UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

June 6, 2001

Gregory M. Rueger, Senior Vice President
and General Manager
Nuclear Power Generation Bus. Unit
Pacific Gas and Electric Company
Nuclear Power Generation, B32
77 Beale Street, 32nd Floor
P.O. Box 770000
San Francisco, California 94177

SUBJECT: DIABLO CANYON SPECIAL INSPECTION REPORT 50-275/01-10; 50-323/01-10

Dear Mr. Rueger:

On May 18, 2001, the NRC completed a special inspection at your Diablo Canyon Plant facility. The enclosed report presents the results of this inspection which were discussed on June 5, 2001, with Mr. Becker and other members of your staff.

The inspection examined activities associated with an unusual event declared on April 5, 2001, in response to a brush fire outside the protected area that effected the 230 kV startup power supplies to both Units 1 and 2. The inspection focused on the root cause and extent of condition of the event, the corrective actions taken, and your staff's actions following escalation of the controlled burn and the subsequent loss of 230 kV offsite power. The inspectors reviewed selected procedures and records, observed restoration and evaluation activities, and interviewed plant personnel. As a result of this inspection, the NRC has developed a sequence of events, assessed the risk significance of the overall event, and assessed the quality of response of your plant staff and managers. The long-term actions to prevent recurrence will be evaluated separately.

Your staff acted expeditiously to assure that the health and safety of the public was maintained. Specifically, operators promptly and appropriately completed the actions specified in the abnormal operating procedures to maintain Units 1 and 2 operating in a stable configuration. The Diablo Canyon site fire brigade and California Department of Forestry responded in a timely manner and allowed the fire to extinguish itself. Your staff took conservative action to post a firewatch throughout the night of April 5 to ensure that the fire did not re-ignite. Operators appropriately notified the NRC Operations Center and state and local government officials and properly classified the event, as specified by regulations and as required by your emergency plan.

No findings of significance were identified.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,

/RA/

William B. Jones, Chief
Project Branch E
Division of Reactor Projects

Dockets: 50-275
50-323
Licenses: DPR-80
DPR-82

Enclosure:
NRC Inspection Report
50-275/01-10; 50-323/01-10

cc w/enclosure:
David H. Oatley, Vice President
Diablo Canyon Operations and Plant Manager
Diablo Canyon Nuclear Power Plant
P.O. Box 56
Avila Beach, California 93424

Lawrence F. Womack, Vice President, Power
Generation & Nuclear Services
Diablo Canyon Power Plant
P.O. Box 56
Avila Beach, CA 93424

Dr. Richard Ferguson
Energy Chair
Sierra Club California
1100 llth Street, Suite 311
Sacramento, California 95814

Nancy Culver
San Luis Obispo Mothers for Peace
P.O. Box 164
Pismo Beach, California 93448

Chairman
San Luis Obispo County Board of
Supervisors
Room 370
County Government Center
San Luis Obispo, California 93408

Truman Burns\Mr. Robert Kinosian
California Public Utilities Commission
505 Van Ness, Rm. 4102
San Francisco, California 94102

Robert R. Wellington, Esq.
Legal Counsel
Diablo Canyon Independent Safety Committee
857 Cass Street, Suite D
Monterey, California 93940

Ed Bailey, Radiation Program Director
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732 (MS 178)
Sacramento, CA 94327-7320

Steve Hsu
Radiologic Health Branch
State Department of Health Services
P.O. Box 942732
Sacramento, California 94327-7320

Christopher J. Warner, Esq.
Pacific Gas and Electric Company
P.O. Box 7442
San Francisco, California 94120

City Editor
The Tribune
3825 South Higuera Street
P.O. Box 112
San Luis Obispo, California 93406-0112

Robert A. Laurie, Commissioner
California Energy Commission
1516 Ninth Street (MS 31)
Sacramento, CA 95814

Electronic distribution from ADAMS by RIV:
Regional Administrator **(EWM)**
DRP Director **(KEB)**
DRS Director **(ATH)**
Senior Resident Inspector **(DLP)**
Branch Chief, DRP/E **(WBJ)**
Senior Project Engineer, DRP/E **(GAP)**
Section Chief, DRP/TSS **(PHH)**
RITS Coordinator **(NBH)**

Only inspection reports to the following:
Scott Morris **(SAM1)**
NRR Event Tracking System **(IPAS)**
DC Site Secretary **(AAJ)**
Dale Thatcher **(DFT)**

R:_DC\DC2001-10RP-DLP.wpd

RIV:SRI:DRP/E	SOE:DRS/OB	C:DRP/E		
DLProulx	TOMcKernon	WBJones		
T - WBJones	***T - WBJones***	***/RA/***		
6/5/01	6/6/01	6/6/01		

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax

ENCLOSURE

U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket Nos.:	50-275 50-323
License Nos.:	DPR-80 DPR-82
Report No.:	50-275/01-10 50-323/01-10
Licensee:	Pacific Gas and Electric Company
Facility:	Diablo Canyon Nuclear Power Plant, Units 1 and 2
Location:	7 ½ miles NW of Avila Beach Avila Beach, California
Dates:	April 5 through May 18, 2001
Inspectors:	D. L. Proulx, Senior Resident Inspector T. O. McKernon, Senior Operations Engineer, Region IV, Division of Reactor Safety
Approved By:	W. B. Jones, Chief, Project Branch E Division of Reactor Projects

ATTACHMENTS:

1. Supplemental Information
2. Diablo Canyon Electrical Distribution
3. Diablo Canyon Offsite Power Configuration
4. Brush Fire Location
5. Chronological Sequence of Events, Diablo Canyon Brush Fire and Loss of 230 kV Offsite Power
6. Diablo Canyon Special Inspection Charter

SUMMARY OF FINDINGS

Diablo Canyon Nuclear Power Plant, Units 1 and 2
NRC Special Inspection Report 50-275/01-10; 50-323/01-10

IR 05000-275-01-010, IR 05000-323-01-10, on 4/5/01 - 5/18/01; Pacific Gas and Electric. Co.; Diablo Canyon Nuclear Power Plant Units 1 and 2. Special insp. re: brush fire and loss of 230 kV loss of offsite power. Maint. Risk Assess., Personnel Perf. during Nonroutine Events.

This report covers a special inspection conducted onsite from April 5-28, 2001, and additional in-office review through May 18, 2001. The report covers a special inspection that assessed the licensee response to a brush fire caused by a controlled burn and a subsequent loss of 230 kV offsite power to both operating units. The inspectors performed several baseline inspection activities, as appropriate, during the review of licensee activities. This executive summary summarizes the results of the individual items listed in the inspection charter (Attachment 6).

No findings of significance were identified.

The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Manual Chapter 0609, "Significance Determination Process." Findings for which the Significance Determination Process does not apply are indicated by "No Color" or by the severity level of the applicable violation. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described at its Reactor Oversight Process website at http://www.nrc.gov/NRR/OVERSIGHT/index.html

Background

Diablo Canyon has two sources of offsite power. One is supplied from the 500 kV switchyard that has two transmission lines from the Midway Substation and one from the Gates Substation. The second supply of offsite power comes from the 230 kV switchyard. Transmission lines from the Mesa and Morro Bay switchyards feed the Diablo Canyon 230 kV switchyard. The normal supply of power to the onsite loads is from the main generator to the 25/12 kV and 25/4 kV Unit Auxiliary Transformers 1-1 (2-1)and 1-2 (2-2), respectively. After a reactor trip, the power supply for the onsite loads transfers to Startup Transformers 1-1 (2-1) and 1-2 (2-2) for the 12 kV and 4 kV loads, respectively. In addition, undervoltage on the offsite standby power source (230 kV) to each 4.16 kV vital bus starts its respective diesel generator and brings it to a condition suitable for loading. The Diablo Canyon Electrical Distribution is displayed in a schematic in Attachment 2, the Diablo Canyon Offsite Power Configuration is displayed in Attachment 3.

Event Overview/Significance

On April 5, 2001, at 3:10 p.m. (PDT), the licensee and the California Department of Forestry failed to contain a controlled burn, resulting in a significant brush fire near the 230 kV offsite power lines. Because the fire consumed wet grass, thick smoke engulfed a 230 kV transmission tower, resulting in two phase-to-phase faults on the Diablo-Mesa and Diablo-Morro Bay 230 kV plant feeder lines. The appropriate relays detected an electrical fault, which tripped 230 kV breakers at the Diablo Canyon, Mesa, and Morro Bay switchyards. As designed, all six diesel generators on both units started when the standby 230kV supplies were lost, but did not

load the vital busses. Because of the high moisture content of the grass on the hillsides near the plant, the fire extinguished itself without active firefighting mitigation measures being implemented.

Operators appropriately implemented the abnormal operating procedures and ensured that both units were in a stable, steady-state operating condition. After completing the actions specified in the abnormal operating procedures, operators began preparations for restoring 230 kV offsite power to the plant. At 4:33 p.m., operators restored 230 kV power to Unit 1 and at 4:43 p.m., operators restored 230 kV power to Unit 2. At 5 p.m. the shift manager exited the Unusual Event since offsite power had been restored to the plant and since the licensee and the California Department of Forestry were convinced that the brush fire was out and no longer a threat to any offsite power lines. Based on communications with the licensee, NRC knowledge of the plant response, and an initial NRC determination that this was a potentially risk significant event, NRC dispatched a special inspection utilizing two inspectors.

Potential for a Loss of Offsite Power

The inspectors concluded that a loss of 500 kV in this event was unlikely. The fire burned away from the 500 kV offsite power lines, and the prevailing winds at the time would not have blown the fire towards the 500 kV lines. In addition, the 500 kV line within close proximity (75 yards) to the fire was the Diablo to Gates line only. Both Diablo to Midway lines remained available to carry all of the 500 kV loads, thus 500 kV offsite power would not be threatened even if the fire caused a loss of the Diablo Canyon to Gates line (Attachment 3).

Dual Unit Trip and Grid Conditions

Although a dual unit trip would have depleted the available operating reserve, the preplanned actions of the Independent System Operator would have maintained grid stability.

Crosstie Features and Operator Controls/Training

The licensee's procedural controls to crosstie the vital ac busses inter- and intra-unit were in place and training had been provided to the operators.

Black Start Power Source

The licensee's "black start" (ability to recover offsite power following total collapse of the grid) capability was appropriately maintained. Licensee and Independent System Operator on-shift personnel were sufficiently knowledgeable in the applicable procedures that directed either Southern California Edison to supply power to the Pacific Gas and Electric territory through the Midway Substation or the Helms Hydroelectric pumping station to provide power to Diablo Canyon through the Morro Bay Switchyard.

Controlled Burn Preparations and Actions to Prevent Recurrence

The loss of control of the planned burn resulted from burning brush in a ravine, which acted like a chimney, drying and igniting brush above. Smoke from burning the wet grass caused the phase-to-phase fault on the 230 kV lines and the loss of startup power to both units. The fire crews did not fully anticipate the effect of burning in the ravine and the potential that the smoke

could cause faulting on the offsite power lines. Licensee actions to preclude recurrence included a requirement to hand carry cut brush out of any ravines prior to performing a controlled burn so that ravines do not act as chimneys which could allow fires to jump established firebreaks during controlled burns (Attachment 4).

Notification to the Offsite Fire Department

The California Department of Forestry was onsite to support the controlled burn. Additional California Department of Forestry firemen arrived on site at 3:20 p.m. to support the apparent escalating fire. They remained onsite to provide a firewatch, for an additional 3-hours, after the fire self-extinguished. The site fire brigade continued the firewatch for the burn area until the morning of April 6.

Emergency Classifications and Notifications

The inspectors concluded that the licensee appropriately classified this event as an Unusual Event although the fire actually occurred outside the protected area. The required emergency class notifications were made to state and local officials and met timeliness requirements.

Pre-evolution Risk Analysis

The licensee's risk assessment for the April 5, 2001, controlled burn and concurrent work was not discussed during their regularly scheduled 12-week rolling schedule planning meetings. Informal discussions had occurred on March 30, 2001, in which the work week manager and the operations manager agreed that the proposed controlled burn did not pose an undue risk to the plant.

Pretask Planning of Control Room Staff

The inspectors noted that, although the risk assessment had occurred, it had not been communicated to the operating crew on April 5, 2001. The licensee later assessed the plant conditions for the period the controlled burn occurred and showed an insignificant increase over the assessment which did not include the controlled burn.

TABLE OF CONTENTS

PAGE

Report Details

Summary of Plant Status

Diablo Canyon Unit 1 began this inspection period at 100 percent power. Operators decreased Unit 1 reactor power to 75 percent on April 7 because of a water leak into the lube oil system of Main Feedwater Pump 1-2. Following swapping of the lube oil heat exchangers for Main Feedwater Pump 1-2 and turbine valve testing, operators returned Unit 1 to 100 percent power later on April 7. Unit 1 continued to operate at 100 percent power until the end of this inspection period.

Unit 2 operated at 100 percent power until April 28 when it shut down for a scheduled refueling outage (2RF10).

Introduction

At approximately 3 p.m. (PST) the controlled burn in the vicinity of the Diablo Canyon switchyard escalated, resulting in the loss of the startup 230kV offsite power supply to both units. The licensee subsequently declared a Notification of Unusual Event because of the fire lasting greater than 15 minutes and effecting plant equipment. The inspectors responded to the control room and provided continuous coverage until the offsite power was restored and the diesel generators were secured. The inspectors evaluated the event and licensee mitigating actions as specified in Inspection Procedure 71153, "Event Followup." Based on communications with the licensee, NRC knowledge of the plant response, and an initial determination that the 500 kV switchyard and\or power lines also could have been effected, the NRC staff assessed that the event could be potentially risk significant. The NRC dispatched a special inspection team of two inspectors. The inspectors evaluated licensee activities following the guidance in Inspection Procedure 93812, "Special Inspection." The inspectors performed several baseline inspection procedures in conjunction with this special inspection. In addition, the inspectors evaluated the items listed in the Inspection Charter (refer to Attachment 6). The report sections that address the points of the Inspection Charter are 1R05, 1R13, 1R14, 1EP6, and 4OA3.

General Electrical Distribution Background

Diablo Canyon Unit 1 has two sources of offsite electrical power, a 230 kV system and a 500 kV system, as shown in Attachment 3.

500/25 kV system

A delayed source of offsite power, the 500 kV system, is backfed from the 500/25 kV main transformers after the main generator is separated from the system. Operators must open the main generator motor operated disconnects before power can be restored following loss of a main generator. During normal power operations, plant loads are powered by the main generators through the auxiliary transformers. The 500 kV switchyard is on a hill behind the plant, obscured from view as one looks away from the plant.

230 kV system

An immediate source of offsite power, the 230 kV system, supplies 230/12 kV Startup Transformers (SUTs) 1-1 and 2-1. SUT 1-1(2-1) supplies Unit 1 startup power to 12 kV nonvital loads and to 4 kV vital and nonvital loads through 12/4 kV SUT 1-2 (2-2) when auxiliary power is not available. The output of SUTs 1-1 and 2-1 can be provided to the opposite unit during an emergency situation through a crosstie circuit breaker. During power operation, the 230 kV system normally provides power to the administrative building and the site buildings outside of the protected area. The plant 230 kV switchyard is supplied from the Morro Bay and Mesa switchyards on common transmission towers as they near the plant (Attachment 3). A common line feeds both units from the 230 kV switchyard. Just before the 230 kV lines reach the plant, the 230 kV line is split into two feeders, one for each unit. The 230 kV lines supply the 230/12 kV SUTs 1-1and 2-1 on the north side of Unit 1 (Attachment 2).

Electrical power transfer following a reactor trip

During power operation, all plant loads are normally powered by the auxiliary transformers with the SUTs unloaded. After a reactor trip, or other event, that would cause loss of auxiliary power, nonvital 12 kV loads are fast transferred to startup 12 kV power, and vital 4 kV loads are slow (dead bus) transferred to startup 4 kV power.

Event Description

On April 5, 2001, at 3:10 p.m. (PDT), the licensee and the California Department of Forestry failed to contain a controlled burn, resulting in a significant brush fire near the 230 KV offsite power lines. Because the fire consumed wet grass, thick smoke engulfed a 230 kV transmission tower, resulting in two phase-to-phase faults on the Diablo-Mesa and Diablo-Morro Bay 230 kV plant feeder lines. The appropriate relays detected an electrical fault, which tripped 230 kV breakers at the Diablo Canyon, Mesa, and Morro Bay switchyards. As designed, all six diesel generators on both units started, but did not load the vital busses. Because of the high moisture content of the grass on the hillsides near the plant, the fire extinguished itself without active firefighting mitigation measures being implemented.

Operators appropriately implemented the abnormal operating procedures and ensured that the both units were in a stable, steady-state operating condition. After completing the actions specified in the abnormal operating procedures, operators began preparations for restoring 230 kV offsite power to the plant. At 4:33 p.m., operators restored 230 kV power to Unit 1 and, at 4:43 p.m., operators restored 230 kV power to Unit 2. At 5 p.m. the shift manager exited the Unusual Event since offsite power had been restored to the plant and since the licensee and the California Department of Forestry were convinced that the brush fire was out and no longer a threat to any offsite power lines.

Fault Location, Mechanism, and Inspection for Damage

The fault was located on Tower X000/2, (refer to Attachment 4). From review of the event sequence, the inspectors concluded that the fault was initially a phase-to phase fault because of the absence of any ground fault alarms.

The licensee performed a detailed inspection of the transmission tower. The licensee noted that minor charring was found on the insulators for Transmission Tower X000/2, and this slight charring would not affect future performance. The smoke from the fire covered a significant area; however, no collateral damage occurred on any of the other 230 kV transmission towers or 500 kV equipment.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity, Emergency Preparedness

1R05 Fire Protection (71111.05, 71153, 93812)

Annual Drill

a. Inspection Scope

The inspectors evaluated the readiness of personnel to fight fires, including the fire brigade notification, onsite response, and offsite response to the report of fire near the 230 kV offsite power lines. In addition, the inspectors evaluated the effectiveness of the fire brigade response as it related to the firefighting preplan strategy, command and control of the fire brigade leader during firefighting efforts, availability of personnel and equipment, radio communications with plant operators, and the method of entry into the fire area.

The inspectors interviewed fire brigade members; evaluated personnel statements of operators, fire brigade members, and security officers; reviewed Procedures CP M-6, “Fire,” Revision 24 (provided actions taken in response to a fire), reviewed Updated Final Safety Analysis Report Chapter 9.5; reviewed sequence of event printouts, and reviewed Action Request A0528754 and Nonconformance Report N0002128.

b. Findings

The inspectors concluded that the Diablo Canyon fire brigade and the California Department of Forestry responded appropriately to the brush fire and implemented conservative measures to ensure the fire did not reignite.

Following reports that the licensee had lost containment of the controlled burn, the shift manager notified the onsite fire brigade and requested additional assistance from the California Department of Forestry. Conflicting reports of the location of the fire were reported to the Shift Manager, because the area was obscured from direct view. Based on reports from licensee personnel, the Shift Manager requested the fire brigade to respond to a fire in the 230 kV switchyard. The fire brigade arrived at the 230 kV switchyard within 10 minutes. Noting that there was no fire at the 230 kV switchyard, the fire brigade captain contacted the California Department of Forestry personnel by radio, who informed the fire brigade captain that the fire was on the hillside underneath the 230 kV lines. The fire brigade captain then established a command post near the chlorine tank on the hillside to closely monitor the progress of the firefighting efforts.

Because of the moisture content of the grass, the fire burned itself out at 4 p.m., without personnel performing any fire suppression activities.

The additional California Department of Forestry firemen arrived on site at 3:20 p.m. Since the fire was out, the offsite assistance was not required. The California Department of Forestry remained onsite to provide a fire watch on the charred hillside until approximately 7 p.m. The site fire brigade continued the fire watch for the burn area until 5 a.m., April 6, 2001.

1R12 Maintenance Rule Implementation (71111.12)

.1 Routine Reviews

a. Inspection Scope

The inspectors reviewed Action Request A0528754, "Controlled Burn Results in Loss of 230 kV to Both Units," to determine if the requirements of 10 CFR 50.65 were properly applied with respect to the event. The inspectors used Procedure MA1.ID17, "Maintenance Rule Monitoring Program," Revision 8, as guidance. The inspectors noted that the action request characterized this event as a maintenance rule functional failure in that the event resulted in the loss of a high risk-significant maintenance rule system and inadvertent safety system actuation.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)

.1 Preplanned Risk Assessments

a. Inspection Scope

The inspectors evaluated the licensee's preplanned risk assessment for the controlled burn under the 230 kV offsite power lines on April 5, 2001. The inspectors reviewed electronic mail messages developed after the fact and interviewed licensee personnel. The inspectors used Procedure AD7.DC6, "On-Line Maintenance Risk Management," Revision 5, as guidance.

b. Findings

The inspectors identified that although a risk assessment had been performed on March 30, 2001, that considered the control burn, the assessment was not communicated to the operating crew on April 5, 2001. Following the April 5 event, the licensee reassessed the plant conditions that existed during the period the controlled burn occurred and showed that there was an insignificant increase in the risk over the original assessment. Although this issue should be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with

Section IV of the NRC's Enforcement Policy. This issue is being documented to provide a detailed accounting of the licensee's actions prior to the controlled burn taking place.

The licensee had in the past deferred performing controlled burns because of scheduler conflicts with other on-line maintenance. This indicated that the licensee has discussed the qualitative risk of controlled burns in the past. The licensee did not have a documented risk assessment for the controlled burn of April 5 and any concurrent work. In addition, this item was not discussed in the regularly scheduled 12-week rolling schedule planning meetings for April 5. The licensee stated that informal discussions had occurred on March 30, 2001, in which the work week manager and the operations manager agreed that the proposed controlled burn of April 5 did not pose an undue risk to the plant. This informal discussion was documented on April 17, 2001.

10 CFR 50.65 (a)(4) requires, in part, that before performing maintenance activities (including but not limited to surveillances, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from proposed maintenance activities. The inspectors noted that, although the risk assessment had occurred, it had not been communicated to the operating crew of April 5, 2001. Thus, the operating crew did not perform an on-shift real-time risk assessment that included the potential for loss of 230 kV from the controlled burn with other ongoing maintenance activities. The risk significance of the event is discussed in Section 4OA3.9.

1R14 Personnel Performance During Nonroutine Plant Evolutions and Events (71111.14)

.1 Operator Performance

a. Inspection Scope

The inspectors evaluated operator performance during the brush fire and loss of 230 kV event of April 5, 2001. The inspection included: review of operator logs and personnel statements, interviews, and direct observation in the control room.

b. Findings

A violation of minor significance was identified for the failure of an operator to observe the precautions and limitations prior to paralleling Diesel Engine Generator (DEG) 1-1 to its respective bus. This occurrence did not result in an adverse impact on the emergency power supply (DEG 1-1). Although this issue should be corrected, it constitutes a violation of minor significance that is not subject to enforcement action in accordance with Section IV of the NRC's Enforcement Policy.

On April 5, 2001, the inspectors responded to the control room to evaluate operator performance and communicate the event progress to NRC personnel. The inspectors noted that upon loss of 230 kV offsite power, the operators implemented Procedure OP AP-26, "Loss of Offsite Power," Unit 1, Revision 5, and Unit 2, Revision 5A, to restore 230 kV offsite power to the plant. In addition, operators implemented Procedure OP J-2:II, "Startup Bank Return to Service," Unit 1, Revision 11B, and Unit 2, Revision 13B. The inspectors noted that the operators

appropriately implemented these procedures. Operators consistently employed three-way communications and performed self-verification when manipulating plant equipment.

Since each of the DEGs operated greater that 1 hour unloaded, the operators manually loaded each of the DEGs sequentially, one at a time per unit. Operators used Procedure OP J-6B:IV, "Diesel Generator 1-1, "Manual Operations," Revision 15, to parallel DEG 1-1 and similar procedures for each of the other five DEGs. When preparing to parallel and load DEG 1-1, the operators entered Procedure OP J-6B:IV in Section 6.2, "Paralleling Diesel to Bus H," because the diesel was already operating. Entering Procedure OP J-6B:IV at this point was appropriate; however, the operators did not adequately review the precautions and limitations section of the procedure to determine which of these were applicable. Section 5.2 of Procedure OP J-6B:IV required the operator to observe the precautions and limitations of Procedure STP-M9A, "Diesel Engine Generator Routine Surveillance Test," Revision 57A. Section 10.12 of STP M-9A required that the applicable D/G MODE SEL (diesel generator mode selection switch) must be in MANUAL prior to paralleling the diesel generator to the bus. Otherwise the DEG would be in the isochronous mode, in which the DEG would attempt to pick up as much load as possible in a short period of time. On April 5, 2001, while attempting to parallel DEG 1-1 to Bus H, because of an inadequate review of the precautions and limitations, the operators left the D/G MODE SEL switch in AUTO. This action resulted in the diesel generator loading to approximately 2800 kW in 12 seconds. Procedure STP M-9A directs the user to load the DEG up to 500 kW per minute. Once DEG 1-1 reached 2800 kW, the operators recognized their error and shifted the DEG 1-1 D/G MODE SEL switch to manual. DEG 1-1 immediately unloaded. Following this error, the operators performed a complete review of the precautions and limitations of Procedure OP J-6B:IV and implemented the applicable steps for DEG 1-1 and the other five DEGs. This violation is in the licensee's corrective action program as Action Request A0528753.

Attempting to parallel DEG 1-1 with Bus H with the D/G MODE SEL switch in the AUTO position, is a violation of Procedure OP J-6B:IV and Technical Specification 6.8.1.a. This violation is of minor significance that is not subject to enforcement action in accordance with Section IV of NRC's Enforcement Policy. This issue is being documented to provide a complete summary of the operators response to the issues identified during this special inspection.

The inspectors noted that this item did not impact on safety. Although the operators exceeded the recommended loading profile (less than 250 kW per minute) and exceeded the ratings recommended in the procedure (<2750 for up to 2000 hours per year), the engine did not exceed its short time rating in the Final Safety Analysis Report Update. Section 8.1.1.13.1 of the Final Safety Analysis Report Update states that the DEGs are rated at 3250 kW and can run up to 30 minutes at 3000 kW. Therefore, the operator error did not result in DEG 1-1 exceeding its rated capacity. Had the operator not taken the machine to MANUAL after 12 seconds, DEG 1-1 would have eventually tripped on overcurrent. Operators could have manually restarted DEG 1-1 in this case.

1EP6 Emergency Preparedness Drill Evaluation (71114.06)

a. Inspection Scope

The inspectors evaluated the emergency classification and notifications that occurred as a result of the brush fire and resulting loss of 230 kV offsite power. The inspectors reviewed the official notification documents prepared by control room personnel; reviewed control room logs; interviewed operators; reviewed the critique of the emergency response by the emergency planning organization; and reviewed procedures that specified notification and classification requirements. Specific procedures reviewed included: (1) EP G-1, "Emergency Classification and Emergency Plan Activation," Revision 29; (2) EP G-2, "Activation and Operation of the Interim Site Emergency Organization," Revision 22; (3) EP G-3, "Notification of Off-Site Agencies and Emergency Response Organization Personnel," Revision 35; and (4) EP RB-10, "Protective Action Recommendations," Revision 7.

b. Findings

The inspectors concluded that the licensee appropriately classified the event as an Unusual Event. The shift manager noted that Procedure EP G-1 required an Unusual Event for fires in the protected area greater that 15 minutes that affected plant equipment or power supplies in or near the protected area. The inspectors determined that the notifications to state and local officials met timeliness requirements.

4. OTHER ACTIVITIES

4OA3 Event Followup (71153 and 93812)

The inspectors responded to the control room, monitored operator response, and collected data to perform risk evaluations. In addition, NRC dispatched a special inspection team to review all aspects of the event and address the items in the Inspection Charter (Attachment 6). The inspectors developed a detailed sequence of events (Attachment 5), reviewed information that supported assumptions used in determining the conditional core damage probability (CCDP), assessed the potential root causes, and identified that the licensee had initiated a review for actions to prevent recurrence.

.1 Crosstie Features and Offsite Power Restoration (71153 and 93812)

a. Inspection Scope

The inspectors reviewed the design of the 500kV and 230kV switchyards, the offsite inter-tie connections with the Morro Bay generation facility and connections to the Midway and Gates substations (Attachments 2 and 3). The inspectors also reviewed the offsite power breaker alignments and protective relaying. The licensee's procedures for response to a loss of offsite power and emergency restoration of power following electrical grid instabilities were considered. Licensee procedures and licensed operator

requalification training attributes were reviewed to ascertain the type and amount of training the operators received for responding to a loss of ac power.

b. Findings

The licensee's procedural controls and training to crosstie ac power intra- and inter- unit were effective.

The licensee's primary methods of responding to a loss of offsite power are proceduralized in Abnormal Operating Procedures OP AP-26 and OP AP SD-1, "Loss of AC Power," Revision 12. These procedures provided steps for power recovery between units by crosstie of one unit's startup transformer to the operating unit's auxiliary transformer. Other provisions have been made to allow the crosstie of lower electrical distribution busses using operating diesels such as vital and nonvital busses (e.g., 4160 Vac and 480 Vac). The licensee also maintained Independent System Operator Operating Procedure T-112, "Off Site Power Requirements for Nuclear Power Plants," and the plant's implementation procedure, Operating Instruction O-34, "California Nuclear Plant Emergency Restoration Procedure," in the control room. The procedures used two power restoration plans. The primary plan utilized the 500 kV source from Midway through the Midway-Vincent 500kV line from Southern California Edison. The secondary plan utilized the 230 kV transmission system from the hydroelectric generation system.

Discussions with the learning services department licensed operator requalification training representative and reviews of training material indicated that licensed operators received frequent simulator training on scenarios which included loss of offsite power, restoration of power, and crosstie of power to the operable unit. Some focused classroom training occurred in the biennial requalification training program's sample plan. Additionally, 30 percent of the licensee's biennial operating exam included scenarios related to the loss of vital power.

.2 Controlled Burn on April 5, 2001

a. Inspection Scope

The inspectors reviewed time lines of the notifications and response for the brush fire, interviewed the licensee fire captain, and inspected the burn site.

b. Findings

The loss of control of the planned burn resulted from burning brush in a ravine which acted like a chimney, drying and igniting brush above. Smoke from burning the wet grass caused the phase-to-phase fault on the 230 kV lines. The fire crews did not fully anticipate the effect of burning in the ravine and the potential that the smoke could cause faulting on the offsite power lines. Licensee actions to preclude recurrence included a requirement to hand carry cut brush out of any ravines prior to performing a controlled burn so that ravines do not act as chimneys which could allow fires to jump the fire break during controlled burns.

The area of concern involved a valley that runs westward from the plant and contained the 230 kV and 500 kV switchyards, in which the two offsite power sources come in close proximity. The controlled burn planned for April 5, 2001, was the second of two planned burns to clear heavy brush beneath the 230kV line, thus decreasing the chances of seasonal brush fires potentially affecting both the lines to and from the plant. In preparation for the controlled burn, the California Department of Forestry crews cut and stacked brush in windrows, which are run vertically from the top of the slope to the planned bottom area of the burn. The cutting and stacking of brush is done yearly and left to dry for the spring burning. The California Department of Forestry controlled burns by starting at the most downwind spot (the area closest to the 230 kV towers) and burning top to bottom, creating a buffer area between the burn area perimeter and the remainder of the windrows. The slope on which the burn was being conducted included a vertical ravine. The California Department of Forestry crews had previously finished a five acre controlled burn of the westward side of the ravine on March 30, 2001.

During the controlled burn on April 5, 2001, the California Department of Forestry crews burned the majority of windrows without incident by igniting the windrows with drip torches (a mixture of gasoline and diesel fuel). It was about 2 p.m., when the crews started on the remaining cut brush in the ravine. The bottom of the ravine had cut brush piled in it, and slightly higher in the ravine was cut brush on top of uncut brush. Further, above this area was another pile with partially cut brush on top of green uncut brush. To the immediate east of the ravine was an already burned path some 50-75 yards wide with no vegetation on it. Above the ravine and the planned burn area was uncut green brush with a larger area of green grass above it. Because of the steep slopes in the valley, the hills reduced the force of the winds off the ocean. While the control room reported 18 to 19.5 mph wind speeds, discussions with the fire captain and observation of the burn site indicated that the direct effect of the wind would have been much less. Instead, once the dried cut brush in the bottom of the ravine ignited, the updraft from the fire used the ravine as a natural chimney. The heat from the cut burning brush below dried and ignited the uncut green brush above it in the ravine and some partially cut brush on a small patch on the eastern side of the ravine. The green brush provided a smoke medium, which resulted in a phase-to-phase fault on the 230kV lines on Tower X000/2.

Inspection of the burn site indicated that the fire propagated vertically up the slope's ravine until it burned itself out on green brush some 100-200 yards uphill and away from the 230 kV tower. The inspectors concluded that the fire had very little chance of spreading in the direction of the nearest 500 kV tower (i.e.,Tower 0/2A, Diablo to Gates 500 kV line, Attachment 3) because of the fire break of some 150 yards created by prior controlled burns.

Discussions with the fire captain and review of event logs indicated that the wind direction during the event was from the west-northwest blowing toward the east-southeast. Because of the protective nature of the hills, the wind would have had to shift approximately 90 degrees from the southwest in order to create a wind direction toward the nearest 500 kV tower. Discussions with the fire captain and review of seasonal meteorological data between March 28 and April 7 for the past 3 years indicated that winds typically blow from the west or west northwest. As such, because

of the prior fire breaks established east of the ravine and the small likelihood of an unfavorable wind shift, very low risk of the fire or smoke affecting the 500kV towers or lines existed. Additionally, had the smoke blown toward the 0/2-500 kV tower and resulted in a phase-to-phase fault, only the Diablo to Gates 500 kV line would have been lost. In such an instance, Breakers 722 and 622 would have tripped open in the 500kV switchyard, but the units would still have been tied to the 500kV electrical grid through the Midway 2 and 3 500 kV lines.

The licensee stated that the fire crews did not fully anticipate the effect of burning in the ravine and the potential that the smoke could cause faulting on the offsite power lines. Discussions with the licensee indicated that corrective actions to preclude similar recurrence has been implemented. This action includes hand carrying cut brush out of any ravines prior to performing a controlled burn so that ravines do not act as chimneys which could allow fires to jump the fire break.

.3 Offsite Fire Department Response

a. Inspection Scope

The inspectors reviewed control room logs, notification forms, and statements from key personnel and interviewed the fire captain.

b. Findings

The site notifications to the offsite fire departments (i.e., San Luis Obispo County Fire Department, the California Department of Forestry at Cuesta Camp) were made in a timely manner. Phone calls were made within 5 minutes of the event initiation. Additionally, the licensee fire brigade responded to the event within 5 minutes based upon reports that a fire and explosion in the 230kV switchyard had occurred. Within 2 minutes of arrival at the 230kV switchyard, the fire brigade realized no fire was in the switchyard and set up a command post at the nearby chlorine tank. The California Department of Forestry crews established themselves on the lower slope in a fire break area just east of the ravine. The licensee fire crews could not respond to fight the spread of the fire because of the steepness of the slope (>53°). As such, the fire crews monitored the fire until it burned itself out away from the 230 kV tower. By 3:20 p.m., the dense smoke from the burn was no longer in the area of the 230kV lines and, by 4 p.m., the fire extinguished itself. Once the fire was burned out, the California Department of Forestry crew cut fire breaks to preclude the fire from spreading should re-ignition occur. Licensee fire crews maintained a firewatch to monitor for re-ignition of the burn site until 5 a.m. on April 6, 2001.

While notifications for support and fire department responses were rapid, the licensee stated that it would be difficult to fight this fire on steep terrain. Had such a fire occurred during the summer months when the brush on the hillsides is considerably drier, additional firefighting support from the California Department of Forestry would probably been needed.

.4 Emergency Classifications and Notifications

a. Inspection Scope

The inspectors reviewed control room logs and notification sheets to ascertain whether notifications were made in the required time periods. Specific procedures reviewed included: (1) EP G-1, “Emergency Classification and Emergency Plan Activation,” Revision 29; (2) EP G-2, “Activation and Operation of the Interim Site Emergency Organization,” Revision 22; (3) EP G-3, “Notification of Off-Site Agencies and Emergency Response Organization Personnel,” Revision 35; and (4) EP RB-10, “Protective Action Recommendations,” Revision 7.

b. Findings

The licensee’s emergency classifications and associated notifications were made within the procedurally required times. Procedure EP G-1 required that an Unusual Event be declared for fires in the protected area not under control greater than 15 minutes that affect plant equipment or power supplies in or near the protected area. The licensee declared the Unusual Event at 3:26 p.m., and notified San Luis Obispo County (Sheriff’s Watch Commander) with a fax at 3:31 p.m. and the California Office of Emergency Services also with a fax at 3:36 p.m. The NRC Operations Center was notified at 3:40 p.m. and was faxed the notification worksheet at 3:53 p.m. Followup notifications to local and state organizations and the NRC were made at the appropriate times. The shift manager terminated the Unusual Event at 5 p.m. and the operators completed the termination notifications.

.5 Black Start Capability

a. Inspection Scope

The inspectors evaluated the "black start" capability (the ability to recover offsite power following a total collapse of the grid) for the plant. The inspectors reviewed Independent System Operator Operating Procedure T-112, “Off Site Power Requirements for Nuclear Power Plants,” and Operating Instruction O-34, “California Nuclear Plant Emergency Restoration Procedure.” The inspectors also interviewed licensee and Independent System Operator on-shift personnel.

b. Findings

The inspectors noted the licensed operators and on-shift Independent System Operators were knowledgeable in the applicable procedures that directed either Southern California Edison to supply power to the Pacific Gas and Electric territory through the Midway Substation or that the Helms Hydroelectric pumping station provide power to Diablo Canyon through the Morro Bay Switchyard.

.6 Grid Conditions

a. Inspection Scope

The inspectors evaluated the ability of the grid to withstand a dual unit trip in the unlikely event that the brush fire propagated to the 500 kV switchyard.

b. Findings

Although a dual unit trip would have depleted the available operating reserve, the preplanned actions of the Independent System Operator would have maintained grid stability.

On April 5, 2001, the California Independent System Operator designated the grid as in a "No Touch Day" (no elective maintenance that represented a very high trip risk). The licensee stated that an 8 percent operating reserve existed at this time with peak loading of approximately 26,000 MWe, yielding an operating reserve of approximately 2075 MWe. The licensee noted that a dual unit trip (-2200 MWe) would have used up the grid operating reserve, but the Independent System Operator would obtain additional out-of-state resources and other mitigative actions to maintain grid stability. The inspectors reviewed the licensee evaluation and determined that it was satisfactory.

.7 Risk Evaluation

a. Inspection Scope

The NRC dispatched a special inspection, consisting of two inspectors, to evaluate this brush fire and loss of 230 kV offsite power event. The level of NRC response was decided by assessing the potential risk posed by this loss of offsite power, as characterized by the conditional core damage probability (CCDP) combined with knowledge of plant conditions and the licensee response. NRC Management Directive 8.3, “NRC Incident Investigation Program,” establishes guidance for the level of agency response to events.

b. Findings

The loss of 230 kV offsite power best reflected the fire event and subsequent plant response. The mission times evaluated at 2 hours bounded the conditional assessments. The licensee calculated the CCDP for this case around 9.6 E-9 for the 2 hours. The inspectors and the Senior Reactor Analyst found the assessments to be detailed and conservative. Based on the preliminary assessment performed by the Senior Reactor Analyst and the revised model analysis of this fire event, the resulting CCDP was determined to be on the order of a magnitude of 1 E-8.

CCDP determination

The Senior Reactor Analyst performed an initial CCDP assessment. The Senior Reactor Analyst used the Diablo Canyon 1997 probabilistic risk assessment model and

considered the loss of 230 kV (mitigating system) and an increased frequency of a loss of offsite power from the fire effecting the 500 kV transmission lines. A preliminary risk analysis assessed the CCDP for the fire at 1E-6 using a probability of .5 of losing 500 kV offsite power.

The 230 kV offsite power was restored 2 hours after the initiating event occurred. Following a review of the initiating event and plant response, the licensee and NRC staff determined that the initiating event was better characterized as a loss of 230 kV, with a low probability (3.8E-2) of losing 500 kV as well. The licensee stated that a loss of 500 kV in this event was unlikely. The licensee noted that the fire burned away from the 500 kV offsite power lines, and the prevailing winds at the time would not have blown the fire towards the 500 kV lines. In addition, the 500 kV line within close proximity (75 yards) to the fire was the Diablo to Gates line only. Both Diablo to Midway lines remained available to carry all of the 500 kV loads, thus 500 kV offsite power would not be threatened even if one assumed that the fire caused a loss of the Diablo to Gates line. The inspectors concluded that the licensee's determination was reasonable.

The licensee performed a detailed risk assessment of the event. This assessment included modifying their probabilistic risk assessment model to calculate the core damage frequency for the period this event occurred. This assessment conservatively assumed that the probability of loss of 500 kV power increased by a factor of 10. The core damage frequency and resulting CCDP for operating the plant in the configuration without 230 kV offsite power for 2 hours were calculated as approximately 1E-8 (9.6 E-9) .

Validation of assumptions

The inspectors validated the licensee assertion that the probability of loss of the 500 kV lines was improbable. The inspectors reviewed the meteorological data for April 5, examined the burn area, and observed the actual configurations of the 230 and 500 kV offsite power lines. The inspectors concluded that the 500kV power lines were sufficiently removed from the burn area that a loss of offsite power was unlikely.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. J. Becker, Station Director, and other members of licensee management on June 5, 2001. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

ATTACHMENT 1

SUPPLEMENTAL INFORMATION

PARTIAL LIST OF PERSONS CONTACTED

Licensee

A. A. Afzali, Senior Engineer, Nuclear Quality Assurance and Licensing
J. R. Becker, Station Director
D. D. Christensen, Engineer, Nuclear Quality Assurance and Licensing
S. C. Ketelsen, Supervisor, Regulatory Services
M. L. Lemke, Supervisor, Emergency Preparedness
D. B. Miklush, Director, Engineering Services
P. T. Nugent, Director, Regulatory Services
D. H. Oatley, Vice President
P. J. Roller, Manager, Operations
D. T. Stocks, Captain, Diablo Canyon Fire Department
J. W. Tompkins, Director, Nuclear Quality Analysis and Licensing
R. A. Waltos, Director, Maintenance Services

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None.

Opened and Closed During this Inspection

None.

Previous Items Closed

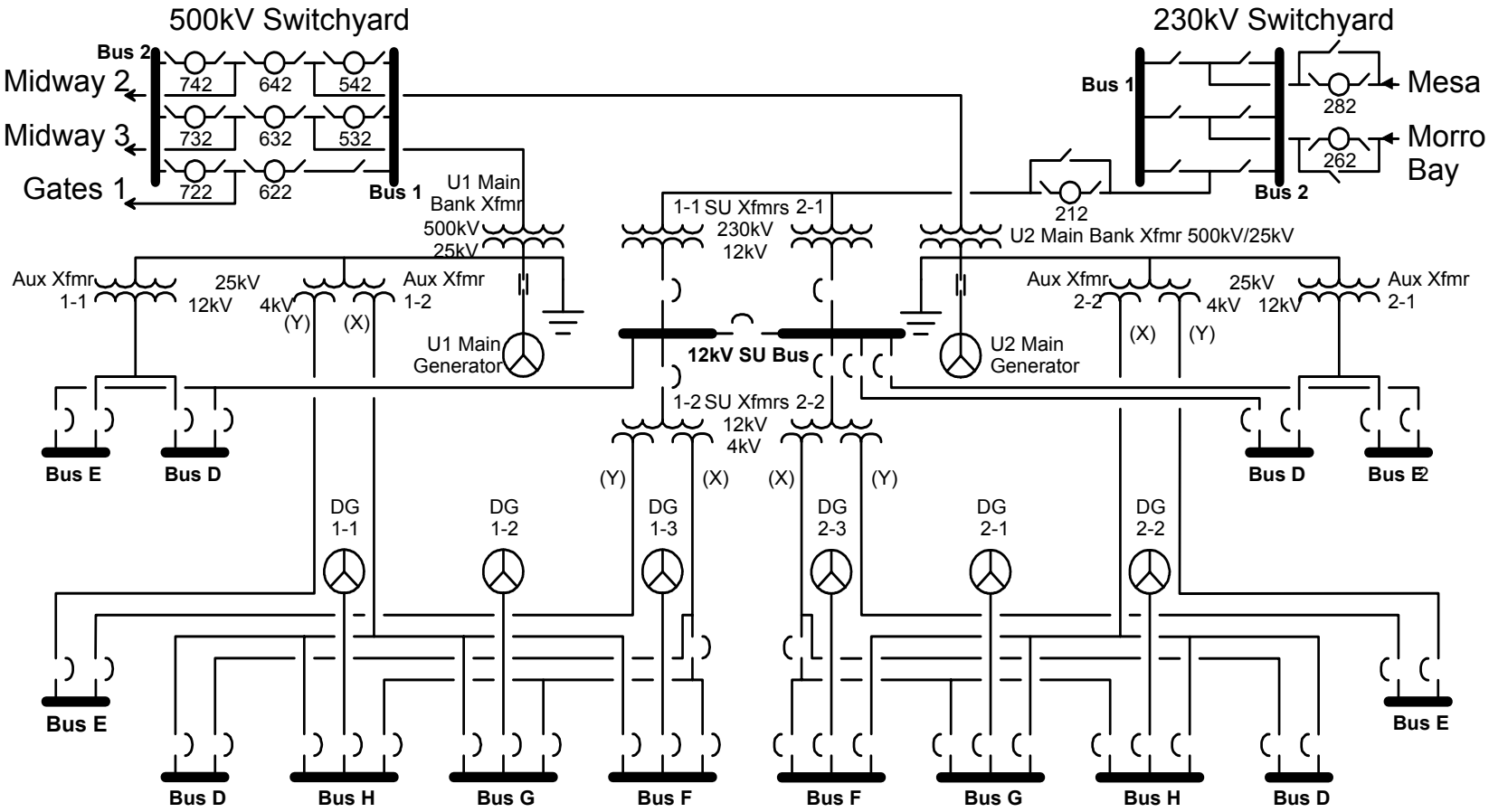
None.

LIST OF ACRONYMS USED

ac	alternating current
CCDP	conditional core damage probability
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
DEG	diesel engine generator
kV	kilovolt
MODE SEL	mode selection
NCV	noncited violation
NRC	Nuclear Regulatory Commission
SUT	startup transformer

Diablo Canyon Electrical Distribution

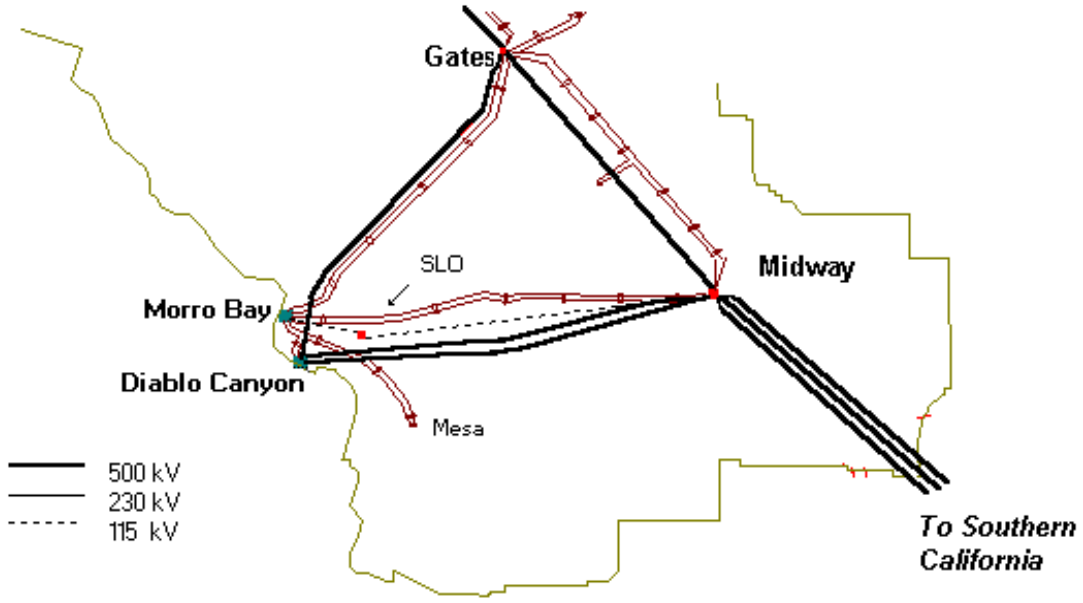
Attachment 2



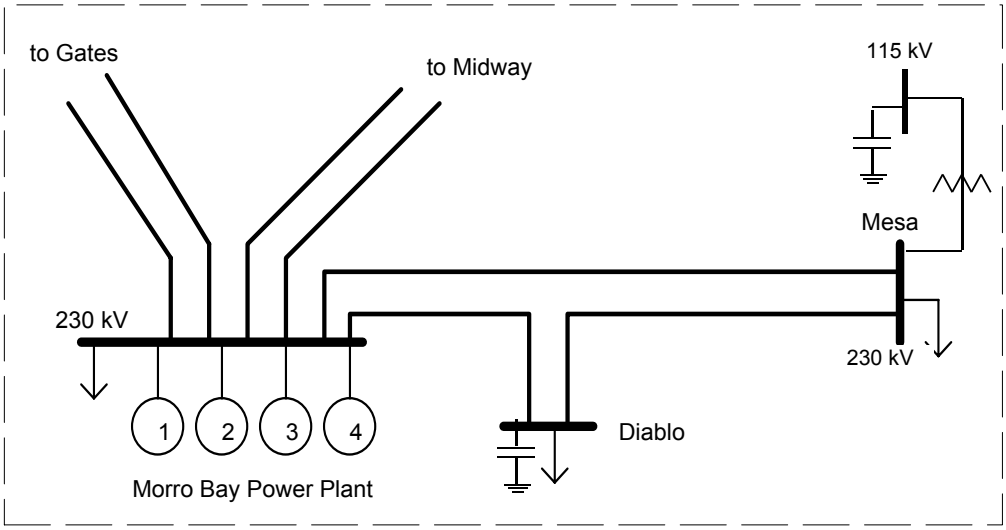
ATTACHMENT 3

TRANSMISSION DIAGRAM

Geographic Layout of 500 and 230 kV transmission lines & substations



Single Line Diagram of 230 kV System



Attachment 4

Attachment 5

Chronological Sequence of Events for Diablo Canyon Brush Fire and Loss of 230 kV Power

All Dates and Times April 5, 2001, and Pacific Daylight Time

Time	Description
9:45 a.m.	The Fire Captain contacted the Shift Manager that a controlled burn would commence at approximately 10:00 a.m., until 3 p.m.
10:45	The fire crew began burning test plots
10:45	The Unit 1 Senior Control Operator received a phone call on the dedicated fire alarm phone that a fire existed north of the 230 kV switchyard.
10:50	The shift manager made a public address announcement that the fire department was conducting a controlled burn north of the 230 kV switchyard.
11:00	The fire crew began burning the windrows.
2:35 p.m.	The fire crew ignited the brush in the ravine below the 230 kV towers.
3:00	The smoke and heat from the brush in the ravine created a chimney effect, which dried the wet grass above the control burn area.
3:05	The grass above the control burn ignited, resulting in flames reported as 50 feet high.
3:08	The control room received several reports that the fire crew had lost control of the windrow burning activities.
3:10:38	The smoke from the ignition of the wet grass enveloped 230 kV lines near Tower X000/2. The inspectors witnessed a phase-to-phase fault of the 230 kV lines, causing lights in the protected area to flicker.
3:10:50	The inspectors witnessed a second phase to phase fault of the 230 kV lines near Tower X000/2. 230 kV Breakers 212, 262, and 282 tripped in the Diablo Canyon 230 kV switchyard. Breaker 532 in the Morro Bay Switchyard, and Breaker 212 in the Mesa switchyard as well to clear the fault. All 230 kv offsite power was lost (Attachment 2).
3:10:51	All six diesel engine generators successfully started but did not load the vital busses.
3:11	Operators made a public address announcement that both units lost 230 kV offsite power. The Unit 1 shift foreman directed the Unit 1 senior control operator to contact the CDF to request assistance. The Unit 1 and 2 shift foreman declared the 230 kV offsite power source inoperable and entered Technical Specification action statement 3.8..1a (72 hours).

Attachment 5

Chronological Sequence of Events for Diablo Canyon Brush Fire and Loss of 230 kV Power

All Dates and Times April 5, 2001, and Pacific Daylight Time

3:13	Several licensee personnel reported to the control room that there was an explosion and fireball at the 230 kV switchyard
3:14	The NRC Senior Resident Inspector arrived in the control room.
3:16 p.m.	The Senior Resident Inspector informed the NRC Headquarters Operations Officer of the impending event and requested that the appropriate NRC management be contacted and establish a conference bridge.
3:20	The shift manager directed the Diablo Canyon Switching Center relief operator to investigate the report of an explosion and smoke in the 230 kV switchyard.
3:26	The Shift Manager declared a Notification of Unusual event based on Procedure EP G-1 UE#1 "Fire not under control within 15 minutes of initiating fire fighting efforts and affecting plant equipment or power supplies in or near the Protected Area."
3:28	The fire burned past the 230 kV lines and moved up the hill away from the lines.
3:31	The Emergency Liaison Coordinator notified the San Luis Obispo County Sherriff's Watch Commander of the Unusual Event.
3:36	The Emergency Liaison Coordinator notified the California Office of Emergency Services of the Unusual Event.
3:40	The Emergency Liaison Coordinator notified the NRC Headquarters Operations Officer of the Unusual Event, the 4-hour report of notification of other offsite agencies (CDF), and the starting of all six diesel engine generators.
3:51	The 500 kV switchyard operator directed the closing of Morro Bay Breaker 532. The Morro Bay-Diablo Canyon 230 kV line tested satisfactorily.
3:55	The 500 kV switchyard operator closed Breaker 262 that feeds the Diablo Canyon 230 kV switchyard, and Breaker 212 that feed Startup Transformers 2-1 and 2-2 in the plant (Attachment 2).
4:00	The fire captain reported to the shift manager that the fire had burned itself out. The CDF established a fire line to prevent reignition of the fire.
4:07	The Emergency Liaison Coordinator provided an update to the California Office of Emergency Services.

Attachment 5

Chronological Sequence of Events for Diablo Canyon Brush Fire and Loss of 230 kV Power

All Dates and Times April 5, 2001, and Pacific Daylight Time

4:08	The Emergency Liaison Coordinator provided an update of the event to the San Luis Obispo County Sherriff's Watch Commander.
4:21	The Emergency Liaison Coordinator provided an update of the event to the NRC Headquarters Operations Officer.
4:33	The Unit 1 operators closed Breaker 52-VU-12, which restored 230 kV offsite power to the Unit 1 startup bus. Annunciators for the startup feeder undervoltage relays cleared. The Unit 1 shift foreman declared the 230 kV offsite power source operable and exited Technical Specification 3.8.1.a, well within the 72 hour allowed outage time.
4:35	The Emergency Liaison Coordinator updated the San Luis Obispo County Sheriff's Watch Commander with the current event status.
4:39	The Emergency Liaison Coordinator updated the California Office of Emergency Services with the current event status.
4:40	The Unit 1 operators attempted to parallel Diesel Engine Generator 1-1 to Vital Bus H with the system in "AUTO," contrary to procedures. Diesel Engine Generator 1-1 picked up 2800 kW of load in 12 seconds before being switched to "MANUAL." The operators gradually manually loaded Diesel Engine Generator 1-1 to about 1350 kW on Vital Bus H, commencing a 1hour loaded run.
4:40	The Emergency Liaison Coordinator updated the NRC Headquarters Operations Officer with the current event status.
4:43	The Unit 2 operators closed Breaker 52-VU-24, which restored 230 kV offsite power to the Unit 2 startup bus. Annunciators for the Unit 2 startup feeder undervoltage relays cleared.
4:55	The Unit 2 shift foreman declared the 230 kV offsite power source operable and exited Technical Specification 3.8.1.a, well within the 72 hour allowed outage time.
5:00	With the brush fire out, and 230 kV offsite power restored and operable to both units, the shift manager terminated the Unusual Event.
5:02	The Emergency Liaison Coordinator notified the San Luis Obispo County Sheriff's Watch Commander that the Unusual Event had been terminated.
5:04	The Emergency Liaison Coordinator notified California Office of Emergency Services and the NRC Headquarters Operations Officer that the Unusual Event had been terminated.
5:06	The Unit 2 operators paralled Diesel Engine Generator 2-1 to Vital Bus G, commencing a 1 hour loaded run at 1350 kW.

Attachment 5

Chronological Sequence of Events for Diablo Canyon Brush Fire and Loss of 230 kV Power

All Dates and Times April 5, 2001, and Pacific Daylight Time

6:02	The Unit 1 operators separated Diesel Engine Generator 1-1 from Vital Bus H and returned it to "AUTO."
6:08	The Unit 1 operators paralled Diesel Engine Generator 1-2 to Vital Bus G, commencing a 1 hour loaded run at 1350 kW.
6:20	The Unit 2 operators separated Diesel Engine Generator 2-1 from Vital Bus G and returned it to "AUTO."
6:25	The Unit 2 operators paralled Diesel Engine Generator 2-2 to Vital Bus H, commencing a 1 hour loaded run at 1350 kW.
7:00	The night shift operating crew relieved the watch
8:10	The Unit 1 operators separated Diesel Engine Generator 1-2 from Vital Bus G and returned it to "AUTO."
8:14	The Unit 2 operators separated Diesel Engine Generator 2-2 from Vital Bus H and returned it to "AUTO."
8:20	The Unit 2 operators paralled Diesel Engine Generator 1-3 to Vital Bus F, commencing a 1 hour loaded run at 1350 kW.
8:51	The Unit 2 operators paralled Diesel Engine Generator 2-3 to Vital Bus F, commencing a 1 hour loaded run at 1350 kW.
9:37	The Unit 1 operators separated Diesel Engine Generator 1-3 from Vital Bus F and returned it to "AUTO."
10:25	The Unit 2 operators separated Diesel Engine Generator 2-3 from Vital Bus F and returned it to "AUTO."
5:00 a.m. April 6, 2001	Diablo Canyon Fire Department personnel secured from the fire watch on the hillside near the brush fire area.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

Attachment 6

April 11, 2001

MEMORANDUM TO: David L. Proulx, Senior Resident Inspector, Diablo Canyon

FROM: Ken E. Brockman, Director, Division of Reactor Projects
/RA/ Elmo Collins acting for

SUBJECT: DIABLO CANYON SPECIAL INSPECTION OF BRUSH FIRE CHARTER

On April 5, 2001, Pacific Gas and Electric Company declared an unusual event when control of a planned burning of brush on the hillside outside of the protected area was lost. The event declaration was made when the fire continued uncontrolled for longer than 15 minutes and threatened safety-related equipment. Based on a preliminary review of the circumstances surrounding this event, it was determined that there existed a potential for moderate risk significance. In addition, this event was significant from a public confidence standpoint because of the limited electrical supply on the California grid and the problems that have previously been experienced in the Western United States with controlled burns.

Accordingly, a special inspection is being chartered for the NRC to better understand this event. This memorandum designates you as the lead inspector for the special inspection. Mr. Thomas McKernon, Senior Operations Engineer, will support you in the inspection efforts.

The objectives for your inspection should, at a minimum, include the following:

1. Develop a detailed sequence of events.

2. Qualitatively assess the likelihood of the fire propagating and resulting in a loss of all offsite power. Determine the effect that a dual unit trip could have had under the existing grid conditions and its impact on the licensee's ability to recover offsite power. Evaluate the viability of the cross-tie features (inter- and intra-unit) for the safety-related busses, the availability of the black start power source, and the adequacy of operator controls/training.

3. Determine the controls put into place by the licensee and the CDF for this controlled burning evolution. Evaluate whether the licensee has plans to provide additional controls to prevent recurrence of this type of event.

4. Evaluate the effectiveness of the notification to the offsite fire department for additional support and the subsequent response.

5. Evaluate the adequacy and timeliness of the licensee's emergency classifications and the associated notifications.

6. Evaluate any pre-evolution risk analysis used to schedule, plan, and approve the controlled burning evolution, especially as it could relate to the requirements of 10 CFR 50.65(a)(4).

7. Determine the amount and or type of pretask planning and briefings performed to assess the impact of the offsite electrical supply. Evaluate preparations of the control room staff to deal with this type of event.

These inspection activities should be conducted using Inspection Procedure 93812 (Special Inspection) in conjunction with appropriate baseline inspection procedures. You should coordinate with the Chief, Project Branch E in defining the appropriate baseline inspection procedures to use.

The inspection activities commenced on April 5, 2001, when you responded to the control room in response to this event. A report documenting the results of the inspection should be issued within 14 days of the completion of the inspection (tentatively scheduled for April 14, 2001).

This charter will be modified should the team develop significant new information that warrants review by the special inspection team. Should you have any questions concerning this charter, contact William B. Jones, Chief, Projects Branch E, at 817-860-8147, or Greg Pick, Senior Project Engineer, Project Branch E, at 817-860-8270.

cc via E-mail:
E. Merschoff
T. Gwynn
E. Collins
A. Howell
W. Jones
G. Pick
J. Melfi
D. Proulx
T. Jackson
D. Powers
G. Larkin