# U. S. NUCLEAR REGULATORY COMMISSION OFFICE OF INSPECTION AND ENFORCEMENT

		REGION V	
Report No.	50-312/78-15		
Docket No.	50-312	License No. DPR-54	Safeguards Group
Licensee:	Sacramento Municipal	Utility District	
	P. O. Box 15830		
	Sacramento, Californ	ia 95813	
Facility Na	ame:Rancho Seco		
Inspection	at:Clay Station, C	alifornia	
Inspection	conducted: Septembe	r 18-22, and 29, 1978	
Inspectors	entin.	una	10/19/18
	R. D. Thomas, Radi	ation Specialist	Date Signed
			Date Signed
	ARAL H+		Date Signed
Approved By	H. E. Book, Chief, I	Fuel Facility and Materia	als Date Signed
Summary:	Sarecy	branch	
	Inspection on Septem Areas Inspected: IE followup; Radiation audits, training, ra equipment, exposure labeling, surveys, a effort in the status miscellaneous waste the summary of annua	ber 18-22, 29, 1978 (Rep Bulletins followup; Con protection including org adiological protection pr controls, respiratory pr and notifications and rep s of an unresolved item; evaporator system; Shipm 1 man-rem exposures. Th	port No. 50-312/78-15) ifirmatory measurements anization and personnel, occedures, instruments and otection, posting and ports; Independent inspection ALARA program; Status of the ment of dewatered resins; and me inspection involved 47

<u>Results</u>: Of the eighteen areas inspected, no apparent items of noncompliance or deviations were identified in sixteen areas; two apparent items of noncompliance (deficiency - no label on container containing radioactive materials; infraction - no posting of radiation area)(Paragraph 4.H.) were identified in two areas.

inspector-hours onsite by one inspector.

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RV Form 219 (2)

# 1. Persons Contacted

\*R. Colombo, Technical Assistant

- \*R. Miller, Superviso:, Chemical and Radiation Protection
- S. Coats, Plant Health Physicist
- J. Newey, Sr. Chemical and Radiation Assistant
- W. Wilson, Sr. Chemical and Radiation Assistant
- T. Morrill, Sr. Chemical and Radiation Assistant
- S. Nicolls, Chemical and Radiation Assistant
- J. Mau, Training Supervisor
- D. Gardner, Nuclear Plant Instructor I
- J. King, Reactor Shift Supervisor
- A. Alvi, Sr. Chemical Engineer
- B. Coombs, QA Temporary Employee (VICTOR)

#### Others

L. E. Reynolds, Director of Plant Services, Chem-Nuclear Systems, Inc.

\*Denotes those attending the exit interview.

# 2. IE Bulletins Followup

The licensee's response dated August 15, 1978 to IE Bulletin 78-08 pertaining to radiation levels from fuel element transfer tubes was reviewed. All information submitted was acceptable. IE Bulletin 78-07 pertaining to the protection afforded by air-line respirators and supplied-air hoods is still being reviewed for applicability.

# 3. Confirmatory Measurements Followup

During this inspection, the analytical data results of the confirmatory measurements samples collected during a previous inspection were reviewed. (See Paragraph 8, IE Inspection Report No. 50-312/ 78-04.) Since the comparison between the DOE-RESL analytical results and those of the licensee contained some items of disagreement, the licensee agreed to resample those items for another comparison. The final results of all analytical data will be reported in a subsequent inspection report.

4. Radiation Protection

A. Organization and Personnel

All organizational changes made since the last inspection of the radiation protection program were reviewed. As of January 1978, the Chemical and Radiation Protection Supervisor reports directly to the Plant Superintendent. One Senior Chemical and Radiation Assistant was transferred to the training group which left one opening for a Senior Chemical and Radiation Assistant. The present staffing consists of a Supervisor, a Plant Health Physicist, a Plant Nuclear Chemist, three Senior Chemical and Radiation Assistants, nine Chemical and Radiation Assistants, a secretary, and two clerks. The recent overall changes in plant management and reporting staff functions were submitted to NRR on February 21, 1978 for a Technical Specification change. Staff personnel are maintaining the required Technical Specifications qualifications by attending training seminars and classes. Two Senior Chemical and Radiation Assistants received the National Certification for Radiation Protection Technologists in 1977.

No items of noncompliance or deviations were identified.

B. Audits

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The QA audits relative to the radiation protection program were examined. Audit 0-104, conducted on February 17, 1977, indicated that the Solid Waste Storage Inventory and Disposal Log form was not being used. Audit 0-174, conducted on February 28, 1978, indicated that the above situation had been corrected. All audits had been conducted in accordance with Section 6.5.2.8 of the Technical Specifications.

No items of noncompliance or deviations were identified.

C. Training

The records since the last inspection relative to training in the radiation protection program were examined. Since the last inspection, the training program has grown considerably with the establishment of a training office staffed with qualified instructors. The licensee established a new training procedure, AP-700, effective May 1978. The new procedure implements Technical Specification 6.4 Training. The examination of the training records indicated that courses in health physics are taught twice a week for two hours. Training in respiratory protection is also given twice a week for two hours. Classes are limited to approximately eight students so "hands on" demonstrations can be conducted. Numerous slides with verbal explanations are used throughout the courses.

No items of noncompliance or deviations were identified.

#### D.

## Radiological Protection Procedures

Since the last inspection in this area, there have been several changes in the Radiation Control Manual. Several procedures have been added concerning the use, operation, and calibration of various types of instrumentation. A series of procedures associated with AP-305-15 is being added on the instructions for the use of various types of respiratory protection apparatus. AP-306, Section VIII, entitled, "Quality Control-Laboratory Operations-Revision 11," has been established as the quality control procedure for the analytical laboratory. AP-305-2, Revision No. 1 was established to cover the use of film badges instead of TLD badges. As the result of Audit O-174, dated February 28, 1978, AP-305-20 was established as the whole body counting procedure. All procedures had been reviewed by the PRC and approved by the Plant Superintendent in accordance with Section 6.8.2. of the Technical Specifications.

No items of noncompliance or deviations were identified.

#### E. Instruments and Equipment

Over the past year, the licensee has purchased several pocket dosimeters, 0-500 mr range, full face respirators and the supplied-air manifold type masks. Two Victoreen 470 A Panoramic Survey Meters, two Technical Associates Cutie Pies, 0-250 R/hr range, and one Xetex, 0-1000 R/hr range instrument have also been purchased. New walkie-talkie radios for the emergency lockers are on order.

The records of calibration for the remote area monitors, stack monitors, and portable survey instruments were examined. The remote area monitors and the stack monitors are being calibrated in a timely manner in accordance with the Technical Specification requirements. Portable survey instruments are being calibrated in accordance with the Radiation Control Manual Procedures which specify either a three-month or sixmonth calibration cycle, depending upon the type of instrument. An examination of the records indicated some cases where the three-month cycle had slipped to four or five months, and the six-month cycle had slipped to seven or nine months between calibrations. This problem was discussed with the licensee, and it was proposed by the licensee that all portable survey instrument calibration would be placed on a surveillance procedure schedule in order to maintain timely calibrations. A sample of available portable instruments examined were in calibration.

No items of noncompliance or deviations were identified.

# F. Exposure Control

## (1) External Exposures

As of June 1978, the licensee started using a film badge service instead of the TLD badges. An examination of the exposure records for 1977 and the first two quarters of 1978 indicated that quarterly radiation exposures ranged from 10 mrems to 1.04 rems. The maximum annual exposure was 2.175 rems. Pocket dosimeter records were also examined for the same period of time. All dosimeter readings were within reasonable agreement with the TLD and film badge data.

# (2) Internal Exposures

The licensee performs routine whole body counts on individuals who may be exposed to airborne contamination. Whole body counting frequency is determined by the type of work being performed. Normally, whole body counts are performed annually. Whole body counts are given to newhires working in radiation controlled areas, and individuals terminating employment. An examination of the whole body counts for the period of March 1976 to July 1978, indicated maximum body contamination levels as follows; Cs-137, 0.025% MPBB, Co-58, 0.152 % MPBB, and I-131, 0.507% MPBB.

No items of noncompliance or deviations were identified.

# G. Respiratory Protection Control

The licensee maintains a respiratory protection program in accordance with 10 CFR 20.103 and Regulatory Guide 8.15. The program is implemented by the use of AP-305-15 and supporting procedures listed in AP-305-15A through AP-305-15H. A discussion was held with the licensee concerning the use of unapproved respiratory protection apparatus and the use of sorbent canisters or cartridges for protection against radioactive gases or vapors. The licensee agreed that if unapproved respiratory protection apparatus or masks with sorbent canisters were used, no credit for the protection factors would be assumed.

The licensee is presently using an evaluation technique which relates air contamination monitoring results to the whole body counting data in order to determine the internal exposures. It was noted and discussed with the licensee that the NRC has placed an interpretation on this type of evaluation as follows, "If respiratory protection equipment was worn, then bioassays and other measurements may be utilized to determine whether intake limits have been exceeded; however, if no respiratory protective equipment was worn, the determination must be based on the highest values whether determined by air concentration measurements or bioassay results."

No items of noncompliance or deviations were identified.

### H. Posting and Labeling

During a walk-through inspection and radiation survey conducted by the inspector in the Auxiliary Building on September 21, 1978, the posting of radiation areas and the labeling of components containing radioactive materials were examined. It was noted by the inspector that the licensee has made an assertive effort to maintain proper postings at all levels in the Auxiliary Building and the general status of posting had improved over previous inspections. However, during the radiation survey conducted by the inspector, a Vent Rig Filter container was identified in the machine shop which did not have the required labeling and posting. Radiation levels associated with the container ranged from 480 to 550 mr per hour on contact with the surface. The radiation level at ten feet from the container was 5 mr per hour. The radiation area was not posted as required by 10 CFR 20.203(b). The container was not labeled as required by 10 CFR 20.203(f). The lack of labeling and posting associated with the container were identified as two items of noncompliance. A discussion with the licensee disclosed that the container had previously been located in a posted radiation area; however, it had been inadvertently removed from the posted area and placed in the machine shop only a few hours before the walk-through inspection and radiation survey were conducted by the inspector.

The posting required by 10 CFR 19.11 was observed on the bulletin board located in the hallway on the third floor of the Auxiliary Building.

### I. Surveys

The licensee conducts physical radiation surveys daily. Air contamination checks are made approximately two times a week at different locations within the Auxiliary Building. The physical radiation survey and air contamination records for the period of January 1978-September 1978 were examined. The radiation levels ranged from 2.5 R/hr to 5 mr/hr (beta-gamma) depending upon the location of the survey. The maximum

radiation level was 70 R/hr (beta-gamma) in the PZR Spray Valve Area. Contamination levels ranged from 10<sup>2</sup> to 10<sup>6</sup> dpm/100 cm<sup>2</sup>. The maximum air contamination levels determined<sub>5</sub> during a gas\_leak at the -20 feet level ranged from 1.2 x 10<sup>9</sup> to 3.0 x 10<sup>5</sup> uCi/ml (gaseous), and 2.7 x 10<sup>-11</sup> to 2.2 x 10<sup>-9</sup> uCi/ml (particulate). Neutron surveys conducted on January 28, 1978 inside the biological shield in the Reactor Building indicated levels of 50 mrems/hr to 500 mrems/hr depending upon the location inside the shield. Some areas with neutron streaming recorded up to 1000 mrems/hr. The reactor was at a maximum of 3.0% power during the survey.

The leak test records for eight sealed sources were examined for the period of August 17, 1976 to August 22, 1978. All results were less than 0.005 uci of contamination, and all tests had been performed in a timely manner on a six-month cycle.

No items of noncompliance or deviations were identified.

#### J. Notifications and Reports

Discussions with the licensee indicated that there had been no loss or theft of materials, no reportable radiological incidents, and no overexposures to radiation in the past year. The annual 10 CFR 20.407 personnel exposure and monitoring report was submitted to the NRC on March 14, 1978. The termination reports required by 10 CFR 20.408 are submitted routinely to the NRC and to the individual in accordance with 10 CFR 19.13. Upon termination, a formal letter is sent to the employee containing the NRC Form 5, whole body counting data, and any other bioassay data results. When a NRC Form 5 is not available, a form letter equivalent to a NRC Form 5 is sent to the individual.

The 1978 semiannual report on Effluent and Waste Disposal was reviewed as a part of this inspection. The report appeared to be complete. No trends were noted. The reporting of semiannual effluent releases appeared to be consistent with the Technical Specification requirements.

No items of noncompliance or deviations were identified.

#### 5. Status of Unresolved Item

In response to NRC letter dated August 7, 1978 from the Division of Operating Reactors (DOR) the licensee is taking corrective action on the unresolved item described in NRC Inspection Report 50-312/77-17, Paragraph 5.E. and 7.(1). The corrective action being taken

by the licensee is to purchase and install new gaseous and particulate monitoring equipment with ranges which would ensure an "on-scale" indication of the airborne radioactivity inside the Reactor Building. The presently installed gaseous and particulate detector channels will remain on line to monitor the reactor stack effluents during the purging operation. In addition to the new monitoring channels, a radioactive iodine monitor is also being installed to be able to monitor for the 1 gpm leakage as specified in Section 3.1.6.2 of the Technical Specifications. Pursuant to a discussion with the licensee on October 11, 1978, it was determined that the installation of the new monitoring equipment will require approximately one year to complete. In the interim, to fulfill the intent of the requirement of Section 3.1.6.7. of the Technical Specifications, which requires the monitoring for radioactivity associated with primary coolant leakage, the licensee has agreed to perform an evaluation study of the radioactivity sources present within the Reactor Building during purging operations. The results of the evaluation study will establish the feasibility of taking daily airborne radioactivity grab samples to monitor for reactor coolant leakage during purging operations when the currently installed monitors function as vent effluent monitors. Based upon the actions being taken by the licensee, this item is considered closed.

### 6. ALARA Program

A discussion was held with the licensee in regard to establishing an in-house ALARA program as outlined in Regulatory Guides 8.8 and 8.10. It was determined from the discussion that the licensee does not have a specific ALARA program, however, the licensee does practice the operating philosophy and concepts of ALARA. An examination of the overall radiation protection program indicated several areas where the ALARA concepts were being practiced. The licensee stated that Regulatory Guides 8.8 and 8.10 would be reviewed from the standpoint of establishing an in-house ALARA program.

## 7. Status of Miscellaneous Waste Evap ator System

A discussion was held with the licensee's Senior Chemical Engineer in charge of developing the waste evaporator system. The system will be designed to remove tritium from the liquid waste system thereby reducing the overall quantity of liquid waste for disposal. The design of the evaporator system is still in the conceptual stages of development. No hardware has been obtained. The operation of the evaporator system will be on a batch process with a water reduction rate of approximately five gallons per minute. It has been estimated by the licensee that approximately 100 curies of tritium would be released to the atmosphere per year. The release of tritium to the environment has been evaluated from an offsite exposure standpoint by the licensee in Appendix 11B of the Final Safety Analysis Report, Volume VI, for the Rancho Seco site. Based upon steam dilution factors and dispersion at the point of release, tritium airborne concentrations at the site boundary should remain within acceptable limits. Construction time is estimated to be 18 months to a year. The operation and installation of the evaporator system will be reviewed and approved by SMUD management and the NRC prior to use.

# 8. Shipment of Dewatered Resins

During this inspection, a transfer of dewatered resins was observed at the Rancho Seco Site. The resins were being transferred to a Chem-Nuclear Systems cask located on a Tri-State Company truck. The radiation levels at the fence surrounding the operation were 3.0 to 3.5 mr per hour. The area was posted in accordance with 10 CFR 20.203. A review of the shipping container indicated that the container had been approved by the NRC, and the licensee had a certificate of compliance on file with the NRC.

No items of noncompliance or deviations were identified.

## 9. Summary of Annual Man-Rem Exposures

A review of the annual man-rem exposures for the period of January, 1974 to August, 1978 was completed. The following data were obtained:

1974	0.941 man-rem
1975	20.226 man-rems
1976	51.91 man-rems
1977	406.25 man-rems
1978	35.039 man-rems (as of August)

The exposures in 1977 is attributed to the refueling outage and the inspection and repair of the steam generators. The exposure data does not indicate any adverse trends.

#### 10. Exit Interview

In addition to those individuals denoted in Paragraph 1, the following individuals were in attendance: P. Oubre, Plant Superintendent; W. Ford, Nuclear Operations; N. Brock, Electronics/I&C Supervisor; H. Funk, Plant Scheduler; and G. Coward, Maintenance Supervisor. The inspector summarized the scope and findings of the inspection. The items of noncompliance were identified and discussed. A discussion was held pertinent to the corrective action being taken by the licensee to correct the unresolved item relative to monitoring coolant leakage during a purging operation of the Reactor Building. The licensee was informed that the unresolved item was closed. (See Paragraph 5.) The ALARA program was discussed relative to the establishment of a specific program for Ranch Seco. (See Paragraph 6.) A discussion was also held on the use of proper radiation area signs to indicate the present level of posting. It was pointed out that several areas were posted as high radiation areas, but the radiation levels present were less than 100 mrems/hr which would require the areas to be downgraded to radiation areas. (See Paragraph 4.H.)