DIABLO CANYON
INDEPENDENT SAFETY COMMITTEE

INTERIM REPORT
ON
SAFETY OF DIABLO CANYON OPERATIONS

January 1 - June 30, 1990

Draft: March 19, 1991
Approved: June 6, 1991

176562

DIABLO CANYON INDEPENDENT SAFETY COMMITTEE

INTERIM REPORT ON SAFETY OF DIABLO CANYON OPERATIONS

January 1 - June 30, 1990

March 19, 1991

176562

DIABLO CANYON INDEPENDENT SAFETY COMMITTEE
INTERIM REPORT ON SAFETY OF DIABLO CANYON OPERATIONS

JANUARY 1 - JUNE 30, 1990

Exhibits

DIABLO CANYON
INDEPENDENT SAFETY COMMITTEE

INTERIM REPORT ON SAFETY OF DIABLO CANYON OPERATIONS

1.0 Introduction

1.1 Formation of Independent Safety Committee. The establishment of the Diablo Canyon Independent Safety Committee (the DCISC) was provided for as one of the terms of a settlement agreement entered into by the Division of Ratepayer Advocates (DRA) of the California Public Utilities Commission (CPUC), the Attorney General (AG) for the State of California and Pacific Gas and Electric Company (PG&E). The settlement agreement, dated June 24, 1988, covers the operation and revenue requirements associated with the two units of PG&E's Diablo Canyon Nuclear Power Plant (Diablo Canyon) for the 30-year period following the commercial operation date of each unit. The agreement arose out of rate proceedings that had been pending before the CPUC for four years, and which included numerous hearings and pre-trial depositions. Just prior to the commencement of trial, the DRA, the AG and PG&E prepared and entered into the settlement agreement and submitted it to the CPUC for approval.

Rather than applying traditional ratemaking procedures of putting Diablo Canyon in a rate base less a disallowance of plant costs determined after hearing, the settlement agreement provides for an alternative pricing structure referred to as "performance based pricing." The agreement also provides that:

> "An Independent Safety Committee shall be established consisting of three members, one each appointed by the Governor of the State of California, the Attorney General and the Chairman of the California Energy Commission ("CEC"), respectively, serving staggered three-year terms. The committee shall review Diablo Canyon operations for the purpose of assessing the safety of operations and suggesting any recommendations for safe operations. Neither the committee nor its members shall have any responsibility or authority for plant operations, and they shall have no authority to direct PG&E personnel. The committee shall conform in all respects to applicable federal laws, regulations and Nuclear Regulatory Commission ("NRC") policies."

The agreement further provides that the DCISC shall have the right to receive certain operating reports and records of Diablo Canyon, and that the DCISC shall have the right to conduct an annual examination of the Diablo Canyon site and such other supplementary visits to the plant site as it may deem appropriate. The DCISC is to prepare an annual report, and such interim reports as may be appropriate, which shall include any recommendations of the committee.

The settlement agreement and its supplemental implementing agreement were referred to the CPUC for review and approval. Following hearings before a CPUC Administrative Law Judge and the Commission itself, the CPUC, in December 1988, approved the settlement agreement, finding that it was reasonable and "in the public interest" and that the "Safety Committee will be a useful monitor of safe operation at Diablo Canyon."

1.2 Appointment of Committee Members. The settlement agreement provides that the committee members are to be selected from a list of candidates jointly nominated by the President of CPUC, the Dean of Engineering of the University of California at Berkeley, and PG&E, and that they "shall propose as candidates only persons with knowledge, background and experience in the field of nuclear power facilities." In July 1989 CPUC President G. Mitchell Wilk announced a list of nine candidates nominated for appointment to the DCISC. Mr. Wilk noted that "An independent safety committee clearly requires members who could demonstrate objectivity and independence. For this reason, none of the nominees has testified for PG&E or any other party before the PUC or the Nuclear Regulatory Commission in any proceeding regarding Diablo Canyon."

William Kastenberg. In September 1989 Governor George Deukmejian appointed UCLA nuclear engineering professor William E. Kastenberg to a one-year term on the DCISC. William Kastenberg received his BS and MS in Engineering from UCLA and his PhD in Nuclear Engineering from the University of California, Berkeley. Upon graduation, he joined the faculty at UCLA where he is currently Professor of Engineering and Applied Science. Dr. Kastenberg has taught courses in nuclear reactor theory, design and safety; applied mathematics; thermo-dynamics and heat transfer; energy transfer; energy technology and environmental risk. His research interests include nuclear reactor safety and risk-benefit studies. Professor Kastenberg has studied the potential safety and environmental problems of other nuclear energy systems including laser and magnetically confined fusion, fusion-fission hybrids and electronuclear breeders.

Professor Kastenberg spent a sabbatical year at the Nuclear Research Center in Karlsruhe, West Germany (1972-73) and a sabbatical year as a Senior Fellow with the Advisory Committee on Reactor Safeguards, USNRC (1979-1980). He has published papers on severe accident mitigation systems for LWRs, on value-impact assessment for decay heat removal systems in LWRs and on the allocation of safety goals for LMRs. More recently he has been applying risk analysis techniques of problems associated with toxic waste control with emphasis on metal emissions from incinerators and groundwater contamination. The latter involves volatile organic compounds and pesticides.

Professor Kastenberg has won distinguished teaching awards from the Engineering Graduate Students Association at UCLA and the American Society for Engineering Education. He was elected an Assistant Dean for Graduate Studies in the School of Engineering and Applied Science (1981-1985) and Chairman of the Mechanical, Aerospace and Nuclear Engineering Department (1985-88) at UCLA. Dr. Kastenberg has served as Chairman of the Nuclear Reactor Safety Division of the ANS,

on two National Research Council Committees related to nuclear reactor safety, and was Chairman of the NRC Peer Review Committee for the first draft of NUREG-1150, "The Reactor Risk Reference Document." Professor Kastenberg was a member of the Advisory Committee on Nuclear Facility Safety to the DOE and a member of the Special Review Committee which reviewed the second draft of NUREG-1150.

In July of 1990 Professor Kastenberg was reappointed by the Governor to a new three-year term on the DCISC.

Warren H. Owen. In December of 1989 Warren H. Owen was appointed to a three-year term as the second member of the DCISC by the Chairman of the California Energy Commission. Mr. Owen is Executive Vice President of Duke Power Company in Charlotte, North Carolina, where he is responsible for power group operations. In this capacity, he directs all electric power production activities (plant design, construction and operation) as well as related technical and information services for the company.

Mr. Owen graduated from Clemson University with a Bachelor of Science Degree in Mechanical Engineering. He joined Duke Power in 1948 as an engineer in the Steam Production Department. He was named Vice President of the Design Engineering Department in 1971; and Senior Vice President, Engineering and Construction in 1978. He was also elected to the Board of Directors and Executive Committee in 1978. He was promoted to Executive Vice President, Engineering and Construction, in 1982, and Executive Vice President, Engineering, Construction and Production, in 1984. He was named to his present position in 1988.

Under Mr. Owen's leadership, Duke's fossil and nuclear generating plants have achieved one of the industry's highest levels of operating performance and efficiency. Duke Power has had the number one fossil generating system in the country for the past sixteen years and finishes high in total generating efficiency, both nuclear and fossil each year. Mr. Owen's involvement in the design and construction of power plants led to placing in operation 14,295 megawatts of productive capacity, half of which is comprised of seven nuclear units. Mr. Owen is now directing the company's efforts toward completion of four pumped-storage hydroelectric units with a combined capacity of 1,000 megawatts.

Mr. Owen is a member of the National Academy of Engineering and a Fellow in the American Society of Mechanical Engineers. He is also a member of the American Nuclear Society, North Carolina Society of Engineers, Professional Engineers of North Carolina and the National Society of Professional Engineers.

In 1981 Mr. Owen received the Clyde A. Lilly, Jr. Award from the Atomic Industrial Forum for managing recovery efforts following the accident at Three Mile Island; in 1984 the Award for Outstanding Engineering Achievement, presented by the North Carolina Society of Engineers; and the American Society of Mechanical Engineers' James N. Landis Medal in 1987 for outstanding contributions to the electric industry in the management of design, construction and operation of one of the nation's best and most efficient nuclear power generating systems. In December 1988, he received an Honorary Doctor of Law Degree from Clemson University.

As of the date this report was drafted, the AG has not yet made the third appointment to the DCISC.

1.3 Documents Provided to the DCISC. The settlement agreement provides that the DCISC shall have the right to receive on a regular basis specified operating reports and records of Diablo Canyon, as well as "Such other reports pertinent to safety as may be produced in the course of operations and may be requested by the committee." Hundreds of documents have been provided by PG&E to the DCISC, relating to both historical and current operations. Examples of lists of documents provided to the DCISC on a quarterly basis, as well as upon specific request, are attached hereto as Exhibit A.

1.4 Committee Member Site Inspection Tours. Professor Kastenberg visited the Diablo Canyon site for a facility tour on April 20, 1990. The tour agenda, which covered from 7:30AM to 5:30PM, is set forth on Exhibit B hereto. His site visit was during the refueling outage on Unit 2 so he had the opportunity for an extensive tour of the containment building. He went through the training facility, both for maintenance and operator training, through the simulator, the laboratories and the warehouse, and spent the afternoon in the containment auxiliary building and the control room. As a follow-up to his initial tour, Professor Kastenberg went back to the plant September 10-11, 1990.

Mr. Owen took a similar day-long tour of the plant on May 4, 1990. Since Unit 2 was just coming out of a refueling outage, he had an opportunity to observe the restarting process. Mr. Owen met with many of the plant senior staff members and had some opportunity to assess their experience levels.

1.5 First DCISC Meeting. The first meeting of the DCISC was held at the Grange Hall in San Luis Obispo on May 22, 1990. The meeting was conducted in three sessions, from 9:30 until noon, from 1:30 to 5:40 in the afternoon, and from 7:30 until 10:50 in the evening. A Notice of Meeting (see Exhibit C) was published and was also mailed to some 150 individuals, 17 newspapers and 25 radio and television stations from a service list provided by the CPUC. At the morning business session (see Agenda attached as Exhibit D), the DCISC approved contracts with an accounting firm and legal counsel, authorized the execution of member indemnification agreements with PG&E, as suggested by the CPUC, and adopted five committee policies and procedures relating to a) committee organization, b) accounting procedures, c) reimbursement for expenses, d) conduct of meetings and e) communications to the committee. Approximately 65 persons were in attendance at the morning session.

About the same number of people attended the DCISC's afternoon session, which consisted of technical presentations requested by the committee members of PG&E representatives. These technical presentations covered such topics as an overview of the Diablo Canyon organization and operations, planned operational improvements and modifications, training programs, maintenance programs and NRC issues and assessments.

The evening session, attended by approximately 95 persons, was devoted to public comments and communications to the DCISC members. Minutes and a transcript of the 10+ hour first meeting have been prepared, and copies were filed with the Governor's office, the CPUC, the AG and the NRC Public Document Room at the Cal Poly Library in San Luis Obispo.

2.0 Assessment of the Safety of Diablo Canyon Operations for the Period January 1 - June 30, 1990

2.1 Organization

Pacific Gas and Electric Company (PG&E) consists of six business units, as shown in Exhibit E. Three of the business units -- electric supply, nuclear power generation, and engineering and construction -- report to the President of PG&E, Mr. George A. Maneatis.

The Senior Vice President and General Manager (Sr. VP&GM) of the Nuclear Power Generation Business Unit (NPGBU), which has its headquarters in San Francisco, is Mr. James D. Shiffer. The Diablo Canyon Power Plant (DCPP) is a part of the NPGBU. Mr. John D. Townsend is the Vice President of Diablo Canyon Operations and Plant Manager at DCPP, and reports to the Sr. VP&GM of NPGBU. There are over 1800 PG&E employees in NPGBU, with more than 1200 located at the plant.

Exhibit F shows the organization of the NPGBU. As indicated in the other figure, DCPP reports to the Sr. VP&GM along with several other departments. These other departments and their managers are:

1) Nuclear Engineering and Construction Services, with R. C. Anderson as Manager, which provides design engineering support for the plant and provides construction forces in the event major modifications are required;
2) Nuclear Operations Support, with L. F. Womack as Manager, which provides staff support to the plant in operational matters;
3) Nuclear Safety Assessment and Regulatory Affairs, with J. B. Hoch as Manager, which interacts with all regulatory and other outside agencies;
4) Humboldt Bay Power Plant, with R. T. Nelson as Manager, which includes a decommissioned nuclear facility;
5) Quality Assurance, with J. A. Sexton as Manager, which is responsible for quality-related matters, including audits;
6) Nuclear Documentation and Support Services, which reports to B. A. Dettman, the Assistant to the Sr. VP&GM; and
7) Nuclear Business and Financial Management, with W. B. Kaefer as Manager.

Exhibit G shows the DCPP organization. Reporting to Mr. Townsend are the following departments, each reporting to an Assistant Plant Manager (APM):

1) Support Services, with W. G. Crockett as the APM, which is responsible for a number of items, such as training, emergency planning, safety and health programs, and security;
2) Operations Services, with D. B. Miklush as the APM, which includes operations, chemistry, and radiation protection;
3) Maintenance Services, with B. W. Griffin as the APM, which includes maintenance activities for electrical equipment, instrument controls, and mechanical equipment as well as outage planning and work planning; and
4) Technical Services, with M. J. Angus as the APM, which includes such technical items as reliability engineering and systems engineering.

Reporting also to Mr. Townsend are the Manager of Quality Control, W. D. Barkhuff, and Manager of Human Resources, E. M. Conway. Quality Control is a separate organization from quality assurance and provides on-going inspection efforts, materials receipt inspections, and other inspections of daily activities.

2.2 Summary of Unit 1 and Unit 2 Operations

Experience has demonstrated that nuclear plants with higher capacity factors and longer continuous operation periods have encountered fewer challenges to plant safety systems and less demand on safety equipment. In the long term, the reduced challenges to plant systems would also minimize any potential negative effects of cyclic operation on plant life. Consequently, capacity factors and days of continuous operation are important indicators in the consideration of overall plant safety assessment. These indicators, together with the current operating status of the plant as described below, formulate the basis of an assessment of DCPP operation in 1990.

The two units at DCPP operate on approximately 18-month cycles, with approximately 16 months of power operation and two months of refueling activities in each cycle. Unit 1 was operating at 100 percent power at the beginning of 1990, early in its fourth cycle of operation following a refueling outage late in 1989. Throughout the assessment period (January 1, 1990 through June 30, 1990), Unit 1 operated consistently with a capacity factor of above 90 percent, excluding the shutdowns that occurred as discussed below. There were several reductions in power level, lasting an average of several days each, in order to complete maintenance or repair work. These maintenance and repair activities included main condenser tube leak repair, main condenser cleaning, feedwater regulating valve work, and heater drip pump seal maintenance work.

On February 20, 1990, Unit 1 was manually tripped due to a loss of flow from both main feedwater pumps, but it returned to 100 percent power within two days of the trip. This event was reported to the NRC in PG&E Licensee Event Report (LER) 1-90-002-00. PG&E established a multi-disciplinary technical review group to investigate and analyze this event to identify the cause of the reactor trip. The immediate cause of this event was the inadvertent trip closure of the feedwater control valves, resulting in both main feedwater pumps tripping on high feedwater header pressure.

The exact root cause of the closure of the feedwater valves could not be determined. However, based on the information available, PG&E concluded that the most probable cause of the tripping of the feedwater control valves was either a non-repeatable solid state protection system (SSPS) card failure or inadvertent actuation by technicians working the SSPS racks. As a precaution, PG&E replaced the appropriate logic cards in the SSPS and retested the related SSPS train. Additionally, PG&E technicians were reminded by management personnel of the potential hazards of test equipment during SSPS testing.

An unplanned automatic scram of Unit 1 occurred on June 14, 1990, due to a Power Range Nuclear Instrumentation high positive rate trip signal, caused by a load rejection. The event was reported to the NRC in LER 1-90-005-00. This reactor trip resulted in a loss of 10 effective days of generation, with the facility returning to 100 percent power within 15 days of the trip. The load rejection occurred due to an off-site disturbance caused by a brush fire under PG&E transmission lines remote from the plant.

The turbine generator speed increased due to the load rejection. The increasing turbine speed increased the generator frequency, which in turn increased the reactor coolant pump speed and flow. The higher reactor coolant system flow rates caused a decrease in the reactor coolant temperature in the upper core region. Due to a negative moderator temperature coefficient, the reactor power increased, causing the trip.

The cause of the unplanned scram was determined to be mis-operation of a relay by PG&E Power Control personnel who were not familiar with DCPP operations in an off-site switchyard in PG&E's transmission system, which caused the unit's output breaker to open. The mis-operating relay was investigated by PG&E, and DCPP management met with the Power Control personnel, advising them of conditions which may cause DCPP to trip off line if certain switchyard work were performed.

Unit 2 also was operating at 100 percent power at the beginning of 1990, late in its third cycle of operation. The unit operated consistently with a capacity factor of close to 100 percent during this assessment period. There was only one brief curtailment in power, to allow for main condenser cleaning. The unit was shut down for 57 days for its third refueling outage during this period.

The refueling outage for Unit 2 was started on March 4 and was completed on April 30. This period was shorter than any other outage at DCPP to date. This improved refueling outage performance is due to PG&E's integrated use of the Outage Control Center concept, lessons learned from earlier outages, and the High Impact Team (HIT) concept.

PG&E has in place an Outage Control Center for managing outage tasks for both units. During outages the Center is staffed twenty-four hours a day with representatives from all major departments involved in an outage, including mechanical maintenance, electrical maintenance, instrumentation and control, operations, engineering, planning and scheduling, radiation protection, quality control, materials, general construction, contractor management, outage coordinators, and the outage manager. This organization is in charge of all aspects of the outage,

including work control, scheduling, obtaining spare parts, problem resolution, and containment coordinating. The Outage Control Center provides a single focal point for direction and control, and for responding to any outage-related problem anywhere in the plant.

HITs are a multi-department group of individuals assembled well in advance of the outage to discuss, plan, and prepare for complex and critical outage activities. The team includes individuals responsible for planning and implementing the work, such as maintenance engineers, foreman, craft personnel, as well as support personnel, who have performed similar tasks in past outages.

Specifically, there have been several significant operating achievements at DCPP in its operational history. These achievements include the following: 1) Unit 1 - This unit had the highest capacity factor (88 percent) for a nuclear power plant in its first year of operation. This value surpassed the world record for comparable Westinghouse units and the U. S. Record for large nuclear units. Additionally, Unit 1 operated continuously for approximately 400 days during its third cycle of operation, which was completed in late 1989. 2) Unit 2 - This unit had the highest 1986 capacity factor (86 percent) for any U. S. Westinghouse four-loop unit. Further, this unit had the longest continuous operation for Westinghouse four-loop units during the first cycle; it operated continuously for 151 days.

2.3 Unit 1 and Unit 2 Performance Indicators

One vital tool used by PG&E to assist in the management oversight of DCPP operations is the use of performance indicators. The following seven performance indicators are among the most important and give a general flavor of overall DCPP performance during the assessment period.

2.3.1 Capacity Factor

Capacity factor is the measure of the facility's effectiveness in producing electrical generation. This factor is determined by taking the ratio of actual energy production (net megawatt hours) to the maximum dependable net capacity multiplied by the hours in the time period of operation. PG&E's objective in 1990 is to have DCPP achieve an 84 percent combined annual capacity factor for the two units at DCPP.

The purpose of the capacity factor indicator is to monitor progress in attaining high unit capacity and availability factors. It provides an indication of the effectiveness of plant programs and practices in maximizing electrical generation and also provides an overall indication of how well a plant is operated and maintained. Experience has shown that units with high capacity factors and low forced outage rates are often well maintained, follow good operating practices, and can be expected to have a higher margin of safety. However, it is also true that high capacity in short term can be obtained with a decrease in margins of safety. One of the objectives of the DCISC is to monitor DCPP operations for indications of the latter.

The cumulative capacity factor for DCPP as of June 30, 1990 was 77.8 percent. The primary causes for this factor being lower than the objective were the Unit 2 refueling outage and two Unit 1 trips during the assessment period. However, it is worth noting that the two units have operated at well above 90 percent during normal operation, and that Unit 2 completed its refueling outage in record short time. The projected capacity factors for 1990 are 79.5 and 94.4 percent for Units 1 and 2, respectively, assuming 100% power for the rest of the year.

2.3.2 Collective Radiation Exposure

The collective radiation exposure is the total external whole-body dose received by all on-site personnel (including contractors and visitors). The dose is reported in units of man-rem. PG&E's goal for 1990 is to assure the collective

radiation dose equivalent exposure does not exceed 350 man-rem for the two units at DCPP. It is worth noting that the 1990 industry average goal established by the Institute of Nuclear Plant Operations is 288 man-rem/unit or 576 man-rem for two units.

The purpose of the collective radiation exposure indicator is to monitor efforts to minimize total radiation exposure at each facility and in the industry as a whole. This parameter is a measure of the effectiveness of radiological protection programs in minimizing radiation exposure to plant workers.

As of June 30, 1990, the collective radiation exposure for DCPP was approximately 283 man-rem. This total includes approximately 264 man-rem from the Unit 2 refueling outage that occurred during the assessment period. The collective radiation exposure prior to the outage had totalled less than 7 man-rem, and had increased by about 12 man-rem following the outage.

2.3.3 Industrial Safety Lost Time Accident Rate

A lost time accident is defined as a work-related accident, involving DCPP personnel, which results in the loss of at least one full day of work. PG&E's goal for 1990 is to achieve an industrial safety lost time accident rate (disabling injuries) for NPGBU of less than 0.2 per 200,000 hours worked.

The purpose of the industrial safety lost time accident rate indicator is to monitor progress in improving industrial safety performance for utility personnel permanently assigned to the plant. The lost time accident rate was chosen as the personnel safety indicator over other indicators, such as injury rate or severity rate, because the criteria for this rate are clearly defined, utilities currently collect this data, and the data are the most objective.

For the first half of 1990, the industrial safety lost time accident rate was 0.35 per 200,000 hours worked.

2.3.4 Unplanned Reactor Trips

A reactor trip (scram) means the automatic shutdown of the reactor by a rapid insertion of negative reactivity (for example, by control rods or liquid injection shutdown system) that is caused by an actuation signal of the reactor protection system. The signal may result from exceeding an operational setpoint or may be spurious, such as equipment noise. An unplanned trip means that the scram was not an anticipated part of a planned test. The PG&E goal here was to have no unplanned automatic reactor trips while critical.

The purpose of the unplanned automatic scrams while critical indicator is to monitor performance in reducing the number of unplanned automatic reactor shutdowns. The indicator provides an indication of success in improving plant safety by reducing the number of undesirable and unplanned thermal-hydraulic and reactivity transients requiring reactor scrams, which places stresses on the reactor systems. The indicator also provides an indication of how well a plant is operated and maintained. Manual scrams and, in some cases, automatic scrams as a result of manual turbine trips to protect equipment or mitigate consequences of a transient, are not counted because operator initiated scrams and actions to protect equipment should not be discouraged. Manual scrams are tracked by PG&E, however, for use as a management tool for improved performance.

For the first half of 1990, PG&E experienced one automatic reactor trip, which occurred during Unit 1 operation in June. This trip was initiated following a load rejection, which was due to a series of other events that were beyond the control of DCPP staff, and the reactor was shut down safely.

2.3.5 Unplanned Safety System Actuations

This indicator is defined as the sum of the following safety system actuations: 1) the number of unplanned safety injection (SI) system actuations that result from reaching an SI actuation setpoint or from a spurious or inadvertent signal; and 2) the number of unplanned emergency AC power system actuations that result from a loss of power to a safeguards bus. Actuations due to spurious or inadvertent starts of the emergency AC power source are not counted. Safety system actuations are counted during all plant conditions. PG&E's goal is to achieve fewer unplanned safety system actuations at DCPP than one per unit/year.

The purpose of the unplanned safety system actuation indicator is to monitor progress in reducing the number of occurrences of significant off-normal plant conditions.

Emergency core cooling system actuations indicate events that are severe from a thermal-hydraulic perspective, while emergency AC power system actuations indicate a significant degradation of a vital support system. Generally the lower the number of unplanned safety system actuations the larger the margin of nuclear safety.

For the first half of 1990, DCPP experienced no unplanned safety system actuations.

2.3.6 Secondary Chemistry Index

This index compares the concentration of selected impurities to industry-accepted values for those impurities. The concentration of each impurity is divided by the accepted values for the impurity, and the sum of these ratios is normalized to 1.0. The accepted values are the "normal values" defined in the Steam Generator Owners Group, pressurized water reactors (PWRs), Secondary Water Chemistry Guidelines for recirculating steam generators. The PG&E goal here aims to attain a DCPP secondary chemistry index of less than 0.25 for each unit.

The purpose of the chemistry index is to evaluate and trend progress in improving chemistry control in PWR steam generators. The chemistry index calculation is based on the concentration of important impurities in the plant systems that are the most likely cause of deterioration of PWR steam generators. Experience has shown that operation with impurity concentrations above the "normal values" used in this indicator will likely cause significant corrosion damage. However, the impurity levels below which such corrosion damage is prevented have not yet been clearly established. Therefore, plants should be operated with the lowest practicable impurity levels.

As of June 30, 1990, the secondary chemistry index for Unit 1 was 0.275. The index for Unit 2 was 0.286. These values are somewhat higher than the PG&E objective. PG&E has completed two major design changes on both units to improve performance. First, the recycle piping from the condensate polishers has been rerouted from the condensate pump suction back to the condenser. Second, the condenser crosstie has been doubled in size. Any improvements would be expected during the second half of 1990.

2.3.7 Fuel Reliability

This indicator is defined as the steady state primary coolant activity concentration of the iodine-131 isotope, corrected for the tramp uranium contribution and normalized to a common purification rate. Tramp uranium is fuel which has been deposited on reactor core internals from previous defective fuel or is present on the surface of fuel elements from the manufacturing process. Steady state is defined as continuous plant operation above 85 percent power for at least seven days. The PG&E goal here is to assure that the equivalent iodine-131 activity due to fuel failures does not exceed 0.0015 microcuries per gram at each unit.

The purpose of the fuel reliability indicator is to monitor industry progress in achieving and maintaining high fuel integrity, and to foster a healthy respect for preservation of fuel integrity. Failed fuel represents a breach in the initial barrier preventing off-site release of fission products. It also has a detrimental effect on operating cost and performance, and increases the radiological hazards to plant workers. The indicator provides a relative simple measure of fuel integrity while allowing comparison among units.

In June 1990, the fuel reliability index was 0.000099 microcuries per gram for Unit 1 and 0 microcuries per gram for Unit 2. These values are well within the objectives set by PG&E. PG&E fuel reliability, as measured by the indicator, exceeds the industry average.

2.4 Discussion of SALP Report

The Nuclear Regulatory Commission periodically assesses each nuclear plant licensee on its performance in meeting NRC requirements in six major functional areas. The report is call the Systematic Assessment of Licensee Performance (SALP) and includes plant operations, radiological controls, maintenance/surveillance, emergency preparedness, security, engineering/technical support, and safety assessment/ quality verification. Each area is rated in one of three categories: Category 1: performance substantially exceeds regulatory requirements and reduced NRC attention may be appropriate; Category 2: performance is good and NRC attention may be maintained at normal levels; or Category 3: performance is not sufficient and NRC attention should be increased. Exhibit H more fully describes the assessment criteria.

2.4.1 Plant Operations

2.4.1.1 SALP Discussions

2.4.1.1.1 Overall Assessment

Plant operations has improved to Category 1 up from "Category 2, Improving Trend" in the previous SALP period. One remaining concern is licensee's (PG&E's) occasional apparent inability to recognize and address issues in a timely manner.

2.4.1.1.2 Strengths

Unit 1 completed a record 399 day run.

Units 1 and 2 each experienced only one automatic trip.

Unit 2 operators initiated three manual reactor trips in conservative responses to abnormal plant conditions.

PG&E initiated comprehensive data gathering to identify the root cause of the most significant events.

Approaches to resolution of technical issues were viable, generally conservative, sound and thorough.

PG&E has been at the forefront of safety valve reviews and testing.

Fire protection enhancements have been well beyond NRC minimum requirements.

PG&E has been generally responsive to NRC initiatives.

Key positions were identified and responsibilities defined with key vacant positions usually filled in a reasonable time.

Operational training program was well defined and implemented with dedicated resources. The overall pass rate on qualification exams was 94%, well above average.

Overall high quality of operator training was consistently exhibited. Inadequate training was rarely the cause of plant events.

2.4.1.1.3 Noted/Recommended Improvement Areas

There should be increased management attention to ensure timely corrective action is taken to address repeated valve and equipment lineup problems. The equipment lineup problems resulted in the issuance of an escalated enforcement action and a civil penalty.

Timely problem recognition and the initiation of corrective action could be improved.

Management should continue to require that operations personnel conduct their duties in a professional and conservative manner.

2.4.1.2 DCISC Evaluation and Recommendations

The Category 1 rating is the highest NRC gives and is not given lightly. PG&E has shown substantial strengths and improvement in this area. However, the need for continued improvement in the timely recognition and resolution of problems is a continuing theme throughout the SALP report. The Diablo Canyon Independent Safety Committee (DCISC) recommends that substantially increased emphasis be given to this issue in all areas.

2.4.2 Radiological Controls

2.4.2.1 SALP Discussion

2.4.2.1.1 Overall Assessment

Radiological control performance remains Category 1, no change from the previous SALP period. Licensee has successfully addressed previous recommendations with additional attention needed in the management of outage activities.

2.4.2.1.2 Strengths

Management continued to exhibit active involvement in the areas of chemistry and radiological controls.

Management had developed goals and performance indicators in several areas. PG&E Staff's awareness of management's goals and expectations was evident.

Continued commitment for the implementation of a strong and effective radiation protection program was evident.

PG&E implemented a completely revised and improved outage ALARA program, including some substantial innovative concepts. Overall exposure for 1989 was 3% less than licensee established goal.

The staff was highly qualified, and the normal plant turnover rate was low.

Authorities and responsibilities were well delineated.

There is a strong training program for the technical staff and radiation protection and chemistry technicians.

Licensee has set demanding standards for contract technicians providing assistance during outages. For example, senior radiation protection technicians employed for outages must take and pass a 2-4 hour specific knowledge examination. This practice has resulted in an increase in the quality of technicians sent to the plant.

2.4.2.1.3 Noted/Recommended Improvement Areas

Quality of health physics and work practices during outages continue to need attention.

Continue the current aggressive approach towards ALARA.

More timely and effective actions are needed to correct root cause of problems.

2.4.2.2 DCISC Evaluation and Recommendations

The continuation of the Category 1 rating, the significant strengths noted and the limited recommendations, confirm that PG&E has been doing very well in this area. The DCISC has no recommendations to add to those of the NRC in this area.

2.4.3 Maintenance/Surveillance

2.4.3.1 SALP Discussions

2.4.3.1.1 Overall Assessment

Maintenance/surveillance performance is rated "Category 2, Improving Trend" up from the previous Category 2 rating. Issues discussed in previous SALP were not a significant contributor to plant events during this SALP period.

Remaining concerns are excessive use of overtime during outages, oversight of problem identification and timely resolution, and maintenance and operations staffs' understanding of the plant design.

2.4.3.1.2 Strengths

Management's oversight of maintenance activities was generally effective.

Surveillance program is well established and implemented.

Inservice Inspection (ISI) program is well established and implemented.

Understanding of technical issues was generally apparent including taking an industry lead in a number of issues.

Conservatism was generally exhibited as well as an understanding of subtle technical problems by maintenance personnel.

Responses to NRC concerns are technically sound and thorough in almost all cases.

PG&E is adept at handling root cause investigations of more significant events.

Events attributable to procedure errors and procedure compliance were infrequent.

PG&E maintains a state of the art training facility demonstrating dedication to providing quality training. Inadequate training has not been a significant contributing factor to plant events caused during construction, maintenance or surveillance activities.

2.4.3.1.3 Noted/Recommended Improvement Areas

Management oversight is needed of the use of personnel overtime during outages including periodic review of overtime records as required in the Technical Specifications.

There should be more timely response to NRC concerns.

Management oversight is needed of timely problem identification and resolution.

Understanding, by the maintenance and design staffs, of plant design bases and sensitivity of the design to deficiencies could be improved.

Increased management emphasis is needed on maintenance of plant material conditions.

2.4.3.2 DCISC Evaluation and Recommendations

The "Category 2, Improving Trend" rating given DCPP is a significant improvement over the acceptable previous Category 2 rating. It recognizes the substantial improvements that PG&E has made in this area. The DCISC adds its support to the importance of understanding the design bases by the maintenance and operating staffs. The DCISC specifically recommends that management emphasis be applied to reduce overtime during outages and to provide management oversight consistent with the Technical Specifications. The Technical Specifications place a limit of 72 hours of work per week and require periodic review of overtime records by plant management. Neither requirement is being satisfied.

2.4.4 Emergency Preparedness

2.4.4.1 SALP Discussions

2.4.4.1.1 Overall Assessment

The rating of Category 1 has not changed in the last four SALP reviews. Strong management support of the Emergency Preparedness (EP) program and a conservative approach to EP issues were cited assets. A remaining concern is strengthening of the engineering support in the Technical Support Center (TSC) and the Emergency Operations Facility (EOF).

2.4.4.1.2 Strengths

Management support of the EP program was evident.

There was good responsiveness to NRC initiatives.

Corrective actions were thorough and well thought out.

Implementation of EP, in each of several opportunities, was timely and in accordance with procedures.

A stable and effective staff was maintained to implement the EP.

There has been an effective training and qualification program.

Dose assessment capabilities were dependable.

2.4.4.1.3 Noted/Recommended Improvement Areas

Problem escalation to appropriate levels of management or priority level to assure timely corrective action needs improvement.

Level of engineering support in the TSC and EOF could be improved.

2.4.4.2 DCISC Evaluation and Recommendations

The continued high rating of Category 1, the significant strengths, and the limited recommendations demonstrate the high level of attention that PG&E management has given this area. The DCISC has nothing to add to the NRC recommendations. During FY 91 the committee will complete a report on the DCPP emergency drill held in the Fall of 1990.

2.4.5 Security

2.4.5.1 SALP Discussions

2.4.5.1.1 Overall Assessment

Security is rated "Category 2, Improving Trend" up from Category 2 in the previous SALP period. The overall security program was acceptable and exceeded minimum requirement in the area of security officer training. A remaining concern is more timely resolution of issues.

2.4.5.1.2 Strengths

Modifications were completed to the security radio communications equipment to avoid possible interference with the radio communications equipment of the Units 1 and 2 operations staff.

The licensee redesigned and completed 90% of the installation of the protected area barriers and associated security alarms.

Corporate and plant management continued to review the operation of the overall security program.

PG&E has been generally responsive to NRC concerns.

PG&E completed expansion and remodeling of security access control building.

Long term image deficiencies with installed CCTV cameras (to allow viewing of the entire protected area perimeter) were resolved.

The capacity of the security emergency power supply was upgraded.

PG&E totally redesigned the placement of the protected area barriers and required security alarms at the Intake Structure.

Overall, the security training program exceeded minimum requirements, and key positions and responsibilities were generally well defined.

The fitness for duty program was comprehensive and well presented.

2.4.5.1.3 Noted/Recommended Improvement Areas

More management attention is needed for finalization of hardware corrective actions on a timely basis.

Weaknesses were identified in integrated security system (barriers, perimeter alarms, and CCTV cameras).

There were identified inadequacies with portions of vital area barriers at Units 1 and 2 pipe galleries.

Supervision of alarm station operations needs improvement.

More management attention is needed to improve employee awareness towards compliance with safety/security procedures.

2.4.5.2 DCISC Evaluation and Recommendations

The "Category 2, Improving Trend" rating recognizes the substantial effort PG&E has invested in this area. The DCISC has nothing to add to the NRC recommendations except to reemphasize the importance of timely actions.

2.4.6 Engineering/Technical Support

2.4.6.1 SALP Discussions

2.4.6.1.1 Overall Assessment

This area is now rated "Category 2, Improving Trend" up from Category 2 during the previous SALP period. Remaining concerns are configuration management and system engineering programs, interface between corporate engineering and the plant, formal resolution of problems, self-critical evaluations, early identification of problems and aggressive corrective actions, and plant material condition.

2.4.6.1.2 Strengths

Reemphasis of a comprehensive configuration management program was evident.

Reemphasis was noted of closer system engineer ties with their design engineering counterparts.

FSAR and other correspondence have been reviewed to assure commitments are being met.

Vendor manuals were reviewed to assure important maintenance activities are being accomplished.

There was increased emphasis on self-critical assessment by engineering management including greater involvement of engineering quality services, stronger ties between Nuclear Engineering and Construction Services (NECS) and site engineering personnel, and PG&E engineering and corporate management spending more time at the site and more time with engineering personnel.

Understanding of technical issues was generally apparent, and conservatism was generally exhibited.

Engineering has been generally responsive to NRC and industry initiatives, producing products of good quality.

PG&E has been carrying out a substantial effort to improve design understanding and consolidation. They completed the reconstruction of the design bases for several safety related systems. Concerns identified during the reconstruction are being resolved in a responsible manner.

PG&E conducted substantial inspections, similar to Safety System Functional Inspections (SSFI), which resulted in several important improvements.

Technical staff training in several areas was strong.

There has been management interest in engineering improvement initiatives and commitment to the system engineering program.

There was a well-staffed engineering organization.

2.4.6.1.3 Noted/Recommended Improvement Areas

Staff understanding of the design bases could be improved.

Interface between San Francisco-based NECS and the site needs strengthening.

There needs to be a thorough approach to solving problems by system engineering.

NECS self critical assessment is needed.

Timely identification of problems and their resolution is needed.

There should be better understanding of all implications of changes on actual plant operations.

Timely assessment of plant material condition should be improved.

Formal training program for design system engineers should be improved.

There should be continued emphasis on established long term programs such as the configuration management and system engineering programs.

2.4.6.2 DCISC Evaluation and Recommendations

The increase in the rating to "Category 2, Improving Trend" follows from the substantial effort by PG&E and the significant strengths noted in the SALP report. The DCISC has nothing to add to the NRC observations and recommendations except to add emphasis to the importance of maintaining good working relationships and interfaces between the San Francisco based operations and the site.

2.4.7 Safety Assessment/Quality Verification

2.4.7.1 SALP Discussions

2.4.7.1.1 Overall Assessment

This area was rated "Category 2, Improving Trend" up from Category 2 in the previous SALP period. Remaining concerns are control and monitoring of QA audits, understanding of technical issues, resolution of less critical items, and problem identification.

2.4.7.1.2 Strengths

QA organization has been on the forefront of the development of performance-based inspection activities with the implementation of the Safety System Functional Audit and Reviews (SSFAR) and the audit of their NSSS vendor.

In most cases, root cause reviews appeared to be technically sound and thorough.

There was good use of auditors with direct experience in the technical areas being audited.

PG&E was generally responsive to NRC initiatives.

PG&E developed the Event Investigation Team (EIT) methodology for major events which produced good results.

Overall, PG&E implemented a viable program for conducting in-depth event analysis/root cause evaluations.

There was high assurance that personnel responsible for conducting event evaluations are appropriately trained and qualified in the techniques of root cause analysis.

A large quantity of highly technical material on the Long-Term Seismic Program (LTSP) including a full Level 1 Probabilistic Risk Assessment (PRA) was provided while being responsive and timely to the NRC's requests.

The corrective action program was managed on the Plant Information Management System (PIMS), a computer based tracking and communications system used for essentially all types of items, issues, or problems which require corrective action. Extensive evaluation did not identify any safety-significant items which had not been entered into the PIMS program.

Preliminarily, no safety-significant problems were identified which had not received appropriate and timely action.

A new organizational group was being established to provide oversight of the corrective actions, root cause, trip reduction, and other similar programs.

Understanding of technical issues involved in actions on safety issues related to six generic letters, three NRC bulletins, and three TMI items was apparent, and in most cases, action was timely.

Staffing of quality verification organization was evident.

QA was effective in finding and using contracted personnel to round out audit teams and train their personnel.

The training and qualification programs made a positive contribution.

2.4.7.1.3 Noted/Recommended Improvement Areas

Management should assure proper control and monitoring of the performance of the QA audits of the safety related equipment suppliers to meet both scope and content of NRC requirements.

QA implementation of corrective action program requirements should be strengthened.

Improved understanding of technical issues is needed.

Improved problem review scope and corrective actions when formal structure of EIT is not implemented. Resolution of items of lesser individual significance have been under evaluation for as much as a few years and may not have been fully evaluated for safety significance.

Plant housekeeping needs improvement.

Emphasis should be maintained on the quality verification programs on performance-based audits.

There should be increased emphasis on identification of problems.

2.4.7.2 DCISC Evaluation and Recommendations

The increased rating to "Category 2, Improving Trend" recognizes the effective effort by PG&E in this area. The DCISC has not identified any issues to emphasize or add to those of the NRC.

2.5 NRC Assessments and Issues

(NOTE: This section of the Report excludes security-related materials.)

2.5.1 Summary of Licensee Event Reports

2.5.1.1 Discussion

Licensee Event Reports (LERs) are reports required of the licensee by Nuclear Regulatory Commission regulations when an off-normal event occurs at an operating nuclear station. These events include operation or conditions outside station Technical Specifications or procedures or NRC regulations.

There were 19 LERs submitted during the period January 1, 1990 through June 30, 1990. Of the 19, 12 reports represented events occurring in this time period, three reports were submitted for late-1989 events (reported within the 30-day reportability time), and three reports were for events occurring in earlier periods which were discovered in this period. There was one revised report submitted.

Of the 18 newly-reported events, the predominant root cause was reported as personnel error in 13 events. Of the five remaining event causes, one is unknown; one is still under investigation; one was electrical transient; and two were cases of inadequate procedures. The personnel errors were primarily due to inadequate training, inadequate attention to detail, and misinterpretation of requirements. Five (four on Unit 2) of the 18 events involved automatic mode changes in safety-related ventilation systems. These were inadvertent Engineered Safety Feature (ESF) actuations in which the systems aligned to their safety mode of operation. There were three additional inadvertent ESF actuations on other systems.

2.5.1.2 DCISC Evaluation and Recommendations

In each completed case the PG&E event investigation appeared in-depth and complete, resulting in the identification of a reasonable root cause. No event adversely affected the health and safety of the public, and there were no adverse consequences.

The predominance of personnel errors is a trend which deserves increased attention by PG&E. The DCISC recommends PG&E closely monitor personnel error trends and determine their specific causes to help reduce their occurrence and significance. The DCISC requests that, at an upcoming

meeting, PG&E present an analysis of personnel error trends to date and their proposed or existing plans for their resolution. Similarly, the DCISC requests additional PG&E analysis of inadvertent actuations or mode shifts of safety-related ventilation systems.

2.5.2 NRC Inspection Reports

2.5.2.1 Discussion

Nuclear Regulatory Commission (NRC) inspectors performed 15 formal inspections for which reports were issued the first half of 1990. These inspections included the following areas:

- Containment sump screens
- QA audits of suppliers
- Corrective action program
- System Engineer and Design System Engineer programs
- Plant chemistry and radiochemistry and radiological measurements
- Emergency preparedness
- Plant operations, maintenance and surveillance
- Occupational exposure; control of radioactive materials and contamination, surveys, and monitoring; and ALARA
- Inservice inspection
- Independent inspection activities
- Shipping of low level waste and radioactive waste management
- Motor-operated valve actuator spring pack relaxation
- Follow-up of onsite events, open items and licensee event reports (LERs)

The inspections identified strengths in the areas of initiating corrective action where needed; timeliness of corrective action; primary and secondary water quality; timely operator action; maintenance organization; event investigation; problem identification; outage dose tracing; radwaste management; ALARA; and installation of components by the electrical maintenance group.

NRC found weaknesses in the plant/corporate interface of the System Engineers/Design System Engineers; plant housekeeping; operations equipment lineup process; communications between security, plant engineering and operations; timeliness of maintenance engineering actions on identified problems; and control and posting of Radioactive Material Areas and design change implementation.

NRC identified no safety-significant items in the above inspections.

2.5.2.2 DCISC Evaluation and Recommendations

Some areas of weakness identified by NRC were cause for notices of violation and are discussed below in Section 2.5.3. Other of the weakness areas did not appear significant and/or were adequately addressed by PG&E or found acceptable by NRC without further action. After reviewing these items, the DCISC has no plans to follow up.

2.5.3 Enforcement Actions

2.5.3.1 Discussion

NRC considers items not in compliance with its requirements or with the licensee's commitments to be violations. NRC identifies five severity levels for violations. Level I is the most severe representing the most significant regulatory concern which usually involves actual or highly-potential impact on the public. Level V is the least severe representing minor safety or environmental concern. Level IV violations are of more than minor concern and should be corrected to not lead to a more serious concern. Civil penalties are usually imposed for Level I and II violations, considered for Level III, and usually not imposed for non-recurring Level IV or Level V violations.

There were no Level V violations during the first half of 1990.

NRC identified the following twelve Level IV violations during its inspections reported in this time period:

1. No administrative procedures to assure the positive displacement charging pumps were operable for shutdown following a fire
2. Inadequate supplier audits not properly identified, documented and corrected
3. Failure to assure correction of identified deficiencies in safety-related parts
4. Non-analyzed seismic scaffold attachments used
5. Temporary changes to approved procedures not in accordance with PG&E program
6. Timely corrective action not performed on potentially-inoperable component
7. Plant housekeeping not per procedure
8. Damaged auxiliary saltwater system piping not identified and resolved
9. Operations involving fuel movement in the spent fuel pool without required ventilation systems operable
10. Leakage tests not performed on time for sealed radioactive source
11. Vendor maintenance update not forwarded as required
12. Quality evaluation not performed on Limitorque actuator spring pack deficiencies

NRC identified two Level III violations as follow:

1. Use of a formerly-licensed Senior Reactor Operator (SRO) as a shift supervisor instead of a licensed SRO. A civil penalty was not issued in this case because of the corrective action taken and general good overall past performance.

2. An aggregate of three violations on the containment sump screens not installed in accordance with design documents and debris found in the containment sump resulted in a $50,000 civil penalty.

There were no Level I or II violations in the first half of 1990.

NRC described one non-cited violation for failure to use appropriate nondestructive examination (NDE) data sheets. In this case, because PG&E had completed corrective action immediately during the inspection, the violation was not officially cited.

Additionally, NRC held a meeting at its Regional Headquarters with PG&E representatives to discuss needed QA performance improvements in the area of identifying precursors to programmatic weaknesses and elevating them to a higher level where they could be more effectively handled. PG&E representatives described QA organizational and management changes which would help resolve the problems.

2.5.3.2 DCISC Evaluation and Recommendations

PG&E responded to each violation with a reason for each violation, immediate corrective action taken, measures taken and planned to prevent further similar violations, and the date by which full compliance would be achieved. These responses appeared adequate to resolve the violations and to prevent recurrence. In addition, changes in QA organization and management emphasis appeared responsive to NRC concerns. The DCISC will continue to monitor the new QA organization management structure and its performance.

Although there were some weaknesses and violations discovered in NRC inspections, none of the Level IV violations was considered safety significant by NRC. The Level III violations are considered serious safety concerns and are discussed below.

<u>Non-SRO Licensed Shift Supervisor</u> (Level III Violation)

Contrary to DCPP Technical Specifications (TS), PG&E had placed a Non-Senior Reactor Operator Licensed (SRO) individual in the operating Shift Supervisor (SS) position for about four months. PG&E had used SROs on all shifts in

another position, the Shift Foreman (SFM); however, written procedures did not clearly specify the SFM role as having lead responsibility for the shift as a "shift supervisor". PG&E clarified the roles procedurally to require the SS have a current SRO, be on-shift at all times, and have overall responsibility for plant operation.

The violation appears to have been caused by a difference in TS interpretation and a lack of clarity in procedures on overall responsibility for shift management. It is recognized that PG&E had at least one SRO Licensed supervisor on shift at all times.

The DCISC does not find this violation had adverse safety significance, although it recognizes Level III violations as serious. PG&E's response and corrective actions were appropriate. No further review or follow-up is recommended by the DCISC.

Containment Sump Violations (Level III Violation)

The DCPP Final Safety Analysis Report (FSAR) and TS specify design, cleanliness and operability requirements for the Containment Recirculation Sump. The sump is part of the DCPP Engineered Safety Features used to screen, collect and recirculate reactor coolant (spilled in containment in a loss-of-coolant accident) for emergency core cooling. The sump depends on wire mesh screens to prevent debris from degrading system operation. NRC issued three violations for excess screen gaps, sump inoperability exceeding TS requirements, and debris in the sump area. The three violations were combined into a Level III problem.

PG&E acknowledged the violations were caused primarily by inadequate construction acceptance criteria by the engineering group; inadequate procedure safety evaluation of sump operability; and failure to follow and lack of specificity in maintenance and inspection procedures. Corrective action by PG&E consisted of screen repair, debris removal; revision of procedures and programs to provide more specificity and control; additional inspections; and training of affected personnel.

PG&E analyzed the affect of the sump discrepancies on the system performance, concluding with a high degree of confidence that the system would perform its intended function. The basis was the highly conservative design of the sump, the low likelihood that debris would enter the sump, and the very low risk significance of total core damage if the sump were rendered inoperable. The DCISC accepts the corrective actions as appropriate to resolve sump operability concerns; however, notwithstanding the PG&E operability analysis, the DCISC does have a serious concern about the potential degradation of an Engineered Safety Feature such as the Containment Recirculation Sump.

Although no specific follow-up action appears warranted, the DCISC will be sensitive to similar future events and problem causes for their significance and possible trends.

2.5.4 Industry and Generic Issues

Industry and generic issues are tracked and monitored by both NRC and nuclear industry organizations. NRC maintains a list of Generic Safety Issues (GSIs) and Unresolved Safety Issues (USIs) which are safety concerns affecting the design, construction, or operation of all or a class of nuclear power plants. The list is periodically sent to each nuclear station for review and status reporting back to the NRC. The NRC also sends to nuclear stations Generic Letters, Bulletins and Information Notices advising of potentially applicable events or occurrences which have taken place in the nuclear industry.

Industry groups track and monitor industry issues as well as events which may affect individual nuclear power plants. The Institute of Nuclear Plant Operations (INPO) distributes operating event reports to all stations for information and possible action. The Nuclear Management and Resources Council (NUMARC) maintains lists of priority and monitored industry issues, usually a result of NRC concerns or rule making.

PG&E has established procedures including site and headquarters committees to review these issues.

The DCISC plans to review this process for addressing these issues, their applicability to Diablo Canyon, and their review and implementation status.

3.0 Public Comments

3.1 Introduction

Public comments were requested at the first DCISC meeting held on May 22, 1990 in San Luis Obispo. Thirty-four members of the public presented comments to the DCISC. The sections below describe the subjects included in these comments.

3.2 General Comments

General (non-safety or non-technical) public comments received are categorized as follows (in many cases more than one person commented on each item):

Glad to have DCISC; appreciate chance to be heard

The DCISC took too long to form and begin its reviews

Need a local public document room and better provision to get documents to the public

There should be a local DCISC office opened

The DCISC should have an "800" telephone number and confidential call-in line for plant employees with concerns

Where is the third DCISC member?

Want members from outside the nuclear industry, and one should be a geoscientist

Openness of DCISC is appreciated

DCISC has no authority

DCISC should monitor the DCPP plant, especially radiation releases

The DCISC report goes to PG&E before the public

Responses to some concerns were made by the DCISC at the meeting. Dr. Kastenberg explained that a DCISC member was appointed each by the Chairman of the California Public Uitlities Commission, the President of PG&E, and the California Attorney General. All but the Attorney General had appointed a member, resulting in two current members. He explained that the DCISC was in its formative stages because appointments had just been made. Mr. Wellington described how meeting notices had been sent to the PUC service distribution list, newspapers, and radio and television stations, including a special notice in the

San Luis Obispo paper. This process would be improved for future meetings. Applicable documents are sent by PG&E to the local NRC Public Document Room at Cal Poly Tech in San Luis Obispo. Dr. Kastenberg stated that the DCISC intended to listen to all public comments and that he or other members would be available to meet with any interested individual or group. The DCISC report procedure had been established in the PUC order establishing the DCISC. This procedure requires the finished report be submitted to PG&E for an opportunity to add a section with their comments, although PG&E cannot change the DCISC position of the report. Concerns not addressed at this meeting will be reviewed by the DCISC for future actions or response.

3.3 DCPP Safety Comments

The following categories of comments related to plant safety were received from the public (in many cases more than one person commented on each item):

Concerns about the Hosgri Fault and the effect earthquakes could have on the plant, including the spent fuel pool

There is no place to dispose of nuclear wastes, and nuclear wastes are being stored at DCPP

DCPP is safe and a valuable energy source for California

Concern about human factors and errors at the plant

There is knowledge of plant employee drug and alcohol abuse

The emergency plan is not workable or realistic

An earthquake would degrade evacuation routes, i.e., roads and highways

Can't trust PG&E to operate plant safely

Need nuclear energy to help the environment

Concerned about radiation releases and knowing amounts released

DCPP is being operated properly and safely

Medical community is not equipped to handle multiple radiation exposures

The DCISC did not discuss these issues at the meeting because it had not had a chance to study them at the time. These and other plant items will be considered for further

review as the DCISC develops its plan on how to proceed with its charge.

In the interim, the DCISC has made some preliminary plans for the next reporting period which include meeting with the public; establishing an "800" number for use by the public; examining the impact of the Hosgri Fault Earthquake on the Spent Fuel Pool; looking into how drug problems are being handled; and being represented at a DCPP emergency drill.

4.0 Conclusion & Recommendations

The Diablo Canyon Independent Safety Committee was established by a June 24, 1988 settlement agreement (of the California Ratepayers Advocate, California Public Utilities Commission, the California Attorney General, and Pacific Gas and Electric) to ". . . review Diablo Canyon operations for the purpose of assessing the safety of operations and suggesting any recommendations for safe operations."

During the period January 1 through June 30, 1990 the DCISC reviewed appropriate PG&E and NRC documents related to the operation of Diablo Canyon Power Plant during this period; toured DCPP; held one meeting and heard presentations from PG&E on plant operations and programs; and received input from the public in the vicinity of the plant. Within the scope of the inputs received and formal reviews made, the Committee is satisfied that Diablo Canyon Power Plant is being operated safely.

Notwithstanding the above, the Committee noted that, while overall the NRC gave very high ratings to PG&E, there were specific weaknesses that needed to be addressed. The actions PG&E needs to take to address these weaknesses include (1) increased management attention to timely problem recognition and initiation of root cause corrective action, (2) improved understanding of the design by maintenance and operations staffs, (3) reduced overtime during outages and (4) continued focus on the interface between corporate engineering and the plant.

Consistent with the preceding, the Committee will continue to monitor these areas for any significant items or trends adverse to plant safety. Additional areas of overview for the future include, but are not limited to, the following:

- Emergency Planning
- On- and off-site safety review committees
- Fitness for duty and nuclear access
- Seismic reviews
- Maintenance
- Radiological emissions
- Fuel movement
- Personnel errors

5.0 PG&E Response

(See following 2-page letter and 9-page response.)

176562

Pacific Gas and Electric Company
77 Beale Street
San Francisco, CA 94106
415/973-6540

George A. Maneatis
President

August 5, 1991

Mr. Warren H. Owen, Chairman
Diablo Canyon Independent Safety Committee
857 Cass Street, Suite D
Monterey, CA 93940

Dear Mr. Owen:

Re: Pacific Gas and Electric Company Response to
Diablo Canyon Independent Safety Committee
Interim Report on Safety of Diablo Canyon Operations
for January 1-June 30, 1990

Enclosed is Pacific Gas and Electric Company's response to the Diablo Canyon Independent Safety Committee's Interim Report on the safety of Diablo Canyon operations.

We are pleased with the Safety Committee's overall conclusion that Diablo Canyon Power Plant is being operated safely. We also concur with the Safety Committee's recommendations and have taken aggressive steps to improve our performance in the areas noted in the report.

We greatly appreciate the time and energy expended by the Safety Committee in arriving at their comprehensive assessment of our operations. We were particularly impressed with the thoroughness of the Safety Committee's review and their in-depth technical knowledge of our nuclear operations. The Safety Committee's assessment coincides with our own self-assessment and with that of other independent nuclear review groups, including the Nuclear Regulatory Commission. As such, it provides us with another level of assurance that our Diablo Canyon operations are being conducted safely.

PG&E is committed to operating Diablo Canyon at the highest levels of safety, reliability, and performance. We, therefore, welcome any recommendations from the Safety Committee which will further enhance the safety and effectiveness of our operations.

If you have any questions on our response, please feel free to contact me at (415) 973-6700. We look forward to working with you and providing you with any information you may require to assess the continued safe operations of Diablo Canyon Power Plant.

Sincerely,

George A. Maneatis

GAM:mef

Enclosure

cc: W. E. Kastenberg
H. H. Woodson
R. Wellington
San Luis Obispo Public Document Room
(Docket Numbers 50-275, 50-323)

Pacific Gas and Electric Company's Response to Interim Report on Safety of Diablo Canyon Operations, January 1 - June 30, 1990:

We are pleased to respond to the first annual report of the Diablo Canyon Independent Safety Committee (DCISC), covering the period January 1 - June 30, 1990. The DCISC was created as part of the comprehensive Diablo Canyon ratemaking settlement approved by the California Public Utilities Commission (CPUC) in December 1988. As set forth in that settlement, the role of the DCISC is to assess and make recommendations concerning the safety of Diablo Canyon operations. The DCISC consists of three members who are required to have knowledge, background, and experience in the field of nuclear power facilities. The DCISC is advisory only, and has no authority or responsibility for plant operations or to direct plant personnel.

Under the Diablo Canyon settlement, the DCISC is required to submit an annual report to PG&E, and PG&E must respond to the report in writing within 45 days. The DCISC report is then submitted, along with PG&E's response, to the Governor, the State Attorney General, the CPUC, and the California Energy Commission. The annual report was transmitted by the DCISC to PG&E on June 20, 1991, and our response to the report is given below.

A. Overview

We agree with the conclusion of the DCISC (Report, page 39) that the "Diablo Canyon Power Plant is being operated safely" under the ratemaking settlement. We have spared no effort to operate Diablo Canyon at the highest levels of safety and reliability. PG&E's pursuit of operational excellence extends well beyond Diablo Canyon's nuclear organization. It is affirmed as one of PG&E's most explicit and widely communicated corporate goals: "Operate the Diablo Canyon Nuclear Power Plant at the highest level of safety, reliability, and performance."

Diablo Canyon continues to be numbered among the top performing nuclear plants in the nation. As the DCISC report notes, PG&E received high ratings from the NRC in its March 1990 Systematic Assessment of Licensee Performance (SALP) report. Diablo Canyon earned the highest rating ("superior") in three categories (plant operations, radiological controls, and emergency preparedness), and a "good" rating in the remaining categories (maintenance surveillance, security, engineering/technical support, and safety assessment/quality verification). The next NRC SALP report on Diablo Canyon is expected in September 1991.

We are taking aggressive steps to sustain the high level of performance at Diablo Canyon and to improve upon it. In this regard, we welcome the DCISC's recommendations concerning certain weaknesses noted by the NRC in its 1990 SALP report. The actions we have taken to correct these weaknesses are discussed below, under the heading "Specific Issues."

B. Recent Performance

Diablo Canyon's recent performance in four key categories -- organizational strategy, plant improvements, radiological controls, and operations -- demonstrates that PG&E is sustaining and improving the safety and reliability of the plant.

1. Organizational Strategy - The experience of the nuclear industry is that plant performance is largely a function of the quality of human processes. Diablo Canyon has implemented organizational and cultural enhancements necessary to support and maintain reliable and safe plant performance. Many of the plant's human resource initiatives are aimed at instilling greater levels of employee involvement and sense of ownership in the business. Every operator spends one week out of five in training, an increasing percentage of which is spent training in a $10 million simulator, located at the plant site, designed to replicate the operation of the Diablo Canyon units. PG&E has achieved a 100 percent pass rate in each of the last two years for reactor operator examinations administered by the NRC.

   In 1990, industrial behavior scientists from the University of California at Berkeley studied Diablo Canyon personnel and decision-making as part of a study of organizations which exhibit high reliability in their performance. The scientists concluded in general that Diablo Canyon personnel demonstrate a high regard for technical systems, are alert and aggressive, consistently search for better ways and procedures for accomplishing tasks, and cooperate well among different line departments toward the solution of plant problems. In order to further enhance this record of personnel excellence, we have initiated development of a "Technical Career Program" at Diablo Canyon that will attract and retain the best and most qualified candidates for high level technical and engineering positions.

   In January 1991, Diablo Canyon's management was strengthened with the establishment of the position of Vice President -- Nuclear Technical Services. This vice president, along with the Vice President -- Diablo Canyon Operations and Plant Manager, and the Senior Vice President and General Manager of the Nuclear Power Generation Business Unit, form the senior management team that is responsible to PG&E's President for the safe operation of Diablo Canyon.

2. Plant Improvements - Recent capital improvements that have contributed to the plant's excellent operation include an upgrade of the plant process computer which monitors plant operations, and the installation of a digital feedwater control system for each unit to reduce feedwater-induced reactor shutdowns. PG&E continues to maintain the plant's $90 million spare parts inventory to ensure proper maintenance and timely replacement of equipment.

The computerized Plant Information System in place at Diablo Canyon is one of the most extensive, state-of-the-art, on-line computer networks in use at nuclear power plants in this country. This system is available to thousands of PG&E employees who use it to document problems, order spare parts, monitor the progress of plant outages, and learn the status of plant activities.

In 1990 and 1991, we procured and began the installation of a sixth emergency diesel generator at Diablo Canyon at a cost of over $40 million. When operational in 1993, this important plant improvement will provide additional emergency back-up power for keeping safety systems operational in the event of a loss of offsite power to the plant.

Overall, we plan to continue to make capital improvements to existing Diablo Canyon systems and equipment to further enhance plant safety and availability.

3. Radiological Controls - As both the DCISC and the 1990 NRC SALP report note, we have taken aggressive action, including the employment of significant employee incentives, to ensure that personnel radiation exposure at Diablo Canyon remains as low as reasonably achievable. We have established ambitious goals for reducing collective radiation exposure and have achieved even greater reductions than our goals in both 1989 and 1990.

   The controlled radiological effluents to the environment from Diablo Canyon have consistently met and remained under all federal and state standards. Results from Diablo Canyon's radiation monitoring program have demonstrated that such effluents are factors of more than 100 below the most stringent limits set by the NRC, and that radiation levels at the site boundary are essentially unchanged from pre-operational, natural background levels. Notwithstanding this excellent record, we continue to make additional improvements to our radiological effluent program in order to further minimize liquid and gaseous effluents. For example, Diablo Canyon is a leader in the industry in removal of radioactive cobalt from the liquid effluent stream through pretreatment.

   Similarly, Diablo Canyon is now recycling radioactive gas in the plant's liquid holdup tanks in order to minimize the release of radioactive gas.

4. Operations - Experience has demonstrated that nuclear plants with higher capacity factors and longer continuous operation have encountered fewer challenges to plant safety systems and fewer demands on safety equipment. The combined lifetime capacity factor for both Diablo Canyon units through June 1991 is 76 percent. In this respect, the Diablo Canyon units are among the best operating nuclear units in the nation.

   During 1990, the two units operated at a combined capacity factor of 86 percent. In April 1990, Unit 2's refueling outage was completed in a company record of 57 days. Unit 1's 1991 refueling outage was completed

in 62 days, a record for this unit. On June 10, 1991, Unit 2 established a new record for the longest continuous operation of a nuclear unit of its kind (a four-loop Westinghouse pressurized water reactor) in the United States -- 400 days. This unit continues to set new records with each day of continuous operation, now at more than 455 days. The previous national record of 399 days was set by Unit 1 in October of 1989.

C. Specific Issues

1. Valve and Equipment Lineup - Section 2.4.1.1.3, page 20: This section states that valve and equipment lineup problems should receive increased management attention to ensure timely corrective action. We note that the problems and the enforcement action, along with the civil penalty, referenced in the report occurred between late 1988 and early 1989. These problems were summarized in the NRC's Systematic Assessment of Licensee Performance (SALP) report for Diablo Canyon for the period of August 1988 through December 1989, and PG&E implemented improvements in response to the report beginning in early 1990. The SALP report was issued in March 1990 and was reviewed by the DCISC in its assessment of our operations.

   As the Committee members appreciate, there are literally thousands of valves in a power plant such as Diablo Canyon that must be controlled and operated properly for the plant to function efficiently. Although misoperation of a small number of valves does not necessarily affect safety, all plants -- including Diablo Canyon -- give considerable attention to administratively controlling valving operations. Typical programs include use of written procedures with valve checklists for significant valving operations, providing independent verification of safety-related valving operations, and sealing or locking important valves in their proper positions.

   Tens of thousands of valve manipulations are performed each year -- and our goal is to never make an error. We extensively study errors, which occur at Diablo Canyon and at other nuclear power plants, and take aggressive corrective action to prevent occurrence or recurrence at Diablo Canyon. We have enhanced our existing programs for valving operations in several areas:

   - We implemented a major program to provide a unique identification number for even the smallest instrument valves, and to show these valves on our piping diagrams. Previously, the piping diagrams had not shown instrument valves at this level of detail.

   - Most valves are operated only by operators. However, some valves -- principally instrument valves and chemical sample valves -- must be operated by technicians in other departments. This occasionally led to instances where the operators were unaware of the status of a valve. To rectify this, we now require that operators verify proper alignment

of these valves as part of the normal system alignment checks that they routinely perform.

- Operating policy, training, and procedural requirements were clarified to specify that all system alignments and valve positions be clearly documented or tagged if they are out of the normal position.

- The plant procedures on valve clearances was revised to incorporate lessons learned from the previous events involving mispositioned equipment. The revision includes clarified instructions governing clearance reviews, return to service, and alignment of plant components, including independent verification of such clearances.

Experience in the last 18 months has shown that these measures have further reduced the incidence of valve misoperations.

2. Timely Recognition and Resolution of Problems - Section 2.4.1.2, page 20 (also Section 4.0, page 39): This section states that, in general, improvements were needed in the timely recognition and resolution of problems at the plant. In 1990, we also recognized this issue needed continued management attention, because it had been an area of concern with the NRC as documented in the March 1990 SALP report.

   As with valving operations discussed above, the subject of problem identification and resolution is one which receives continuous management and industry attention. For several years, Diablo Canyon has employed a computerized Management Information System, which is available to all employees and serves as the principal vehicle by which employees document problems and their resolution. A formal process is employed to review all problems entered into the system, prioritize them, and resolve them. Typically, about 10,000 action items or potential problems are identified and resolved each year. The process includes provisions to segregate the more significant problems and perform formal root cause analyses utilizing multi-disciplined "technical review groups."

   Diablo Canyon's management seeks to assure that problems are identified promptly and are given the proper priority and attention, and that problem resolution is thorough and timely.

   Much of the criticism of the process at Diablo Canyon relates to occasions where a problem was judged to have been handled at too low a level in the organization, and not elevated to one of the higher level review groups to undergo more extensive analysis; or to occasions where many parts of the organization are involved in the problem resolution process -- making it more difficult to identify a problem "owner" and get timely action.

   To address these weaknesses, we have taken steps to more clearly define the criteria for elevating problems to higher levels of management; we have enhanced the authority of the Quality Assurance/Control organizations to elevate problems and assign ownership; and we have enhanced our

processes for reviewing progress on significant problems with senior managers. We believe these measures are having a positive effect on the overall process -- and will tend to lessen, if not entirely eliminate, our concerns in this area.

3. Personnel Overtime - Section 2.4.3.2, page 23 (also Section 2.4.3.1.3, page 22 and Section 4.0, page 39): This section, referring to our requirements for an overtime limit of 72 hours per week and for periodic management reviews of overtime, states: "Neither requirement is being satisfied." PG&E agrees that overtime controls were not strictly enforced during the review period covered by the NRC's SALP report, particularly during refueling outages. This resulted from lack of sufficient management oversight, as well as some confusion as to the applicability of the requirements (the license requirements apply to "plant staff who perform safety-related functions," and it is not always clear-cut who falls into this category).

   We took corrective actions to address this issue in early 1990. We have reemphasized to plant personnel, through both memoranda and meetings, the importance of complying with overtime restrictions and of adequate management oversight reviews of overtime usage. We revised our overtime procedures to clarify the guidance on overtime restrictions. As a result of these actions, we significantly improved the control of overtime usage. Reviews by the Quality Control department of overtime usage since these improvements were implemented have confirmed that overtime controls are effective and that no significant deviations have occurred.

4. Design Engineering Involvement - Section 2.4.3.1.3, page 22 (also Section 2.4.4.1.3, page 24 and Section 4.0, page 39): This section addresses the issue of design engineering involvement as summarized in the SALP report. The report notes that improvements in the following areas were needed: (1) understanding by plant staff of the design basis, (2) interface between corporate engineering and plant staffs, and (3) level of engineering support in the Technical Support Center (TSC) and the Emergency Operations Facility (EOF).

   We have implemented several improvements in these areas over the past two years. Actions we have taken to address the issues of design basis understanding and interface between corporate and plant staffs include: (1) implementation of a system engineer program, assigning individual engineers to specific plant systems, as a part of the plant staff, (2) increased involvement of corporate engineering staff in plant operations, (3) implementation of a design basis document program, a setpoint control program, and an analysis basis program (all projects are currently in progress) to assure that the design basis and key analytical assumptions are readily available and well understood, (4) inclusion of engineering personnel in the replacement parts procurement program, (5) improvements in the engineering training program, (6) reviews of selected work to ensure adequacy, and (7) strengthening of engineering procedures. These programs have significantly enhanced the plant staff's understanding of

the design basis and have improved the interface between corporate engineers and the plant staff.

In the area of engineering support of the TSC and the EOF, we have committed additional resources to each of these two facilities. More specifically, we have devoted additional support though a more active role of PG&E's Corporate Incident Response Center (CIRC) and the significant engineering resources of the corporate office. This support allows the TSC staff to focus attention on its primary task, that of supporting the trending and evaluation of plant conditions during a plant emergency. Additionally, we have strengthened the functions of the EOF by placing the engineering responsibility at this facility under a single manager, providing a larger staff, and using the resources of the CIRC for assistance. We believe these improvements contributed toward a favorable evaluation by the NRC, as well as the Federal Emergency Management Administration, of our emergency exercise that was conducted in 1990.

5. Plant Material Condition - Section 2.4.3.1.3, page 23: The last sentence in this section states "Increased management emphasis is needed on maintenance of plant material conditions." This issue primarily involves the corrosion degradation of plant structures and systems, such as the intake structure and related components, due to the continuous salt water environment at the facility. It should be noted that although Diablo Canyon has only been in commercial operation since the mid-1980s, the majority of the equipment in this area has been in place and in operation for nearly 20 years.

   Because of the harsh environment at the intake structure, considerable attention has been given to the maintenance of this equipment since its original installation. Nevertheless, in early 1990 we developed an enhanced action plan to address the corrosion issue. First, we constructed a permanent maintenance shop at the intake, and have committed additional personnel to this location. We have established an ongoing program to repair corrosion damage and improve the condition at the intake area, and we have taken precautions, such as painting vital equipment, to minimize corrosion degradation to plant structures and systems. Finally, we continuously inspect plant areas to ensure that significant degradation has not occurred.

6. Personnel Errors - Section 2.5.1.2, page 30: This section addresses personnel errors and recommends increased management attention by PG&E. The subject of personnel error reduction was discussed in detail at the DCISC meeting of June 6, 1991. The personnel errors discussed in this section, as reported by PG&E to the NRC in a number of Licensee Event Reports, were due primarily to inadequate training, insufficient attention to detail, and misinterpretation of requirements.

   Personnel error reduction at Diablo Canyon has received substantial management attention. In 1986, we were among the first to adopt INPO's Human Performance Evaluation System (HPES) program. This program

identifies the human factors that cause personnel error and provides guidelines for corrective actions to prevent recurrence. With the HPES programs as a foundation, we established a multi-faceted personnel error reduction program.

The personnel error reduction program is comprised of a number of elements which include enhanced procedures, improved pre-job planning, aggressive departmental error reduction goals, and improved plant painting, labeling, and lighting. These elements heighten personnel awareness and fully communicate management's focus on reducing personnel errors. Based on recent personnel error rate data at the plant, these improvements have succeeded in reducing the number of personnel errors.

7. Conclusion - Section 4.0, page 39: We agree with the conclusion and recommendations reached by the DCISC. The findings of the DCISC are consistent with and reinforce those of our own self-assessments and those documented in inspection reports and other assessments of Diablo Canyon issued by the NRC. We are pleased with the DCISC's conclusion that "Diablo Canyon Power Plant is being operated safely," and we are committed to maintaining the safe and reliable operation of the plant.

   We also agree with the DCISC that during the review period, "there were specific weaknesses that needed to be addressed." As we have discussed, we have given considerable attention to improving our performance in the cited areas, as well as numerous other areas that were not cited. The nature of the nuclear industry is that it is committed to achieving ever increasing standards of excellence. Therefore, while we are confident that our efforts have resulted in substantial improvements in our performance, we also recognize that striving for excellence is a continuing process. We, therefore, welcome the recommendations of the DCISC and will incorporate them as part of our overall improvement program to insure that Diablo Canyon continues to be operated at the highest levels of safety, reliability, and performance.

We particularly welcome the DCISC's independent expertise and careful evaluation of our performance, and concur with their assessment that Diablo Canyon is currently being operated safely. We also concur with the DCISC's recommendations regarding specific improvements, and have initiated and aggressively implemented improvement efforts at Diablo Canyon since the first half of 1990, the period covered by this DCISC report.

Diablo Canyon is a vital and strategic resource for meeting the growing electricity needs of northern and central California. Diablo Canyon is also helping PG&E meet its commitments to clean air and water throughout its service territory. During drought years, when hydroelectric resources are severely curtailed, as in 1990 and 1991, Diablo Canyon's generating capability is invaluable in meeting the energy needs of our electric system.

The independent assessment and recommendations of the DCISC provide PG&E and the public additional assurance that Diablo Canyon is being operated safely and will continue to be a reliable source of power for northern and central California.

EXHIBITS

A through I

Exhibit A

Example List of Documents Received by the DCISC

A. Diablo Canyon Monthly Operating Reports (May 15, 1990; June 15, 1990; July 16, 1990)

B. Licensee Amendment Requests (LARs)

1. NRC Approval of LAR 90-04, April 20, 1990.
2. Additional information on LAR 90-01, May 11, 1990.
3. NRC Approval of LAR 89-07, May 11, 1990.
4. NRC Approval of LAR 88-05, June 11, 1990.

C. Licensee Event Reports LERs)

1. LER 2-90-002-00, April 16, 1990.
2. LER 2-90-003-00, May 2, 1990.
3. LER 1-84-043-00, May 2, 1990.
4. LER 1-88-025-01, May 14, 1990.
5. LER 2-90-004-00, May 17, 1990.
6. LER 1-83-037-00, May 21, 1990.
7. LER 2-90-005-00, May 22, 1990.
8. LER 1-90-006-00, May 25, 1990.
9. LER 2-90-006-00, May 29, 1990.
10. LER 1-90-007-00, June 1, 1990.
11. LER 2-90-007-00, June 5, 1990.

D. Inspection Reports/Notices of Violation (NOVs)

1. NRC Inspection Report 90-06, March 16, 1990.
2. NRC Inspection Report 90-09, April 9, 1990.
3. Response to NOV in Inspection Report 90-01, May 2, 1990.
4. Response to NOV in Inspection Report 90-05, May 4, 1990.
5. NRC Inspection Report 90-11, May 23, 1990.
6. NRC Inspection Report 90-08, May 24, 1990.
7. NRC Inspection Report 90-16, May 25, 1990.
8. NRC Inspection Report 90-16, June 22, 1990.
9. Response to NOV in Inspection Report 90-08, June 25, 1990.

E. Information Notices (INs)

1. IN 90-24, April 10, 1990.
2. IN 90-25, April 16, 1990.
3. IN 90-26, April 24, 1990.
4. IN 90-28, April 30, 1990.
5. IN 90-29, April 30, 1990.
6. IN 90-30, May 1, 1990.
7. IN 90-32, May 3, 1990.
   IN 90-32, Supplement 1, June 19, 1990.
8. IN 90-33, May 9, 1990.

E. Information Notices (INs) (Cont.)

9. IN 90-34, May 10, 1990.
10. IN 90-35, May 24, 1990.
11. IN 90-36, May 24, 1990.
12. IN 90-37, May 24, 1990.
13. IN 90-38, May 29, 1990.
14. IN 90-39, June 1, 1990.
15. IN 90-40, June 5, 1990.
16. IN 90-41, June 12, 1990.
17. IN 90-42, June 19, 1990.

F. Generic Letters (GLs)

1. GL 90-04, April 24, 1990.
2. GL 90-03, Supplement 1, May 14, 1990.
3. GL 90-05, June 15, 1990.
4. Response to GL 90-04, June 28, 1990.

G. Miscellaneous

1. Unit 2 Containment ILRT Report, June 2, 1990.
2. NRC First Quarter 1990 Performance Indicator Report for DCPP, June 21, 1990.
3. Special Report 90-01, May 30, 1990.
4. Request for Temporary Waiver from T S Table 3.3-1, June 1, 1990.
5. NRC approval of Table 3.3-1 Waiver, June 7, 1990.
6. Annual Radiological Environmental Operating Report for 1989, April 26, 1990.
7. Chapter 6 from Long Term Seismic Program Final Report, July 31, 1988.

DIABLO CANYON POWER PLANT
Units 1 and 2

William Kastenberg's Visit to DCPP

April 20, 1990

Exhibit B

TOUR AGENDA

7:30 a.m.	Introductory Meeting
8:00 a.m.	Tour Training Building and Maintenance Training Facilities
8:30 a.m.	Simulator Demonstration
9:15 a.m.	Tour Administration Building • 6th Floor Computer Center • PIMS Demonstration
9:45 a.m.	Tour Protected Area • Turbine Deck • Control Room • Cable Spreading Room • Electrical Rooms • Main Feedwater Pumps • Unit 1 Diesel Generators • I&C Maintenance Building • Technical Support Center • Cold Machine Shop • Warehouse

04/16/90 14:00

Exhibit B (Cont'd)

TOUR AGENDA

Continued

12:15 p.m.	Meeting with NRC Residents
12:30 p.m.	Working Lunch in the Blue Conference Room
1:00 p.m.	Tour Protected Area - Auxiliary Building • Access Control • RHR Pumps • Containment Spray Pumps • Charging Pumps • Component Cooling Water Pumps • Safety Injection Pumps • Auxiliary Feedwater Pumps • Spent Fuel Pool • Containment
5:00 p.m.	Exit Meeting
5:30 p.m.	Whole Body Count - Training Building

Exhibit B (Cont'd).

Exhibit C

NOTICE OF MEETING
OF THE
DIABLO CANYON INDEPENDENT SAFETY COMMITTEE

NOTICE IS HEREBY GIVEN that on May 22, 1990, at the Grange Hall, 2880 South Broad Street, San Luis Obispo, California, a public meeting will be held by the Diablo Canyon Independent Safety Committee. The Committee, with one member now appointed by the Governor and one by the Chairman of the California Energy Commission, was established by an agreement approved by the California Public Utilities Commission Decision 88-12-083 to review the safety of operations at Pacific Gas & Electric Company's Diablo Canyon Nuclear Power Plant, and will conduct its initial meeting in three separate sessions, at the times indicated, to consider the following matters:

1. Morning Session - 9:30 A.M. to 12:00 Noon: Selection of Chair and Vice-Chair; introductory comments; approve indemnification agreement and contracts with accounting firm and legal counsel; adopt Committee policies and procedures for operation; Committee member reports on plant inspection tours and documents provided; and public comments. If time permits the afternoon technical presentations may be started in this morning session.

2. Afternoon Session - 1:30 P.M. to 5:00 P.M.: Consider various technical presentations requested by the Committee from PG&E on topics relating to plant operations. (These may commence in the morning session.)

3. Evening Session - 7:30 P.M. to 10:00 P.M.: Public comments and communications to the Committee. If time permits, the Committee will conclude its initial meeting with a wrap-up discussion by the members concerning actions the Committee may wish to take next, further information it may want to obtain or review, consultants or experts it may retain, and the scheduling of future site visits, study sessions and meetings. If there is not adequate time for these matters, NOTICE IS HEREBY FURTHER GIVEN that the Committee may elect to continue these concluding discussions and reschedule them for a fourth session to be held the following morning, on Wednesday, May 23, 1990, at the Grange Hall, at a time to be announced by the Committee prior to the adjournment of the public meeting on the evening of the 22nd and posted immediately thereafter.

The specific meeting agenda and the staff reports and materials regarding these items will be available for public review commencing Friday, May 18, 1990, at the Documents and Maps Department of the Cal Poly library in San Luis Obispo. For further information prior to the public meeting, please contact Robert Wellington, Committee Legal Counsel, 505 Abrego Street, Monterey, California; telephone: (408) 373-8733. Written statements or communications to the Committee which are received at the foregoing address by no later than May 15, 1990, will be placed into the Committee's agenda packets prior to its meeting.

Dated: May 9, 1990

Exhibit D

DIABLO CANYON
INDEPENDENT SAFETY COMMITTEE

Committee Members: William Kastenberg
Warren Owen

* *

A G E N D A

Tuesday, May 22, 1990
San Luis Obispo, California

The Grange Hall
2380 South Broad Street

Morning Session - 9:30 A.M. to 12:00 Noon

I. CALL TO ORDER - ROLL CALL

II. NOMINATION AND SELECTION OF CHAIR AND VICE-CHAIR

III. INTRODUCTORY COMMENTS

A. History of Committee Formation - Legal Counsel
B. Introduction, Background and Comments - Committee Members

IV. CONSENT AGENDA (Routine items which the Committee can approve with a single motion and vote. A member may request that any item be placed on the regular agenda for separate consideration.)

A. Contract with Accounting Firm - Ratify
B. Contract with Legal Counsel - Ratify
C. Member Indemnification Agreement - Ratify
D. Committee Policies and Procedures re:
1) Committee Organization; - Approve
2) Accounting Procedures; and
3) Reimbursement for Travel and Other Expenses.

V. ACTION ITEMS

A. Committee Policies and Procedures re:
1) Rules and Procedures for Conduct of Meetings; and
2) Communications to the Committee.

VI. COMMITTEE MEMBER REPORTS

A. Member Plant Inspection Tours
B. Documents Provided to the Committee

VII. STAFF-CONSULTANT REPORTS

VIII. CORRESPONDENCE

IX. PUBLIC COMMENTS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred to further study, response or action.)

X. ADJOURN MORNING SESSION (If time permits the afternoon technical presentations may be started in the morning session.)

Afternoon Session - 1:30 P.M. to 5:00 P.M.

XI. RECONVENE FOR AFTERNOON SESSION - ROLL CALL

XII. INFORMATION ITEMS BEFORE THE COMMITTEE (May commence in the morning.)

A. Technical Presentations requested by the Committee of PG&E Representatives:

(Continued....)

1) Introductory Remarks.
2) Overview of DCPP/NPGBU Organization and Operations.
3) Planned Operational Improvements and Modifications.
4) Training Programs.
5) Maintenance Programs.
6) NRC Issues and Assessments.

XIII. ADJOURN AFTERNOON SESSION

Evening Session - 7:30 P.M. to 10:00 P.M.

XIV. RECONVENE FOR EVENING SESSION - ROLL CALL

XV. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)

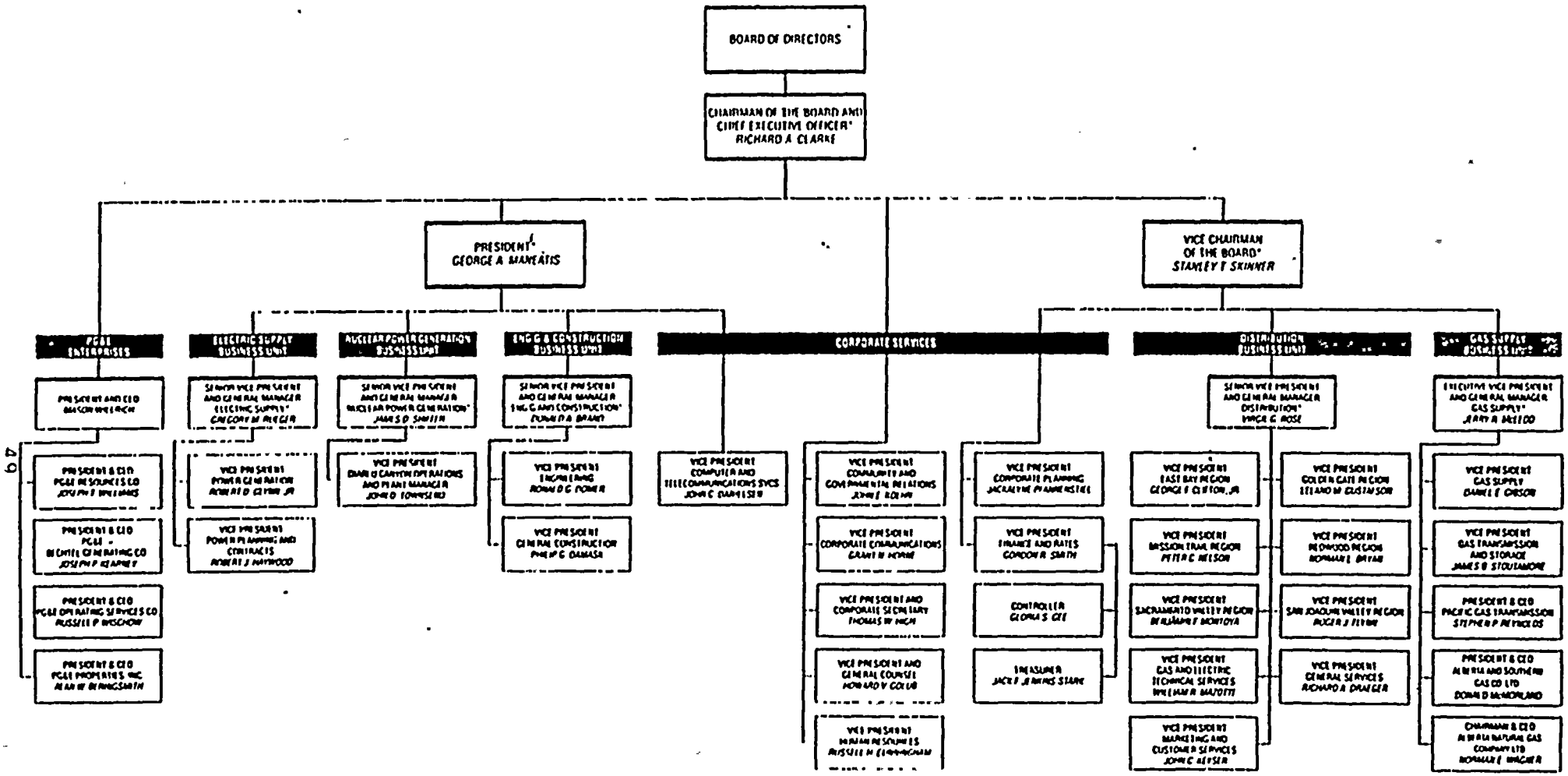
XVI. CONCLUDING REMARKS AND DISCUSSION BY COMMITTEE MEMBERS

A. Future Actions by the Committee.
B. Further Information to Obtain/Review.
C. Retaining of Experts or Consultants.
D. Scheduling of Future Site Visits, Study Sessions and Meetings. (NOTE: If the Committee so elects, it may continue these concluding discussions to a Fourth Session to be held on the morning of May 23, 1990, at the Grange Hall, at a time to be announced prior to adjournment of the Evening Session.)

XVII. ADJOURNMENT OF MEETING

PACIFIC GAS AND ELECTRIC COMPANY

CORPORATE ORGANIZATION CHART



Management Committee Member
October 1990
Organization Planning and Development Department

Exhibit E

NUCLEAR POWER GENERATION

J. D. SHIFFER - Senior VP & General Manager

DIABLO CANYON POWER PLANT

J. D. TOWNSEND - VP Diablo Canyon Operations & Plant Manager

MANAGER
NECS
R. C. ANDERSON

Engineering & Construction

MANAGER
NOS
L. F. WOMACK

Operations Support

MANAGER
NSARA
J. B. HOCH

Safety Assessment & Regulatory Affairs

MANAGER
HBPP
R. T. NELSON

Humboldt Bay Plant Operations

MANAGER
QA
J. A. SEXTON

Quality Assurance

ASST TO SR VP
NDSS
B. A. DETTMAN

Document & Support

MANAGER
NBFM
W. B. KAEFER

Business & Financial Management

Diablo Canyon Power Plant

J.D. TOWNSEND - VP DIABLO CANYON OPERATIONS & PLANT MANAGER

ASST PLT MGR
W.G. CROCKETT
Support Services

ASST PLT MGR
D.B. MIKLUSH
Operations

ASST PLT MGR
B.W. GIFFIN
Maintenance

ASST PLT MGR
M.J. ANGUS
Technical Services

Q. C.
W.D. BARKHUFF
Quality Control

H. R.
E.M. CONWAY
Human Resources

Exhibit H

NRC SALP PERFORMANCE ASSESSMENT CRITERIA

Licensee performance is assessed in selected functional areas, depending on whether the facility is in a construction or operational phase. Functional areas normally represent areas significant to nuclear safety and the environment. Some functional areas may not be assessed because of little or no licensee activities or lack of meaningful observations. Special areas may be added to highlight significant observations.

The following evaluation criteria were used, as applicable to assess each functional area:

1. Assurance of quality, including management involvement and control;

2. Approach to the resolution of technical issues from a safety standpoint;

3. Responsiveness to NRC initiatives;

4. Enforcement history;

5. Operational and construction events (including response to, analyses of, reporting of, and corrective actions for);

6. Staffing (including management); and

7. Effectiveness of the training and qualification program.

However, the NRC is not limited to these criteria and others may have been used where appropriate.

On the basis of the NRC assessment, each functional area evaluated is rated according to three performance categories. The definitions of these performance categories are as follows:

1. Category 1. Licensee management attention and involvement are readily evident and place emphasis on superior performance of nuclear safety or safeguards activities, with the resulting performance substantially exceeding regulatory requirements. Licensee resources are ample and effectively used so that a high level of plant and personnel performance is being achieved. Reduced NRC attention may be appropriate.

2. Category 2. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are good. The licensee has attained a level of performance above that needed to meet regulatory requirements. Licensee resources are adequate and reasonably allocated so that good plant and personnel performance is being achieved. NRC attention may be maintained at normal levels.

3. Category 3. Licensee management attention to and involvement in the performance of nuclear safety or safeguards activities are not sufficient. The licensee's performance does not significantly exceed that needed to meet minimal regulatory requirements. Licensee resources appear to be strained or not effectively used. NRC attention should be increased above normal levels.

Exhibit I

GLOSSARY OF TERMS AND DEFINITIONS

As Low As Reasonably Achievable (ALARA) refers to maintaining offsite radioactive releases or occupational radiation exposures as low as achievable in a reasonable, cost-effective manner.

Civil Penalty is a penalty in the form of a monetary fine levied by the Nuclear Regulatory Commission for a significant violation of its requirements.

Closed Circuit Television (CCTV) is a nuclear plant security device used for video surveillance of the plant and immediate surrounding areas by the plant security personnel.

Configuration Management is the process of controlling changes to the licensed and analyzed physical configuration of the plant to assure the changes are properly reviewed to the same degree as the original design.

Design Bases are the current features and criteria upon which the nuclear plant is designed and are also the bases for Nuclear Regulatory Commission review and approval.

Emergency Preparedness (EP) is the assurance that the plant and its personnel are practiced and prepared for postulated emergencies to be able to mitigate them and recover with a minimum of damage and health effects.

Engineered Safety Features (ESF) are the systems and equipment engineered into the plant to mitigate the effects of anticipated and postulated accidents.

Escalated Enforcement Action is action taken by NRC beyond a notice of violation of its requirements for a single severe violation or recurring violations. Examples include a civil penalty, suspension of operations, and modification or revocation of a licensee to operate a nuclear plant.

Emergency Operations Center (EOC) is the facility away from the immediate vicinity of the plant which is used to direct the operations for mitigation of and recovery from an accident.

Final Safety Analysis Report (FSAR) is the document which describes the plant design, safety analysis, and operations for Nuclear Regulatory Commission review and approval for licensing for plant operation.

Fitness for Duty describes the state of an employee (cleared to access the nuclear plant) being in sound enough physical and mental condition to adequately and safely carry out his or her duties without adverse effects.

Health Physics is the field of personnel radiation protection.

Inservice Inspection (ISI) is the practice of inspecting certain selected components periodically during their service lives to determine degradation patterns and repair, if necessary, any degradation beyond acceptable limits.

Licensee Event Reports or LERs are reports from the plant operator to the Nuclear Regulatory Commission describing off-normal events or conditions at a nuclear plant outside established limits.

Nuclear Steam Supply System (NSSS) is the nuclear reactor and its closely associated heat removal systems which produce steam for the turbine. The NSSS usually includes the nuclear reactor, nuclear fuel, reactor coolant pumps, pressurizer, steam generators, and connected piping.

Probabilistic Risk Assessment (PRA) is a formal process for quantifying the frequencies and consequences of accidents to predict public health risk.

Protected Area is the outermost area of the nuclear plant which is protected by physical means, a security system, and security force to prevent unauthorized entry (see also Vital Area).

Quality Assurance (QA) comprises all those planned and systematic actions necessary to provide confidence that a structure, system, or component will perform satisfactorily.

Surveillance is the process of testing, inspecting, or calibrating components and systems to assure that the necessary quality is maintained, operation is within safety limits, and operation will be maintained within limiting conditions.

Systematic Assessment of Licensee Performance (SALP) is a periodic assessment by the Nuclear Regulatory Commission of a nuclear plant operator's performance in meeting regulatory requirements in six major functional operation areas.

Technical Specifications are the rules and limitations by which the plant is operated. They consist of safety limits, limiting safety system and control settings, limiting conditions for operation, surveillance requirements, description of important design features, administrative controls, and required periodic and special notifications and reports.

Exhibit I Cont'd.

Technical Support Center (TSC) is the in-plant facility which directs plant activities in mitigating accidents and minimizing their effects.

Trip (or scram) is the shutting down of the nuclear reactor by inserting control rods which shut down the nuclear fission process. An automatic trip is initiated by plant monitoring systems when one or more parameters differ from preset limits. A manual trip is initiated by plant operators in an off normal event to prevent preset limits from being exceeded or as a backup to the automatic system.

Vital Area is an area inside the plant within the Protected Area which contains equipment vital for safe operation.