U. S. ATOMIC ENERGY COMMISSION

DIVISION OF COMPLIANCE

REGION V

Report of Investigation

CO Report No. 50-133/71-01

Licensee:	Pacific Gas and Electric Company (Humboldt Bay) License No. DPR-7 Category C Complaint - Allegations by a former employee that radiation safety was deficient at the Humboldt Bay Power Plant.
Dates of Investigation:	May 11-12, May 19-20, May 26-28, July 20-21, and August 2, 1971

Investigator: John J. Ward — 9/15/71

John J. Ward, Investigation Specialist — Date
Region V, Division of Compliance

Reviewed By: G. S. Spencer — 9/15/71

G. S. Spencer, Senior Reactor Inspector — Date
Region V, Division of Compliance

Proprietary Information: None

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REASON FOR INVESTIGATION

Inquiry from the District Attorney, Humboldt County, Eureka, California, and a letter of complaint dated April 30, 1971, to AEC from Robert J. Rowen, Jr.

SUMMARY OF FACTS

Mr. Rowen's letter, and subsequent interviews with him, delineated forty-nine separate instances wherein he believed radiation protection procedures or practices were deficient or actual incidents had occurred. One other instance was described by another Control Technician which indicated a possible inadequate evaluation and overexposure to personnel resulting from a pump seal failure.

Investigation at the plant, examination of plant records, and interviews with all persons who would have firsthand knowledge of the specific incidents or allegations were undertaken. The investigation has found that, except for the two instances cited below, none of the other alleged occurrences were in violation of AEC regulations. Several allegations made by Mr. Rowen were substantiated; however, none of these alleged occurrences caused any overexposures to personnel, or endangered health and safety.

The investigation has found the licensee to be in noncompliance as follows:

> Contrary to the requirements of 10 CFR 20.408, "Reports of personnel exposure on termination of employment or work," a report on his radiation exposure had not been given to Robert Rowen within the time limit prescribed. (See paragraph 139, Details.)
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> Contrary to the requirements of 10 CFR 20.201, "Surveys," adequate surveys were not made for radioactive particulates in the air prior to employees entering the dry well access shaft on June 21, 1970, when the cleanup pump seal failed. (See paragraphs 230, 231, Details.)

Additionally, the investigation found one potential item of health and safety significance in that:

> A possibility exists for the plant domestic water system to be indirectly contaminated with reactor water. (See paragraphs 134-137, and 145, Details.)

DETAILS

Background

1. On February 3-5, 1970, Mr. R. T. Dodds, Reactor Inspector, Region V, conducted an announced inspection of the licensee's reactor facility 1/. Mr. Dodds was accompanied during the inspection by Mr. J. R. Metzger, Radiation Specialist, Region V. In the course of the inspection, Mr. Dodds and Mr. Metzger privately interviewed Mr. R. Rowen, Jr., a Control Technician, who was working in Chemistry during the fourth quarter of 1969 when he was exposed to 4200 mrem which included 1000 mrem gamma and 3200 mrem beta. Mr. Dodds' interrogation of Mr. Rowen did not develop any substantial variance from the licensee's investigation of this unusually high exposure which concluded that the exposure could not be explained on the basis of his routine occupation. This discussion appears on page 16 of the inspection report.

2. On May 27, 1970, Mr. Herbert E. Book, Senior Radiation Specialist, Region V, received a telephone call from Mr. J. C. Carroll of the Pacific Gas and Electric Company (PG&E) San Francisco offices stating that he wanted to relay some information on a personnel problem that had developed at the Humboldt reactor. He stated it involved two control technicians at the reactor who were giving the company problems. He identified them as Mr. Forrest Williams and a Mr. Rowen. He stated these individuals made an unfounded accusation, at a regular safety meeting, that the company had deliberately set the alarm points higher on the hand and foot counters during the last reactor outage to avoid detection of contamination and subsequent embarrassment of management and to speed up the flow of personnel in and out of the radiation area.

   He stated PG&E security had made an investigation of these individuals and, reportedly, both were active in the SDS movement and other militant groups at the College of the Redwoods, with one having been heard to threaten burning the College down. Mr. Carroll stated that Mr. Williams possibly would place a complaint with AEC. Mr. Carroll stated that the PG&E contract with the Union prohibited employees from complaining to the AEC. Mr. Book told Mr. Carroll that this prohibition may be in conflict with AEC regulations which require posting of Form AEC-3 and encouraged radiation workers to come to AEC if they had problems or complaints. Mr. Book recorded this conversation in a Memorandum to File, dated June 1, 1970 (Exhibit A).

3. On July 7, 1970, Mr. Book received a telephone call from Mr. Ed Weeks at the PG&E Humboldt reactor who wished to discuss their practices regarding the alarm point settings on the hand and foot counter at the reactor. He stated they had been attempting to maintain the alarm point at 80 to 100 cpm over background by changing the alarm point twice per shift in an attempt to "follow" the changing background (caused by the effluent plume shifting with the slight variations in wind direction) which varies from 300 to 500 cpm. Mr. Weeks stated they were

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1/ Inspection Report No. 50-133/70-1 of inspection conducted February 3-5, 1970.

considering setting the alarm point at 560 cpm. He stated they had done this previously with no problems. He stated no problems of contamination spread to the clean areas had occurred. Mr. Book informed Mr. Weeks that the proposed settings above background were conservative and AEC had no specific requirements on the settings. Mr. Book recorded this conversation in a Memorandum to File dated July 9, 1970 (Exhibit B).

4. A letter dated September 14, 1970, to the Director, Region V, from Robert J. Rowen, Jr., asked if a nuclear power plant employee had the right to contact the AEC Compliance Division about radiation protection safety problems. By letter dated September 16, 1970, from the Director, Region V, to Mr. Rowen, he was told that he most certainly had the right to do so as stated in Form AEC-3.

5. In response to a similar letter, also dated September 14, 1970, L. D. Low, Director, Division of Compliance, advised Mr. Rowen that if he had information indicating any violation of AEC regulations or endangering health or safety of any person that he should inform the Region V office promptly.

Introduction

6. On May 5, 1971, Mr. William F. Ferroggiaro, Jr., District Attorney of Humboldt County, California, appeared at the Region V office and met with R. W. Smith, Regional Director; G. S. Spencer, Senior Reactor Inspector; and, H. E. Book, Senior Radiation Specialist. Mr. Ferroggiaro stated he was seeking information on behalf of the Humboldt County Grand Jury regarding an allegation made by two PG&E employees who work or had worked at the Humboldt reactor. Mr. Ferroggiaro said the two employees, he identified as Robert J. Rowen and Forrest Williams, stated that they had been required by PG&E management to certify to standards which they felt were not being met by the plant. He said he believed the complaint was related to the release of effluents from the plant, but he had no details on the allegations.

7. Mr. Ferroggiaro was told that the AEC had received a letter from Mr. Rowen inquiring into an employee's right to talk to Compliance, but had received no complaint either from him or Mr. Williams. Mr. Ferroggiaro was informed that, because of his inquiry, the AEC would conduct an investigation into this allegation and that he would be contacted by the investigators on the morning of May 11, 1971.

8. On May 6, 1971, a letter of complaint dated April 30, 1971, addressed to the Director, Division of Licensing and Regulation, from Robert J. Rowen, Jr., was received in the Office of the Director of Regulation. A copy is attached (Exhibit C). Two typographical errors on page 5 of the letter were later corrected on the copy by Mr. Rowen, who initialed these corrections.

9. An investigation was commenced at Eureka, California, on May 11, 1971, by Herbert E. Book, Senior Radiation Specialist, Region V, and the Investigator, John J. Ward. It was continued at Eureka, and the Humboldt Bay Power Plant (HBPP) on May 19-21 by Jesse L. Crews, Reactor Inspector; Harry S. North, Radiation Specialist; both Region V, and the Investigator.

Additional investigation was conducted at San Francisco, and Walnut Creek, California, by the Investigator on May 26; and at Eureka and the Humboldt Bay Power Plant on May 26-28, by Mr. North and the Investigator. Information developed by the assistants to the Investigator during interviews of principals and the review of the licensee's records has been incorporated into the following chronological narrative.

Investigation at Eureka, California, May 11-12, 1971

10. On May 11, 1971, at 9:00 a.m., Herbert E. Book, Jr., Senior Radiation Specialist, Region V, and the Investigator met with Mr. W. F. Ferroggiaro, Humboldt County, California, District Attorney, and Mr. Robert D. Hickok, his Chief Investigator, in the Humboldt County Courthouse, Eureka, California. Mr. Ferroggiaro was told that we would investigate the matter he had informed us of on May 5, but that in the meantime we had received a letter of complaint from another source concerning the same matter. He was told we would proceed on the basis of the latter complaint, and that we could not identify the complainant to him. Mr. Ferroggiaro was asked if his department was considering an investigation of its own and if our investigation would interfere in any way. Mr. Ferroggiaro stated that his department planned no investigation, that he had referred the matter to AEC, and had no objection to our investigation. He stated he would like to be verbally informed of the results of our investigation. He was told that this would be furnished to him. Mr. Ferroggiaro subsequently confirmed this conversation in a letter to the Director, Region V (Exhibit D).

11. Mr. Ferroggiaro stated that both he and Mr. Hickok knew Mr. Rowen and believed him to be a concerned and conscientious individual. He stated that some two years ago Mr. Rowen had observed an incident of a police arrest of an individual wherein a policeman had used undue force in arresting an Indian youth and that Mr. Rowen had gone to the District Attorney about this incident, saying that he was willing to testify in any legal proceeding. Subsequently, according to Mr. Ferroggiaro, there was a suit filed and the decision in the resulting trial was in favor of the Indian youth, whose name was Walters.

12. Mr. Ferroggiaro stated that he expected a call from Mr. Rowen at about 9:55 that morning and that he would advise Mr. Rowen that he should call the AEC investigator at his hotel room that day. At approximately 10:30 a.m., Mr. Rowen telephoned the Investigator and stated that he would appear for the interview at 6:30 that evening.

Interview of Robert Jack Rowen, Jr., on May 11, 1971

13. At 6:40 p.m. on May 11, Mr. Rowen appeared at Room 23 of the Lamplighter Motel in Eureka for interview by Mr. Book and the Investigator. He was accompanied by another individual whom he introduced as his brother, Frederick Arthur Rowen, whom Robert Rowen stated he wanted to be present during the interview. Mr. Rowen stated his brother would record the interview on his tape recorder, which he had with him, if the investigators had no objection. He was told we had no objection to the recording, providing a copy of the

transcript was furnished the AEC. Mr. Rowen stated he would do this and he was given the Investigator's card containing the address to which he should send the transcript.

14. Mr. Rowen was told the AEC had received his letter of April 30 and that we wished to investigate the matters brought up in that letter. He was told we wished to question him concerning the numbered items in the letter and the other matters mentioned as well as to receive from him all other such information that he wished to give. He was told his confidence would be protected and that he would not be identified as the source of the information furnished, during the course of the investigation or thereafter. Mr. Rowen stated that he was gratified to be able to do this. He stated he had not been able to contact AEC during his employment with the licensee and had been specifically prohibited from doing so. He stated he had obtained copies of a number of company memoranda and copies of pages from the Control Technicians' log books which were concerned with the specific incidents he wished to discuss. During the interview, he produced copies at intervals and allowed the investigators to review them briefly. He stated he could not furnish copies to the investigators. Mr. Rowen also exhibited a copy of what he termed the "black book" the company had kept on him which recorded all the occasions when the company and he had had disagreements. He stated this book (a loose leaf binder with pages, approximately 1-1/2 inches thick) had been subpoened during the union arbitration hearing in his case and that the union had subsequently furnished him a copy.

15. Mr. Rowen stated he was born December 28, 1940, his social security number is 552-52-9526, his address is 2504 "O" Street, Eureka, California, and his telephone number (unlisted) is 443-3689. He stated he is attending Humboldt State College in Eureka where he is a Senior and that he works part time driving a school bus for the Eureka High School. He stated he was employed by PG&E from April 2, 1962, to the time that he was discharged from the company on June 5, 1970. He stated he was first employed as an electronics technician; in August 1964, he was made a Control Technician apprentice, and between 1968 and June 1970 had been a journeyman Control Technician (CT). He stated that job consisted of his being assigned in rotation to duties of nuclear instrument repair and maintenance, chemistry (taking samples and analyzing them), and radiation protection monitoring. He stated there were seven control technicians in the plant who would also do these duties on a straight day job rotation.

16. Mr. Rowen was questioned about the examples cited in his letter to AEC of April 30, and they were discussed in the same order as they appear in the letter.

Mr. Rowen explained that Routine Work Permits did not reflect the levels of radiation exposure currently experienced in particular areas of the plant, particularly those for taking water and gas samples. He explained that the levels used on the work permits were set several years ago when the background levels were lower. He said the permits were developed when the plant was new and specified dose rates of from 5 to 50 mr/hr for the work. He said as the reactor got older and failed fuel developed, the actual dose rates on samples were up to 2500 mr/hr, but the conditions of the Work Permits were not changed. He considered working under the outdated conditions of the work permit to be in

violation of procedures. He also said that for a long time the beakers and other sample containers were handled directly, but after repeated insistence by him and other employees, tongs and other handling devices were furnished.

17. Concerning the smears taken of material to be shipped, Mr. Rowen said that in early August, 1969, a shipment of spent fuel was being prepared and decontamination of the spent fuel shipping cask was going on around the clock, with little reduction in some contamination levels. Smear results indicated a relatively small area around the circumference of the cask at the top and a similar area at the bottom of the cask were low in contamination and the middle of the cask was still high. The cask was scheduled to be shipped, and the shipping papers had already been typed indicating removable contamination of less than 2200 d/m which is a Department of Transportation (DOT) limit. Mr. Rowen said Mr. Gale Allen, Radiation Control Engineer, instructed him to wipe only the top and bottom areas of the cask known to be relatively clean. He did this, and the eight smears averaged 2610 d/m. After some argument, the shipping document was changed to reflect this number and the cask was shipped. Mr. Rowen's objection was that the small area smeared (800 cm^2) was not representative of the total area of the cask which he described as 10 or 12 feet high and 5 feet in diameter, with a finned exterior. He also stated that known areas of higher contamination levels were avoided during the smear survey. Mr. Rowen exhibited a copy of a handwritten log sheet dated August 6, 1969, stating that R. Skidmore took wipes of the center section of the cask and found it "out of limits," and that 20,000 c/m existed around the seal. In answer to Mr. Book's question, Mr. Rowen estimated the center section of the cask to be 4,000 to 6,000 c/m on smears[2/].

18. Mr. Rowen also exhibited a description of this situation written by Mr. Allen, verifying the change made in the shipping document and verifying the 20,000 cm/ level around the cask seal. Mr. Allen's description stated the final wipes of the cask were less than 50 c/m. Mr. Rowen said this was a kotex swab wipe of the cask, checked with a portable GM instrument when the cask was removed from the restricted area. We asked Mr. Rowen where he obtained the document by Allen. He said it was part of the "black book" compiled on him by PG&E prior to firing him.

19. Next Mr. Rowen spoke of a case where PG&E management wanted to take a group of visitors on a tour of the refueling building. According to Rowen this was done normally by laying down clean sisalcraft paper, and putting up standards, ropes and signs to keep the visitors on the clean paper. In this particular case, the tour was not planned beforehand, but was decided upon a short notice. Management was in a hurry, and according to Rowen wanted to utilize used paper of doubtful contamination status previously used in the refueling area, and no ropes, signs or standards. According to Mr. Rowen, at his insistence the established practice of clean paper with standards, ropes, and signs was followed

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2/ (Book's Note: On the counting equipment being used, d/m is normally about c/m times 2.)

20. Mr. Rowen stated that most work performed over the reactor core when the plant is shut down is done from a work platform installed over the vessel flange after the reactor head is removed. When this platform is not in place, company regulations require workers to wear a safety harness and rope. He said during the refueling outage of April, 1970, he observed instrument people and other maintenance personnel working over the open reactor without safety harnesses and ropes. Mr. Rowen objected to his supervisor, the Radiation Protection Engineer, who stopped the work until harnesses were obtained. According to Mr. Rowen, Mr. Weeks, the Plant Engineer, ridiculed his concern later and said harnesses were not absolutely necessary.

21. Concerning being refused permission to speak to an AEC inspector, Mr. Rowen stated this occurred at the time Mr. Dodds was making an inspection at the plant on May 10-12, 1970. Mr. Rowen stated he saw Mr. Dodds in the plant at about 4:15 p.m. on May 10. He recognized him from having talked to him during the February, 1970, inspection (see paragraph 1).

Mr. Rowen stated he asked the shift supervisor, John Kamberg, if he could talk to Mr. Dodds. Mr. Kamberg said he would check with management, and at 4:25 told Rowen the request was denied. The next morning Mr. Rowen was called into the Manager's office where Messrs. Weeks, Boots and Raymond talked to him and wanted to know why he wished to talk to the AEC inspector. Mr. Rowen stated he told them he felt he had achieved no results in bringing safety matters to the attention of management and the union at safety meetings. Mr. Rowen stated that he had 21 items concerned with safety which he then proceeded to describe to Mr. Weeks. He stated Mr. Weeks agreed with him about some items and said corrective action would be taken. One of the items involved the replacement of incore monitors. Mr. Rowen stated that in flushing the seats for the monitors, underneath the reactor, employees often experienced high level contamination on skin, hair, shoes, and personal clothing, in spite of the use of protective clothing. Mr. Weeks agreed this was a bad situation and something would be done about. Mr. Rowen stated he replied that the situation had existed since 1966 and nothing had been done about it.

22. Mr. Rowen stated that at the conclusion of this meeting, Mr. Weeks told him he did not have permission to speak of these matters to Mr. Dodds. Mr. Rowen stated he wanted this in writing. Mr. Weeks stated he would not put it in writing, but "It will not pay you to talk to AEC on company time. Of course, you can see him after hours, but you will place yourself in serious jeopardy."

Concerning his prior discussion with Mr. Dodds during the February 1970 inspection, Mr. Rowen stated that in addition to the discussion of the high dose on his film badge (as noted in the inspection report), which he could not account for, he had discussed the uneven distribution of exposure among workers and situations when changes in equipment, shielding, or procedures would have reduced exposures. He said Mr. Dodds told him he could not do much about this as long as the personnel exposures were within AEC limits, and this was a matter for discussion between management and the employees or the union. He stated

he also told Mr. Dodds about an occasion he learned of by hearsay when Chet Bartley, a shift foreman, off-shift auxiliary operator, was shifting spent and new fuel elements around in the fuel storage pool. He stated the hoist had not been checked before use and on the first shift of an element the hoist automatic stop malfunctioned and the fuel element was lifted clear out of the water before the hoist could be stopped. He stated by mere chance the element was a new one. Rowen said if it had been a spent one, serious exposures, with possible melting of the element, could have occurred.

23. Concerning his comment on page 3 of the letter about the PG&E agents and Police Chief Emahiser of the Eureka Police Department, Mr. Rowen stated this came about after he and Mr. Williams had attended a safety meeting on May 20, 1970. Under "new business" at the meeting, Rowen stated he asked "off the top of his head" a question of the chairman "whether PG&E considered ionizing radiation to be a carcinogenic agent." He stated the chairman did not understand the term "carcinogen" and the question was referred to the RSO. In the subsequent discussion Rowen stated he and Forrest Williams discussed the 21 items he wanted to bring to their attention as poor safety practices. Included among these were: improperly high settings of hand and foot counter alarm settings, radiation levels at the school across the highway, and the condition of the high level waste vaults. (Rowen believes when the lids are removed from the high level waste vaults there is a good probability of high level radioactive material escaping to the unrestricted area.)

24. Mr. Rowen stated that on May 21, 1970, he and Mr. Williams were asked to appear at the Plant Manager's office to be interviewed by Mr. Burt Jones, PG&E Security Agent, from San Francisco, and Mr. Robert Taylor, PG&E Personnel Manager. He said they questioned him and Mr. Williams on their motives for bringing up all the questions at the safety meeting. Mr. Rowen stated that he told Mr. Jones that he had brought the matters up in good faith and he refused to talk to Jones further. He told him he would discuss the matter further through union channels. Subsequently, on May 25 or 26, Forrest Williams was discharged for insubordination.

25. Mr. Rowen said on May 29, 1970, he put up a collection box at the plant so employees could contribute financially to aid Mr. Williams and his family. He was told this was against company policy, was required to take the box down, and was reprimanded for putting up the collection box. Mr. Rowen said he was so upset by these matters that he was physically ill and went home sick about noon. Mr. Rowen said Mr. Weeks reportedly received a telephone call late that afternoon at his home from a man whose voice he thought he recognized as Mr. Rowen's. The caller informed Mr. Weeks that if he continued his present course of actions he would "break his stupid arm." Mr. Rowen denied making the call.

26. Mr. Rowen stated the next working day, on Monday, June 1, 1970, he was informed at noon that he was suspended from employment indefinitely pending a PG&E investigation of the matter of the alleged threatening phone call to Mr. Weeks, and Mr. Rowen's actions at the May 20, 1970, safety meeting. He stated Chief Emahiser wrote a report on June 3 at the request of PG&E which named Darington, Skidmore, Williams, and Rowen, and described them as four activist types involved in a plot to blow up the power plant. It stated they were known

dissenters, are known as a group, and all live at the same address, 1503 O Street. He stated he had personally asked Chief Emahiser if he had written such a report and the Chief said he had. Mr. Rowen stated he had seen a copy of the report which a friend had showed him. He stated he had not been allowed to make a copy, but had taken notes from it. He stated copies of the report had been sent to Messrs. Jones and Taylor of PG&E, and that Mr. Hickok of the District Attorney's Office had told him a copy had been sent to the FBI. He stated the report gave a synopsis about each of the captioned subjects. The synopsis concerning Rowen stated he had read Rapp Brown and Eldridge Cleaver, and that Mr. Jones and Mr. Taylor had stated that he had advocated fire-bombing, violence, etc., and that he was a confirmed "Cop hater."

27. Concerning these statements, Mr. Rowen said he had checked and found there is no such address as 1503 O Street. He stated some years before he had lived at 1503 G Street, which may have been misread by the investigators. He stated the implication that they lived as a group was absurd since they were all married and lived in separate homes. Rowen stated all of the above statements concerning him were untrue. He stated the report further stated Rowen had appeared as a witness in the Walters' case which was true, and that there was no record from Sacramento 3/. It stated further that he was one of the protesters about adult fees at the College of the Redwoods and that he may have made a threatening phone call to the wife of the manager of the water company with whom he had an argument.

28. Mr. Rowen said as a result of the PG&E and police investigation he was discharged on June 5, 1970. He stated he received a letter from PG&E dated June 5, 1970, three or four days after that, which stated he was discharged for the following reasons:

1. Failure to follow instructions.
2. Insubordination.
3. Poor performance record.
4. Harrassing the company and supervisors.
5. Poor work attendance and threatening a supervisor with bodily harm.

29. Mr. Rowen then described the Walters' case, an incident he observed at a grocery store in Eureka some two years before. The situation involved what Rowen considered to be undue force and brutality on the part of the Eureka Police Department officer in making an arrest of Walters, a 20 year old Indian boy who was drunk and creating a disturbance in the store. Mr. Rowen said he was concerned enough that he went to the District Attorney's office and made a complaint, which was investigated by the District Attorney's office. Rowen said subsequently the victim of the alleged police brutality sued the officers and the City of Eureka. Rowen said that he was subpoened by both sides in the case and appeared as a witness in the subsequent trial, which involved a $350,000 damage claim against the City of Eureka and the police officer involved. Mr. Rowen said his testimony in this case resulted in a detrimental report against him in the police department files. Concerning his argument with the water company manager, Mr. Rowen stated he

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3/ Presumably this refers to a record check of the California Bureau of Investigation.

had objected to the deposit being held by the company and which would not have been returned to him without his asking for it. He stated the day after this incident he was reprimanded at work by PG&E management for this. He stated this was typical in that PG&E management knew everything going on in Eureka by virtue of being in various civic organizations, etc.

30. Mr. Rowen said that as a result of union arbitration, Mr. Forrest Williams was reinstated at the Humboldt Plant. He said Mr. Williams went back to work for one day and asked PG&E management to have the police report removed from his file. Mr. Rowen said PG&E management refused to do this and in his words "resigned" Mr. Williams. Mr. Rowen said the other two individuals named in the police report, Mr. Skidmore and Mr. Darington, are also Control Technicians and were still working at the plant. He added that the company wants to get rid of them also because they also are critical of plant safety programs.

31. This concluded discussions of the matters included in Mr. Rowen's letter to the AEC. He was asked if he had any other situations or matters he could relate to the AEC representatives, particularly the 21 items he had mentioned previously. He said the matters discussed in his letter were a few of the cases he had observed and went on to say that he was reluctant to "put all of his apples in one basket." He said he may want to save more of his testimony and situations for other people. He indicated he was dubious of the ability or the intent of the AEC to investigate the matters he reported, to his total satisfaction. During this portion of the discussion, Mr. Rowen's brother Fred injected a question concerning the AEC's responsibility to both regulate and promote atomic energy. The Investigator refused to be drawn into that argument and told Fred Rowen that the question was out of order and not proper for discussion at that time. At about this point, however, Mr. Rowen evidently had second thoughts and began to relate other matters to the AEC representatives.

32. Mr. Rowen said that about the time of the shipping cask incident, described in paragraphs 17 and 18, some off-scale stray radiation chamber dosimeter readings occurred in the plant environmental monitoring program. He said the off-scale readings occurred at three stations in a line between the plant stack and Humboldt Hill. He referred to the three stations as the ones at the railroad track, at South Bay Elementary School, and at Humboldt Hill. Rowen said the range of the stray chambers was zero to 10 mr. He said he had personally read the chambers and had made an entry concerning the matter in the radiation protection log. Rowen could not remember a specific date although he said August, 1969, stuck in his mind. He said he did not have those records with him, but he did have a record which would specifically identify the date and also the log page number of the radiation protection log entry. Rowen verified that each environmental station also had a film badge, and there should be a film badge record for the period involved.

33. Rowen then described one situation involving personnel contamination possibly carried off site. He said a general construction paint crew had worked at the plant and had not received a survey before they left. About four days later a

radiation control technician discovered an unexplainable high background on the GM survey instrument he was using. Further investigation revealed the high background was caused by contamination on the painters who were nearby. Rowen said extensive decontamination effort, which he observed, was required to get the painters cleaned up. He said the contamination was discovered by Raymond Skidmore who still works at the plant. Mr. Skidmore also decontaminated the men, according to Rowen. Rowen said he recommended to plant management, possibly Gale Allen, that the painters' homes be surveyed, but he was told to mind his own business and the homes were never surveyed.

34. Mr. Rowen said he considered the high level waste storage vault at the plant to be a radiation safety problem. He explained that this vault is used for waste material consisting of filters, 55-gallon drums of contaminated liquid, etc. Most of this waste material is wrapped in plastic, but quite often things like welders' rods and other sharp objects are put in the plastic which causes tears and allows contamination to spread in the storage vault. He explained that the storage vault is outside and when the vault door is open this possibly causes contamination to the air immediately around the vault which can be swept downwind outside of the restricted area.

35. In 1968 or 1969, during the time that Mr. Dodds was making an inspection and Mr. Dodds and Mr. Weeks were in the upper end of the plant, Rowen and Skidmore were in the low level storage area near a 55-gallon drum containing primary reactor water. He stated that this drum had originally been in the High Level Storage Area, but it had been moved later to the Low Level Storage Area. In their moving equipment around they knocked against this drum. It had a jury-rigged fitting for a sight glass along its side which would permit one to observe the level of the liquid in the drum. They inadvertently knocked the lower fitting off the sight glass which caused the liquid in the drum to drain out. They did not observe this until it had run down under the fence onto the clean side. He stated Mr. Weeks came by at about that time, accompanied by Mr. Dodds. Weeks saw this liquid where it had spilled out of the low level storage area, recognized it for what it was, and glared at Rowen. Rowen stated a survey and cleanup were subsequently made by Radiation Protection.

36. Mr. Rowen also said he believed the settings on the hand and foot counter alarms during plant shutdown periods were higher than the usual release limits in effect at the plant. He said the plant release limit was less than 100 counts per minute over background. He said the hand and foot counter settings were 200 - 300 counts per minute over the stated plant release limit. He said during shutdown periods the background on the hand and foot counter is lower than during operation, but that other contamination monitoring equipment at the access control area had a high background because of contaminated clothing which accumulated nearby. As a result, Mr. Rowen believed people may leave the plant during shutdown periods with 300 to 400 counts per minute of contamination on their shoes, skin, or clothing.

37. Mr. Rowen then described a situation which occurred as a result of a major outage in about 1966. He said during that outage structural design changes were incorporated into the plant and this involved cutting large pieces of pipe out of the suppression chambers. He said these sections of pipes were stored in the contaminated waste area for a while and evidently somehow found their way into the uncontaminated scrap bins. Rowen said that during a survey of the clean machine shop at the plant he ran across one of these pieces of pipe with contamination of 300 to 400 counts per minute over background on the pipe. He followed up on this situation and learned that somehow the pipe had been transferred to the scrap bins and had been picked up by G&R Metals, a local scrap metal firm, a few days earlier. Rowen said Mr. Boots, the Radiation Protection Engineer, made surveys of the pipe in the machine shop and gamma scanned the contamination, and declared it not to be a problem. Rowen also said that Gale Allen told him the pipe had been surveyed. Rowen also said that he personally checked with all of the nuclear control technicians at the plant and none of them could remember having surveyed the pipe, before it had been transferred to the scrap metal dealer. Rowen said he discussed this matter with Weeks and suggested that they should go down to the scrap metal dealer and survey the possibly contaminated material. Mr. Weeks refused to have surveys made at the G&R Metals Company because he was afraid it would cause a panic, according to Mr. Rowen. Mr. Rowen said this matter had come up during the Unemployment Compensation Hearing, and he had asked during the hearing that the company produce the release survey records on the pipe. He said the company did not produce those records during the hearing.

38. Mr. Rowen then described two situations where he and others not wearing masks were exposed to the fumes from welding and cutting operations on contaminated piping. In these situations the welding or cutting was taking place in areas adjacent to other work, but upwind in the ventilation system of the plant. He used these situations as descriptive of what he considered to be poor overall control of operations in the plant during shutdown periods. He said that there were so many jobs going on that plant management could not keep track of what was going on in adjacent areas and take protective action as necessary.

39. Mr. Rowen described a situation involving the primary reactor water sample station. He said in the original design of the plant, high radiation levels were not anticipated at this location. However, as the plant operated, and "crud" built up in the system, dose rates of 200 to 500 mr per hour were experienced which later built up to 2 to 3 r/hr at the sample station. Mr. Rowen said he brought this matter up in a plant safety meeting in December of 1967. Following that meeting he said an edict came down from higher management stating that such matters were not appropriate for discussion in plant safety meetings. He said he thought this order was issued because minutes were kept of the plant safety meetings and the plant management did not want these matters to be made a matter of record. He said a copy of the minutes is filed in the San Francisco headquarters, where insurance companies would have access to them. Rowen said that about six months after the safety meeting additional shielding and remote tools were furnished, greatly reducing the radiation exposure for this sampling operation.

40. Mr. Rowen said a similar situation existed at the off-gas sampling station. He said during original operations of the plant the 15 milliliter vials used to collect the sample were handled directly, and valving involved in the sampling operations was done directly. He said finger badges were used during this operation. During later operations, he said he had measured off-scale readings on a C. P. portable monitoring instrument indicating dose rates greater than 50 r/hr at the valve of the sampling station. He said he demanded that management do something about this situation and additional shielding and extension handles were subsequently installed.

41. While he was discussing finger rings, Mr. Rowen said that at one time he exposed a finger ring secretly to a radioactive source to such a degree that it should have had a significant dose on the film. He said when the report came back from Radiation Detection Company, Mountain View, California, it indicated 0 on the finger ring film.

42. Mr. Rowen said at one point a General Electric chemist came into the plant to conduct a study. The G-E man collected some radioactive samples from plant systems, and unknown to PG&E, placed them in a lower cupboard in the chemistry lab. Rowen said at a later time he (Rowen) was performing a routine radiation survey in the toilet area on the other side of the wall from the chemistry laboratory. He said he detected 4 to 10 mr/hr on the wall beside the toilet stool. He traced this to the samples in the cupboard in the chemistry lab, which reportedly exhibited dose rates of 5 to 6 r/hr at the cupboard door. Mr. Rowen said this matter was discussed at the December 1967 safety meeting. He said the radioactive samples were later disposed of.

43. Mr. Rowen said that during refueling outages maintenance people such as welders, carpenters, pipe fitters, and other craftsmen were brought to the nuclear plant from PG&E conventional plants throughout northern California. He said that these people were not given sufficient training before they were assigned to do work in radiation areas. He said he had seen them wipe their mouths, pick materials out of their eyes, and scratch their ears with their contaminated gloves while they were working in the contaminated areas. He also described a situation involving a PG&E employee from Redding who had previously had skin cancer and was on the third year of the 5-year period which had to pass before the cancer is considered cured. He said this man was assigned to radiation work at the Humboldt Plant. Mr. Rowen said he objected to this assignment and the man was removed from the radiation work. Rowen said it was the responsibility of the Control Technicians to control the actions of these off-site personnel when they were working at the Humboldt Plant. However, he said that frequently there were four or five such jobs in progress at the same time and only two Control Technicians, and they could not watch them all at the same time.

44. Mr. Rowen said during one of these outages he was assigned to work on the instrument transmitter in the minus 66 foot level of the lower dry well. He said this transmitter was situated directly over a cleanup line which was heavily shielded with lead yet still had dose rates of 300 to 400 mr/hr at surface. Mr. Rowen said

when he got to the job location all of the shielding had been removed from the line and dose rates were 3 to 4 r/hr at the work location. He went back and told his supervisor who explained that the shielding had been taken off because the weight of the shielding might result in a problem in case of an earthquake. Mr. Rowen said he informed his management that he thought the dose rates were too high at that location to perform the work, and he said management accepted his position. He said he later learned the plant management assigned two uninformed electricians from a conventional power plant to do the work. Rowen said he again objected to plant management and the assignment of the electricians was cancelled, and the work was not accomplished during that outage. He said during these plant outages it was not unusual for electricians, welders, or other maintenance personnel from other PG&E plants to receive up to 2,800 mr on one work assignment, completed in less than an hour.

45. Mr. Rowen said during a winter refueling outage in November or December of 1967 or 1968, Mr. Skidmore was approaching his 5 R annual limit. According to Rowen, Skidmore was assigned to work on an off-gas detector monitoring system. While Skidmore was actually working on the assigned job, the report of the last film badges was received from the film badge supplier, and this report indicated Mr. Skidmore had an annual radiation dose of about 4,900 mr. Mr. Rowen said plant management immediately removed Mr. Skidmore from radiation work areas. Rowen said in his discussions with Skidmore that Mr. Skidmore told him he knew he had exceeded the 5,000 mr annual limit by a significant amount. However, according to Rowen, when the final film badge was processed Mr. Skidmore's total for the year turned out to exactly 5,000 mr. Mr. Rowen stated that he had no direct knowledge of the situation and perhaps Mr.Skidmore did not know what he was talking about.

46. Mr. Rowen said that at one period of plant operations the off-gas detector was giving them considerable trouble. During one period Mr. Rowen said he personally was trouble shooting the operation all day which required him to work in a confined area with a high radiation dose rate. Following that assignment, he suggested verbally to plant management that they could put longer cables on the detector and this would permit the detector to be moved away from the area of high radiation levels and greatly reduce personnel exposures during work on the system. When he received no action on the verbal suggestion, Rowen said he turned in a written suggestion on the matter. He said this suggestion was formally turned down by plant management.

47. Mr. Rowen said that intermittently in 1968, and possibly at other times, airborne radioactive material was present in the control room during reactor operation. He said the concentrations were high enough so that according to plant standards masks would be required. However, he said masks were not worn in the control room during these periods. He said these situations were detected because personnel assigned to control room work would become contaminated. He said then air samples would be taken in the control room. He said these situations often resulted in several members of the control room crew leaving with contaminated clothing and hair at the end of the shift. When this occurred one pair of trousers

were given a gamma scan. This scan identified short half life materials associated with stack effluents. Rowen said that the entire crew was sent home with contaminated clothing. He did not think this was proper because the possibility always existed that these people had picked up other long half life material during the shift. Rowen said this had actually happened to him at one point when a pair of his trousers became contaminated, were gamma scanned, and the material was identified as the short half-life emitters from the gaseous effluent. Rowen said a subsequent scan of his trousers on the following day revealed Cobalt-60 contamination. He thought possibly the Cobalt-60 had been masked by the presence of other peaks from the short half-life material during the first scan. He said the stack effluent had also caused contamination of cars in the parking lot on one occasion in the spring, 1970, probably May. He stated he was not a CT at the time, but ~ 100 cpm/foot^2 was detected by a smear on his car. One man had 200 - 300 cpm. The word was the company was going to evaluate it, but they did not before the men went home.

48. Mr. Rowen said most AEC inspections at the plant were announced. He expressed the opinion that all such inspections should be unannounced. He said when the plant received the word that an inspection was to be conducted they spent three or four days cleaning up, decontaminating, and getting everything in order for the inspection. He said on one such occasion he had been assigned to do housekeeping in the reactor feed pump room which he said was generally a non-contaminated area and was entered in street clothing with no protective clothing worn. As part of his cleanup efforts, Mr. Rowen said he made a smear survey on the floor of the room and discovered very high contamination. He recalled one smear showed a dose rate of 128 mr/hr. He said he decontaminated the area. He said he thought he should make an entry into the radiation protection log since this was an unusual situation when a normally clean area was found to be contaminated. He said Mr. Jerry Boots instructed him not to make the entry in the log because of the AEC inspection which was to be conducted in a day or two. Mr. Rowen said he told Boots he thought the AEC inspector should be aware of this kind of situation. Rowen said that Jerry Boots responded to this with the statement "Not a plant in the country could pass a surprise inspection by the AEC."

49. Mr. Rowen said that during the spring of 1970, Nuclear Engineering Company was scheduled to come to the plant and pick up radioactive waste. He said that in anticipation of this pick up the radioactive waste was moved outside and placed on pallets in the restricted area. He said the waste was covered with plastic and tarps, but a stretch of bad weather came with wind and rain and much of the waste got wet. He said much of it was in cardboard boxes which were coming apart because they had become soaked with water. He believed many of the plastic liners in the boxes became punctured during handling and that rain also seeped into the radioactive waste within the boxes. He said the Nuclear Engineering people almost refused to pick up the shipment and when they did eventually load it into the truck, water was observed to be leaking out of the truck which was backed up in the uncontrolled area with its open end at the gate to the restricted area.

50. Mr. Rowen described one situation which occasionally occurs during analyses of off-gas samples. He said the bottle containing the off-gas sample is inverted in a bucket of water and the cap removed. At this point electrodes are inserted into the bottle and a spark is introduced into the sample. He said this ignites the combustible portions of the samples and all that is left are the non-condensable gases. He described this operation as "popping" off-gas samples. He said occasionally in this operation the sample bottles break and all of the contents come bubbling up into the operator's face.

51. At this point, Mr. Rowen was asked if he was aware of any other situations which might result in the release of radioactive materials to the environment. He said that during a reactor outage the plant laundry processed a great deal of contaminated clothing and the laundry hold-up tank collected a large amount of water. He said sometimes when the situation is bad and time is critical the laundry hold-up tank is dumped directly to the effluent channel on the basis of a cable GM instrument reading on the side of a sample bottle of the hold-up tank water. He did not know whether this was according to plant procedures, but did know that the normal analyses of water from these hold-up tanks was much more extensive than a single GM instrument reading. He said he could not verify this, but he suspected that upon occasion the laundry hold-up tanks may be dumped without any analysis.

52. Mr. Rowen described a situation in which Forrest Williams was using a borescope in the fuel storage pool. This involved use of the hoist and raising and lowering a fuel element under the water in order to look at various sections of the elements by means of the borescope. At lunch, Rowen stated Williams said he intended to raise the element out of the water to get a close look at it directly without the use of the borescope. Rowen said this was a spent fuel element and Williams was unaware of the extreme hazard which would be involved in raising it out of the water. He said he told Williams the hazard and he (Williams) did not actually raise the element out of the water. He stated Williams' training had not prepared him for this hazardous work.

53. During some general discussions with Mr. Rowen, he was asked why the employees' union did not take a stronger position if some of the situations as he was describing were actually true. He explained that the union was made up of PG&E power plant employees from all over the State of California. He said in this union of many thousands of individuals there were only about 30 radiation workers. As a result the radiation workers did not have a very strong voice in the union, and the union was not particularly interested in their unique problems. At this point, Mr. Rowen said this was about all he had to discuss at the time, and the interview was completed at approximately 12:00 midnight after about 5-1/2 hours of discussion.

Telephone Discussion with R. Rowen on May 12, 1971

54. At approximately 9:35 p.m. on May 12, 1971, H. E. Book spoke with Mr. Rowen on the telephone, the purpose of the call was to verify certain information which had been supplied the night before and to see if Mr. Rowen had any additional information to supply. The following paragraphs contain information supplied by Mr. Rowen during that telephone call.

55. Mr. Rowen repeated his earlier statements regarding the off-scale dosimeter readings in the environmental program. He said the three stations in line with the stack all went off scale, but he could not recall exactly when. He said he thought it was about August of 1969 and the date August 27 stuck in his mind. He said he had records which would specifically identify the date. He said the three stations were Humboldt Hill, Station No. 11; the South Bay School, Station No. 14; and the Station at the railroad tracks near the plant which he could not recall whether it was Station 31 or 33. He said the dosimeters had a range of 0 - 10 mr and that he personally read the dosimeters. He said he made a record of the off-scale reading by an entry to the radiation protection log, but there were also other records made of dosimeter results. He verified there were film badges at each of the monitoring stations and dose information should be available from those film badges.

56. Mr. Rowen said he wanted to talk to the AEC inspectors some more, but he felt he should review his records and get his own thoughts in order before he did this. He was told that the AEC representatives would certainly be in Eureka again in the near future and they would contact him at that time. He verified an earlier statement that he was hard to reach, but can usually be reached at his home after 5:00 in the evening. He said this would be the case until about June 11 or 12 and then there was a ten-day period between semesters at school when he would not be attending college classes and he would not be driving a school bus which is his usual part-time job.

57. At this point Rowen said he had been reading about the Environmental Protection Agency flights which were being conducted around the plant. He said he also was in communication with people still working at the plant and was aware of the EPA project. He seemed to be aware that EPA was in the area at the time to make some flight around the reactor. He said he wanted us and EPA to be aware that the reactor level had been reduced to about 50% of the normal level. He did not know whether this was for operational reasons or because of the EPA monitoring flight. We told Mr. Rowen that the current EPA flight had been cancelled because of bad weather and that EPA had returned to Las Vegas.

58. Mr. Rowen also asked whether the District Attorney would be informed of the results of the AEC investigation. Mr. Book told him that no AEC report could be released, but that the County District Attorney would at least be verbally informed of the results of our investigations. Mr. Rowen seemed satisfied with that answer.

Telephone Interview with Forrest Williams, May 12, 1971

59. Forrest Williams lives at 1633 29th Street in Arcata, California. His telephone number is 822-4325. He was telephoned by the Investigator at 4:30 p.m. on May 12 to arrange a meeting to discuss safety considerations at the PG&E reactor where he was a former employee. Mr. Williams stated that he had no free time that week in which he could appear for interview. He explained that he is going to school full time and has a part-time job which leaves him no free time. He stated he was scheduled to teach a class that evening for which he was preparing and could not appear for interview, but that he would be willing to answer questions by telephone. Mr. Williams was then asked to describe as specifically as possible situations that were safety problems.

60. Forrest Williams stated he had no specific instances to report - it was just the general attitude on part of management that when safety questions were brought up they went on the defensive. He stated that because he had brought them up he was looked at as somehow subversive. Also, generally he stated training was inadequate. For example, he stated he had not had too much experience, yet was given the responsibility of being in charge of radiation protection. As an example, he stated that although his job was Nuclear Control Technician, and he was supposed to be enforcing radiation protection, his knowledge was so little that he almost received a fatal exposure to radiation himself. He stated on one occasion he had been assigned to work with a student engineer who was inspecting the spent fuel elements. He stated they were using the fuel stripping machine with a boiescope, under water, when Williams attempted to pull the fuel element up out of the water. He stated the automatic stop on the crane prevented him from doing this. He stated he learned later that if the stop had not been there, or had not functioned, and the fuel element had been lifted out of the water, he would have received a fatal dose of radiation.

61. Mr. Williams stated that the PG&E Company just maintained a facade that personnel were being protected, and they (Nuclear Control Technicians) were under pressure to maintain this appearance. He stated they tended to put people into hazardous areas with minimal protection. For example, he stated the company would bring in machinists from other non-nuclear plants to do repair work during reactor outages and overhaul. He stated they were given minimal instructions in the hazards they were subject to. He stated when they worked under the reactor they were in a 1 R field of radiation. He stated they were closely watched by the Control Technicians, but the workmen sometimes did not closely time their work and would "run off their pencils" (i.e., go off scale on a 200 mr dosimeter). He stated they were issued pocket personnel dosimeters and film badges, but he remembers incidents when they had forgotten to wear their badges and the CT had to make estimates as to the workers' exposure. He stated the radiation protection personnel were all too busy to check out each man as he reported for work and to check them out of the plant.

62. He stated the workers were not skilled in checking out from contaminated areas. He stated there is no one assigned to insure the workers are clean as they leave. He stated it was each person's responsibility to check himself for contamination

with the frisker probe and the hand and foot counter. He stated that oftentimes contamination would be inbedded in the soles of shoes, the workers would scrub their shoes with water and while the soles were still wet check out on the foot counter. He stated the water would act as a shield and the foot counter would not register the contamination.

63. Mr. Williams stated he could not be precise about levels or about the background level settings of the hand and foot counters. He stated they were not supposed to be used to check a person's contamination - only as a final check out. However, he stated the background setting was high enough to mask any contamination.

64. Concerning surveys, he stated that when surveys for clearance of material and persons were run that if the survey showed counts of 50 to 200 cpm over limits and there was obvious contamination, management would say we'll run it this way - average some other figures, take three lower figures and average them to pass.

65. Mr. Williams stated that he had a specific complaint about the High Level Storage Vault. He stated it was full of used filters and other material in torn plastic wrappings and when the lid is taken off to put more in the vault, airborne contamination is blown off on the wind.

66. He stated that one of his jobs was to run a smoke test from the top of a tower the same height as the nuclear unit stack. He said that during the spring there is a temperature inversion and a prevailing N or NW wind. He stated he has seen the smoke (from a surplus Navy oil fog generator at the top of the tower) dive right down to the ground and blow across the freeway at ground level right into the school yard on the other side of the freeway. He stated PG&E does not have an air sampler station at the school. (He apparently did not realize AEC does have.) Instead, he says they have placed their air sampler up on the hill.

67. He stated that he has noticed high backgrounds in the control room caused by stack emissions coming into the control room (he had no specific dates, doses, or levels).

68. Mr. Williams stated he had regularly brought these matters up at safety meetings, but he stated management's attitude was that he was just trying to scare people and they did not appreciate it, and did not take his suggestions seriously. He stated that at the last safety meeting he had attended he had brought up a number of these items, but had been criticized by management for bringing them up. He stated he was frustrated because he had brought them up only out of a sense of obligation and to suggest measures to correct them. He stated his suggestions were treated as intended somehow to discredit the company.

69. Mr. Williams stated that shortly following the safety meeting he had been interviewed by a man from the PG&E Security Department who stated he was investigating his motives for making the statements at the meetings. He stated that the implication was that they were subversive motivations, which Mr. Williams said was not true. Mr. Williams stated he was fired shortly after this and he had filed a grievance

through his union. As a result of a hearing on this grievance, he stated the decision was in his favor and he was reinstated by PG&E approximately three weeks ago. He stated he went back to work for one day and then quit the company on his own volition.

Interview with Robert Rowen on May 19, 1971

70. Mr. Rowen was telephoned by the Investigator from Berkeley on May 14 to inquire if he would have his records available for a continuation of our discussion on Monday, May 17. He stated he had no free time for this until the evening of Wednesday, May 19. He stated his school work kept him busy every night till 11:00 p.m., except for Wednesday when he would be glad to appear.

71. On Wednesday, May 19, at 8:30 p.m., in Room 11 of the Sandpiper Motel, Eureka, Mr. Rowen was reinterviewed by the Investigator in the presence of Jesse L. Crews, Reactor Inspector, and Harry S. North, Radiation Specialist, both of Region V. In the preliminary pleasantries exchanged, Mr. Rowen was asked why it had been such a long delay between his initial inquiries of AEC by the September 14, 1970 letters, and his letter of complaint dated April 30, 1971. He stated he had not wanted his contact of AEC to interfere with the union arbitration of his dismissal which was then in progress.

72. Mr. Rowen was asked to review a draft statement which listed three specific complaints he had made in his previous discussion that we felt could be substantiated by record checks at the PG&E plant. He stated the statements were correct and that he had more specific dates for the occurrences, which he supplied, and which were added to the statement by the Investigator. He stated he had an additional item concerning the company's laxity in giving him his exposure record at termination of his employment. This also was added to the statement. Mr. Rowen stated he wished to show the statement to his attorney before signing it. He was told there was no objection to this and it was arranged for the final typed copy of the statement to be left for him in his mother-in-law's mailbox (next door to his residence) the following day. (On June 4, 1971, the statement signed by Mr. Rowen on May 28, 1971, was received at the Region IV office. A copy is attached as Exhibit E.)

73. Mr. Rowen first supplied the specific date for the cask contamination occurrence as August 6-8, 1969. He also stated the off-scale stray chamber occurrence was on August 12, 1969, and the contaminated pipe occurrence was sometime before February 18, 1970.

Mr. Rowen then proceeded to describe other matters as follows:

74. After June, 1970, the company revised the job classification and made it into two jobs; Instrument Technician and a combined Radiation Protection and Chemistry Technician. Mr. Rowen stated Bill Evans is the only experienced employee in the radiation protection program. Two new employees have had about three months' training. Management says now that one month training for radiation protection is sufficient. He stated that the new radiation protection men admit their training

is inadequate; he stated the issue has been raised informally through the Union-Company grievance procedure. (Mr. Rowen continues to attend union meetings although no longer a PG&E employee.)

75. Mr. Rowen stated that on several occasions in the past, a blower had been used to blow away contamination in work areas without sampling for airborne contamination. These incidents occurred at the base of the stack in the air ejector room and in the condensate pump room.

76. Mr. Rowen stated that he was suspended June 1, and notified on June 5 by phone after he had gone home sick that he had been discharged. Approximately June 15, before the proceedings of the Local Investigating Commission of the IBEW on July 1, he asked management for a full account of his occupational exposure. He stated he again asked for this on July 1 or 2. He stated he again asked for it on August 1 when he called Robert Taylor, the personnel man in Eureka, to ask him for the exposure record. He received the exposure record by letter dated September 20, 1970.

77. He next discussed the Pu-Be source, a neutron source the company uses to "bug" a detector. They get it out prior to an outage and keep it out in the calibration facility, under water, under lock and key. In order to take the source out, they have to unlock it, pull the paraffin shield off, and take a rod and screw it into a female connection on the end of the source. They take this source out on the end of this rod and put it in a can of paraffin. Mr. Rowen stated he has seen or heard about two or three times when it has been dropped because of the difficulty in threading this extension rod into the female fitting of the source. He has seen it dropped and picked up by hand. He, Rowen, has picked it up himself, on one occasion he guesses in 1966 or 1967, and he later used tongs. Rowen stated that he had notified Gale Allen at the time this occurred and from hearsay, he had learned that Mr. Skidmore had dropped it and picked it up with his hand and Mr. Rowen stated he saw Mark Stevens, in 1965 or 1966, drop it and pick it up in his hands. Mr. Rowen stated there was no formal training on how to handle a source, they were told merely not to touch it with their hands. Only after the situation developed, that is, they were told to use the remote handling tool and make sure the rod was secure, but he said that was not brought up at a safety meeting. He said there was no documentation on these incidents concerning the Pu-Be neutron source.

78. He next discussed the Co-60 source, which is used for "Cutie Pie" calibration. He stated that in the spring of 1970, it was about February or March, they were getting ready for the April outage and they exchanged the Co-60 sources. The old cobalt source was losing its strength and it was hard to calibrate the "CP." They finally got a new Co-60 source. Forrest Williams and Gale Allen went up to the scrap bins, and got pipe to make the exchange. One of the sources dropped on the floor. He does not know how it was recovered. He stated the old source had a radiation level of approximately 24 r/hr at five feet at the time.

79. He stated that two outages preceding the April 1970 refueling outage he and others were to receive instructions from Bob Chaffey, the Nuclear Instrument Engineer, and Chaffey had them get down in the reactor area to be briefed. All the time they were in a 2 R field. Mr. Rowen stated he discussed this at safety meetings. He stated it was unnecessary for Chaffey to brief them while they were in the radiation field, but he lays this to Chaffey's inexperience. Mr. Rowen did not claim any overexposure from this; he stated that this was just a case of needless exposure.

80. He stated that Mr. Kennedy, a Nuclear Instrument Engineer, was notorious for going down into radiation areas without his badge. He stated he believed that he had recorded in a log when Mr. Kennedy has left his badge at the step-off pad and it may have been in the startup and late 1968. He stated that certain employees emulated Mr. Kennedy and also did not wear their badges. He stated when he had called Mr. Kennedy's attention to it he stated he had forgotten it and placed the badge on his clothing.

81. In 1968, or thereabout, he stated there was some sort of spill off the concrete to the gravel outside the southwest airlock of the refueling building. He stated the contamination was in about the mr/hr level, probably not more than 500 mr/hr. He said there were several special radiation surveys. Rowen recommended verbally to the radiation protection engineer that they shovel off the gravel. One day somebody put plastic over it. The contamination had possibly come from filters being taken out there by Mr. Boots. He stated the gravel was later picked up.

82. He stated Warren Raymond climbed down over the open reactor without a safety line during the April 1970 refueling. Jim McRay saw him do it. Chaffey had done it before in the previous refueling. As a result of Chaffey doing it, Messrs. Weeks and Raymond assured him (Rowen) that it would never be done again. On May 12, when Rowen raised it at a safety meeting, Mr. Raymond admitted to having done it.

83. He stated the company conducts a grazing animal test in which they feed rabbits grass removed from the environs. The rabbit thyroids are later removed from the rabbits and checked for I-131. They claim this demonstrates the safety of the plant and yet this test is not a representative test, according to Rowen, because 90% of what the rabbits eat comes from the feed store. He stated it is the duty of the Control Technicians to go out with a hand scythe and cut grass to feed to these rabbits, but they don't really feed them that much. He stated the low activity of the rabbit thyroids would be misleading since the rabbits eat principally feed bought from the feed store, according to Mr. Rowen.

84. He stated in the spring of 1970, and February and March, each employee was supposed to keep a card on his dosimeter record and several employees had up to 770 mr on their dosimeters, cumulative, and only 15 mr showed on the film badge. Mr. Boots was one. Boots was to call down to Radiation Detection Company concerning this incident, according to Mr. Rowen.

85. He stated in December, 1967, at a safety meeting, reactor water sampling, off-gas sampling, and the storing of high level samples were discussed. Subsequent to this, management called in Rowen and in January 1968 or February 1968 he got his first "counseling" session in which he was asked to curtail his statements.

86. He stated there were five air samplers when he first started work at the plant; only one of these is still on the hill. It has been recommended at safety meetings that they place one at the school.

87. He stated that the #3 sampling well near the base of the stack has the same analysis of materials as the spent fuel pool; therefore, he believes that there are leaks from the spent fuel pool which find their way into the water table.

88. He stated that in the clean machine shop, contaminated tools were used on several occasions. He had no specific dates or incidents. In the hot machine shop, he stated there was 200 to 300 or 400 mr/hr contamination, fixed or removable. After the outage there was a procedure established to check the tools.

89. He stated he suggested on about May 16, 1966, that different arrangements be made for the electric hoist to raise the high level vault plug. The company approved his suggestion and gave him a $15 reward on November 29, 1966. However, he stated that the suggestion was never implemented.

90. He stated there is a cover for the spent fuel pool;however, it is not usually covered. Eighty percent of the time, he estimates, it is uncovered.

91. He stated there is one fork lift for the whole plant, and he stated it is in and out of #3 gate and the seat is contaminated and it was covered with plastic. He stated the levels are on record.

92. He stated Mr. Skidmore went to San Francisco and a doctor looked at his hands and the doctor asked him, "Do you work with radiation?" and Skidmore said "yes." Skidmore has a fingernail problem and the company has not sent him to the doctor.

93. He stated that during the April 1970 refueling outage, Dick Mckenna and Don Voss had come up from the reactor and they were surveying out and they checked off the step-off pad and Skidmore saw that they were both contaminated in the head region.

94. He stated there was a question raised by other employees in the general discussion, probably about April 1970, concerning the domestic water system that can back up in the core spray. It seems possible to get reactor water to the domestic system. There is supposed to be a butterfly valve to stop this. Through hearsay he stated that reportedly there was activity found in the fire water system and that the domestic water system ought to be checked.

95. Mr. Rowen stated he had no further matters to bring up. He was told by the Investigator that the specific complaints would be looked into in a subsequent inspection at the plant and every effort would be made to identify serious violations of safety. The interview was concluded at 11:30 p.m.

Investigation at the PG&E Humboldt Bay Power Plant, Eureka, California, May 20, 1971

96. On May 20, 1971, at 8:30 a.m., Mr. Crews telephoned Mr. Paul Matthew, Manager, Steam Generator Department, PG&E, San Francisco, from Eureka to advise him that there would be an investigation at the Humboldt Plant starting that morning. Messrs. Crews, North, and the Investigator then went to the plant and met there Mr. R. D. Ramsay, Plant Superintendent; Mr. W. A. Raymond, Assistant Plant Superintendent; and, Mr. E. D. Weeks, Power Plant Engineer.

97. The Investigator explained to these gentlemen that we were there to conduct an investigation concerning a complaint we had received. They were told the complaint was in reference to radiation safety and that we were obligated to investigate to determine the facts of the matter. They were told we could not divulge the source of the complaint, or the results of the investigation, except as the latter might disclose items of noncompliance with AEC regulations. If such were found, they were informed they would be advised at the conclusion of the investigation. They were told we wished to check company records and possibly later would have to interview company personnel on a private, individual basis.

98. Mr. Ramsay questioned the need for the confidential nature of the investigation. He asked for the name of the complainant and the specific complaint. He was told we could not give him that information.

99. Mr. Weeks questioned the need for an investigation at all since all of the inspections by the Division of Compliance in the past had found them in full compliance with AEC regulations. He questioned the need for an AEC Investigator, per se, rather than having the investigation conducted by Radiation Specialists.

100. Mr. Ramsay questioned the Investigator on his background, experience, and acquaintance with one of their San Francisco staff members, a former member of the FBI.

101. The investigators asked Messrs. Ramsay, Raymond, and Weeks about PG&E's policy and practice with regard to their employees contacting AEC inspectors. Mr. Raymond stated that the contract between PG&E and the Union discouraged such contacts. In this regard, he referred the inspectors to the following article in the Agreement Between Pacific Gas and Electric Company and Local Brotherhood of Electrical Workers, effective July 1, 1966. "Title 3. Continuity of Service ... 3.4. Company and Union shall cooperate in promoting harmony and efficiency among Company employees."

102. Mr. Raymond stated that this article (3.4.) in the contract was aimed at encouraging employees to bring complaints to the Company or Union, and that attempts should be made to resolve these complaints within the procedures provided for within the contract. Mr. Weeks stated that approximately a year ago he had denied a request by one employee (he subsequently identified the employee as Mr. Rowen) to talk to Mr. Dodds about complaints he had with the radiation safety program at the Humboldt Bay Plant. Mr.Weeks said he had refused Mr. Rowen permission to talk to Mr. Dodds "on Company time." He said he did not recall any discussion with Mr. Rowen about his talking to Mr. Dodds during nonworking hours. Mr. Weeks also said that he did not believe that Mr. Rowen had exhausted the procedures for resolving his complaints within the Company and Union. He said that some of the complaints Mr. Rowen spoke of at that time were new and unfamiliar to him.

103. The investigation team then was allowed to use the conference room where records were supplied as asked for. Company management would not permit machine copies to be made of the records, and during the first part of the record searching either Mr. Weeks or Mr. Raymond occupied the conference room with the AEC representatives, under orders from Mr. Ramsay. When the Investigator complained to Mr. Ramsay that their presence hampered our investigation in that we could not openly discuss certain matters in their presence, he allowed the investigators to occupy the room alone.

104. During the course of the investigation, the Investigator stated to Messrs. Ramsay, Raymond, and Weeks that it might be necessary for current employees at the Humboldt Bay Plant to be interviewed privately by the investigators. Mr. Ramsay subsequently informed the Investigator that if any current employees were to be interviewed at the plant a member of PG&E management must be in attendance. He further stated that this had always been a Company policy.

105. Investigation at the plant consisted of a review of records and interviews of management personnel to establish facts concerning the problems referred to by Mr. Rowen (and Mr. Williams). Discussion of these findings follows under the separate headings which identify each of the allegations, or occurrences, which appeared to have substance and which could be checked in this manner. They are placed in the order in which they were presented by Mr. Rowen in his letter of April 30, 1971, to AEC, and in the two subsequent interviews with him.

Radiation Work Procedures Not Current

106. Mr. Rowen referred to the existence of Radiation Work Procedures (RWP) which did not reflect the current exposures permitted for specific areas (see paragraph 16). Mr. Crews' review of company records determined that the RWP's are subject to the specifications appearing in the licensee's "Radiation Control Standards for Humboldt Bay Power Plant," Section A – "Control of Access to Radiation Zones" 4/. On page RCP 4-5 of this procedure, dated October, 1966, subsection 4 states

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4/ These standards are incorporated in the PG&E license by Technical Specification IX.B.5.

each RWP will specify in the block entitled "Maximum Radiation Condition" the dose rate and the critical organ for each area of work. The current RWP's for air and water sampling, and for the hot laboratory do not specify the critical organ. The hot laboratory and water sampling RWP's do not give the radiation levels. Copies of all three are attached (Exhibit F).

Shipping Cask Contamination of August, 1969

107. Mr. Rowen stated that on August 8, 1969, a spent fuel cask was shipped, having contamination levels above those permitted by 49 CFR 173.397 (see paragraphs 17 and 18, above). In the plant records, Special Radiation Survey Report No. 1977, dated August 6, 1969, 5:00 p.m., was examined. The description shown on the report was "final survey of shipping cask and railroad car before shipment." The information shown on the report was as follows:

Item	Dose Rates mr/hr	CPM per Background	CPM Smear
Railroad car	-	400	< 100 per sq. ft.
Cask around lid flange	-	400	20,000
Cask (except lid flange)	1	400	< 100 per sq. ft.

The report identified the GM and C.P. ion chamber as the instruments used in the survey and smear pads. Under the comment section of the report was a note signed with the initials GEA (G. Allen, formerly Radiation Protection Engineer, Humboldt Bay Power Plant), which stated "item 2. above was crack where lid met the cask. It was washed and will be taped in the future." The survey report was signed by Evans.

108. Mr. North examined Radioactive Materials Shipment Record, Shipment No. 99, dated August 6, 1969. This shipment record was a completed form which had been filled in with a typewriter with the exception of certain signatures and corrected items of information. The record showed the shipment was to Nuclear Fuel Services, Incorporated, Hoyts Landing, West Valley, New York, and consisted of fissile and large quantity radioactive material as irradiated nuclear fuel, 9.22×10^5 curies. The container was identified as bearing DOT No. SP5901 NFS Cask No. 100 with a weight of 120,000 pounds. The cask coolant activity was identified as 9.66×10^{-3} microcuries per ml. Radiation levels were shown at less than 10 mr/hr at contact and three feet. Contamination levels had been typed in with the corrections as noted. Surface level was typed as less than 2200; however, the second 2 had been crossed out, and a 6 written in, raising the value from 2200 to 2600 dpm per hundred square centimeters beta gamma, and less than 220 dpm per hundred square centimeters alpha. The form had been signed by Robert Rowen on August 6, 1969. The form showed that the shipment was sent by special railroad car and was marked as Dangerous Radioactive Material and bore a DOT radioactive yellow III label. Mr. Weeks produced the draft form from which the shipment record had been made. It was handwritten in ink by R. Parker and showed surface contamination as 1100 cpm/100 cm^2. Rowen had corrected this in pencil to read 2200 dpm and signed it for final typing. Mr. Parker, the Company RSO, told the Investigator that the dpm notation was correct.

109. The Control Technician's log for August 6, 1969, contained the following entry on page 62598-65B:

> "C. F. R. J. Rowen R. Skidmore August 6, 1969
>
> G. Allen asked Rowen to sign the release papers for the spent fuel shipping cask stating the contamination level of the cask to be < 2200 d/m, when in fact, they were > 2600 d/m. Further, G. Allen gave Rowen directions to take final smears for determination of release conditions on the top and bottom avoiding the middle areas on all sides of the cask, when just previously, R. Skidmore took smears of the middle areas to find out of limit conditions.
>
> R. Rowen"

110. A memorandum to file on this incident had been written by G. E. Allen. A copy is attached (Exhibit G). This is the document referred to by Mr. Rowen in paragraph 18.

111. Concerning this shipment, Mr. Ed Weeks stated that prior to release of the shipment he had telephoned an individual at DOT he remembered to be a Mr. Grella, concerning the shipment of material and the reported surface contamination of 2600 dpm per 100 square centimeters. Weeks stated that he explained the circumstances of the shipment to Grella and that Grella said that he would not like it to be routine, but that in this case it sounded all right to him. Mr. Weeks further stated that the Compliance Region V staff was informed of the matter during a subsequent inspection, but he was unable to identify whether the information was given to R. Dodds or J. Metzger of the Region V staff.

112. In a telephone discussion with Mr. Al Grella, DOT, Washington, on June 4, 1971, Mr. Grella advised the Investigator that he had no specific record or recollection of the discussion with Weeks concerning the cask, but that he very probably would have responded that 400 dpm was within the statistical error limits of the instrument, and would have approved the shipment.

Off-Scale Stray Chamber Readings of August 12, 1969

113. In paragraphs 32, 55, and 73, Mr. Rowen's statements on his readings of off-scale stray chambers are reported. Review of the Company records revealed that on August 12, 1969, three pairs of stray radiation chambers at environmental stations 11, Humboldt Hill; 14, Southbay School; and 33, 110 kv Line, went off scale (note - reading in excess of the chamber range of 10 mr). Mr. Rowen stated that this information was recorded in the Radiation Protection Log. (During the investigation, it was determined that the information was recorded in the "Control Technician's Log.")

114. PG&E operates 36 environmental monitoring stations in the vicinity of the Humboldt Bay Power Plant. Stations 1 through 30, inclusive, are situated on the plant site in the environs and are the licensee's basic commitment for environmental background measurements. Stations 31 through 36, inclusive, are situated outside the plant exclusion area within a short distance of the plant. Stations 31 through 36, inclusive, are not a part of the licensee's commitment for environmental monitoring. All environmental stations are equipped with two 10-mr Victoreen stray radiation chambers, a film badge, and a TLD. The low stray chamber reading is accepted by PG&E as the offical value. When both chambers read full scale (10 mr), or data have been lost due to vandalism, the reading is reported as full scale.

Control Technician's Log No. 25, Pacific Gas and Electric Company, Humboldt Bay Power Plant, Unit No. 3, entry of August 13, 1969, page No. 62598-71A contained the following information relating to the allegation. Assigned Control Technicians were Skidmore and Rowen. In addition to miscellaneous information relating to surveys, analysis of air samples, and gaseous effluent releases, the following hand written entry appears, "Rowen used a hand scythe to blaze a trail to Section #33 to change and read environmental dosimeters. Both dosimeters were off scale as were the dosimeters at Station #14 located at the elementary school and Station #11 on Humboldt Hill above the school, read August 12." A footnote following the above entry was as follows: "Boots walked out to the station prior to Rowen's trail blazing epic journey (signed J. J. Boots)."

115. The licensee's file folder titled Environmental 1969 containing summary data for that year was examined. This record showed the following stations to have exhibited off-scale, or full scale, stray radiation chambers on the noted dates, during the year.

Date	Station No.
February 11, 1969	15
April 8, 1969	29
August 12, 1969	11, 14, 33
August 19, 1969	29
September 9, 1969	34
November 4, 1969	20 (reported as question mark) Ed Weeks stated that this station had been vandalized and the stray chamber data lost.
December 2, 1969	20 (reported as question mark) Ed Weeks stated this station had been vandalized and stray chamber data lost.

116. Mr. Weeks stated that PG&E suffers a fairly high incidence of vandalism connected with the stray chambers at their environmental stations. He said that it had not been customary to distinguish between off scale readings and vandalism, i.e., damaged, destroyed, or stolen, stray chambers and that all such occurrences were shown in the records as full scale.

117. The data for all 36 stations for the third quarter of 1969 were examined in detail. It was observed that stray chamber data from all stations reported as read on August 12, 1969, were from approximately 1-1/2 to 2-1/2 times the indicated radiation levels from the preceeding reading period, July 29, 1969. For comparison purposes stray chamber data for Stations 11, 14, and 33 were compared with TLD and film badge data from the same stations. The following is a result of this comparison during periods determined by TLD and film change cycles respectively.

Item	Station 11	Station 14	Station 33
Gross stray chamber readings 7/29-9/23/69	29.6	33.1	40.7
Background average of Stations 2 and 5 7/29-9/23/69	12.3	12.3	12.3
Net stray chamber data 7/29-9/23/69	17.3	20.8	28.4
TLD results 7/29-9/23/69	10	25	35

TLD background for the stated period at Station Nos. 2 and 5 — 0 both stations.

118. Comparison with film badge data for the film monitoring period 7/29-9/9/69 with stray chambers:

Item	Station 11	Station 14	Station 33
Stray chamber gross 7/29-9/9/69	23.8	25.9	30.7
Background average of Stations 2 and 5 7/29-9/9/69	9.3	9.3	9.3
Net stray chamber data 7/29-9/9/69	14.5	16.6	21.4
Film data for the period 7/29-9/9/69	4	4	30

Film background data for Stations 2 and 5 reported as zero. TLD and film badge service is provided by Radiation Detection Company. TLD and film badge data are reported by Radiation Detection Company over the following footnotes: "TLD calibration based on exposure of controls to ^{60}Co. Exposures are net above background at Radiation Detection Company for the time period shown. Radiation Detection Company natural background measured with high sensitivity ion chambers averages 8 mr/month. Precision of the reported levels is approximately ± 5 mr." The film badge report for the period carried the following printed

notice: "Environmental exposures reported are your net exposures above background at Radiation Detection Company for the time period shown. Radiation Detection Company natural background measured with high sensitivity ion chambers averages approximately 8 millirem per month. The environmental background for this report period is 12 millirem." The raw stray chamber data contained in a file folder titled Environmental Dosimeters from January 2, 1969, to (unspecified) is recorded on forms. The Environmental Survey Field Data Sheet dated August 12, 1969, signed by Rowen, was examined. An examination of the raw data revealed that chambers at Stations 11, 14, and 33 were full scale on the date read. Stations 11 and 14 were read on August 12, 1969. Station 33 followed Station 32, which was identified as having been read on August 13, 1969. Comments concerning the three stations on this sheet were as follows:

Station 11 - "Both dosimeters are in good working condition."
Station 14 - "Both dosimeters are in good working order."
Station 33 - "The Sta is inaccessible."

119. At the suggestion of R. H. Engelken, Compliance Headquarters, Mr. North inquired into the following matters during or subsequent to the investigation: Stack releases, possible effects of foreign weapons tests, and meteorological conditions immediately surrounding the August 12, 1969 period, which might account for the factor of 1-1/2 to 2-1/2 increase in the stray radiation chamber indicated radiation levels during the two week period ending August 12-13, 1969. With respect to stack releases Control Technician Log No. 25, pages 62598-49A through -81A, covering the period July 16 through August 27, 1969, were examined. Control Technicians record the estimated average and peak count rates of the stack gas recorder once each day in this log. Beginning on July 16, 1969, with an average of 95 counts per minute average reported for the stack gas recorder, the readings rose to a maximum of 1.7×10^4 cpm, average by August 7, 1969, subsequently falling and ranging from 3.5 or 4×10^3 to 1.5×10^4 cpm average through August 27, 1969.

120. Subsequent information was obtained from the Nuclear Plant Operating Report for 1969 which showed that the plant had been shut down and was made critical on July 19, 1969. Until July 20, the average gaseous release was 88×10^{-6} curies per second. Commencing on July 20th, with an average release rate of 4100×10^{-6} curies per second at a power level of 46 Mwe gaseous rad waste climbed to 9900×10^{-6} curies per second by July 29 (52 Mwe) when it again climbed to 18500×10^{-6} curies per second (65 Mwe) which was sustained with minor variations through August 11, 1969. The plant operated essentially base loaded during these intervals. From August 12-23, plant power was at 45 Mwe and average gaseous rad waste ranged from 4500 through 7500×10^{-6} curies per second. The highest average and peak off-gas activities observed were on August 7 when both were 21000×10^{-6} curies per second.

121. With respect to possible environmental effects as a result of foreign weapons tests, John Harley, Director, USAEC, Health & Safety Laboratory, New York, was

interviewed by Mr. North by telephone on May 25, 1971. After an examination of records for the latter part of July and early August of 1969, Mr. Harley stated that there were no indications of possible nuclear weapons effects which their laboratory could see. He stated that there was only one above-ground test, September, 1969, that year. He stated that there were no reported ventings of Nevada test shots.

122. An attempt was made to examine meteorological records maintained by PG&E at the Humboldt Plant site. Mr. Ed Weeks stated that reduction of data from the wind direction and the velocity strip chart records stopped approximately three years ago. The only available records are in the form of 3 strip chart recorder rolls identified as 2, dated August 1, 1969; 3, August 17, 1969; and 4, September 2, 1969. Due to a shortage of time, it was not possible to examine strip chart records during the period of interest.

Spill of Aged Reactor Water from the Low Level Storage Area

123. Mr. Rowen's comments on this occurrence appear in paragraph 35. His entry in the Control Technician's Log for this occurrence is on page 62598-82A dated August 28, 1969, and is quoted as follows:

> "C. T. Skidmore and Rowen
>
> From 2:30 p.m. to 4:00 p.m., rad protection was working behind low level storage. About 3:15 p.m., we were installing radiation rope around some barrels located behind the low level storage building. Rowen heard some water running and looked around to find a barrel 1/3 full of aged reactor water running out and onto the black top, then across and down the fence. About 5 gallons poured out. J. Boots was notified. A tygon tubing sight glass w/o a clamp had come loose. A G-M was used to determine the contamination level. With a direct reading no counts in excess of 100 c/m was found. A sample was collected for analysis tomorrow. A clamp was installed to correct the situation. Further, Boots was heard to say that the sun was shining bright and that he hoped the spill would dry up before the AEC Compliance man, Mr. Dodds, arrived in this area."

124. Radiation and Contamination Survey "B" records dated August 29, 1969, were examined. No mention of problems associated with this occurrence was found.

Mr. R. Parker, Chemical-Radiation Protection Engineer, for PG&E, Humboldt Bay Power Plant, described the Company's "A", "B", and "C" surveys. "A" surveys are conducted daily and are measurements of radiation levels at various locations within the plant at fixed locations. "A" surveys are an abbreviated form of the "B" survey. "B" surveys record measured levels of radiation at various levels within the plant at fixed locations on a weekly basis. "C" surveys consist generally

of smear surveys of floors, hot workshop, laboratories, and a check of the perimeter fence and are performed at weekly intervals. The licensee also conducts special surveys as required by operating conditions.

Suppression Chamber Pipe Sold to Scrap Dealer

125. Mr. Rowen referred to pipe having been removed from the plant and sold to a scrap dealer, which he believed had been contaminated (see paragraph 37).

Mr. Crews reviewed the Special Surveys for February and March 1970, and found Special Radiation Survey Report No. 2135 dated February 18, 1970, "PM", Location: Cold Machine Shop. Under "Job Description," it stated that a routine "C" survey had found contaminated pipe in the cold machine shop. Under "measurements made," it showed that a 14" diameter pipe from the suppression chamber had a contamination of 300 cpm over a background of 300 cpm and that it was not cleared for unconditional release. The survey form was initialed by "RR." (This was Robert Rowen, according to Mr. Weeks.) The form showed the instrument used was a GM counter. On the back of the form was an additional comment:

> "Found contaminated pipe in cold shop (machine) out of limits per radiation control standards and specs. Informed R. P. engineer of condition and for his evaluation."

126. Mr. Weeks stated the 14" pipe was part of the piping removed during modifications to the suppression chamber in about 1965. He stated most of this material was surveyed out of the controlled area in about 1966, and the material was sold as scrap to G&R Metals in Eureka. Mr. Weeks stated Mr. Boots had reviewed the matter thoroughly and had written a report on the pipe matter. A copy is attached (Exhibit H). In a subsequent discussion, Mr. Parker stated to the Investigator that they had survey records of the material which had been released during 1966, but that there was no specific survey record of the pipe removed from the suppression chamber and released at that time. He stated a lot of material had been surveyed out of the area at one time and some of it, including this pipe, had not been specifically identified.

Skidmore's Total 1967 Exposure of 5R

127. Mr. Rowen stated, as reported in paragraph 45, that another Control Technician, Raymond Skidmore, had probably exceeded the 5 R whole body exposure yearly limit (set by the company) during 1967. A review of the film badge reports furnished to the Company by Radiation Detection Company showed the following record for R. R. Skidmore, social security number 558-421-9071:

Monitoring Period	Exposure for Badge Period	Qtr. Exposure	Year to Date
Sept. 15 to Oct. 15, 1967 (end of quarter)	290 mr	1650 mr	2660
Oct. 15 to Nov. 15, '67	2300 mr	2300 mr	4960
Nov. 15 to Nov. 22, '67 (a special pull)	40 mr	2340 mr	5000
Nov. 15 to Dec. 15, 1967	(no report)		
Dec. 15, 1967, to Jan. 14, 1968 (end of year)	0	2340 mr	5000

Mr. Parker explained that since the monthly report covers from the 15th to the 14th, the year's totals are ended on January 14. He stated the special pull on Skidmore's badge was made when it was noticed that he was close to the Company 5 R limit for the year. Mr. Parker stated Skidmore was kept away from radiation exposure from November 22, 1967 to January 14, 1968, so that he would not go over the yearly limit.

Radioactive Waste Shipment

128. Mr. Rowen's comments about a shipment of radioactive waste are reported in paragraph 49. The plant records contained a Special Radiation Survey Report (No. 2148), dated March 5, 1970, which described a radiation survey of a "truck full of radiation waste boxes." The report showed a surface radiation level of 80 mrem and radiation levels at six feet of 13 and 10 mrems. The latter value contained the notation "using truck driver's instrument." The report showed the result of contamination surveys on the outside of the truck to be less than 100 c/m. This report contained the initials "R.S." in the signature block. Mr. Weeks stated that these were the initials of Mr. R. Skidmore, a Radiation Control Technician.

129. The records also contained a Radioactive Materials Shipment Record (No. 114), dated March 5, 1970. This report described a shipment of "low level radwaste" to the Nuclear Engineering Company, Richland, Washington. The record contained radiation survey results which indicated a maximum radiation level at surface of < 200 mr/hr, and at six feet of < 10 mr/hr. Following the latter entry was the notation, "(Nuc. Engr. Inst.)." Surface contamination survey results were shown to be < 2200 dpm/100 cm^2, beta and gamma, and < 220 dpm alpha. This section of the report was signed by R. Skidmore.

The Control Technicians' Log Book on March 5, 1970, contained the following entry:

> "C. T. Skidmore, Rowen and Gable .... Truck loaded with rad waste boxes for shipping. Had some trouble with boxes leaking water. Boxes were repacked."

Dropping of Pu-Be Source

130. Mr. Rowen's statements concerning alleged mishandling of a Pu-Be neutron source are reported in paragraph 77. Ed Weeks, J. Boots, and R. Parker were questioned by Mr. North on May 21, 1971, concerning the plutonium-beryllium neutron source. They stated that it was a 5-curie source with an emission rate of 8.38×10^6 neutron per second and that a 2-foot handling rod was available for source manipulations. Boots stated that he had not used the source. Parker stated that he had performed leak tests on the source only. It was stated generally that G. Allen, who was not at the plant that day, had been the one principally involved in the handling and use of the neutron source. No one present knew of any instances involving manual recovery of a dropped source.

Dropping and Recovery of a ^{60}Co Source

131. Paragraph 78 reports Mr. Rowen's statement concerning the ^{60}Co source. Mr. North discussed the source exchange procedures with R. Parker, Chemical-Radiation Protection Engineer, and J. Boots, Chemical Engineer, Diablo Canyon Task Force, formerly Chemical Engineer and Radiation Protection Engineer for Humboldt Bay Power Plant. Mr. Weeks was also present during the discussion. Mr. Boots stated that the old cobalt 60 source had decayed to approximately 7 curies and a new 15-curie replacement source was procured from U. S. Nuclear Division of ICN. The new source was a type 378, Serial No. W-729, and was a nominal 15 curies. He stated that the source exchange occurred on January 27, 1970. Mr. Boots stated that those present during the source exchange procedure included R. Parker, F. Williams, Control Technician, and himself. The source was received in a spherical shield with a plug lid in which a smaller shield with a plug lid was positioned. A 2-foot tag wire was attached to the source. The source was placed in the inner compartment of the smaller shield. The tag wire from the source passed from the interior of the smaller shield around the lid of the smaller shield and was coiled between the lids of the small and the large shields. Boots stated that positive closing 2-foot tongs were used to handle the sources. Boots stated that practice runs in the source exchange procedure had been carried out using a dummy source. The procedures consisted of removing the exterior lid of the container, grasping the tag wire on the new source using the 2-foot tongs. Using tongs, the small shield lid was lifted from the shield and the source was lifted from the shield using tongs attached to the tag wire and placed in the source well at a distance of a few feet.

132. The work was performed behind shield walls of lead bricks. Mr. Boots stated that the procedure went as designed until the removal of the small shielded container lid from the cask containing the new source. He stated that apparently the tag wire fouled on the lid so that when the lid came free the source popped out of the container landing on the outside of the container where it hung by the tag wire. The C. P. ion chamber survey instrument in use at the time immediately indicated full scale on the 0 - 50 mr/hr scale. All personnel evacuated the facility. Surveys using the C. P. survey instrument were performed and acceptable dose rates were observed. Using tongs the source was returned to the shield. Subsequently, the source was successfully moved to the spider carriage in the well, using the tag wire and tongs, and the old source was then positioned in the spider carriage in the well again, using tongs. At the conclusion of the source exchange none of the dosimeters used by the individuals involved were discharged. The Radiation Detection Company film badge reports for the period January 15 to February 14, 1970, revealed the following whole body and finger ring exposures for the participating personnel:

Individual	Whole Body Exposure, Mr	Finger Ring Exposure, Mr
F. Williams	140	600
J. Boots	40	530
R. Parker	15	---

Contamination of Gravel in Restricted Area

133. Mr. Rowen stated there was contamination in a graveled area near the airlock and at the base of the stack, probably during 1968 (see paragraph 81). Control Technician Logs Nos. 23, 24, 25, and 26 covering the periods 1968 and 1969 were examined in detail by Mr. North for a reference to this occurrence. No reference to this spill was identified. Examination of individual survey records was not attempted since notes of unusual condition or activities are generally included in Control Technician Logs as specified by the Humboldt Bay Power Plant Unit No. 3 Memorandum dated August 29, 1966, Subject: Control Technician Logbook (Exhibit I).

Potential Contamination of Domestic Water System

134. One of Mr. Rowen's statements was that he had heard from other employees at the plant that the fire water system of the plant had been radioactively contaminated during the depressurization occurrence of July 1970 (see paragraph 94). He said, also, that he understood the fire water system connects to the domestic water system and, therefore, questioned whether this system might also have been contaminated. The potential for contamination of the domestic water system was reviewed, in depth, by Mr. Crews, and he discussed it with Messrs. Raymond and Parker. The core flooding system schematic (Exhibit J) shows the interconnection between the domestic water system and the reactor vessel. The design and operation of low pressure core flooding system are in general agreement with the description given in Section III.A.3.d. of the technical specifications.

135. The following specific information was provided by Mr. Raymond. The shutoff head of each of the three fire water pumps ranges between 150 and 154 psig (based upon tests conducted on May 9, 1971). The domestic water pressure (from the booster pump) is approximately 60 psig. The time required for the electric driven fire pumps to reach full speed during starting is approximately 1.5 seconds (based upon observations during the twice weekly starting tests of these pumps). The diesel-driven fire pump reaches full speed in approximately 12 seconds (based upon previous tests). The motor operated valves (MO 6103 and MO 6112) have been successfully leak tested during each refueling outage. The air operated butterfly valve (BV-4435) is not subjected to leakage rate testing. The full stroke opening time for valves MO 6103 and MO 6112 is approximately 39 seconds (based upon tests conducted during April 1970). The opening time for valve BV-4435 is approximately 39 seconds (based upon tests conducted during 1965). The check valves at the discharge of the fire pumps, those in the domestic water system, and the check valves in the cross-tie line between the domestic and fire water systems, have not been subjected to leakage rate tests. According to Mr. Raymond, there have been occasions when domestic water was supplied from the fire water system, by opening the manual bypass valve in the cross-tie line.

136. Mr. Crews asked if there had been any occasion when the fire water or domestic water systems had been contaminated and, specifically, if there was any evidence of this being the case during or following the depressurization occurrence of July, 1970. Mr. R. Parker, the RSO, provided the following information regarding

the analyses of these water systems. The domestic and fire water systems are not routinely analyzed for radioactivity. The most recent analysis of the domestic water system (sample was taken from a drinking fountain) was on July 1, 1970. This analysis showed a total radioactivity content of 7.5×10^{-10} uc/cc. The records showed that on July 17, 1970, water samples were obtained from the piping downstream of valve BV-4435. The results of analyses of these samples taken at 1630 and 2215 showed a total radioactivity content of 2.94×10^{-3} and $\leq 1.73 \times 10^{-2}$ uc/cc, respectively. The latter value was given as equal-to-or-less-than, since the recorder scale for the multichannel analyzer was unmarked.

137. Mr. Parker said that the actual value could have been a factor of 10 lower, but not higher. Mr. Parker said that "unfortunately" no water samples had been obtained from the fire or domestic water systems following the July 17, 1970 depressurization occurrence[5/]. In response to Mr. Crews' inquiry, he said that no samples are taken of the sanitary water discharge (from septic tanks) prior to release.

Delay in Compliance with 10 CFR 20.408

138. As reported in paragraph 76, Mr. Rowen stated that he had not received from the Company a report of his exposure to radiation and radioactive materials incurred during his employment, until he received the Company's letter with this information dated September 20, 1970. . Company personnel records were checked by the Investigator and the following was determined.

139. Mr. Rowen was discharged June 5, 1970. The letter notifying him of his discharge was dated June 8, 1970. Mr. Rowen's exposure was determined by the licensee from receipt of the last film badge report for Mr. Rowen which was dated July 13, 1970. The licensee's letter to Mr. Rowen telling him of his total exposure

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5/ On May 24, Mr. James C. Carroll, Supervising Steam Generation Engineer, PG&E, called Mr. Crews and provided the following additional sample results for the domestic water system:

Date of Sample	Activity (gross beta, uCi/cc)
3/3/70	1.16×10^{-9} uCi/ml
7/1/70	0.75×10^{-9} uCi/ml
9/24/70	1.12×10^{-9} uCi/ml
1/12/71	0.78×10^{-9} uCi/ml
4/21/71	1.18×10^{-9} uCi/ml

Mr. Crews told Mr. Carroll that the sample results shown above for March and September, 1970, were provided by Mr. Parker at the time of our investigation at the plant; however, Mr. Parker stated at that time that these water samples had been taken from water wells rather than from fountains or faucets. Mr. Carroll said that Mr. Parker was mistaken. He said that the source of the samples (drinking fountains or water faucets) was verified by talking to the technician who obtained the samples.

was dated September 20, 1970. Compared to the requirement of 10 CFR 20.408, the licensee's report to Mr. Rowen was not submitted within the 30 days following July 13 or the 90 days following June 5.

140. Records were also examined in this regard, pertaining to Forrest Williams. Mr. Williams was discharged May 25, 1970. The letter notifying him of this discharge was dated May 27, 1970. The final badge report for Williams was dated June 9, 1970. The letter from the licensee to him giving a report of his total exposure was dated September 30, 1970. However, Mr. Williams was successful in being reinstated in his job after a Union hearing on his grievance. On April 15, 1971, he was put back on the job from which he was discharged. He stayed just that one day and, according to Mr. Weeks, did not come back after that. Mr. Weeks contended that Mr. Williams' actual date of termination was the last day that he worked (during which he was not exposed to any radiation) and, therefore, the report of exposure dated September 30, 1970, was timely.

Discussion with Management

141. At the conclusion of the investigation, the afternoon of May 21, a discussion was held by the investigators with Messrs. Ramsay, Raymond, and Weeks. They were informed that the investigation had proceeded as far as it could, being limited in access to a review of records and discussion with management. They were told that additional investigation might be necessary the following week, but that Mr. Ramsay would be informed if this was scheduled. They were told that four items had been disclosed so far as possibly involving items of noncompliance, or safety, and that these were:

1. That Company employees had been specifically told not to report matters of safety significance to AEC inspectors, contrary to the intent of Form AEC-3.

2. That a report on his radiation exposure had not been given to Robert Rowen within the time limit prescribed by 10 CFR 20.408.

3. That there existed a possibility that the domestic water system could be contaminated by its interconnection with the fire water system, if that system became contaminated.

4. That the RWP's for air and water sampling, and the hot lab did not meet the Company's specifications in the "Radiation Control Standards."

142. Mr. Weeks responded to the first item, and as reported in paragraph 102 above, repeated that he had specifically told Mr. Rowen that he could not talk to AEC on Company time. He reiterated that he had no recollection of having told Mr. Rowen that he should not talk to AEC on his own time 6/.

6/ In a subsequent telephone call to Mr. Dodds on May 25, Mr. Carroll advised Mr. Dodds that Mr. Weeks had remembered that he had told Mr. Rowen that the AEC inspector may not appreciate having him contact him during non-working hours.

143. Mr. Crews addressed the following question to Mr. Ramsay, and requested a statement from him:

> "Is PG&E policy and/or practice with regard to employees contacting AEC representatives in conflict with the Notice to Employees contained in Form AEC-3?"

Mr. Ramsay said that he could make no statement in response to the above question. He suggested that the question be asked of PG&E management in San Francisco.

144. In response to item 2., Messrs. Raymond and Weeks stated they had not been aware of the requirement of 10 CFR 20.408 which requires that persons specified by 10 CFR 20.407 (i.e., operators of nuclear reactors) must furnish a report of personnel exposure to a terminating individual, without it having to be requested by the individual. They stated they had assumed they were subject only to 10 CFR 20.404(a), and had furnished the report to Mr. Rowen shortly after he had specifically requested it.

145. In regard to item 3., Mr. Crews explained the situation, as described above in paragraphs 134 through 137. He stated there was no conclusive evidence that either the fire water or the domestic water had been radioactively contaminated during the depressurization occurrence of July, 1970. He expressed concern, however, that the design and operation of the low pressure flooding system does present the potential for cross contamination of these systems, and that routine analyses of these systems for radioactivity are not conducted. Mr. Ramsay said that Mr. Crews' observations were worthy of serious consideration.

146. In regard to item 4., Mr. Weeks stated that the conditions were always changing at the air and water sampling stations and in the hot lab and it was difficult to establish levels of radiation which would cover all cases.

Investigation at San Francisco and Walnut Creek, California, May 26, 1971

147. On the morning of May 26, 1971, the investigator visited the San Francisco office of the California State Unemployment Compensation Board, 745 Franklin Street, San Francisco. It was learned there that the transcript of the hearing in the matter of Robert J. Rowen, Jr., had not yet been completed and was not available for review. A copy of the Decision of the Referee in this Case No. SF-1319 was obtained and is attached (Exhibit K). In the afternoon of May 26, 1971, the Investigator visited the District Headquarters of the International Brotherhood of Electrical Workers (IBEW) at Walnut Creek, California. The transcript of the proceedings in the arbitration Case No. 36 between IBEW Local Union No. 1245 and PG&E Company was reviewed. The transcript covered all of the items referred to in Mr. Rowen's letter to AEC of April 30, 1971, and others referred to in his interviews with AEC, reported above. Additional items appeared in the testimony of John Kamberg between pages 162 and 187 of the transcript as follows.

148. Mr. Kamberg recalled an occasion when he had seen Rowen working with the hand and foot counter and had it open. Mr. Kamberg stated he asked Rowen what

he was doing and Rowen stated he was attempting to determine the settings for the counter which he had heard were set too high. Kamberg stated that he demonstrated to Rowen that the background count at that time was 400 cpm. He stated he showed Rowen that the setting of both the right and left hand counters was 600 cpm, or 200 cpm over background and that the shoe counter was set at 640 cpm, or 240 cpm over background. Kamberg stated he asked Rowen if the settings were what he thought they would be and Rowen said, "No, they weren't, the accusation was false."

149. Mr. Kamberg also testified that on May 27, 1970, he was in Ed Weeks' office with R. Parker when a call came in from Rowen saying he had counted a smear taken from his truck in the parking lot and found that it was contaminated. Kamberg explained to Rowen that a survey of the cars in the parking lot was being conducted, and had been underway for the past half hour, and that Rowen would be advised if there was any cause for concern.

150. A copy of the Decision of the Board of Arbitration in this Case No. 36 was obtained and is attached (Exhibit L). A copy of the Decision of the Board of Arbitration in the Case of Forrest E. Williams, Case No. 35, was also obtained and is attached (Exhibit M).

Investigation at Eureka, California, and the Humboldt Bay Power Plant, May 26-28, 1971

151. At the direction of Compliance Headquarters, additional investigation was conducted May 26-28 with an additional purpose to ask as many HBPP employees as possible whether they had specifically been told not to talk with AEC inspectors and if they had been threatened with reprisals if they did.

Interview with Howard Darington on May 26, 1971

152. Howard J. Darington, IV, resides at 2423 D Street in Eureka. His telephone number is 442-2610. Mr. Darington was interviewed between 8:30 and 10:30 p.m. on the evening of May 26, 1971, in Room 3 of the Sandpiper Motel in Eureka, by Mr. Harry S. North and John J. Ward. Mr. Darington identified himself as a Control Technician at the HBPP and a Union representative. He stated that he was Chairman of the Negotiating Committee of the Union with PG&E. He stated that he has been a steward and is presently one of the shop stewards for the local chapter of the Union at the plant. Mr. Darington was asked if he had ever been told not to speak to or had been "prohibited" from speaking to AEC representatives by Company management. He stated that the usual channel for handling complaints was through the Union in an attempt to resolve problems and questions with the Company management before going to an outside agency. Darington stated that he had never been specifically prohibited from contacting AEC, but said that it was understood this was not approved. When asked if he knew of other persons who had been told not to talk to AEC he stated Robert Rowen had told him that he had been told by a supervisor that he would "put his job in jeopardy" by contacting AEC. He also recalled that some years before a former employee, Bob Moore, a garrulous individual, had struck up a friendly conversation with an AEC inspector when he met him in the change room, and had been given "black looks" by the supervisor for having done so.

153. Mr. Darington said that a Union committee formed with respect to health and safety practices at the plant came to the conclusion that the radiation protection engineer at the HBPP should be completely independent and report outside the plant management. He stated that this recommendation was made to Company management on Union letterhead. Mr. Darington said that there was no action as a result of this recommendation. He stated it was his opinion that the Company does not try to keep radiation exposures to the lowest practicable level; if they can keep under the limits of 10 CFR 20, that satisfies them. When asked for an example he stated that the water sampling station at the -2 level had been known to be a high rad area, registering over 100 mr/hr, over the past month and nothing had been done about it until last week when some AEC inspectors were in the plant (Crews, North, and Ward). He stated that in the last week lead shielding had been placed around this station to cut down the exposure. He stated CT Bill Evans would know about this situation.

154. Mr. Darington stated high exposures were routine for the Control Technicians who obtain the reactor water and off-gas samples and make leak tests. He said Ray Skidmore had received 5 R in one year for example, partly because he had not used tongs to carry the samples. He stated that on some occasions when the reactor water bottles are carried up to the lab he believes the Control Technicians would receive more than the 18.75 R to the extremities for the quarter (the limit set by 10 CFR 20.101). He had no specific calculations or knowledge of actual instances to support this belief.

155. When asked for specific instances wherein he believed there had been some radioactive hazards, Mr. Darington mentioned an incident which occurred while he was attending Union negotiations at Walnut Creek in 1970. He stated he had been told about it subsequently. He stated that on approximately June 21, 1970, a seal blew on the reactor cleanup pump at the minus 66 foot level which resulted in a steam cloud of reactor water. He stated that three men went into the cloud to isolate the pump. An air particulate sample collected on a Schmidt Sampler on the plus 12 foot level was reportedly too hot to count and only a fraction of the sample was counted. Reportedly, the person who counted it did not know what to do with the results. The men entering the area wore half masks only. A junior man was reported to have suggested the use of Scott Air Packs; however, a senior man said no. Ed Weeks was alleged to have said that if a GM does not show anything when you breath on it, it is all right. Mr. Darington stated he had no particulars on what the count was or what had happened to the results.

156. Mr. Darington stated he and some other employees at the plant would like an opportunity to speak to the AEC inspectors some evening during a regular visit to HBPP concerning the AEC's regulatory program and the AEC regulations as they apply to the plant. Mr. Darington was informed by Mr. North that such a discussion would be possible, but that a request for the meeting should be submitted in writing to the Region V office to coordinate it with an inspection trip to the area, if possible, and a brief format of the items to be covered during the discussion should be included.

Telephone Interview with Raymond Skidmore, May 27, 1971

157. The Investigator telephoned Mr. Raymond Skidmore at his home, 3342 K Street, Eureka, telephone number 443-0736, at 7:30 a.m. on May 27, 1971. Mr. Skidmore was asked if he could appear for an interview that evening. He stated he preferred not to since he didn't want to jeopardize his job. He was reassured and told that everything he said would be held in confidence and there would be no disclosure to management. He said he preferred not to, but that he didn't mind talking on the phone. He was then asked the question, "Have you ever been told that you could not talk to AEC about safety problems?" He stated, "No, he had not." He stated he had not been threatened with any reprisals if he had done so; however, Skidmore stated it was generally understood at the plant that persons should not talk to outside agencies - they should stay within the procedure set between the Company and the Union for discussion of grievances.

158. Mr. Skidmore was then asked about any specific problems he might have or if he had any particular questions to ask AEC. He stated he could recall none. He was asked about the cask incident where he reportedly had found higher exposures in his wipes of the fuel element cask than those reported. He stated he did not recall the specific incident or the specific values he had found. He stated, however, these should be in the Control Technician's log. Skidmore was also asked about the problem that he has with his nails and as to whether he thought it had been caused by radiation and he said no, he did not think so. He stated that one doctor had asked him if he had worked with radiation, but didn't indicate that it had come from radiation. He stated that other doctors had told him that it was a fungus disease and they had put him on an antibiotic pill which was supposed to clear the thing up by going into his system, but this had not worked and he stated he is going for other treatments to other doctors, but he did not believe the problem was related to radiation. Concerning Skidmore's alleged handling of the neutron source, he stated that he remembers, on one occasion, having dropped the neutron source and having picked it up with his right hand. He was asked who was present at the time, he said that Gale Allen was present and saw him pick it up with his hand. He stated he did not know any other persons who had done this, he stated that he estimated that he had the source in his hand no more than one or two seconds. He was reassured on this score that it was explained to him that he would have gotten perhaps no more than 1 R to his hand for that period from this 5-curie source.

Investigation at Humboldt Bay Power Plant, May 27-28, 1971

159. Further examination of records and interviews of management personnel were conducted on May 27-28, 1971, by Mr. North and the Investigator. Except for a visit to the upper level outside gallery to look at the High Level Vault, all work was done in Mr. Ramsay's office. Messrs. Ramsay and Raymond were present part of the time, as was Mr. Gale Allen. Messrs. Weeks and Boots were present during all or most of the Investigators' visit.

Interview with Gale Allen -- Neutron Source

160. Allegations of the neutron source being dropped were made by Mr. Rowen as reported in paragraph 77. Mr. Allen was specifically asked about any occasion of the neutron source being dropped. Mr. Allen stated he could recall no such occurrence. He stated he was present during all times that the source was removed from storage for use. He was asked if he had ever seen the neutron source dropped and picked up with bare hands. He stated he knew of no such occurrence. Mr. Allen stated that all neutron source handling was conducted under Special Work Permit, and that with a few minor exceptions he had always been the one to use the neutron source. He stated that Mr. E. Kennedy, Instrument Engineer, had used the source occasionally. He stated that it actually had been used very little and that he knew of no use of it without his knowledge. To use the source he stated it is removed from its plastic tube under water by screwing a 3-foot threaded rod into the female fitting on the end of the source, pulling it out of the tube, and placing it in the calibration unit. He stated the threaded connection was loose enough not to bind, but would not allow the source to jiggle off. He stated in most cases an exposure of no more than 30 mrem would be received by the source user.

Rabbit Feeding

161. Mr. Rowen's comments about rabbit feeding are reported in paragraph 83. Mr. Allen was asked several questions based on Rowen's allegations. He was asked about the rabbit feed and his reaction to an allegation that the rabbits were fed 90% commercial rabbit food and 10% grass. Mr. Allen stated the allegation was untrue. He stated the rabbits always had fresh cut grass and store feed in the cages. (Also, the open mesh floor cages were placed on the grass.) He said the rabbits ate both, according to each rabbit's preference. Concerning the possibility that the rabbits did not eat enough grass to have ^{131}I show up in their thyroids, he stated the thyroids showed no count, but this was not the reason. He stated the same results were obtained from counting the thyroids of beef cattle who grazed in the same area, downwind from the stack plume, and they did not eat anything but grass.

162. Mr. Allen stated the rabbit feeding program was discontinued because the rabbits contracted an infectious disorder which was diagnosed by a local veterinarian, who stated that once started in a colony of rabbits it spread rapidly and generally with fatal results. As a result, the rabbit feeding program was terminated by the sacrifice of the remaining rabbits for their thyroids.

Interview with Jerry Boots - Traveling Maintenance Crew Training

163. Allegations concerning the training of traveling maintenance crews are reported in paragraphs 43, 61, and 62. Mr. Jerry Boots was asked about the training for these persons. Mr. Boots stated that the traveling maintenance group personnel are given a quick survey course prior to beginning work at HBPP. He stated that the course did not follow a prepared procedure, but includes discussion of the

SWP (Special Work Permit) procedures, protective clothing, monitoring, hazards associated with nuclear plant work and a short radiation protection course. He said that the course ranges from 1/2 to 1 hour in length depending on the questions raised by trainee personnel. Courses have been presented by Allen, Boots, Parker, and Bill O'Hara, Chemical-Radiation Protection Engineer. Mr. Boots stated that traveling maintenance group personnel had essentially no independent access to the facility, but are essentially always accompanied, generally by a technician, formerly Control Technicians. Maintenance crews are subject to supervision by plant management.

Dosimeter Readings Higher Than Badges

164. Paragraph 84 reports Rowen's allegation concerning Boots' dosimeter readings for February-March, 1970. Mr. Boots was asked about his exposures for that period and records were examined for the first quarter of 1970. Mr. Boots stated that the cumulative exposure recorded by the individual from his dosimeter readings generally runs about 10% higher than the film badge shows at the end of a quarter. He stated he recalled one quarter, he doesn't remember when, when the dosimeters, in general, not just his, were 15% to 20% higher than the badge. He could not explain it and he believes he may have called Radiation Detection Company about this, but he does not remember.

165. "The Exposure Estimate Work Sheet" for Boots was examined. The sheet referenced "Exposure Estimate Card No. S-3." The information shown on the above identified record is as stated below:

Monitoring Period	Dosimeter Measured Exposure *	Film Badge Correction for Dosimeter Measured Exposure	Film Badge Measured
First Quarter, 1970			
Jan. 15 - Feb. 14	90		40
Feb. 15 - Mar. 14	0	40 **	0
Mar. 15 - April 14	85	135	110

* All units in mr.

** The film badge correction to dosimeter results shown was improperly applied in that dosimeter exposures are corrected on the basis of film badge reports which are the formal record. The correction applied to the Jan. 15 - Feb. 14, 1970 dosimeter exposure should have been 50, resulting in dosimeter measured exposure during this period of 40 mr, which would correspond with the film badge.

Improper application of the correction factor resulted in recording a first quarter 1970 cumulative dosimeter total of 135 mr, rather than 125 mr, which would have resulted from use of the proper film badge correction factor.

(continued)

(continued)

Monitoring Period	Dosimeter Measured Exposure	Film Badge Correction for Dosimeter Measured Exposure	Film Badge Measured
Second Quarter, 1970			
April 15 - May 14	30		0
May 15 - June 14	20		0
June 15 - July 14	175		130
Third Quarter, 1970			
July 15 - August 14	190		280
August 15 - Sept. 14	0		0
Sept. 15 - Oct. 14	0		(no reading)
Fourth Quarter, 1970			
Oct. 15 - Nov. 14	0		30
Nov. 15 - Dec. 14	0		0
Dec. 15 - Jan. 14	0		(not shown in 70 records, contained in 71 records)

Test Well Analyses

166. Comment on test well #3 appears in paragraph 87. The results of the licensee's sampling of test wells and other sources of underground water and fuel pool leakage were last examined during the inspection conducted September 2-4, 1970, and is reported on page 21, paragraph 3 of CO Report No. 50-133/70-5. The licensee samples the spent fuel pool and the spent fuel pool liner drain, the caisson sump, french drain, two domestic wells identified as Nos. 1 and 2 which provide potable water for the plant and four shallow wells. Nos. 4. With respect to the spent fuel pool wells 4-6 are located as follows: No. 4 generally south, No. 5 generally east, and Nos. 3 and 6 generally north. The licensee reported that ground water flow in the area is toward the bay in a generally northerly or northeasterly direction. For comparisons, see table attached, titled Activities in Ground Water and Other Samples - 1970-71 to date. (Exhibit N).

High Level Waste Storage Vault

167. The vault allegations appear in paragraphs 34 and 65. Possible airborne surveys conducted during opening of the high level dry waste storage vaults were discussed with Messrs. Weeks and Boots. Mr. Boots stated that he never had anyone collect samples for airborne radioactive materials and to his knowledge no one else had collected any. He stated that the reason that no such surveys were performed was because materials placed in the vaults were drummed or wrapped in plastic and the material was not considered to be a source of airborne contamination. Mr. Boots said that he had no recollection of anyone ever returning from work in

this area with contaminated clothing or indication of activity on nasal smears. Boots said that routine checks were performed of clothing, skin, and nose following work in this area. It was stated that materials were placed in the high level waste storage vault for decay and storage prior to transfer to a waste disposal agency. The vaults are considered to be temporary storage areas from which waste is removed at intervals for disposal. Materials placed in the vault are packaged, essentially for shipment, prior to their placement in the vault.

Airborne Contamination in the Control Room During 1967-1968

168. Allegations are noted in paragraph 47. Boots stated that he remembered the samples collected in the Control Room and stated that the principal contributor was ^{138}Cs. Air samples for 1967 and 1968, which were filed by the month, were examined. Alpha and beta activities were determined by internal proportional counting, gamma spectrums were used to identify activities.

Results of analysis of air particulate samples collected in the Control Room during January 1967:

Date	Time	Gamma Spectrum	Alpha Activity uCi/cc	Beta Activity uCi/cc
Jan. 3	11:43	Scan	-	-
Jan. 5	11:36	-	1.43×10^{-12}	1.9×10^{-9}
Jan. 23	09:45	Scan	-	4.12×10^{-8}
Jan. 23	13:33	-	-	1.65×10^{-9}
Jan. 25	10:30	-	6.0×10^{-12}	6.3×10^{-8}
Jan. 25	16:13	-	-	3.94×10^{-8}
Jan. 25	09:30	-	-	3.49×10^{-8}
Jan. 27	09:43	-	3.71×10^{-12}	2.5×10^{-8}
	09:50	Scan	-	-
Jan. 27	11:56	-	-	9.3×10^{-9}
Jan. 27	13:14	-	7.41×10^{-12}	1.86×10^{-11}
Jan. 29	09:36	-	1.4×10^{-11}	5.57×10^{-10}
Jan. 29	10:10	-	7.06×10^{-11}	1.9×10^{-8}
Jan. 29	14:32	-	-	1.005×10^{-11}
Jan. 30	11:26	Scan	-	-

169. A summary of total air particulate samples collected and analyzed by the licensee in the Control Room during the periods 1967-1968 is shown

below. Ranges of airborne particulate activities were as shown for January, 1967, except as noted:

Month	Number of Samples	Values Above Those Shown for Jan. 1967
January, 1967	12, see above	-
February	28	None
March	9	None
April	7	None
May	1	None
June	2	None
July	0	None
August	0	None
September	1	None
October	0	None
November	1	None
December	13	None
January, 1968	5	None
February	0	None
March	3	
	3/13 - 1844	5×10^{-7} uCi/cc beta
	3/13 - 1934	2.6×10^{-7} uCi/cc beta
April	0	None
May	0	None
June	0	None
July	0	None
August	0	None
September	0	None
October	0	None
November	2	None
December	5	12/27 - 1.36×10^{-7} uCi/cc beta

170. Mr. Boots stated that the principal activity observed was ^{138}Cs which has a half life of less than two hours which provides an MPC of 1×10^{-6} uCi/cc. Mr. Weeks stated that the airborne activities observed in the Control Room were the result of certain meteorological conditions (wind directions and shifts) which resulted in the movement of air, contaminated with steam leaks in the turbine building, through the air intake plenum supplying the Control Room. Mr. Weeks stated that the Control Room intake plenum was later relocated which resulted in a reduction in the number of occasions when airborne activities were observed in the Control Room.

Allegation Concerning Contamination of Employees' Cars in the HBPP Parking Lot on May 27, 1970 - Referred to in Paragraphs 47 and 149

171. Mr. North examined HBPP Special Radiation Survey Report No. 2274, dated May 27, 1970, p.m., location identified as Counting Room Survey Description - Smear survey of cars in south parking lot

		Contamination Above Background	
Item	Cpm Background	Cpm Smear	Cpm
Rumrill's car	350	200	~ 8 ft. sq.
Rumrill's car	350	< 100	~ 1 ft. sq.
Gables' truck	350	< 100	~ 1 ft. sq.
Barkers' truck	350	< 100	~ 1 ft. sq.

Instrument used GM. No check mark was shown on the form indicating additional comments or sketches. A check mark on the form indicated unconditional release with a footnote RCP (less than 100 cpm per ft. sq.). The form was signed by Evans.

(The entry, "RCP, (less than 100 cpm per ft. sq.)" refers to R. C. Parker and the DOT smearable contamination release limits.)

Cleanup Pump Mechanical Seal Failure and Exposure of Personnel to Contaminated Steam at the Minus 66 Foot Level in June, 1970, Allegation Noted in Paragraph 155

172. The failure of the mechanical seal on the reactor cleanup pump was discussed with Mr. Weeks. Mr. Weeks stated that operators entering the area used masks. He stated that no air samples were taken before entry, but that a constant air monitor at the plus 12 foot elevation was operating. Mr. Weeks stated that he believed that air samples were taken after the pump was isolated from the system. He stated that the occurrence had been included in the inspection conducted on September 2-4, 1970 (CO Report No. 50-133/70-5). Weeks stated that plant personnel went into the area before knowledge concerning the steam leak was available. He said that cartridges from the half masks used by plant personnel were surveyed. He stated that plant policy requires respiratory protection one decade below the MPC. He stated that ^{138}Cs was observed in steam leaks in the plant. Mr. Weeks was asked if any air samples collected at the time of the occurrence were so high that they could not be counted and that they might have been thrown out without evaluation. Mr. Weeks stated that he did not know of any. Mr. North looked at the Control Technician Log and the Control Operator's Log for June 21, 1970. The Operator's Log showed only when the leak had occurred and when it was fixed.

173. Mr. Weeks stated that Senior Control Operator, N. Pena, on the graveyard shift, was making a plant tour and was at the minus 66 foot level in the access shaft when the seal failed and the reactor scrammed. Mr. Pena was wearing a half face filter mask at the time since he planned to enter the pipe tunnel where steam leaks were known to exist and where respiratory protection was required.

Mr. Pena reportedly left the area (-66 foot). Mr. Pena and his mask were subsequently surveyed. The mask was found to be contaminated. Mr. Pena's breath, nostrils and the inside of the mask were clean. Weeks stated that on the basis of these surveys, Pena, J. D. Shiffer, Nuclear Engineer at that time, and one other individual, not identified but possibly Voss, re-entered the area. Weeks said that only half face masks were used. Weeks stated that as a rule nasal contamination was initially observed to be a factor of 10 below the MPC for airborne ^{138}Cs.

The air sample log for the refueling building for June 21, 1970, was examined. An abstract of the information contained in that record is on the attached table, Air Sample Log Refueling Building 6/21/70 (Exhibit O).

The Control Operator's Log recorded that the seal failed at approximately 1:40 a.m., 6/21 and the system was secured at 3:18 a.m., the same date.

174. On the morning of May 28, 1971, J. Ward and H. North prepared a list of questions to be resolved at the licensee's facility. These questions were to include interviews with all persons who were reportedly involved in the reactor cleanup pump seal failure of June 21, 1970. This would include:

N. C. Pena, Senior Control Operator
J. D. Shiffer, Nuclear Engineer
R. Grauer, Auxiliary Operator
D. M. Voss, Shift Foreman
R. W. Grundhofer, Control Operator

Questions to be resolved included:

Who collected air samples on June 21, 1970?
Were any samples discarded because they were too hot to count?
What portion of samples were counted (fraction)?
Where were samples collected?
Where were valves and pump requiring service (level)?
Where was steam cloud release (level)?
Who went into the steam cloud to fix the pump and/or close valve?
How long was the individual present in this environment?
What were the results on the whole body counting and urine analysis on Pena?
Where was Pena when the seal failed and where did he go?
When was maintenance work done?
Check for iodine peaks on gamma spectrometer run on the sample collected on June 21.
Why did the seal fail through a pipe rather than directly to the atmosphere?

175. On the morning of May 28, 1971, Messrs. Low, Engelken, and O'Reilly spoke to Ward and North by telephone concerning the event of June 21, 1970, involving the seal failure and subsequent maintenance on the reactor cleanup pump. It was stated that the investigators should speak to Darington again after work and

question him as to who had provided him with information involving the seal failure on the reactor cleanup pump and what they said. We were directed to ask him if samples were destroyed to his knowledge. Interviews with non-management personnel at the plant were specifically excluded from the investigation.

176. Following the telephone call from Headquarters, questions resulting from that conversation and previously identified questions were used to plan the plant visit to follow. The resulting list included the following items for examination.

1. Drawings of the plant layout as it related to the access shaft and reactor cleanup pump, reactor equipment drain tank and scram dump tank.

2. Drawings of the reactor cleanup pump.

3. Identification of the locations where Pena was when the seal failed and why he was at that location.

4. Location where plant personnel and maintenance personnel worked to isolate the reactor cleanup pump and to perform maintenance on that pump.

5. Examination of airborne sample records for June 20-21 which might be associated with the reactor cleanup pump seal failure. Identify levels at which samples were taken.

6. Determine when maintenance on the reactor cleanup pump was performed.

7. Determine what airborne samples were taken during the maintenance work on reactor cleanup pump.

8. What survey, or if no surveys, what Special Work Permits are shown in the Control Technician's Log for the maintenance work.

9. Examine Special Work Permits for seal failure occurrence and cleanup pump maintenance.

10. Examine Control Technician's Log for the period June 20-21 for reference to the seal failure occurrence and pump maintenance.

11. Examine maintenance and repair records on the reactor cleanup pump.

12. Examine Control Operator's Log for the period June 20-21, and the reactor cleanup pump maintenance period.

13. Examine exposure records for individuals involved in the seal failure occurrence and pump maintenance, film badge, whole body counts, and urinalysis.

177. On the afternoon of May 28, 1971, the investigators went to the HBPP where they interviewed Messrs. Ramsay, Raymond, and Weeks. The various documents which the investigators wished to examine were specified. While waiting for records to be collected Weeks was questioned concerning the time required to isolate the reactor cleanup pump. He stated that he could have done the job in 5 to 6 minutes, but after a telephone call to Shiffer, he said that Shiffer reported that it took 10 minutes to shut off the pump and 5 minutes to clear the access shaft.

Documents Examined

178. Control Technician Log No. 66102 for the period June 13-October 30, 1970, was examined. The previous log was 64919. Page 66102-04A Skidmore and Gable, Control Technicians, dated June 19, 1970, had the following entries: Reactor building air sample alpha activity 2.7×10^{-11} uCi/cc, beta activity 1.57×10^{-8} uCi/cc. Stack gas activity, June 19, 1970, average 1.1×10^{4} cpm, no peaks; June 20, 1970, average 1.1×10^{4} cpm, no peaks; June 21, 1970, average 0.4×10^{3} cpm, peak 3.0×10^{4}.

Next entry shown was page 266102-05A on June 22, 1970, Skidmore and Gable, Control Technicians, reactor building air sample alpha activity 2.12×10^{-11} cpm, beta activity 1.05×10^{-8} cpm, $T1/2 = 40$ minutes. Stack gas activity average 1.3×10^{4} cpm, peak 1.5×10^{4} cpm. There were no entries in the Control Technician's Log for the period June 19-22, 1970, relating to the cleanup pump seal failure.

Control Technician's Log, page 66102-10A dated 6/29/70, noted Skidmore, Control Technician. Special Work Permit No. 9360, "Transfer tools - 66 for cleanup pump job" issued. Control Technician's Log page 66102-11A, June 30, 1970, noted Skidmore, Control Technician, SWP 9363 "clean up pump" and SWP 6365 "inspection motor clean up pump" issued. Notes were included in the log on this date "Constant monitoring for removal of clean up pump to hot shop." "Step off pad established at hot shop." SWP 9366 "Remove drain line from scram tank" issued.

Control Technician's Log page 66102-14A, dated July 3, 1970, noted Skidmore, Control Technician, SWP 9375 "Clean up hot shop," SWP 9376 "Clean up -66" issued.

With the exception of the entries shown above for the period June 29-July 3, no other entries were contained in the Control Technician's Log relating to the maintenance on the reactor cleanup pump seal failure or scram dump tank.

Cleanup Pump Maintenance Crew

179. Maintenance on the reactor cleanup pump was done by a traveling crew plus one HBPP man. Four men from other PG&E plants reported to the facility on June 29, 1970. Work on the reactor cleanup pump began on June 30, and was completed July 3, 1970. The four crew members were Charles Humbert, Robert Collins, Phillip Brooks, and Darwin Blair. Tom Backens, Mechanical Foreman, HBPP, was assigned to supervise the crew.

Bioassay Results on Traveling Maintenance Crew

180. Radiation Detection Company Bioassay Report No. 97, dated July 14, 1970, reported that urine samples received July 8, 1970, were analyzed for beta activity with a GM detector having a 2-inch diameter. Counts were corrected for back scatter, geometry, window and absorption and self-absorption based on sample weight. Net counts shown below are gross beta less than 40 corrected for 95% recovery. ^{90}Sr is assumed to be the most hazardous isotope with a Los Alamos Laboratory stated tolerance of 660 dpm per liter. Data are reported at the 90% confidence level.

Name	Net Beta Activity dpm/liter	Statistical Error ± %	Sample Collected
Blair	212	12	7/1/70
Brooks	126	23	7/1/70
Collins	312	7	7/1/70
Humbert	261	7	7/1/70

With respect to the date of sample collection, Raymond stated that past procedures have been to date bottles on the date issued and then collect the urine sample over a 24 to 30 hour subsequent period. Raymond's statement indicates that sample collection terminated on July 2, 1970, at the conclusion of the maintenance operation.

Whole Body Counts

181. Information relating to whole body counts on HBPP personnel involved in the cleanup pump seal failure and maintenance activities were examined. Whole body counts were performed by Helgeson Nuclear Services, Inc. Counts were made on June 8-10, 1970, with the report dated July 8, 1970, and on December 3, 4, and 7, 1970, with the report dated December 23, 1970. See Chart - Whole Body Counting 6/8-10/70 - 12/3-7/70 (Exhibit P).

Control Operator Logs

182. The Control Operator's Log No. 3 was examined for the period June 14-July 12, 1970.

Page No. 66098-26A, HBPP No. 3, June 21, 1970, 000 - 0800, Shift Foreman Voss, Senior Control Operator, N. Pena, Control Operator, Grundhofer, Auxiliary Control Operator, Grauer, Reactor at approximately 210 mwt, generator at approximately 65 mwe (Note: This section relates only those entries pertinent to the investigation) as follows:

"0140 - dump tank high level alarm followed by dump tank high level scram annunciator - scram channel No. 2 and finally scram channel No. 1 at 0141 scram complete - swapped house power and cut out No. 5 reactor feed pump."

"0318 cut out clean up pump open clean up pump bypass and close outlet and inlet to clean up pump (Manual valves at -66). Seal apparently blew on clean up pump."

"0355 notify System Dispatcher Smith of clean up pump failure and by passing of same - apparently steam and water from seal failure caused dump tank level spurious scram. Notified System Dispatcher of preparation for startup."

"0432 Note: Weeks and Shiffer (Nuclear Engineer) in plant for trouble investigation and startup."

(Note: Weeks stated that he arrived at the plant one-half hour after he was called. He stated that he was called when the reactor scrammed and that Shiffer arrived at the plant at approximately the same time. Weeks stated that the late log entry of his and Shiffer's presence in the plant must have been due to the fact that there was considerable activity and the log entry was made late.)

"0710 Reactor critical approximately 150 second period clean up pump cleared and bypassed."

(Note: There were no entries concerning the pump between June 21 and June 29.)

Control Operator's Log page 66098-57A, 0800-1600, June 29, 1970.

"10:34 - Tully reports on reactor clean up pump to remove leach."

Control Operator's Log page 66098-60A, 0800-1600, June 30, 1970.

"1115 Received OK per Ramsay to break refueling building containment through railroad doors to remove clean up pump."

"1220 Open refueling building railroad doors."

"1304 Closed refueling building railroad doors."

(Note: There were no entries concerning the pump between June 29 and July 2.)

Control Operator's Log page 66098-69A, 0800-1600, July 2, 1970.

"1037 received OK from Weeks to open building railroad doors to take in clean up pump."

"10:58 Open refueling building railroad doors."

"11:02 Closed refueling building railroad doors and start leak rate test."

Control Operator's Log page 66098-70A, 1600-2400, July 2, 1970.

"1606 Backens, Reports clear up pump."

"1650 Start warming clean up pump."

Cleanup Pump Location

183. Mr. Weeks was asked to identify the location of the reactor cleanup pump, the reactor equipment drain tank and scram dump tank. Mr. Weeks produced a drawing like that shown in the Final Hazards Summary Report, Humboldt Bay Power Plant Unit No. 3, dated September 1, 1961, Section III, Description of the unit, Figure 8, Equipment Location Miscellaneous Plans and Sections, Plan at Elevation (minus 66 feet 0 inches) page 13. Mr. Weeks pointed out that reactor cleanup pump, reactor equipment drain tank and scram dump tank are located in a cubical at the minus 66 foot elevation, separated from the man-lift access area by a shield wall. Mr. Weeks stated that the two manholes on the reactor equipment drain tank are not closed so that operations personnel can observe discharge of liquids to this tank through the holes and identify sources of leakage. Mr. Weeks stated that in order to isolate the reactor cleanup pump and institute bypassed operation of the reactor cleanup system it was necessary to operate three manual valves located adjacent to the reactor cleanup pump. Two of these valves have reach rods with remote operators which permit operation of the reactor pump suction and bypass valves from the protected side of the shield wall. He stated that the discharge line from the reactor cleanup pump was not equipped with a reach rod permitting remote operation and isolation of the pump required entry into the reactor cleanup pump area.

Cleanup Pump

184. The reactor cleanup pump was identified as a vertical type RV pump manufactured by Bingham Pump Company, Portland, Oregon, and Vancouver, B. C. The pump is designed with a fully enclosed shaft between the impeller and motor base which incorporates a long bushing and a rotating and fixed mechanical seal. Leakage from the impeller housing along the shaft passes between the shaft and the bushing and around the rotating mechanical seal passing between the fixed and rotating mechanical seals to a void space surrounding the shaft on the motor side of the fixed mechanical seal. This void space is provided with a leak off line which is connected to a drain line which runs to the reactor equipment drain tank. Mr. Weeks stated that it was difficult to initially determine the cause of the scram which resulted from the seal failure because the licensee believed that the leak off line from the reactor cleanup pump ran directly to the reactor equipment drain tank. He stated that a detailed examination of piping drawing revealed that the leak off line tied into the line connecting the scram dump tank and the reactor equipment drain tank. He stated that it was not obvious that this was the situation since the tee involved was buried in the concrete floor. A sketch of the pump and arrangement of the valves and dump tank and reactor equipment drain tank is attached (Exhibit Q). Further information relating to the piping system is shown in two drawings contained in the Final Hazards Summary Report, Humboldt Bay Power Plant, Unit No. 3, dated September 1, 1961, P & I Diagram Reactor Clean Up and Shutdown Systems, figure 36, page 75, and P & I Diagram Radwaste Collection System Figure 65, page 166.

Reason for Personnel at Minus 66 Level

185. In response to questions concerning N. Pena's presence in the access shaft at the minus 66 foot level at the time the seal failed and the reactor scrammed, Mr. Weeks questioned Mr. Shiffer by telephone, and reported that Mr. Shiffer believed that Mr. Pena was making his normal rounds as the Senior Control Operator. Mr. Weeks stated that under these circumstances Pena would normally have carried a mask if he planned to enter the pipe tunnel. Weeks stated that there had been leakage from the reactor cleanup pump seal and that Pena possibly had been checking the leakage on that pump. Weeks said that Pena was in the area when the reactor scrammed and that he entered the area in which the reactor cleanup pump is located and investigated before he left the area. Mr. Weeks stated that initially they were unable to associate the scram with the failure of the cleanup pump seal until drawings were found which identified that the cleanup pump seal leak-off line tied into the drain line between the scram dump tank and the reactor equipment drain tank. Mr. Raymond said that even though the seal on the pump failed, it resulted in a limited release due to the long leak off bushing and the mechanical seal. Weeks said that there was lots of activity on Pena's mask, but not under his mask.

Cleanup Pump Maintenance

186. Mr. Raymond discussed the findings on the disassembly of the reactor cleanup pump. He stated it was found that the rotating stainless steel seat was steam drawn and that the stationary wearable seal was scored radially. Maintenance records indicated that some small springs, part of the seal mechanism, were broken. The records reported that the pump did not fail to operate, but had to be shut down.

187. The Mechanical Foreman's Log No. 8 (Backens) for the period August 18, 1969 through August 30, 1970, had the following entry on page 61913-79A, dated June 29, 1970:

"June 29 - Monday

(1) Cleanup pump -
T. Brooks, R. Collins (of the Pittsburgh Power Plant) and
C. Humbert, D. Blair (of the Morro Bay Power Plant) reported
in the plant for work on the pump."

The following page, 61913-80A, had the following entries:

"June 30 -

(1) Cleanup pump - Remove from -66 and disassemble.
Seal had failed - rotating seat chipped in several areas.
Stationary seat gauled and worn."

"July 1 -

(1) Cleanup pump -
Continue replacement of seal.
Relocate discharge of seal leakage drain from scram dump tank
drain, to directly into R. E. D. T."

The next page, 61913-81A, had the following entry:

"July 2, Thursday

(1) Cleanup pump - completed installation of mechanical seal, and reinstalled pump, ready for service.

Job exposures:

Humbert	2170
Collins	2000
Brooks	1980
Blair	1790
Backens	300

(Dosimeter readings)

Borrowed men, Humbert, Blair, Collins, and Brooks, traveling to home plants."

188. Mr. Raymond stated these operations were all done under RWP and there were no Special Work Permits for the pump seal occurrence. However, he stated there were SWP's for maintenance work. The file of SWP's for July, 1970, to December, 1970, were examined and the following entries noted:

(undated)
"Cleanup pump

Half-masks were not required on SWP's until pump was to be replaced on 7/1/70. I added half-masks until airborne was checked. It was checked 7/1/70 @ 1420 → 1526 (Schmidt) as 2.1 x 10-8 uCi/cc

R. C. Parker"

"6/29/70 SWP 9359 (Skidmore)
Work Location: Caisson -66' elev.
Description of Work: Remove electrical leads from clean-up pump.
Monitoring Requirements: Continuous by R.P.
Rad. Conditions at start of job: (area survey attached)
(Investigator's note: The survey was not attached. Both Mr. Weeks and Mr. Parker stated it could not be found.)
Protective Equipment Requirement
Caps, coveralls, gloves, rubbers, bootees, film badges, gamma pencils (high range, 0-500, for all) neutron film"

"6/29/70 SWP 9360 (Skidmore)
Transfer tools -66 for cleanup pump job
Monitoring: Cont. by R. P. as required
(1st shift - Barker and Richardson)"

"6/30/70 SWP 6363 (Skidmore)
Remove and repair cleanup pump
Monitoring: Continuous by R.P.
Special Instructions:

1) High range pencils for all (0-500 mr)
2) 2,000 mr limit for job
3) 2nd pair gloves and bootees

Backens, Humbert, Collins, Brooks, Blair"

"6/30/70 SWP 9365 (Skidmore)
Location: Hot Shop
Work: Remove motor for inspection from cleanup pump
Rad conditions at start of job: Whole body 100 mrem/hr
Special Instructions:

1) CT present when opening motor
2) Change gloves when leaving hot shop

Teague and Winbagler"

"6/30/70 SWP 9366 (Skidmore)
Caisson -66 level
Work: Move cleanup drain line from scram dump line directly to REDT
(Blair - Collins)"

"7/1/70 SWP 9367 (Evans)
Hot Shop
Clean and assemble cleanup pump motor
Rad. conditions at start of job: 100 mrem/hr. W.B.
Change gloves when leaving hot shop
(Teague, Windlinx, Backens)"

"SWP 9368 (Evans)
Caisson -66
Descr. of work: Assemble and reinstall cleanup pump and motor
Spec. Instructions:

1) High range pencils
2) Limit of 2000 mr for job
3) Take 2nd pair of gloves
4) Half-masks at least until airborne is checked.

(Humbert, Brooks, Backens)"

"7/1/70 SWP 9369 (Evans)
Caisson -66
Move cleanup drain line from scram dump line directly to REDT
Spec. Instructions

1) Wear half-mask while drilling into tank
2) and until airborne is checked

(Blair, Collins, Backens)"

"7/2/70 SWP 9371 (Skidmore)
Hot shop
Clean and assemble cleanup pump motor
Rad. Cond. at start of job:
W. B. 100 mrem/hr
Spec. Instructions
Change gloves when leaving hot shop
(Teague, Blair, Collins, Backens)"

"7/2/70 SWP 9373 (Woods)
Ref. Bldg. -66
Clean up flange on C. V. pump - run die on studs threads
Spec. Instructions
1) Wear high range pencils
2) 2nd pair of gloves and booties
3) Wear 1/2 face mask while wire brushing
(Brooks, Humbert, Backens)"

"7/2/70 SWP 9374 (Woods)
Ref. Bldg. -66
Install cleanup pump
Special Instructions
1) High range pencils
2) 2nd pair gloves and bootees
3) 2000 mr for job limit
4) limit for electrician
(Teague, Windlinx)"

"7/3/70 SWP 9376 (Skidmore)
Access shaft -66
Clean up
Special Instructions:
1) Stay away from cleanup line
(LeRoy, Porter)"

"7/3/70 SWP 9375 (Skidmore)
Hot shop
Clean up
(LeRoy, Porter)"

189. The Maintenance History Card, No. 428.16, for the pump identified it as the Reactor Clean-up Pump, a centrifugal, vertical type, Bingham Pump Co., Serial No. 34456, with location shown as -66. It recorded the date out of service as 6/30/70 and date returned to service as 7/2/70. A "brief description of work" on the card stated: "Replaced mechanical seal. The seal rotating seat chipped in several areas. Stationary seat chipped in several areas. Stationary seat gauled and worn. Case ring to impeller wear ring (good condition)." There was a notation there was no report in files concerning this work.

190. The work order for the pump replacement was as follows:

> "Memo to File
> 428.16 Work Order 2159
> On replace reactor clean-up pump seal 7/6/70
> Due to high quarter exposures of the mechanical maintenance personnel it was necessary to borrow four men from other plants to accomplish the seal replacement."

Mr. Raymond explained this statement meant that the Company wished to reserve the rest of the quarterly exposure limit for the regular mechanical maintenance personnel for routine maintenance jobs - rather than to have to bring in a traveling crew to do their routine maintenance jobs near the end of the quarter. He stated, however, that no one was liable to have gone over his limit, even with the seal work.

Dosimetry

191. Film badge reports for HBPP from the Radiation Detection Company for the first three quarters of 1970 were reviewed. In the first quarter 1970 there were no personnel exposures over 1370 mr. There was a special pull on R. Rowen, Jr., for the period 3/18 to 3/25. It showed he had received 60 mrem gamma-beta during that time. His quarter and year's total was 170 mrem. No persons received over 1370 mrem during the first quarter. In the second quarter the highest exposure was 2490 mrem (Gable). Mr. Raymond explained the May refueling outage occurred in this period and produced generally high exposures. In the third quarter, the highest exposure for regular employees was 2150 mrem (Winfrey). All others were generally less than 1000 mrem.

192. A special report covered the persons exposed during the reactor cleanup pump failure, and its repair, as follows:

Radiation Detection Company
Report Period 6/15 to 7/14/70

	Gamma	Neutron	Beta	13 Weeks	Cal. Year
Grauer	350	0	0	820	1080
Grundhofer	20	0	0	1220	1250
Pena	540	0	0	2440	3540
Shiffer	100	0	0	340	340
Skidmore	70	0	0	7/2-7/14	3040
				2850	
	910	0	0	6/15-7/14	1250
				1130	
Voss D.M.	160	0	0	1470	1890
Phillip Brooks	2100	0	0	6/30 to 7/2	
Robert Collins	2400	0	0	6/30 to 7/2	
Charles Humbert	2500	0	0	6/30 to 7/2	
Darvin Blair	2200	0	0	6/30 to 7/2	
R. R. Skidmore	260	0	0	6/15 to 7/2	
				2780	2970

Mr. Weeks stated the Company has AEC-4's on the four persons in the traveling maintenance crew (Brooks, Collins, Humbert, and Blair).

Discussion with Management

193. Mr. Ramsay had left the plant in the afternoon of May 28. In his absence, Messrs. North and Ward advised Mr. Raymond that there were no specific items which could be discussed at that time, but that there would possibly be a need for further investigation and that either he or Mr. Ramsay would be notified in such event.

Reinterview of Howard Darington on May 28, 1971

194. Howard Darington was reinterviewed at his home at 2423 D Street, in Eureka, from 5:30 to 6:30 p.m., on May 28, by Messrs. North and Ward. Mr. Darington stated that he had been told of the cleanup pump incident (which occurred when he wasn't there) by Dick McKenna, a Control Operator, who is also a shop steward of the Union. He said the persons who were at the plant and directly involved when the cleanup pump seal failed were Jim Shiffer, R. Grauer. and Nick Pena. He stated all three of them entered the steam cloud. Mr. Darington stated he understood there was no complete air sample. He stated he believes Grauer had been the one to take the sample, that he had to cut it into quarters and counted one quarter, but he did not know how to evaluate it. The next day Jerry Boots was looking for it and couldn't find it. Mr. Darington stated that he was later told it had been found and put on the data sheet. He stated the routine air sampling station was at the +12 level at the south air lock. He stated there is another sampling station at the -57, but samples are not routinely taken there. Mr. Darington stated that Grauer, who took the sample, is an Auxiliary Operator. He stated no Control Technician was called in to take the sample or make an evaluation. He stated the Union has filed a grievance on the practice of operators taking samples.

Compliance Headquarters' Review and Action

195. On June 7-8, 1971, the results of the investigation to date were reviewed by the Headquarters staff of the Division of Compliance. A decision was made to arrange for private interviews of several HBPP employees who would have knowledge of the specific incidents being investigated. Because of the previously stated position of PG&E management on private interviews at the plant (see paragraph 104), L. D. Low, Director, Division of Compliance, personally arranged for these interviews to be scheduled by telephone negotiations with PG&E Corporate Management, San Francisco.

196. With the interviews agreed upon, the Investigator was directed to make specific arrangements for them with PG&E management at the HBPP. On July 15, 1971, Mr. R. D. Ramsay, Plant Superintendent, HBPP, was telephoned by the Investigator and advised that the plant would be revisited on July 20, for the purpose of

conducting interviews with:

James D. Shiffer, Nuclear Engineer
Donald M. Voss, Senior Licensed Operator
Nicanor C. Pena, Licensed Operator
Raymond W. Grundhofer, Licensed Operator
Ronald Grauer, Auxiliary Operator

and all Control Technicians, including:

Mark Stevens
Donald Woods
William Evans
Raymond Skidmore
Howard Darington
Lester Gable

Mr. Ramsay stated all persons would be available, except possibly Mark Stevens, who was at another plant.

Inquiry from IBEW Attorney

197. On July 16, 1971, the Investigator received a telephone call from Mr. Joseph Grodin, Attorney for Local 1245, International Brotherhood of Electrical Workers (IBEW), 100 Bush Street, Suite 2600, San Francisco, California. Mr. Grodin stated he had learned from PG&E management that HBPP employees were to be interviewed by AEC and it was suggested to him that the employees might want to have a Union attorney present during the interviews. Mr. Grodin stated that he had inferred that information developed from the interviews could be prejudicial to some employees and result in findings of their alleged wrongdoing and possibly in violation of the Atomic Energy Act. Mr. Grodin was advised the investigation concerned only possible matters of noncompliance by the licensee only, that is the PG&E Company, and would have no bearing on individuals. He was informed there was no AEC security involved and no question of Atomic Energy Act violations. Mr. Grodin stated this satisfied him, but that he would like a written statement to this effect. He was advised to contact L. D. Low for any further statement.

Investigation at HBPP July 20-21, 1971

198. On July 20 and 21, 1971, nine HBPP employees were interviewed, privately, at the plant, by Mr. Harry S. North and the Investigator. Each person was separately summoned from work by Mr. Warren A. Raymond, Assistant Plant Superintendent. As Mr. Raymond brought each individual into the conference room where the interviews took place, he advised him that interviews were being conducted by the Division of Compliance in response to certain allegations made against the Company's radiation protection program. Mr. Raymond informed the individuals

that if they wished to be interviewed they had a right to have a member of management or a company-supplied attorney present, or a Union-supplied attorney, or other representation, which they might wish to provide themselves. In all cases, individuals agreed to be interviewed without any type of representation. Interviews were held in private with only the individual being interviewed and the two AEC representatives present.

199. As directed by L. D. Low, the Investigator recited the following text to each individual interviewed.

> "I am conducting an investigation at this plant because allegations have been made, and reported to us, which raise questions concerning the adequacy of certain work practices and procedures as they relate to Radiation Safety. Our job is to protect the Health and Safety of employees, and the public, at all AEC licensed facilities, so we routinely investigate all such allegations.
>
> "Investigations are made at other plants throughout the industry. The fact that one is being made here is not necessarily any reflection on the company or anyone in the company.
>
> "Some investigations are made without involving employees of a plant and they are not even aware one has been made. Some, like this one, need the cooperation of employees, whom we have to interview to establish facts. The reason I want to talk to you is because we feel you can help us find the facts. The reason I am talking to you privately is that I want you to feel you can talk freely, without being worried about anyone knowing what you have said. The AEC will keep information you give me strictly confidential. No one in the plant, Union, or plant management will know what you have told me. We will, of course, discuss with PG&E management any violations, should any be found. We will do this in a way, however, so they will not be able to identify any particular person who supplied any particular information.
>
> "Many persons will be interviewed, several have been already, from all levels in the company. The fact you have been interviewed will not single you out over any of the others."

200. After this recitation each employee interviewed as asked the following questions and his responses noted.

> Have you any objection to being interviewed?
>
> Have you ever been told or instructed that you should not speak to, or report radiation safety matters to, AEC inspectors?

I show you here an AEC Notice to Employees, which is posted in the plant. Under this section, Inquiries, it says:

> "Inquiries dealing with the matters outlined above can be sent to the United States Atomic Energy Commission Compliance Office having inspection responsibility over your plant, as shown on the map at the right."

The office for this plant is the one in Berkeley.

Do you understand that this authorizes you to talk to AEC?

Have you ever been told you should not, by company management, or the Union, or anyone else?

Has it ever been implied that you should not talk to AEC?

Is there any unwritten understanding that you should not talk to AEC?

Have there ever been any threatened or implied reprisals if you talked to AEC inspectors?

None of the persons stated he had any objection to being interviewed. One, Skidmore, stated he would answer questions, but would not volunteer anything. None stated he had ever been told that he should not speak to AEC inspectors. None stated there had been any threatened or implied reprisals for contacts with AEC. All understood their right and authorization to talk to AEC. However, two individuals, Skidmore and Woods, stated they had inferred there was an unwritten understanding employees should not talk to AEC. Two individuals, Darington and Skidmore, referred to the case of a former employee, Rowen, who had been told not to talk to AEC.

Interview with James D. Shiffer

201. James D. Shiffer is a Senior Production Engineer, and was a Nuclear Engineer on June 21, 1970, when the seal failed on the cleanup pump at the minus 66 level. He was questioned about his part in the action taken at the time of this incident (0140 hours on the morning of June 21, 1970). Mr. Shiffer stated that he was at home when the incident occurred, and that he was called at home because the reactor had scrammed. He estimates that it took him approximately 20 minutes to get to the plant from his home. He stated that when he got there he went down to the minus 66 level, using the stairs and manlift in the access shaft, together with N. Pena and, he believed, Ron Grauer. He said that he was selected on an exposure basis (he had low exposure) to turn the valves to isolate the pump. Mr. Shiffer said that it was warm and humid up to the plus 12 foot level and that there was visible steam in the access shaft. He estimated that he was in the refueling building approximately 10 to 15 minutes and at the minus 66 level 2 or 3 minutes, and that it took 2 or 3 minutes to go down on the manlift.

202. He stated Pena had been down before he arrived there. Mr. Shiffer said that he, Weeks, and Pena, discussed masks to be used in entering the area and that, based on the fact that Pena showed no nasal contamination and full face masks would have fogged up, half-masks were selected. In addition to a half-mask, he wore coveralls, cap, gloves, and shoe covers. When he came out he checked out his mask and found that it was hot. He stated that he had no nasal contamination and the same was true for Pena and Grauer. He did not remember whether he used nasal wipes to determine this or whether it was just an instrument check. When he checked himself after removing his outer clothing, he did not need a shower so he assumes therefore that he was not subject to any amount of contamination.

203. Mr. Shiffer said that ordinarily a SWP would specify equipment to be used; however, there were no SWP's or RWP's relating to the pump isolation since this was an emergency situation. Shiffer said that the three men went through access control into the southeast entrance of the refueling building and returned through the same point in 10 to 15 minutes. He said that they had a "Cutie Pie" with them, he did not recall the readings, but that they were not unusually high. He said they moved quickly, but did not run. Shiffer said Grundhofer was the control operator on the board and that he was the one that noticed the dump tank alarms which resulted in the scram. Shiffer said that he did not recall if the area monitor in the access shaft or the humidity detector, he believed to be at the minus 34 foot level, gave any abnormal indications, either of radiation level or of high humidity. Shiffer said that the constant air monitor at the plus 12 foot level can be seen from the air lock and that it was observed and found to be essentially normal prior to entry.

204. Mr. Shiffer said that steam leaks generally result in ^{88}Rb and ^{138}Cs airborne contamination. Shiffer said that on one night he ran a piece of filter paper on the gamma spectrometer and identified ^{88}Rb and ^{138}Cs, but he said that he did not recall who had given it to him, and he could not be sure that this occurred the night that the seal failed. He said that he ran the sample on the multi-channel analyzer because he knew how to operate the equipment and the regular operations crew did not. He stated the operators run the air samples. Mr. Shiffer was asked if he knew who had collected air samples in the refueling building at the time of the seal failure. He said that he did not. He did not know where they were collected and he did not know if any had been discarded.

Interview with Raymond R. Skidmore

205. Raymond R. Skidmore is a Radiation Process Monitor who was a Control Technician prior to June 1971. Mr. Skidmore was questioned concerning the plutonium-beryllium neutron source. He stated that at one time the source had been dropped when a group of people ranging from 3 to 5 individuals were present. He said that persons included in the group were Dale Allen and himself, but he could recall no others. He stated he recalled Allen because Allen corrected Skidmore when Skidmore picked up the source in his hand. Skidmore said that he only did this on one occasion to save time because Allen was trying to get the reach rod threaded into the source while it was rolling around and Skidmore decided that the quickest

way was to pick it up and place it in the container. As stated in his telephone interview (paragraph 157) he said he had held it in his right hand for about one or two seconds. Skidmore was unable to identify any of the others present and he was unable to relate this to any other occurrence which might have pinpointed the date.

206. Concerning the question of his receiving 5 R on his badge for 1967, he stated that they had switched badges for him on one particular day about three months before the end of the year and he said he had only about 5 mr left on his badge and he was working on the off-gas system and he feels surely that he must have gone over the limit - the 5 R limit - in the exposure that he received that day. This would have been November 22, as he stated when he reviewed the record of radiation exposure (as shown above in paragraph 127). He stated that he was taken off radiation work for two or three months. He stated that his card would show the dosimetry record. Dosimeter record weekly cards for Mr. Skidmore for the November 1967 period were provided by Mr. Raymond and examined by the Investigator. Lack of dates on many of these cards did not permit identifying the November 22 entry, but no significant exposures for any one day were noted.

207. In connection with the alleged contamination scrap pipe released to a scrap dealer, Mr. Skidmore said that the pipe had been surveyed several times and that it was always too hot for release. He said that the pipe had been left lying in the fenced yard, unprotected from the weather, where it was rained on and contamination was washed off onto the ground. Skidmore was concerned that this was not proper handling for this type of material. He said that after the pipe was released and a piece of it was identified in the clean machine shop, no one could ever remember having surveyed the pipe to make a finding on contamination levels which would have permitted the release.

208. In connection with the cask survey incident, Mr. Skidmore said that he had made the initial surveys and that they averaged 5,000 dpm, but that he had to go to the doctor that day and that he turned the surveys over to Mr. Rowen and had no further connection with the cask. He stated that the cask had been a continuing problem in endeavors to decontaminate it.

209. Mr. Skidmore was questioned concerning the allegation about painters coming in with contamination on their clothing. He stated he was surveying by the fence area when he noted a high background. He checked the painter foreman, Mr. Jackson, and found his clothes were contaminated and took his clothes. He thinks that Boyd was the other painter who was helping Jackson. He stated he advised Radiation Protection that the man's house should be checked, particulary bed clothes. Skidmore reasoned the contamination had been on Jackson's body and that his instrument had observed this on his body through the clothing and the reason the clothing was contaminated was because of it having been on his body. Mr. Skidmore explained that the clothing the painter had worn in his initial entry - 3 to 4 days before - had been left behind at the plant and therefore he did not mean to imply that his clothing had been taken outside, but only that he had come back in with his body still contaminated. He suggested

to Radiation Protection that the man's house should be checked. They let him check Jackson's car and when nothing was found in the car, then they did not think any further check was necessary. He stated there is no record of this survey of these painters. He referred to a more recent occasion on which an electrician by the name of Bugg, who was being monitored by Don Woods, was found to be contaminated during the last outage, June 1971. Bugg's home had been checked for possible contamination, but he did not know the results.

210. Mr. Skidmore was questioned about another incident found by the Investigator in the CT log (and which had not been specifically referred to by R. Rowen) which concerned a crew being sprayed with reactor water. On page 62598-34A of the CT log, dated June 30, 1969, there is the following entry, signed by Skidmore:

> "Crew working on SWP No. 7875 sprayed with reactor water when attempting to stop incore from leaking by pushing up on incore to flush. Reactor water got on head, face, and body. Job was supervised by R. S. C. with Kamberg and Evans keeping their own time for exposure. Chafee and Boots talked over job and decided on job bypassing rad. protection personnel. -66 was grossly contaminated due to R. W. running on floor. Several personnel were grossly contaminated. All floors in refueling from -66 up are contaminated. Step off pad is now established outside N. W. airlock."

Mr. Skidmore stated he could not recall the incident. He stated that he assumed that he made the comment concerning bypassing of Radiation Protection personnel because they were former CT monitors who were checking themselves. He said Chaffee had been sent along to monitor. What he was pointing out here is that no Control Technician was monitoring these persons. He stated that the situation which occurs with spraying of reactor water when the incore is flushed, has been since corrected by the use of protective clothing and better procedures for conducting this exercise. SWP No. 7875 dated June 30, 1969, was examined by the Investigator. It described the work as "clean and lock-in nuclear incore in channels 9-11-13 in the lower drywell area." It specified rubber boots, pencils and film badges were to be used (no coveralls), and continuous monitoring by R. P. It was signed by Skidmore and showed Wonderley as shift foreman and the crew as Kamberg, Chaffee, and Evans.

211. Concerning the training of personnel, Mr. Skidmore stated that he had received good training in radiation protection and Gale Allen was his instructor. He stated Radiation Protection Monitors are not getting the same training today. He stated the company says they can be trained in weeks, but he states it takes longer to train a man for that position.

Interview with Howard J. Darington, IV

212. Mr. Darington is a Control Technician (Instrumentation) and a Union shop steward. He stated that in view of his position as a shop steward he feels sure that the company would never ask him not to talk to AEC. He stated that he knew that

statements had been made to other persons, but they have not made statements like that to him. He stated there is an agreement between the Company and the Union that they will resolve internally any situation before going to other agencies. He stated that sometime in the distant past, a shop steward was called in and severely criticized because of his contact with the State Labor Commissioner's office concerning some disagreement at the plant and that this agreement between the Union and the Company refers to this sort of exchange. It is understood to apply to outside agencies, including AEC. Darington said that one of the discharged employees told the Local Investigating Committee of the IBEW that he was told not to talk to AEC. The same employee was told not to discuss this with any other employees. He stated that during a safety meeting in 1967, questions were raised concerning radiation protection. Afterwards, the Company called the employees together to tell them they should not raise questions of this sort in safety meetings.

213. Darington said that he believed the painter contamination occurrence happened during 1964 or 1965, but he was not sure. He said that a Union radiation protection committee established to review the plant radiation protection program in 1968 discussed this occurrence and was unable to arrive at a date since it was old at that time. Darington identified a contamination occurrence during the June, 1971, shutdown which resulted in contamination having been taken home by an employee named Bugg. Mr. Darington stated that he had been contacted about it as the job steward.

214. When questioned concerning handling of the plutonium-beryllium neutron source, Mr. Darington said that he had seen the source picked up by a Control Technician named Lester Gable at a time when only Gable and Darington were present. Mr. Darington was unable to recall a date for this occurrence.

Interview with Donald L. Woods

215. Mr. Woods stated that he is on the Diablo Canyon Task Force and that he has been a Control Technician at Humboldt Bay since 1962. He stated that he has been working as a Radiation Monitor during the June, 1971, outage. Woods stated that he had the impression that he should not talk to the AEC; however, he had never been told not to or threatened with reprisals in the event that he did. However, Mr. Woods stated that during the current outage, he had checked with his supervisor before making an entry in the CT log book and was told that he shouldn't make the entry, but he made it anyway. This concerned removal of the fuel stripping device from the fuel storage pool without a monitor being present. The work was done by Mark Stevens, Control Technician (Instrumentation) and J. Kamberg, Instrument Foreman, and the radiation level was approximately 300 mr/hr. (Investigator's note: During this outage, Mark Stevens had been brought back from the Portrero plant specifically for monitoring duties as Control Technician.)

216. Mr. Woods stated that he was the one who had surveyed the PG&E electrician, Bugg, during the current outage. He stated that Bugg came offshift during a period when no monitor was present and that on checking out, found activity in checking with the GM. His shirt or T-shirt was confiscated. He came in the next day and worked. At checkout time, contamination was found on his skin. Wood said that he had made a survey at Bugg's home and found 30 cpm on the bed (30 cpm background tota[illegible]0 cpm). He stated this was recorded in a special survey report.

217. Mr. Woods stated that during the current shutdown, the PG&E NDT testing crew from Emeryville was in the plant taking part in the in-service examination of piping in the plant. He stated that one of the men on the non-destructive testing crew participating in an ultrasonic examination of the emergency condenser nozzle received 4 R on a dosimeter pencil (no radiography was used). Woods said that for some reason the man placed the 5R pencil on his left leg rather than his shirt pocket. Surveys had been made of the area and exposure estimates had been in the region of 1000 to 1500 mr for the working time at that particular location. The employee's badge was sent in and showed 1400 mr. The 0 - 200 mr pencil was fully discharged. The 0 - 5 R dosimeter indicated an exposure of 4R. He stated that attempts were made later to reproduce this reading using 4, 0 - 5 R pencils and a film badge; however, all subsequent exposures were in the region of approximately 1100 mr. 7/

218. Mr. Woods expressed the opinion that the Company has not trained the new process monitors (radiation and chemical technicians) adequately. In support of this contention he said that one of the new process monitors had dumped a bucket of dirty water (hot) down a clean drain because he said the man did not know not to do it. 7/ He said that trained monitors had not been used much in the training of the new men. He said that training was heavy in the area of chemistry and light on radiation protection.

219. In connection with the air particulate sampling program at the facility, Mr. Woods stated that he feels that the present sampling plan is not as desirable as the one previously used. He stated the use of a local sample immediately before work is preferable to an area sample collected during a seven day period which could result in a six day period elapsing before a possible exposure to airborne material is known. For example, he stated the Schmidt Samplers, on the dry well in the refueling building and at the base of the stack, are checked on Wednesday. Someone may become exposed on Thursday, but he won't be checked until the following Wednesday.

220. In connection with the plutonium-beryllium neutron source, Woods stated that he had never dropped it and have never heard of anyone else dropping it. He stated that normally the source was handled with two men present and that the source was used at intervals of approximately once per year to check the dunking chamber during refueling outages.

7/ This incident has been inquired into during the Compliance Inspection of August 2-6, 1971.

Interview with Lester E. Gabel

221. Mr. Gabel has been at the Humboldt plant since 1962, and is presently a Control Technician (Instrumentation). Concerning the plutonium-beryllium neutron source, Mr. Gabel stated that he has used the source and he has dropped it on the head of the paraffin drum, but he says there are always tongs available, approximately 30 inches long, and that he has always used the tongs to pick the source up. He stated he had never picked the source up with his hands and had never seen or heard of anyone else having done so.

222. In connection with the release of laundry waste, Mr. Gabel stated that the usual procedure requires recirculation of the laundry waste tank for half an hour, minimum, followed by sample collection. The sample is then analyzed for conductivity and pH. A 2-milliliter sample is dried and counted for alpha and beta activities on the internal proportional counter and a 2-milliliter liquid sample is gross gamma counted. He said that he used to gamma spec the samples routinely, but now does so only when counts are above certain levels to identify isotopes to correct gross counts. Mr. Gabel said that he has seen the use of a thin end window GM detector on a sample bottle and said that a rule of thumb is that the tank can be dumped if the GM survey of the sample bottle is less than approximately 400 cpm. Under these circumstances, the tank can be dumped and the sample is retained for later analysis. If it is above 400 cpm, the sample is dumped to the Turbine Building Drain Tank which puts the laundry waste into the radioactive waste collection and processing system. He stated that he knew of no cases where samples had not been retained for analysis from liquid dumped on the basis of a GM survey. He knew of no cases where laundry waste, which would have normally gone to the Turbine Building Drain Tank, had been dumped to the bay.

223. With respect to the new radiation protection employees, Ray Lewis and Dick Lund, Mr. Gabel expressed the opinion that they were not as well trained as the original crew. He said that they were lacking in practical on-the-job experience, but feels that now, on the basis of on-the-job training they have received, they are adequately trained.

224. Concerning the "popping" of off-gas samples, he stated that the reason for this procedure is because, if there is a leak, some air may get into the condenser vacuum system. They test this by arcing the off-gas sample to combine its hydrogen with the oxygen leaked into the system. He said the system is sampled approximately once a week. Before popping the sample they let it decay for about six hours. Mr. Gabel was asked if he felt that this procedure is hazardous and he replied in the negative. He said that the system used prevents any release of gases during the ignition and subsequent reaction. He described the "popping" apparatus which consists of a large plastic bottle with the bottom of it cut out which has a stopper in its neck. The plastic bottle is kept under water. The small glass sampling vial is inverted over the stopper, which is uppermost, and which has ignition wires coming up through it. He stated when ignition occurs gases will sometimes surge out of the vial, down the opening in the stopper, into the plastic bottle; but the plastic bottle traps them, and as they contract they go back up into the vial. He stated he could not imagine any situation when the bubbles will come up in the face of the sampler.

225. In connection with the spent fuel pool cover, Mr. Gabel stated that the pool is generally not covered, but that he does not see that there is any hazard and that he knows of no requirement that calls for the pool to be covered.

226. Concerning the forklift, Mr. Gabel said that it is surveyed in and out often because it is also used in the other (non-nuclear) units. He stated the forks and hook are generally contaminated. He said the seat was contaminated one time, was covered with plastic and when that wore out, the seat was reupholstered. He stated the reason it shows up so often in the CT logs as being surveyed is because it is shuttled back and forth between the 1, 2, and 3 units, as much as four or five times a day. He stated anything brought out of unit 3 and taken to the other side is the responsibility of the person using it and the Control Technician to monitor it.

227. In connection with the hand and foot monitor, Mr. Gabel said that he believed that it was normally set at 400 cpm above background and that it is essentially the third monitoring location in personnel check out from the controlled area. The first point is the Classmaster at the access control point where individuals leaving the controlled area survey out at the stepoff pad, the second control point is between the change area and the control room where a GM is used to check individuals out of the change before entry into the control room. The hand and foot counter is located at the exit from the control room.

228. In connection with the possible airborne contamination problem resulting from placement of materials in the High Level storage vault, Mr. Gabel said that one section of the vault is metal-lined and has been used for the storage of plastic-bagged filter elements. He stated that this section of the vault is presently filled and that no material is being added to it. He said that materials located in this vault have not been removed for shipment. He said that filters which were formerly placed in this section in plastic bags only, are now bagged and placed in drums which are then sealed and stored in the other two sections of the vault. Later, they will be removed and shipped to Nuclear Engineering Company for disposal. He was not aware of any airborne contamination problem caused by this storage.

Interview with Raymond W. Grundhofer

229. Mr. Grundhofer, Senior Control Operator, was a Control Operator at the time of the cleanup pump seal failure on June 21, 1970. He stated he was in the control room when the seal failed and that Nick Pena was there with him. He is sure of this because Pena transferred 2.4 KV house power from the generator to the 60 KV buss for him when the scram occurred. Mr. Grundhofer stated that there was a dump tank high level alarm (which occurs at the two inch level) and there was a second dump tank high level alarm (which occurs at the 4-inches higher level). He stated there was a sumultaneous channel 2 scram with a channel 1 scram, and all the safety systems were triggered, that is the reactor was shut down. He stated he and Pena then followed normal scram shutdown procedures. He stated they could identify that the trouble was at the minus 66 level and the area monitor

alarm read-out from there showed approximately 15 mr/hr over a 30 mr/hr background. He stated there was no humidity alarm from the dew-point recorder at minus 54. He believes that Nick Pena was the first to go down by himself, into the shaft; he was sure there was no air sample taken before he did. He believed Pena only went into the shaft enough to see the steam cloud and did not go all the way down. He said that Pena was not monitored when he came back up, unless he had done so himself.

230. Mr. Grundhofer stated that he believed only the routine midnight air sample had been collected from the Continuous Air Monitor prior to the scram, and Pena's first entry. Mr. Grundhofer referred to the shift foreman's log as a place where a record of operator-collected samples might be noted. The shift foreman's log was requested from the plant management and entries for the night of June 20-21 were examined.

231. The following is a summary of entries from the shift foreman's log of June 1, 1970 - July 1, 1970, beginning with page No. 65533-65A. 000-08000 - Plant conditions No. 1 shutdown. No. 2 at 5 mw gas fuel, reactor at 210 mwt, No. 3 unit at 65mwe.

Time 0140: Reactor scrammed on "Scram Dump Tank High Level." Changed to #2 HTB and red handled turbine.

Time 0210: Unit No. 3 on TG (turning gear)

Time 0318: C/O (cut out) clean up pump, opened by-pass, closed pump inlet and outlet. Pump seal failed. Apparently steam from the seal failure caused a spurious dump tank hi level-full scram. All other equipment appears to be normal.

Time 0409: Started pulling vacuum.

Time 0432: Completed hot startup check list.

Time 0447: Started pulling rods to go critical. Weeks and Shiffer in the plant. Cleaned south one-half of No. 1 condenser.

Refueling Building air sample alpha = 4.38×10^{-11} uCi/cc, beta = 1.26×10^{-7} uCi/cc. $T_{1/2}$ = 57 minutes (Inspector's note: No time was noted in the record for this sample.)

Time 0710: Critical on 150 secondT(tau) Group G. A-4 and D-6 at 03 and F-3 and C-1 at 02.

Time 0730: Reactor at heating power. Signed Don M. Voss.

Interview with William C. Evans, July 21, 1971

232. Mr. Evans started work at the HBPP in 1962 and was assigned to Unit 3 (nuclear) in 1963. Mr. Evans stated that while he had never been told not to talk to AEC, he has inferred there is an unwritten rule of the plant that employees should not discuss "distasteful" aspects of the job. By this, he said he meant incidents which could possibly cause public concern about the plant's safety.

233. Mr. Evans stated that on July 20 (the day before the interview), he had made the environmental sampling tour. Mr. North questioned him about his readings of the stray radiation chamber dosimeters. He stated that these are read by using a Victoreen Minometer which is carried on the back of a pickup where it is somewhat affected by the weather. He stated he has found stray chambers off-scale when checked by this instrument, but these readings are difficult to evaluate because there is no way to calibrate the minometer in the field. He stated under humid conditions, it will read higher than normal, and it could cause the readings to be high at all stations.

234. Concerning the plutonium-beryllium neutron source, Mr. Evans stated that he saw it dropped one time in the refueling building in late 1964 or early 1965, to the best of his recollection. He stated he first noticed the scramble of people and then he saw Gale Allen holding it down with his foot, trying to line it up so that he could thread the handling rod into it. Evans stated he then saw Skidmore pick the source up in his hand and screw it on the rod. Evans said that the tongs were available, but practically all the time they were stored in the chem lab.

235. Mr. Evans stated that he had on-the-job training under Gale Allen, who he considers very competent. He stated that operating personnel treat radiation protection as an inconvenience. He stated that Gale Allen was caught in between Rad Protection and operating personnel. His attempts to assure good radiation protection practices brought about the slowing of work and as a result plant management tended to reduce the radiation protection coverage. Evans said that he feels that radiation protection personnel should report to someone other than plant management, which is responsible for power production. Evans stated that he knows that the Company does not want to overexpose him, but feels that the Company tends to limit radiation protection coverage because of the time that it adds to the completion of work.

236. In connection with the training of current radiation protection personnel, Evans said that he feels that Lund and Lewis, the two new individuals, have training comparable to his (Evans).

237. In connection with possible airborne contamination at the vaults, Evans said that Williams stated at a safety meeting that he saw lagging (asbestos-type insulating material) dust blowing when the vault was opened. Evans had no direct knowledge of anything blowing out of the vaults.

Interview with Don M. Voss

238. Mr. Voss is a Senior Operator and a shift foreman for the whole plant. He stated, as shift foreman, he was probably in the Control Room of Unit 3 at the time the seal blew on the cleanup pump. He stated that it was the usual procedure for the control operator, probably Grundhofer, to be on the board and the Senior Control Operator (Pena) to be floating, and that the Auxiliary Control Operator (Grauer) was probably on tour of the plant at that time. He said the seal had been leaking; he had been told by the shift foreman that he relieved, that it had been leaking (this is Wonderly). He stated that the evening of June 20, Wonderly took an air sample at 5:13 p.m. (or 1713) which showed 4.20×10^{-11} uCi/ml. Voss said that probably after 1:00 a.m., but before 2:00 a.m., an air sample at plus 12 was taken by Grauer on his rounds, but it was not recorded until after 0447. (At the time he stated this he was reviewing the shift foreman's log, and using it to refresh his memory regarding the air sample information reported on page No. 65533-65A.) When the incident occurred, Voss told Pena to put a half-face mask on, it was the easiest; there was no result of an air sample. He believed they could take an air sample after the fact, and check persons further by taking nasal swabs. He did not know if nasal swabs were collected from Pena. He thinks that after Weeks and Shiffer arrived, Pena went down with them at about 3:18 a.m., and Pena valved-off the pump, although the log shows that Weeks and Shiffer were in the plant at 4:47 a.m.

Interview with Ronald H. Grauer

239. Mr. Grauer stated that he started at Humboldt in May of 1967 and moved to Unit No. 3 in approximately May of 1970. He said he had been at Unit 3 for approximately one month when the cleanup pump seal failed. When asked to describe his activities of that night, Mr. Grauer stated that he customarily left the control room at approximately 12:30 a.m., leaving the control level by means of the west outside stairway, and inspected the outside equipment, arriving at the rad waste area in time to change charts at approximately 1:00 a.m. He stated that he had collected the air sample (base of the stack) and had entered the northeast entrance of the refueling building. He then went down to the minus 66 level between 1:00 and 1:15 a.m. He stated that he had no respirator. He stated that he knew that the cleanup pump packing was not good. He said that there was steam present, but he viewed it through the mirrors into the cleanup pump area. He stated that he had a "Cutie Pie" survey instrument and that he took a reading at the gate at the minus 66 foot level and observed close to normal values. As he recalled, normal values were 60 mr/hr and he probably observed about 75 mr/hr. He stated that it took him 15 or 20 minutes to leave the shaft, collecting data on the way, and he hit the plus 12 level at about 1:30 a.m., where he picked up an air sample at the CAM. He stated that just after he had picked up the air sample and was on the way to the Control Room stairway at the southwest corner of the refueling building he heard a noise, which he later realized was escaping steam. He stated that when he entered the control room, he observed some confusion and rather than asking about the noise immediately, he started the air sample to insure that it was counted promptly. He stated that he then had a discussion with Grundhofer, the control operator who said they had lost the load (had a scram).

240. In connection with his later entry into the access shaft to isolate the cleanup pump, Mr. Grauer said that Shiffer had a "Cutie Pie," and the group entering the access shaft consisted of Pena, Shiffer, and Grauer. He stated that, as he recalled, an air sample was started on the plus 12 foot level on the way to the access shaft; however, Grauer said that he did not run the sample and does not recall anything specific concerning the air sample. Mr. Grauer said that the constant air monitor in the refueling building was checked by Shiffer who said that it was OK. Dosimeter exposures, as he recalled, were approximately 100 mr for the pump shut off which he did not consider to be excessive. He stated that Pena, Shiffer, and Weeks discussed respiratory protection and specifically checked half-masks to assure a tight fit. He stated that the crew stopped at the minus 54 level to see if they could turn the valves from that level, but found it to be too difficult and that they went down to the minus 66 to complete shutting off the pump. Grauer said that he and Shiffer entered the pump area and shut off one valve each and then Pena entered the area and checked both those valves and shut off a third valve. Grauer said that to his knowledge, the first entry made was with him, Pena, and Shiffer. He stated that when they left the area they checked themselves with the classmaster at the stepoff pad and with the hand and foot counter. He stated that a GM detector held under his nose during exhalation showed nothing. Mr. Grauer said that Shiffer checked out people to make sure they were clean, checked inside the half-masks, and found them to be clean. Grauer stated that in the shaft at the minus 66 foot level mirrors fogged up and visibility was approximately 6 feet through the fog. He stated that Pena's and Shiffer's glasses fogged and that it was foggy below the minus 54 foot level. He stated that the party entering to shut off the valve wore masks from the air lock in.

241. Grauer said that the use of Scott air packs was discussed, but that Weeks, Shiffer, and Pena decided they were not required on the basis of the information available. Half-masks were used with a good, tight fit. They put the masks on in the air lock. At the minus 54 and the minus 66 levels, the time spent was 5 to 10 minutes, at most. He guessed a total of 15 minutes. Mr. Grauer stated that when he started his tour, he did not have a mask because the base of the stack was not a high radiation area at that time. He stated the Senior Control Operator (Pena) does take a mask on his tour because he goes into the pipe tunnel where leaks are known to exist.

242. He stated they are now running a daily 24-hour sample at the minus 54 level which is read between 7:30 and 8:00 in the morning. By 2:30 in the afternoon, all the short-life activities have decayed and it is counted then. Iodine samples are pulled off this twice per week. He stated that a special pump is now used at the minus 54 foot level with a second sample collected at the constant air monitor at the plus 12 foot level.

Interview with Mark Stevens

243. Mr. Stevens is a Control Technician (Instrumentation) and is presently assigned to the Portrero Steam Generation Plant, San Francisco, where he was interviewed the afternoon of July 21, 1971. Mr. Stevens stated he had been part of the initial

startup crew at the HBPP in 1962 and had been transferred to Portrero in 1967. He stated during the time he was at HBPP, he had never seen the neutron source dropped. He stated sometimes the source would become disconnected in the tube, but 3-foot tongs were always used to retrieve it and they were always available. He stated he had personally used the source to bug the dunking chamber three or four times. He stated Gale Allen had always been present. He stated he had never picked up the source in his hands and knew of no one else having done so.

Interview with Nicanor C. Pena, August 2, 1971

244. Mr. Pena, Senior Control Operator, was on vacation during July 20-21, 1971, and was not available for interview. On a subsequent inspection trip to HBPP, he was interviewed by Harry S. North, and his report of that interview is as follows:

245. At approximately 2:50 p.m., August 2, 1971, Mr. Pena was given the same briefing concerning the investigation by Warren Raymond, Plant Superintendent, which he had previously given to all PG&E employees interviewed. Mr. Pena indicated a willingness to be interviewed and declined any representation. The interview was conducted by J. Crews, Reactor Inspector, and H. North, Radiation Specialist. A statement prepared by J. Ward was read to Mr. Pena. In response to the questions associated with this statement, the following answers were received:

1. Have you any objection to being interviewed?

   "No."

2. Have you ever been told or instructed that you should not speak to, or report radiation safety matters to AEC inspectors?

   "No."

In response to the paragraph "Inquiries" on the Form AEC-3, Mr. Pena indicated an understanding of his right to contact AEC.

3. Have you ever been told that you should not, by Company management, or the Union, or anyone else (contact AEC)?

   "No."

4. Has it ever been implied that you should not talk to AEC?

   "No."

5. Is there any unwritten understanding that you should not talk to AEC?

   "No."

6. Have there ever been any threatened or implied reprisals if you talked to the AEC inspectors?

   "No."

Mr. Pena stated that he had been an employee of PG&E for 20 years and was a member of the Humboldt startup crew.

246. Mr. Pena was asked to recall the failure of the cleanup pump seal which occurred on June 21, 1970, at approximately 1:40 a.m. He stated that he believed his crew at that time consisted of Ray Grundhofer, Control Operator (C.O.), and Ron Grauer, Auxiliary Operator (A.O.). Mr. Pena had difficulty in recalling the identity of his A.O. and had to be prompted with Grauer's name. Pena said that he and Grundhofer were in the control room.

247. Mr. Pena stated that he was sitting at his desk in the Unit 3 control room when the first indication of a problem in connection with operation of the reactor was received. He stated that he believed that his A.O. was making the first round of plant inspections at the time. Pena said that generally the A.O. makes the first round and the S.C.O. makes the second round, to distribute exposures. Mr. Pena said that the first indication of trouble was a "Scram Dump Tank High Level" annunciator signal which was followed shortly by a "Scram Dump Tank High Level Scram" annunciator. He said they had no idea where the scram came from at that time. Mr. Pena said that he decided to investigate. He said that as he recalled the constant air monitor (CAM) at the plus 12 level was coming up (rising). He said that he believed that this information was given to him by the A.O., but he was not sure. He said that the CAM could be observed from the south wall entrance to the refueling building.

248. Mr. Pena said that he started to go down the access shaft when he noticed a high moisture content in the air. He said that he then returned to the change room and put on a half-face mask. When asked why he used that rather than a full face repirator or self-contained breathing apparatus, he stated that he was going into a high moisture area and that the fogging of face plates on full face masks presents a visibility problem, and that he did not feel that a full face mask was necessary. He stated that he entered the access shaft wearing a half-face mask, coveralls, cap, gloves, booties and rubbers. He stated that he did not recall whether he was wearing a hood. He said he was wearing a film badge and pocket dosimeter. Mr. Pena said that he was following the source of escaping steam, "what I could hear." He went to the access shaft minus 66 foot level on the manlift, and by standing on the stepoff pad on the shielded side of the minus 66 foot level he looked around the shield wall and observed steam coming out of the REDT (Reactor Equipment Drain Tank). He said the steam was coming out around the manhole covers on the tank. Mr. Pena said that at the minus 54 level of the access shaft, and below, he observed a light fog. He stated that this did not prevent him from adequately seeing the cleanup pump and REDT area. He said that the steam fogged his glasses. He said that when he observed the steam coming from the REDT, where steam was not supposed to be, he left the area promptly. Mr. Pena was unable to estimate his entry, exit, or stay time, during the first abortive entry, or the second entry, when he was equipped with a half-face mask. As he phrased it, "I didn't tarry, I'll tell you that."

249. On leaving the area, Mr. Pena said that he changed and surveyed himself, using both the GM classmaster at the stepoff pad leading to the change room, and again with the GM at the entrance to the control room. He stated that he was surprised in that he found no more activity than he would have expected during a normal tour of the turbine building or pipe tunnel. He stated that he surveyed a nose blow sample and found nothing, and a survey of the mask revealed no activity inside the mask. Mr. Pena stated that he found no activity on his skin. He stated that he was surprised at the results of the survey in that he expected to find contamination, but actually found little or nothing. He was unable to recall levels of activity involved.

250. Mr. Pena was asked if he started or collected a previously-started air sample. He stated that he had not, but he believed that the A. O. had started one in the refueling building. Mr. Pena was asked if he knew, or had heard of, the air sample which allegedly was too hot to count, which had been cut to pieces for counting, or which had been thrown away. Mr. Pena stated that he could recall no such sample in connection with this specific occurrence. Mr. Pena said that he believed that a Control Technician was called in, but he did not recall who it was.

251. Mr. Pena was asked to describe the circumstances surrounding the entry to the access shaft to isolate the cleanup pump. Mr. Pena said that as he recalled, Grauer went with him, and possibly one other, but that he could not remember positively who went with him. It should be noted that Pena initially thought that Grauer made the entry and he was not sure that he had done it himself, at this particular time. In connection with Pena's inability to remember clearly whether he went down to isolate the pump, he commented that it had been necessary to isolate this pump a number of times and that he had done it himself many times. He said he could not, after this period of time, recall whether he went down that time. Mr. Pena did say that, in this case, the seal failure released greater quantities of steam than on other occasions.

252. In connection with the discussion of use of the half-face mask, Mr. Pena stated that he did not remember any discussion with management personnel concerning the use of a half-face mask. Pena said that "you don't cross lines with supervision and operations in a discussion." Mr. Pena said that he felt that a half-face mask was adequate and that he had no question concerning its use under these circumstances. It should be noted that Pena did not recall the presence of E. Weeks or J. Shiffer in the plant.

253. Mr. Pena was asked about the use of the remote operators to actuate two of the cleanup pump isolation valves. In response to these questions, Mr. Pena indicated considerable dissatisfaction with what, in his opinion, was inadequate engineering design at the plant, including the remote operators for various manual valves about the plant, including the cleanup pump isolation and air ejector valves. He said the remote operators for the cleanup pump valves were located on the minus 54 foot level. The remote operators were flexible cable extensions on the valve handles. He stated that it was impossible to break loose a valve using these devices. Pena said that he felt it was faster to go directly to the minus 66 foot level and operate the valves on the cleanup pump directly.

254. It was noted that there was some discrepancy between Pena's stated inability to recall the events on the night of June 21, 1970, in detail and his willingness to talk about isolating the pump. It appeared to Mr. North that this discrepancy revolved around Pena's recollection of shutting down or isolating the cleanup pump on a number of different occasions, rather than the specific occurrence under discussion.

255. Mr. Pena said that at the time of the occurrence, failure of the cleanup pump seal was only one of a number of items which he had to consider. He stated that people frequently thought only of the reactor, but that there was much auxiliary equipment, including the turbine generator, in addition to the reactor, which had to be shut down at the time of a scram. He stated that he had a "green" A.O. (Grauer), and as a result much of the work associated with the shutdown fell on him (Pena).

256. Mr. Pena was asked if he felt that the handling of the cleanup pump seal failure had been safe. He stated that he would not have gone down nor would he have taken any one with him down the access shaft if he had not felt it safe. He stated that he was not unwilling to "scream loud and long" if he disagreed with management or supervision or the "guys he worked with" in matters concerning safety. Mr. Pena said that in his nine years at the Humboldt plant he had made a lot of beefs, but that no one had ever been critical of him for raising objections concerning safety. He stated that management and supervision were receptive to comments concerning safety.

257. Mr. Pena volunteered that his body burden was not higher than any one else's at the plant and that he had never been overexposed in his nine years at the plant. He said he felt he would have shown a higher body burden, or an overexposure, had there been anything of significance present in the access shaft when he went down.

MANAGEMENT INTERVIEW

Discussion With P. Matthew and J. Carroll

258. A summary of the findings of the investigation was discussed by G. S. Spencer, Senior Reactor Inspector, and J. J. Ward with Messrs. P. Matthew, Manager, Steam Generation Department, and J. C. Carroll, Supervising Steam Generation Engineer, at the PG&E main office in San Francisco on September 9, 1971.

Mr. Matthew expressed considerable concern that the Commission's letter to PG&E reflect the full magnitude of the number of allegations made versus the small number of items of noncompliance found, including the fact that the several other substantiated allegations were not violations of the license or regulations, or endangered health and safety. Mr. Matthew stated that he intends to issue copies of the letter for posting on the Union and employees' bulletin boards. He indicated that it is important to the Company to provide documented assurance to the employees and the Union that the plant is being operated in a safe manner. Mr. Matthew considered this action to be necessary because of the "traumatic" effect the investigation had on the employees.

Mr. Matthew was informed that our post-inspection letters to licensees are given careful consideration to ensure that they accurately reflect our inspection (or investigation) findings and all other pertinent information of interest to the public.

Mr. Matthew also posed the questions as to whether similar type allegations made in the future (by the same complainant(s) involved in this investigation) would be re-investigated by the AEC, and whether PG&E has any protection against deliberate harassment tactics by individuals with a grudge against the Company. He stated that he felt this sort of thing has a serious disruptive effect on employees.

Mr. Matthew was informed that the AEC has to make a determination as to the need for an investigation on a case-by-case basis and that a blanket answer could not be given to such a hypothetical question.

Mr. Carroll stated that he would be very happy to discuss further (with HQ staff) the question as to whether a potential exists for cross contamination between the low pressure core flooding system and the plant fire protection

and domestic water systems. He indicated that the redundancy of valves incorporated into the design of the interconnections, plus other aspects, provided adequate safeguards against such a possibility.

Both Matthew and Carroll stated that the delay in providing Rowan with a report on his radiation exposure within the time limit required by 10 CFR 20.408 was a misunderstanding on the licensee's part as to whether the report was to be provided automatically, or at the request of the employee.

During the discussion of the adequacy of the evaluation made for radioactive materials in the air prior to employees entering the dry well access shaft on June 21, 1970, when the cleanup pump seal failed, Mr. Carroll took issue with our contention that the extensive "experience" of the individuals involved and the fact that, historically, no airborne contamination problems associated with steam leaks have been experienced at the plant was insufficient justification for not taking air samples, or requiring a higher level of respiratory protection.

HIBITS

A. Book Memo to File, Dated June 1, 1970

B. Book Memo to File, Dated July 9, 1970

C. Letter to AEC from R. J. Rowen, Jr., Dated April 30, 1971

D. Letter to the Director, Region V, from Mr. W. F. Ferroggiaro, Jr., Humboldt County District Attorney, Dated May 17, 1971

E. Statement signed by R. J. Rowen, Jr., Dated May 28, 1971

F. Radiation Work Procedures (RWP's) for Air Sampling, Water Sampling, Hot Laboratory

G. Memorandum to File, by G. E. Allen, on Shipping Cask Survey, Dated August 7, 1969

H. Memorandum to File, by J. V. Boots, on Contaminated Pipe, Dated March 12, 1970

I. HBPP Memorandum, Dated August 29, 1966, Control Technician Logbook

J. Core Flooding System Schematic Drawing

K. Decision of the San Francisco Referee Office in Case No. SF-1319 (Rowen), February 2, 1971

L. Decision of the Board of Arbitration of the IBEW, Case No. 36 (Rowen), April 2, 1971

M. Decision of the Board of Arbitration of the IBEW, Case No. 35 (Williams), April 2, 1971

N. Activities in Ground Water and Other Samples 1970-71

O. Air Sample Log - Refueling Building, June-July, 1970

P. Whole Body Counting - 6/8-10/70 12/3-7/70

Q. Sketch of Cleanup Pump and Associated Equipment