radiation Protection Organization and Management Oversight

The present level of staffing and the organization of the Chemistry-Radiation groups are not adequate to provide the necessary support of routine operations at the technician and first and second line supervisory levels. Further, the loss of the Health Physicist represents a significant reduction in the level of professional staffing of the Chemistry-Radiation group which requires prompt correction. (Section 2.1.3, Staffing)

Section 2.1.3

At the time of the Appraisal the Chem-Rad organization was not fully staffed. The organization was authorized a total of 16 CRAs and 7 CHs however, the staff included only 11 CRAs and 3 CHs. Five contract radiation protection technicians were onsite to augment the permanent staff. Six of the CRAs had been recently hired and were not fully trained. The HP had submitted his resignation and his last day coincided with the last day of the Appraisal.

A total of five SCRAs (3 permanent and 2 temporary) were on the staff. The three permanent SCRAs were assigned responsibilities for health physics, chemistry and radiochemistry and internal quality control/training. One of the temporary SCRAs was assigned permanently to the training organization and the other was assigned to radwaste related activities.

Prior to the establishment of a new position a Goal Oriented Job Analysis (GOJA) must be completed for the proposed position. After appropriate processing by the personnel organization, the positions may be approved. GOJAs had been completed for both the temporary SCRA positions and job

8103180662

announcements for permanent positions were expected shortly.

Discussions with the CRS and SCRA (health physics) identified direct supervision of CRAs as a problem area. Both stated that responsibilities associated with ther respective positions severly limited the opportunity for job site supervision of CRAs. At the time of the appraisal the CRS was preparing a GOJA for the position of Assistant Chemistry and Radiation Supervisor (ACRS). This position would provide for direct supervision of the health physics, chemistry and quality control/training SCRAs.

The CRS believed that since the position which he occupied was becoming increasingly administrative in character, the creation of a subordinate technical supervisory position (ACRS) was necessary to relieve the SCRAs of some administrative duties and provide for more direct supervisory effort.

Delays in establishing this position, which had been approved in principle by plant management, appeared to be principally concerned with the GOJA and with obtaining approval of the proposed salary schedule. Since Rancho Seco is a municipal utility, operating under civil service rules, greater difficulty apparently exists in creating new positions and obtaining salary schedule revisions than for utilities not constrained by such rules.

During outage periods the existing staff is restructured to create a two-shift work force. The HP and NC split the two shifts with two SCRAs on days and one SCRA on the back shift. One CRA is assigned to chemistry duties and all others to radiation protection activities. The permanent CRA staff is augmented with contract technicians who are assigned the more routine duties while the CRAs are assigned the more unusual tasks.

The staffing level in the past did not permit the assignment of specialists exclusively to specific tasks, however with increasing support from the District (SMUD) office greater specialization is possible and is occurring in such areas as Emergency Planning.

Administrative support for the Chem-Rad group consists of a Senior Utility Typist Clerk, a Clerk Typist and a Clean Room Clerk. The Clean Room Clerk performs such functions as stocking clean anti-contamination clothing.

The CRS reported that increased staffing of 4 or 5 CRAs and one SCRA would probably be required if shift health physics coverage was required.

District Response

The Health Physics Appraisal Team did not mention in their report that 6 Chemical and Radiation Assistant positions had been recently authorized. The SMUD board acted in February 1980 to create 6 additional positions for a total of 16 Chem-Rad Assistants.

The search for applicants commenced immediately following that authorization. At the time of the audit, 2 CRAs had been temporarily promoted to Sr. Chemical and Radiation Assistants and the staffing at that time was 11 CRAs and 5 Sr. CRAs. This is in comparison to the Board authorizing a manning level of 16 CRAs and 5 Sr. CRAs. The recruitment of personnel was thus progressing slowly but reasonably well in consideration of the national shortage of

qualified personnel in this field. There are presently 14 CRAs with several potential candidates in the interview process. All 5 Sr. CRAs are in permanent positions.

Although the SMUD board had authorized 7 Craft Helpers (CH), the District had no strong need for more than 3 CHs. At the present time, there are 4 CHs on the staff, and it is expected that all CH positions will be filled prior to the end of 1981.

The Plant Health Physicist resigned during the audit. Classification and Pay Study was performed on this position which generated a significant increase in the salary level. An active recruiting program is being performed, and one candidate has applied. The national shortage of qualified and experienced Health Physicists makes it difficult to expect prompt filling of this position.

An Assistant Chemistry and Radiation Supervisor position was under study by the Personnel Department at the time of the audit. That position was authorized by the SMUD Board in January, 1981. An announcement has been posted, and this position is expected to be filled by May 1, 1981. During this period of personnel shortages, a strong endeavor on the District's part to find well-qualified health physics technicians is continuing. For the 1981 refueling period, a complement of 38 Sr. Techs, 14 Jr. Techs and 4 Supervisors is being used. All personnel are being screened to the level of ANSI 18.1. The District will continue using several of the most experienced contract personnel after the refueling outage, until the Rancho Seco staffing level is reached.

Appendix A, Item 2 Section (a)

Exposure Controls

External

> The existing dosimetry records system failed to provide the accessibility, flexibility and currentness necessary to permit the level of management control of exposures required. In addition, a need exists to improve the reproducability and reliability of reading pocket ionization chambers and recording the results. (Section 4.1.1)

Section 4.1.1 Exposure Review

> The dosimetry records are maintained in a multiplicity of written records. The record system used makes any review of dosimetry records very laborious and time consuming. The sum of the weekly PIC totals is compared against the monthly film badge results and major discrepancies are investigated.
>
> One analysis had been made comparing the doses received during 1976, 1977 and 1978 in performing 13 major repetitive tasks such as drum removal, let down filter replacement, spent fuel coolant filter replacement, etc. This one RWP vs. man-rem analysis was the only one known to exist.
>
> Skin exposures are recorded in a separate log book. In some cases these exposures were not recorded in the individual's dosimetry record. For a number of individuals who have terminated employment and received their NRC form 5 the skin exposure was not included because no record existed in

the individual's file. The office staff attributed this record breakdown to the system and a shortage of help.

District Response

The present dosimetry record system is the product of various attempts to use methods that have been proven reliable. We agree that there are extreme limitations of the manual handling of all data. This has been reflected in the inability to maintain updated, flexible and readily auditable records. In 1977, an attempt was started to develop data processing capability for many of the records and data accumulation processes required. By late 1978, a dosimetry records management technique was available utilizing the District's IBM computer system with a terminal at Rancho Seco. This system was capable of maintaining the records in an updated manner during normal operation. When the system was stressed, that is, large numbers of input and output requirements during the 1978 refueling outage, unreliable transmission, computer program problems, computer outages and lack of computer priority caused unsatisfactory results. This condition required continuation of the manual data handling system. With assurance that priority and programming problems could be overcome, the District again used this computer system during the 1980 refueling outage. The computer system again proved to be unreliable, thereby requiring continuing use of the manual system.

A current program to define an adequate radiation records system and provide specifications for system interfacing to the Rancho Seco operations or Security computer is presently being undertaken by the Generation Engineering Department. The request for a proposal is expected to be issued by the first of March and an estimation of the time frame for implementation should be available by June 1, 1981.

Appendix A, Item 2 Section (b)

Respiratory Protection

The existing controls on air quality for the use of supplied air respiratory protective systems failed to properly evaluate the quality of the intake and supplied air used. Further, a clear delegation of responsibility and authority for the respiratory protection program should be provided and supported by management. (Section 4.2.2)

Section 4.2.2

(1) Administrative Responsibility

A memorandum from the Manager, Nuclear Operations Department dated 31 January 1978, designated the CRS as the individual responsible for respiratory protection and the HP as the individual responsible for exposure reduction concept development. This clear commitment by management was not known by the Chem-Rad staff. When six members of the Chem-Rad staff were questioned four different individuals were identified as responsible for the respiratory protection program.

Despite this uncertainty concerning administrative responsibility, a good program was found to exist except for breathing air quality.

District Response

The Chem Rad staff may consider various individuals as having responsibility for the Respiratory Protection Program. This is due to the Chemistry and Radiation Supervisor delegating or assigning the various aspects of the program to different personnel. The Sr. CRA for Health Physics maintains the Air Supply System and Filter Mask Equipment in a ready condition. The Sr. CRA for Radio-Chemistry maintains the Emergency Locker Equipment; at one time this included the Self-Contained Breathing Apparatus (SCBA) units. The Sr. CRA for Quality Control performs an inspection program to ensure that testing, repairs and other surveillance work on respirators are being performed. The District is gratified by the further audit statement that Rancho Seco has a good respiratory protection program.

In order to better inform the staff of the specific responsibilities to support the Respiratory Protection Program, the District will provide clarification by a change to the Radiation Control Manual (AP.305). Following that change, a review will be performed with the Chem Rad group on these responsibilities. This change and review should be completed within 60 days following the completion of the present refueling outage.

Section 4.2.2

(6) Breathing Air Sources

There are three onsite sources of air either used or planned for use with respiratory protective equipment. At the training center a RIX compressor with teflon piston rings is used to supply the air for the supplied air mask training and operation of the DOP test booth. This system was formally used for filling the SCB supply cylinders. This system draws its intake air from an elevation four feet above the ground by the side of the building and does not include pre or post filters. The supplied air is not monitored for CO or other toxic gases, nor has a grap sample ever been taken for laboratory analysis to verify that the air meets a minimum of class D air as required by 29 CFR 1910.134(d).

The auxiliary building system air supply is furnished by three Joy oil-less compressors, class WGCL9H. The air intake for the compressors is located about 10 feet from the floor above the compressor. The intake air is filtered to remove dust. The compressed air goes through a moisture separator but is not monitored for CO or other toxic gases. When used for supplied air masks and hoods, the air is futher filtered through a MSA manifold filter which is stated to remove all oil vapors, particles, water and organic vapors. The filter is not designed to remove CO or other toxic gases. In addition, no mechanism exists to evaluate the residual capacity or effectiveness of this filter. This air has never been analyzed to confirm that it is of class D quality. The Team's concern was increased when 8 barrels of 35% hydrazine solution were noticed 12 feet from the compressor and a flammable materials storage cabinet containing liquid hydrocarbons was observed to be located 18 feet from the compressor. SMUD had outside environmental consultants

survey the area for hydrazine levels and values far less than the federal and state standard of 0.1 mg/M^3 were found. However, hydrazine, when heated to decomposition, emits highly toxic forms of nitrogen compounds and no evaluation of this hazard had been made (Reference: Dangerous Properties of Industrial Materials, 5th Edition, N. Irving Sax, Van Nostrand Reinhold Co.)

A third compressor (Mako, Inc.) was installed in the spring of 1979 exclusively for the filling of SCB cylinders. Because initial testing indicated that the location of the compressor was unsatisfactory in that hydrocarbon fumes could contaminate intake air, the system has not been placed in routine use. A new, separate building at a location free of any hydrocarbon fumes is in the planning stage and this system will not be used until placed at its new location.

The licensee's staff had requested a control change to increase the system's safety-CO monitor to automatically shut the system down with the compressor switch in either manual or automatic mode of operation. Also under consideration is a CO monitor automatic-manual dead man switch which would preclude bypassing the CO automatic shutdown without deliberate and continual operator intervention.

SCB cylinders are presently being filled at the Galt fire department. In addition, the Sacramento Fire Department has several approved portable compressors which could be borrowed in an emergency.

District Response

The RIX Air Compressor System is an oil-less compressor used to supply air to the training/testing facility and currently is used to refill the SCBA bottles. The District has recently completed, reviewed, and placed in service, an operating procedure for this system. A Surveillance procedure has also been established for the periodic testing of the discharged air to meet Class D under 29 CFR 1910.134(b). This fulfills all of the requirements for the continued operation of this system.

Three JOY oil-less compressors supply breathing air to work stations throughout the reactor building and auxiliary building. During the audit, notice was taken of chemical and flammable liquid storage in the vicinity of the air intake system. Shortly after the audit, all flammable material and all chemicals were removed. Approximately 40 feet from the air system, a plant system uses 35% Hydrazine solution. This solution is utilized in the secondary plant process system and is in permanently-mounted plant equipment.

A red floor stripe has been painted for approximately 20 feet in all directions around the JOY system. Signs have been installed indicating no chemical or flammable material is allowed within that boundary. A notice to all supervisors has been issued which informs them of the purpose of the line and the need to notify the Chem Rad Group of any welding, cutting, or other operations around that area which may affect air quality. The new surveillance procedure, discussed above, also requires periodic analysis of this system to the level of Class D air.

The Mako Compressor Air System is not permanently installed and does not provide breathing air at the present time. All the necessary CO monitoring equipment will be in service and Class D air testing will be completed before this system is placed in service.

Appendix A, Item 2 Section (c)

Surveillance

The existing mechanisms for controlling the generation, recording, retention and retrievability of radiation protection records fails to provide the benefits which such a system should make available in the areas of job planning, trend identification and evaluation and ALARA support. (Section 4.3.2)

Section 4.3.2 Radiation Survey Records

The licensee's radiation survey program records were reviewed against the recommendations of ANSI N-13.6-1966 (R 1972), "Practice for Occupational Radiation Exposure Records Systems." The records system was found to be deficient in that: (1) retrievability of records to verify radiation protection activities (sample results and survey records) was not always possible; (2) survey records were not complete in that signatures, time and instruments used were not always included and, (3) survey records were frequently written in pencil.

The referenced standard recommends that Occupational Radiation Exposure Records Systems should enable the employer to:

(1) Evaluate the effectiveness of the radiation protection program.

(2) Demonstrate and facilitate compliance with contractual requirements and applicable governmental regulations.

(3) Reconstruct for legal or medical purposes, situations and conditions for analysis of the radiation dose received by individuals.

Section 5 of the referenced standard provided guidance on records that may be necessary to establish the conditions under which individuals were exposed. The examination of the survey records identified the following deficiencies when compared with the guidance.

Guideline: Date and time of survey.

Finding: Numerous surveys were noted that did not indicate time of survey.

Guideline: Identification (type and serial number) of the particular radiation detection instrument used to perform the survey.

Finding: Numerous surveys did not identify any instrument or serial number.

Guideline: Identification of the individual performing the survey.

Finding: Numerous surveys did not identify the surveyor, either by signature or initial.

Guideline: The standard implies that records should be permanent and retrievable "to provide for workmen's compensation programs or for conduct of litigation which may transpire many years in the future".

Finding: Numerous records were noted as having been written in pencil.

Records to assure continued surveillance of radiation work activities could not always be found, for example, RWP 80-32 was issued on 1/16/80 to provide "radiation control of the Decon of Reactor building, -27Ft." and was valid until 4/16/80. Only eight air samples could be identified as being specific for the RWP authorized work even though work activities were conducted on both day and swing shift for numerous entries. Respiratory protection was identified on RWP 80-32 as being required. RWP 80-79, issued on 3/14/80 for "Reactor Building weld platform and structure platform", also required respiratory protection. No radiation survey or air sample records could be found to enable one to conclude that adequate radiation protection surveillance was provided for entries made on 3/26/80.

At Rancho Seco, survey records, (routine, special (RWP), air samples) are assembled into daily packages and the package is reviewed and signed by the SCRA and the CRS. An Appraisal Team review of selected packages for 1979 and 1980 indicated a wide variance in the quality of the written surveys. Some excellent records were noted, that is, the surveys were thorough, prepared in ink, and clearly recorded radiological conditions with appropriate date, time, instrument type and number and signature. Others were noted to be essentially devoid of value as records of information, for example, on 7-3-80, daily survey A-12 had a note stating, "See attached results of analysis." No analytical results were attached nor could they be found in the complete package. The thoroughness and effectiveness of the dual review was questionable.

The retrievability of radiation protection records was complicated by the apparent lack of a coherent system of record storage. Records of evaluations of radiological conditions relating to specific work activities were scattered among the RWP file, daily survey packages, air sample files, and the outage log file.

District Response

The audit comments concerning survey records have been reviewed as a significant deficiency. The retrievability and storage of records have been less than desired due to the slow development of a central document control system at Rancho Seco. This system is presently being designed by a consultant and can be expected in operation by June, 1982.

The present state of record storage is such that specifically required documents are in fixed proper locations. The supporting documentation that enables data comparison and ALARA evaluations are hard to retrieve and use. It is expected that the central document storage system will greatly alleviate the situation and improve the retrievability of this documentation.

A separate audit comment concerned the completeness of survey records and data taken in pencil. The training of Chem Rad Assistants, will in the future, include clear direction on the amount and type of information expected on survey records. The use of permanent marking on survey records will be stressed. The procedure governing surveys (AP.305-8) will be revised such that more direction toward proper documentation and review will be added. The procedure change will be accomplished within 60 days following the present refueling outage. ANSI 13.6 will be used as a guide for its revision.

Appendix A, Item 2 Section (d)

Instrumentation

The portable instrument calibration facility and its use failed to minimize the possible exposure of personnel during calibration activities. (Section 4.3.4)

Section 4.3.4 Instrumentation

Instruments associated with the radiation protection program were adequate for routine and outage operations. The supply, maintenance and calibration of the portable survey meters and fixed area, effluent and process monitors were reviewed. The licensee's performance in this area was considered to be adequate.

Portable Instruments

At the time of the Appraisal approximatley 118 portable survey meters were available. During normal operation about 15% are being maintained while 85% of the inventory is available for use. During outages, about 45 to 50% are undergoing maintenance and repair. Shortages may develop if all the contract radiation protection technicians normally employed during an outage are engaged in work requiring instruments. About 2% of the inventory is missing (i.e., considered lost or vandalized) during an outage. The licensee believes that instrument mutilation is caused by contract technicians since vandalism is not observed during periods of normal operation.

Inventory control is adequate but not ideal. There are insufficient centralized locations in the auxiliary building for storage of instruments to make them quickly available. The licensee pointed out that contract technicians were indifferent to where they deposited their instruments after use.

Survey meters, limited to emergency use, are available within sealed lockers at selected locations. One emergency use survey meter is dedicated to prompt analysis of radioiodine that may be collected on a silver zeolite cartridge (also contained in the locker).

Each instrument has an assigned control card as well as individual forms specifying dates for battery check, semi-annual calibration and emergency equipment inventory.

Maintenance records are also kept for each instrument. An Equipment Repair Record with the history of repair and maintenance of all radiological survey instruments (including air samplers) contains the following headings: Date, Initial, Equipment Fault, and Repairs Made. This function is performed by the Instrument and Control (I&C) group. Two people spend full time maintaining radiation protection instrumentation.

Calibration of portable survey meters is performed at the 40' level in the Auxiliary Building. The room contains a rolling instrument stand set on tracks fixed to the floor. At one end of the tracks is a lead shield housing two ^{137}Cs sources of about 1 and 110 Ci respectively. The instrument to be calibrated is placed on the stand and positioned so that the center of its sensitive volume is roughly in the center of the beam. The rolling stand is then positioned at the appropriate location as indicated by a graph (distance vs. dose rate) for the aforementioned sources. The dose rate vs. distance values have been established using Victoreen "R" meter measurements whose accuracy is traceable to NBS calibration. Permanent floor markings indicate the 100 mr/hr isodose line when the largest source is exposed. Two technicians are required to operate the facility. One stands behind the calibrator shield and raises the desired source by means of a source rod handle. The source is held in this position while the other operator adjusts the appropriate potentiometer of the instrument being calibrated to the desired dose rate setting. Whenever possible, the second operator locates himself either behind a concrete wall, where the radiation level is negligible, or behind the 100 mr/hr line demarcation. An optical viewing stand may be used to read the instrument when the source is raised. An area monitor with an audible alarm and flashing light is used to warn personnel in the calibration room, and in the control room, that the source is in an exposed position. Because the noise from this alarm is high pitched and piercing in the calibration room, it is usually muffled or defeated during calibrations so that only the flashing light indicates an exposed source. The alarm can only be deactivated by the control room operator. After completion of calibration at each point, the source is returned to the shield usually with sufficient force to cause hard surface contact with the base. The operator working the source was cautioned to check for potential source leakage at a frequency greater than semi-annually, the technical specification requirement for sealed source leak tests. The Team was concerned that the existing calibration procedure required personnel in a downrange location in the calibration area when the source was in an exposed position. Measurements made adjacent to the face of the person holding the source in the raised position indicated 180 mr/hr. The calibration system and procedure as presently used does not assure that personnel exposures are maintained ALARA during the calibration of portable survey meters.

Calibration of survey meters for beta radiation is not performed per se. Use is made of correction factors for "cutie pie" type detectors from the report BNWL-MA-62 Pt 2 "Portable Radiation Survey Instrumentation Manual." From the correction factor curves given in this report, a factor of two is

used to correct for beta response, independent of beta energy. However, upon review of the curve, the team member commented that a factor of three would provide a more conservative but not unrealistic correction. The HP concurred in this change. This higher correction factor will be used in the future on the Rad Owl 1, 2, and 4 and the Victoreen 470, all of which have cutie pie geometries.

During a tour of the Auxiliary Building it was noted that all observed portable instruments had calibration stickers that indicated up-to-date calibrations, and all had their range switches in the proper "off" position.

During the appraisal, a calibrated survey meter (Eberline, Cutie Pie RO-3B), which had been supplied by Battelle-Pacific Northwest Laboratories, was checked in the calibration facility to compare the licensee's source calibration against Battelle's. The maximum deviation between the instrument indication and the expected reading using the licensee's calibration data was an acceptable 10% over three decades of the instruments' range.

Neutron rem-meter survey instruments are calibrated with 1 and 5 Ci, ^{238}PuBe neutron sources. While the neutron source is being used, the cesium sources are locked in the lead shield and cannot be used. Calibration of a neutron rem-meter was not observed during this appraisal.

Calibration of each type of survey meter is detailed in the licensee's procedure manual. It should be noted that the licensee has an unusually large number of different types of instruments from different vendors including Eberline, Victoreen, Technical Associates, Johnson Laboratory, Xetex, Ludlum, Studsvik, Nuclear Measurements Corporation, and Radeco. I&C personnel expressed frustration at not being consulted whenever new instruments are purchased from new vendors. This is because they are responsible for repair and maintenance and would, therefore, require appropriate schematic drawings and spare parts. Such items should be available prior to or immediately following receipt of any new instruments to support a more effective survey instrument maintenance program.

Records of equipment repair were examined. A history of maintenance of all instruments is kept in the I&C files. The records contained relevant information and appeared to be complete.

District Response

Instrument Inventory control has been significantly improved since the audit. The improvement is through a check-in/check-out system that assigns responsibility to the user so that equipment damage will be traced to the user. Training lectures to health physics technicians have stressed the need to keep equipment in the best operable condition and keep proper account of it.

Although the audit described in detail the existing calibration facility and its operation, the finding was that this operation does not assure ALARA for the calibrating personnel. It is the District's belief that the operation is conducted

with as minimal an exposure as possible under the limits imposed by the present location and existing sources. Other locations have been examined for this work with negative findings. A different design of the calibrator is under examination by the ALARA Committee. Preliminary discussions of a new physical facility is also under review. The District expects to have the various options evaluated by the ALARA Committee within 60 days following completion of the present refueling outage.

The audit members recommended a conservative factor of 3 and correcting "Cutie Pie" reading for beta response. This factor has been stated in instructions to health physics technicians during the present refueling outage. A procedural format for beta calibration work will be provided within 60 days of the conclusion of the present refueling outage.

An audit comment expressed concern over the variety of different vendors of survey instrumentation. A concern was also expressed on the failure to obtain full sets of schematic drawings with new instruments. It is very desirable to use specific devices manufactured by specific vendors from the standpoint of best available technology. ALARA, at times, dictates these special monitoring devices. A few one-of-a-kind instruments have been purchased in order to evaluate their ease of use and maintenance characteristics. The District's Purchasing Department has required detailed drawings for Purchase Orders. Frequently, vendors are reluctant to provide full details because of proprietary interests.

Appendix A, Item 3

ALARA Program

The ALARA Program needs upper-level management guidance and support in the areas of assignment of implementing procedures, instructions, documentation and an effective measurement system. Improved preplanning to minimize exposures needs the support of an effective, accessible exposure data records system. Upper-level management's commitment to ALARA needs to be clearly identified and communicated to all Rancho Seco personnel. (Section 6.0)

Section 6.1 Conclusions: ALARA Program

Based on the above findings, improvement in the following areas is required to achieve an acceptable program:

(1) Upper-level management guidance needs to be provided in the areas of (1) assigning responsibility for the development of an ALARA Program, (2) establishing an effective measurement system, (3) reviewing results and taking corrective actions, and (4) establishing implementing procedures.

District Response

A full time Health Physicist (ALARA Coordinator) position was added to the Generation Engineering Department in October, 1980. The individual filling the position will be responsible for developing a formal ALARA program and implementing procedures. In addition, the person will be responsible for performing ALARA design reviews for all Generation Engineering proposed plant modifications. A number of interviews have taken place; however, a candidate has not yet been chosen.

Upper management is currently in the process of providing staff with direction on the formation of a formal ALARA Committee and list of what management engineering and operations representation should make up the Committee membership.

A consulting firm will be selected to assist District staff in developing an ALARA program (including the writing of implementing procedures). Upon hiring an ALARA Coordinator, and upon review and approval of a plan and procedures, the program itself will be implemented under the guidance of the MSRC and supervision of the newly formed ALARA Committee. This plan and these procedures will provide formal guidance in the areas of ALARA program responsibilities, use of effective measurement systems, and techniques for review and taking corrective action.

The ALARA Coordinator's position is expected to be filled approximately April 1, 1981. An approved ALARA Program Manual is expected to be completed by approximately May 1, 1981 with implementing procedures by June 1, 1981. The ALARA program itself is expected to be fully functional by approximately August 1, 1981.

Section 6.1.(2)

> The ALARA program, including upper-level management guidance and implementing procedures and instructions, needs to be more fully documented.

District Response

In October of 1980 the District, with assistance from an outside Consultant, took steps to identify where current Rancho Seco practices in ALARA failed to meet the intent of Regulatory Guide 8.8. That work is complete and will form the basis for developing the formal ALARA Program Manual and Implementing Procedures described in the response to item 6.1.(1) above.

This same consultant has assisted the District in developing a Rancho Seco interim ALARA Manual which fully documents current ALARA practices and cross references all procedures and correspondence related to ALARA. Upon receiving MSRC review and approval, it will be distributed to all supervisors and incorporated into the training program.

An informal ALARA employee suggestion program was initiated by the Nuclear Operations Department in August 1980. This will be written into an interim procedure. Plans are to incorporate this into the above mentioned ALARA Manual as one of the implementing procedures.

Distribution of the interim ALARA Manual, which documents the current program, is expected to occur approximately March 1, 1981. For an upgraded Program Manual schedule, see the response to 6.1.(1).

Section 6.1.(3)

> The exposure data record system should be improved so as to provide information that can be used during preplanning efforts related to keeping exposures ALARA.

District Response

A study was published in June, 1980, which addressed resource requirements for radiological and radiation-related computer applications for Rancho Seco. Based on this report, it was determined that an ALARA records management software system could and should be installed on the existing District computer system.

In October, 1980, unsolicited proposals were received from three software vendors for supplying an ALARA Data Acquisition and Processing system which incorporates exposure data recording and retrieval subroutines.

Based on data provided in those proposals, as well as information supplied by other utilities with functioning ALARA software systems, a formal Request for Proposals has been issued by the District.

The resultant records management system will, among other things, be capable of providing information that can be used during preplanning efforts related to keeping exposures ALARA; bids are due on April 1, 1981. A totally functional system is expected to be operational approximately January 1, 1982 with the current historical data base online by April 1, 1982.

Section 6.1 Program Improvement Items

Section 6.1.(1)

> Implementation of the recommendations by the Special Review Committee related to the filter improvement program should be completed as soon as possible.

District Response

The District's Architect Engineer is expected to have a detailed design of the various filter modifications completed by April 1, 1981. Equipment procurement will be initiated immediately thereafter. Those filter modifications which can be accomplished during plant operations, are expected to be completed by approximately January 1, 1982; the remainder will await the 1982 outage, which should be completed by August 1, 1982.

Section 6.1.(2)

> A special effort should be made to assure adequate communications exist at all levels of the organization with respect to the ALARA program.

District Response

Upon completion of the ALARA Program Manual described in response to significant weakness 6.1.(2), distribution and training will be initiated. The upgraded program will outline comprehensive methods of communicating ALARA concepts throughout the orgainzation.

Section 6.1.(3)

> The ALARA review related to work performed by or under the cognizance of Generation Engineering and coordination with site radiation safety responsibilities needs to be implemented in a more timely manner.

District Response

In December, 1980, Generation Engineering's Site Principal Engineering Technician (Health Physics) responsibilities were modified, where more than 50% of his time is

now associated with pre-job liaison planning between Generation Engineering personnel and the Nuclear Operations Chemical/Radiation staff. Measurable improvements in attitudes and cooperation are already occurring.

Section 6.1.(4)

> An effort should be made to provide adequate storage for drums containing higher levels of radioactive waste so that rooms in the Auxiliary Building do not need to be used for this purpose.

District Response

In late 1980, the Management Safety Review Committee directed staff to make this a top priority item. Generation Engineering is currently working on the conceptual design (location, size and layout) for an upgraded storage facility. An outside consultant will be hired in the near future to begin detail design. It is expected that construction will be underway prior to the end of 1981, and be completed approximately June 1982.

In the interim, the high dose rate drums previously stored in the Auxiliary Building and in the shielded containers in the outdoor waste storage area, are being shipped off for disposal. This should provide adequate storage capacity until the new facility is complete.

Section 6.1.(5)

> The ALARA program should include operational actions that could result in lowering the radiation levels resulting from hot spots.

District Response

A hot spot identification and reduction technique was initiated in 1975 as the crud activity buildup at Rancho Seco appeared to exceed that experienced at other B&W units. Basically, routine surveys were made to identify piping and equipment crud traps. Updated signs were used to identify these locations. When activity buildup reached levels affecting routine acceptability, blowdown or equipment modifications were performed. A study of crud formation mechanisms led to a testing program to determine if high or low pH levels would affect equilibrium crud production. A formal testing procedure was initiated in 1977 and is continuing.

The formal upgraded program described in response to significant weakness item 6.1.(2), will have incorporated into it an implementing procedure which specifically addresses identification, control, and elimination of hot spots.

Appendix A, Item 4a

Facilities and Equipment

Sampling techniques fail to identify extremity exposure hazards or to monitor for extremity dose. (Section 7.2)

Section 7.2 Chemistry Laboratory

The hot chemistry lab has adequate space, however, both the Chem-Rad staff and the Team believe the cold chemistry lab is over crowded. Without enumerating all the equipment contained in the lab, the amount of free bench space for sample preparation and recording data is minimal.

The hot chemistry laboratory contains a sample collection hood from which samples are drawn for analysis and counting. Adequate engineering features for sampling under normal and anticipated occurrences have been incorporated into the system. Shielding has been installed on walls and doors to keep radiation from piping ALARA. During the appraisal, a let-down line sample was drawn after purging the sample line. The procedure observed was for the CRA to rinse a one liter plastic collection bottle and cap with the sample water pouring from the flexible sample line. The bottle was then filled and capped. Excess water was wiped off the bottle with paper towels which were then placed in a plastic bag for disposal. The sample was then taken to a nearby chemistry bench and placed behind a lead shield. The operation was performed at hand contact with the CRA wearing surgical gloves to preclude hand contamination.

At the request of a Team Member, a measurement was made of the sample bottle which was found to indicate a contact dose rate of 150 mr/hr. The usual dose rate was said to be about 70 to 100 mr/hr. The chemistry supervisor was contacted and the following points were discussed:

(1) The CRA should have had a dose rate meter in the sample hood to monitor the sample during collection. This would provide assurance that only a normal and not a high level (e.g., crud burst) sample was being collected. Procedure A-11 "Reactor Sampling System" calls for an area monitor or a portable monitor to serve the sampling station. The area monitor in the chemistry laboratory is located at some distance from the station and does not effectively serve the function required by procedure A-11.

(2) The CRA should wear dosimeters for extremity monitoring.

(3) With respect to ALARA, the procedure should be reviewed with the goal of reducing radiation exposure received by the CRA to levels that are without sacrifice of collection and sample integrity.

District Response

An audit comment concerned the lack of space in the cold chemistry lab. This lack of space is expected to be overcome by the planned laboratory to be constructed in the new auxiliary building south annex which is now in the final stages of architectural design.

A sampling program of radioactive fluid was considered by the auditor to be performed without proper survey instrumentation and extremity dose monitoring. Instructions have been given to those Chem Rad Assistants presently involved in liquid sampling to use extremity dosimetry and maintain dose records. The District will incorporate procedural requirements for such controls within 60 days of the completion of the current refueling outage. The ALARA Committee will consider the subject of liquid

sampling operation and determine if a reduction in exposure can be obtained.

Appendix A, Item 4b

Facilities and Equipment

Engineered systems designed to protect individuals from possible exposures to airborne radioactive materials failed to provide the air flows necessary to meet industry standards and possibly to protect individuals from unnecessary exposure. (Section 7.6)

Section 7.6 Facility Ventilation

As part of the appraisal air flows in various laboratories and engineered systems were measured for comparison with existing standards and guides. Capture velocities of 100-150 linear feet per minute (lfm) are recommended for laboratory hoods at the hood face with the door open. (Patty, F.A., Ed. (1958) "Ventilation" page 285 in Industrial Hygiene and Toxicology (Inter Science Publishers, Inc., New York)). The instrument used was an Alnor Velometer, Type 6006B equipped with a type 6050 probe, (0 to 300 lfm). The following were the flow rates measured:

(1) Trash compactor barrel cover at edge of cover with cover raised -- no detectable flow;

District Response

After identification of this condition during the audit, it was found that the ventilation system ducting had been isolated by the closure of a damper. After opening the damper and replacing the air filter, the ventilation was returned to its design rate. This existing ventilation system is considered adequate for the type of operation occurring. The full damper setting has been assured by installing a screw stop in the damper handle.

Section 7.6.(2)

Decontamination room, front surface of ultrasonic cleaning tanks -- no detectable flow with damper in any of four allowable positions;

District Response

At the time of the audit, the existing fan for this system was turned off. Subsequently, preventative maintenance on the fan and filters was performed; and the system placed in service. A study of the damper position function, characteristics and proper labeling has been completed. The District intends to redesign the tank air sweep configuration to provide directed air flow over the work space. The design ECN will be completed within 60 days following the completion of the present refueling outage.

Section 7.6.(3)

Decontamination room, work table-scrub area: no detectable flow;

District Response

There is no design air control system affecting this local area. The ALARA Committee will review the ventilation flow requirements for this area within 60 days of completion of the present refueling outage.

Section 7.6.(4)

Radiochemistry Laboratory Hoods, with the face open to permit work in the hood,

by pass-through	85 lfm
small hood by door	110 lfm
oxygen analyzer hood	125 lfm
primary sample hood	60 lfm

District Response

The hoods of interest, in terms of not having high linear face velocity air flow, are of such design that an internal air supply system negates the requirement of a high face velocity. This type of hood is described in "Industrial Ventilation", "A Manual of Recommended Practices" 12th Ed., American Conference of Governmental Industrial Hygienists 1972. Description VS 203.

Section 7.6.(5)

Flow from counting room to radiochemistry laboratory as measured in doorway - 10 lfm

District Response

Air flow from the counting room to the radio-chemistry lab was measured as 10 lineal feet/minute. This interface was never designed as a positive air flow barrier. Prior to the audit, this lack of air supply to the counting room had been recognized; and a design change was in progress. New ductwork is being installed at the present time to increase the air supply from 220 cfm to 650 cfm.

Section 7.6.(6)

Cold chemistry lab

hood	125 lfm
atomic absorption hood (used for radioactive samples)	5 lfm

District Response

The chemical hood in this area is of conventional design requiring high linear air flow velocity at the face. The measured air flow meets the criteria quoted as a standard by the audit group. The small ventilation device of the atomic absorption apparatus meets the requirements of the AA equipment supplier. The fact that trace quantities of radioactive material are analyzed by this device is of no consequence because of the small quantities involved.

Appendix A, Item 5

General Procedure Development

Procedures failed to clearly identify the approval status and currentness to the user as recommended by ANSI N18.7. (Section 9.0)

District Response

Rancho Seco Administrative Procedure AP.2, Review, Approval and Maintenance of Procedures, gives the procedure to follow to ensure that all procedures used at Rancho Seco are approved and maintained current. This administrative procedure establishes the guidelines for providing technical and administrative review, including the approval for all procedures pertaining to the administration, operation and maintenance of Rancho Seco station. It describes the method of distributing procedures, ensuring that the user manuals are kept current and that all approved procedures and changes to procedures are issued under a memorandum to holders of the applicable procedures. This memorandum directs the user on how the changes should be made and what should be done to ensure their procedures are maintained current. Management assures that user procedures are kept current by requiring a signed receipt which is attached to the issuing memorandum, from the user, which indicates that the user has inserted the applicable procedures or changes. A review is made of the issuing memorandums after a selective period of time to ensure that receipts have been returned thereby indicating that the user manuals are current and up-to-date. A review has been made to determine if any changes are required in this Administrative Procedure, AP.2, to improve its effectiveness. At the present time, the District does not feel changes are required and Administrative Procedure, AP.2, is, in fact, performing its intended function.

Respectfully Submitted

Wm. C. Walbridge

Wm. C. Walbridge
General Manager

WCW:RWC:rm

Sworn to and subscribed before me

this 20th day of February, 1981.

Patricia K. Geisler

Notary Public

OFFICIAL SEAL
PATRICIA K. GEISLER
NOTARY PUBLIC - CALIFORNIA
PRINCIPAL OFFICE IN
SACRAMENTO COUNTY
My Commission Expires November 22, 1983