DIABLO CANYON POWER PLANT

QUARTERLY SYSTEM STATUS REPORT

2ND Quarter 1989

SYSTEM 65 120V INSTRUMENT AC SYSTEM

SYSTEM 66 120V SECURITY UPS SYSTEM

SYSTEM 67 125/250VDC SYSTEM

R. ORTEGA R. Ortega / 6/30/89
System 65/66/67 Engineer Date

R. Ortega FOR
K. RICHES / 6/30/89
System 65 Design Engineer Date

D. STREEBLE / 6/30/89
System 66 Design Engineer Date

S. CHEN / 6/30/89
System 67 Design Engineer Date

2ND QUARTERLY SYSTEM STATUS REPORT - 1989

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I. Executive Summary

A. System 65 - 120V Instrument AC System

System has been walkdown with design system engineer and problem areas/proposed enhancements have been addressed in Action Requests. There are currently no operability problems excepti for recurring failures on power available pilot lights(AT EWR A0140994). This work was identified as outage work but was canceled for 1R3 outage. This EWR request 4 items that require a DCN. Most of the items can only are outage related work. However, this light replacement has been performed during normal operation in the past. A DCN to perform this one item should be pursued independently of the rest so the QE against this item can be closed.

The recent SSFAR Electrical Systems Audit identified numerous electrical and ventilation components with loose or missing fasteners. These items have been given top management priority and QE's were written.

An FSAR review was performed to identify any operational, testing, or maintenance commitments. Results of this review are in Attachment V.5.

The SSFAR Electrical Systems Audit was conducted on the 125VDC, vital 120V Instrument AC, vital 480VAC, vital 4KV and diesel generator systems, during March and April. A vertical slice audit encompassing the areas of design, operations, maintenance, testing, training, quality verification, material condition, and plant configuration was performed. The SSFAR concerns involved updating of design bases, procedure refinements, and enhancement of operational readiness of the vital electrical ventilation systems. Specific DCPP concerns identified were in the areas of abnormal operating and annunciator response procedures, as-built conditions differing from as-designed, component labeling, and testing practices deviating from approved procedures. Aside from these concerns, the audit team concluded that the electrical systems audited met their intended functional and performance requirements. DCPP strengths were in the areas of electrical maintenance, surveillance testing, operator training, records management, and housekeeping. A total of sixty four QE's and 17 Ar's were issued to address outstanding issues. 7 QE's and 1 AR were written on this system and are part of Attachment V.3. A majority of these QE's stem from untimely response to the SSFAR questions. Lessons learned from this audit are being

considered in the upcoming SSFAR Audit on the Auxiliary Feedwater System scheduled for July.

The following NCR's were closed this quarter:
NCR DC2-88-EM-EM-136 (U2 PY22 voltage transient)
NCR DC1-88-EM-N011 (ferroresonant transformer failure in NIS Inverter IY-13).
There are no new NCR'S generated against this system.

There are no DCN's on this system.

B. System 66 - 120V Security UPS System

* The Security System Expansion Projects have exceeded the Emergency Power System's capacity. The security diesel generator overloads under transient starting conditions. Temporary reconfiguration of the security electrical system alignment to reduce the generator's load has been implemented to prevent the overload conditions. Security compensatory measures have also been implemented so our regulatory commitments are met until a larger replacement is procured and installed. The new forecast dates for this DCN are as follows. DCP REV A meeting is schedule for July 6 with Rev. 0 issue on around 7/14. The installation of the temporary diesel generator rental unit is scheduled to be performed before the Unit 1 Refueling Outage. The permanent installation is scheduled to start before the Unit 2 refueling outage. Vendor manuals for both the temporary and permanent diesel generator units were requested of NECS so the STP can be appropriately revised.

The security UPS preventative maintenance procedures are being issued as a result of QE 5530. This will include quarterly cleaning of air filters (filters to be installed), tuning of the inverter on an annual basis, and filter capacitor replacement on a six year frequency.

An EWR has been written requesting to jumper out the UPS low air flow alarm. This is a non-latching alarm that flickers frequently due to the unreliability of the flow switches. The alarm in the control room is a recurring nuisance alarm. This same type of change has been performed on the P250 inverters where the flow switch alarm was deleted and temperature sensors were used instead. The security UPS is already equipped with high temperature protection to shutdown the UPS inverter and does not require this modification.

There is only one DCN to replace the Security UPS bypass input breaker. This is an old DCN that has been delayed due to Security power availability constraints. Work is now scheduled for early July.

C. 125VDC AND 250VDC System

There are no operability problems with the vital 125VDC System. One hardware problem, that does not affect
* OPERABILITY, exists in the U2 battery chargers. BTC21 & BTC22 need to have their KIRK key interlocks replaced. This work was started this last quarter but has come to a halt
* after the wrong size locks were procured. Other work that has been delayed because of material pre-fabrication problems is DCP E-38560. This DCN strengthens the 125VDC distribution panel center breaker support. Both Mechanical and Electrical Lead Planners are aware of this delay.

The recent SSFAR Electrical Systems Audit identified numerous electrical and ventilation components with loose or missing fasteners. These items have been given top management priority and QE's were written. 18 QE's pertaining to this system were written and 9 AR's with recommendations came out of this audit. These are included in Attachment V.3.

There is one outstanding DCN to reinforce the 125VDC Switchgear Panels center breaker support which is in progress.

* The non vital 250VDC Unit 2 battery bank was replaced during the Unit 2 first refueling outage. Unit 1 battery has reached the end of its service life. This year marks it's 20th year of service. Within the last two years there have been 7 cells that have been replaced and it has gone on alert status three times because of low cell voltages or low specific gravities. Current surveillance / maintenance tests show that the battery will not hold a charge to bring up the battery's parameters to its nominal range. An EWR was written to replace the battery bank. This work, however, was canceled for the upcoming 1R3 outage. An EWR was written to perform a seismic test on battery cells from this bank in order to qualify our vital station batteries. Our current seismic qualification for our vital station batteries is for 13 years. This was based on the shake test performed on the old vital batteries when they were replaced in 1983. The old vital batteries were 13 years old when they were shake tested. We are into the 7th year of the 13-year qualification. It is imperative that this testing be

performed this year as this is the end of service life for the battery (20 years). The battery will degrade further with time.

The following NCR's were closed this quarter:
NCR DC2-TN-88-N028 (Missing Battery Rack Hardware on Bat22 & 23)
DC2-EM-88-N130 (U2 BATT CHGRS undersized lugs).

* The only NCR open is DC2-TN-89-N002 (battery electrolyte temperature falling below the Tech. Spec value). An EWR was written to provide battery room low temperature alarm. This is the only corrective action to prevent recurrence left in order to close the NCR. No DCN's have been issued yet -this is not outage related work. NECS response is required. No new NCR's were written this quarter.

* NRC IE Bulletin 88-86 and OER 3087 discusses how HELB could cause multiple faults to ground. This issue is applicable to DCPP (see system problems for more info). This is currently being reviewed by NECS.

A FSAR review was performed to identify any operational, testing, or maintenance commitments. Results of this review are in Attachment V.5.

II. System Status and Walkdowns

A. Unit One and Common

All three systems were walkdowned and the following items were noted and documented on ARs.

System 65 - Instrument AC System

System Status - OPERABLE
Walkdown Findings:

* There is a difference in the short circuit rating of the new PY11A and PY13A. Unit one short circuit rating is lower than Unit 2 (10,000 amps/240 volts vice 14,000 amps/480 volts). An EWR was written to determine if this is a design concern. NECS response is pending.

Concern over the classification of the NIS Inverter cooling fans air filters has halted the quarterly PM for filter replacement. NECS has requested that a FCT be submitted to show the filter mounting brackets and filter on the inverter structural detail drawing (initial DCN that installed the cooling fans did not show the filters or the filter mounting bracket). Drawing has been FCT'ed. Response from NECS regarding the safety classification of filter is pending.

System 66 - Security UPS System (Common)

System Status - OPERATIONAL (See executive summary)
Walkdown Findings:
There are no new findings this quarter.

System 67 - 125 & 250VDC System

System Status - OPERABLE
Walkdown Findings:
* There was a discrepancy noted in the Unit One Single Line Diagram. The drawing needs to reflect that the P-2000 Inverter is no longer fed from the vital DC Panel SD13 breaker 44. It is now fed the Unit 1 non vital panel PD18 breaker 13. Drawing 437518 was FCT'ed to reflect this as built condition - this item is closed.

There are no new findings this quarter.

B. Unit Two

Systems 65 and 67 (System 66 is common) were walkdowned and the following items were noted and documented on AR's:

System 65 - Instrument AC System

System Status - OPERABLE
Walkdown Findings:
There are no new findings this quarter.

System 67 - 125 & 250VDC System

System Status - OPERABLE
Walkdown Findings:

* There was a discrepancy noted in the Unit Two Single Line Diagram. The drawing lists the P-2000 Inverter as being fed from vital DC panel SD23 breaker 44. It is fed from SD23 breaker 50. Unit 1 P2000 Inverter is fed from the non vital batteries. This load on Unit 2 may be a problem since the FSAR loading table for battery 13(23) is the same for Unit 1 & 2. However, if the loading table was made including the P2000 Inverter, then this is not a problem. Drawing 441220 was FCT'ed to reflect the as built condition and an AR was generated to determine if this load was accounted for in the battery duty cycle (FSAR worst case loading table). This loading table is used in the battery service test that is conducted on the battery every refueling outage. NECS response is pending.

III. System Problems

The following is a list of EWR's written to address / disposition some of the system problems.

A. System 65 - 120 Instrument AC System

* 1. An EWR has been written to determine if the vital 120V Instrument AC System reliability can be enhanced. Our NIS Inverters are not true uninterruptible power supplies. They do not have a static switch with a redundant bypass source to transfer the load to the bypass source in the event of an inverter failure. Inverter failures may lead to undesired reactor trips, ESF Actuation, or plant transient that may challenge our safety system setpoints. This is especially true at DCPP as maintenance / surveillance activities may require tripping a protection set bistables. Loss of an inverter on another protection set would most like result in one of the above mentioned incidents. This was requested on plant design comment 82-05 back in 1982. Engineering did not consider this a significant enhancement due to the technological standards at that time. Technological advances since that time has prompted a re-evaluation. This is also is being submitted to the trip reduction program. BLI 959A/B has been issued to track this item.

* 2. An EWR has been written to determine if the vital backup voltage regulator TR11/TR21 is undersized for the DRPI loads. The DRPI loads currently powered from a 10KVA transformer / regulator(Unit2). The backup transformer / regulator is a 7.5 KVA unit. This was also a SSFAR concern. NECS response is pending.

* 3. An EWR was written to determine if the sizing requirements for the input transformers to the SOLA regulators are adaquate. SOLA regulator electrical requirements require that the input transformer be rated 40% higher than the regulator. This affects both the vital and nonvital regulators in the 120V Instrument AC System. NECS response is pending.

* 4. An EWR was written requesting to change out the power available lights in the NIS Inverters. There have been numerous failures resulting in light socket failures. These are now a safety concern as some of these lights have exploded while trying to change them out. The most recent event resulted in tripping the DC input breaker to the inverter resulting in entering the Tech. Spec. Action Statement. Operations has issued a safety memo for the operators to take precautions (safety glasses, rubber gloves) when changing out this bulb. Maintenance Engineering reports that the light socket is rated for 120V service and is being used for 135V continuous service. A resistor type / lower voltage bulb is being requested. (NOTE: The EWR requests four items, some of which are outage related work. However, this item is corrective action to prevent recurrence on the QE that is pending . The replacement of the lights is not outage related work. Some of these lights have been replaced during normal operation. It is recommended that a separate dcn be issued for this item so the QE can closed). NECS response is pending.

* 5. An EWR has been written requesting to change out the inverter AC undervoltage relay. The fixed relay setting does not provide adequate annunciation for this application. On one of the last inverter failures, the ferroresonant transformer shorted. The undervoltage alarm did not come in even though the inverter voltage was around 60 volts. It is requested that this new relay be set to alarm at around 110-112 volts (nominal output voltage is 115-122) so Operations is informed of degrading conditions. This item is on the same EWR as item 4 & 6. NECS response is pending.

* 6. An EWR was written requesting to change the NIS Inverter reflash annunciator reset features. Presently, they are auto reset. This prevents any alarm coming in to seal in. This is an important indicator to determine what alarms come in, in the event of inverter transient conditions. This is on the same EWR as items 4 & 5. NECS response is pending.

* 7. An EWR was written requesting to ground the return wire from the ferroresonant transformers at the NIS Inverters. Presently, all of the inverters grounds are tied together at BTH101 and grounded at the the backup transformer. Maintenance on the backup transformer may inadvertently lift the ground return to all the inverters. NECS response is pending.

8. The FSAR was reviewed for operational, maintenance, and testing commitments. An AR was initiated to revise Elect. Maint. Procedure MP E-65.1A in order test the NIS Inverter Alarms in the control room. The present PM procedure calibrates the relay and alarm setpoints. It does not check the alarm typewriter or annunciator window to verify that the alarm comes in. The AR is assigned to the Elect. Maint. Engr. Dept.

9. The same procedure mentioned above also needs to include the calibration of the time delay contactors in MP E-65.1A. The recurring task library work order already includes this. Another AR is tracking this item.

B. Security UPS System

* 1. The present security power system is configured so that the security diesel generator does not overload. Some emergency power system loads have been shifted to normal station power--Security Bldg./Security Lab System). Additionally, security will be taking compensatory measures (one quadrant of emergency quartz lighting has to be manually sequenced on in the event of a diesel generator start). These measures will be in effect until the new diesel generator is installed. The schedule presented in the executive summary states the new diesel generator may be installed by the end of 2R3.

2. An EWR was written requesting to jumper out the flow switch low air flow alarm. The inverter is already provided with high temperature protection. This is a control room nuisance alarm (See Executive Summary). NECS response is pending,

C. 125VDC & 250VDC System

* 1. Unit 1 non vital battery bank needs to be replaced. (No change - see executive summary)

* 2. A setpoint change to the DC Switchgear undervoltage relay setpoint from 125 to 131 volts was considered. However, the recent SSFAR audit identified that the actual setpoint of this relay (the dropout value) is not adjustable. The present alarm setpoint is in the order of 80-90 volts. The SSFAR audit team initiated an AR to re-evaluate this setpoint. NECS Response is pending.

* 3. An EWR was written requesting to also change the battery charger undervoltage and overvoltage relay setpoints. The current undervoltage setpoint for the battery charger is 120 volts. This should be set at 131 volts in order for this alarm to come in just before we reach the Tech. Spec value. At its present setting, even if the battery charger output were to go to zero volts, this relay would not pick up as the battery voltage is above 120 volts with the charger removed. The current setting for the overvoltage relay is 143 volts. This setting is set too high. If the battery charger voltage started to drift upward or if the equalizing voltage is set to high, the NIS Inverter overvoltage relay would trip the inverter AC input breaker. This setting should be adjusted to 140 volts or 138 volts (the equalize charge voltage on the batteries). DCP E-43329/44329 have been initiated.

* 4. There is a current NRC IE Notice 88-86 which discusses the problems with operating with multiple grounds on the DC distribution system. Along with that is an operating experience OE 3087 which discusses the effects of a HELB which could cause multiple faults to ground. It is important to note that most grounds encountered at DCPP are due to steam leaks or humid environment around DC powered equipment or instrumentation. Troubleshooting efforts consist of disconnecting (deenergizing) pieces of equipment to isolate the ground, however, there are some pieces of equipment that cannot be deenergized. As a result, the next step is go out and visually inspect

pieces of equipment. The recent use of a new ground locater that can be used on energized circuits has reduced this effort. Resolution of the IE Notice is with NECS -no EWR was written. NECS response is pending.

5. Recent PM's on the vital battery chargers have revealed replacement part problems with the charger's electronic control cards. EXIDE, the manufacturer, has been contacted to resolve the following problems:

A) There are new revision number cards in the firing modules. There is a concern of compatibility in using them with the older revision cards.

B) A recent INPO OE informs of battery charger control problems caused by the gate and filter module. The new revision control cards were manufactured with a electrolytic capacitor with the polarity reversed. This is causing premature failure of these cards. This is a problem on chargers manufactured prior to 1971 (our Unit 1 Chargers).

C) Three control cards (amplifier module, voltage control module and current control cards) have been superseded by new cards. The unit 2 battery chargers use the new cards, however the unit 1 battery charger cards have been superseded with these new cards. In reviewing the control schematics, it was noted that the Unit 1 and Unit 2 have different control schemes. This is also a compatibility concern.

None of these problems pose an immediate concern but may become an issue if these control cards are used with the Unit 1 vital battery chargers when replacement becomes necessary.

6. There is an old AR and an EWR requesting replacement of the non-vital 125VDC & 250VDC undervoltage relays. The setpoints for these relays have been reported to drift. An EWR has been requested for replacement. NECS response is pending.

7. The FSAR was reviewed for operational, maintenance, and testing commitments. AR's were initiated for the following changes to revise Electrical Maintenance Procedure to:

A) verify charger regulation and current limit setpoint.

B) verify battery charger and 125vdc System alarms in the control room (annunciator typewriter and annunciator window).

C) include other vendor manual recommended testing.

This AR is assigned to Elect. Maint. Engr. Dept.

8. The SSFAR Audit has issued a QE to evaluate whether temperature correction on the battery service test STP M-12C is required. This has been addressed in other NRC SSFI Audits. The STP testing method is in compliance with the IEEE450 industry standard. This standard does not address temperature correction factors or formulas for service tests. An AR also addresses this issue. NECS response is pending.

IV. System Trends

A. 120V Instrument AC System

With the exception of walkdowns performed by Operations, there are no trendable parameters on this system. The nominal operating parameters of the NIS Inverters are checked the daily electrical round sheet. Any value out of this range is documented on Action Requests.
No discrepancies were noted this quarter.

B. 120V Security UPS System

STP SP-312 (security system emergency power source and load transferring test) obtains data of diesel generator voltages / current and also UPS Inverter Data. Other than keeping track of additional loading on the diesel generator or verifying nominal operating parameters, there are no other trendable parameters (security battery parameters are trended - see next section).
No new discrepancies were noted this quarter.

C. 125 & 250VDC System

The vital station batteries and the security battery are trended. Weekly battery STP trend individual pilot cell parameters to detect degrading conditions. A computer program is used to trend level, specific gravity, cell voltages, and the whole battery bank voltage. Another program is being developed to trend the whole battery bank. The quarterly STP on battery 13 has revealed that the specific gravity of cell 36 is trending low. In researching the records it was noted that this cell was reported low in the past and an individual equalize charge had been performed. Also, the initial charge records noted that the specific gravity of this cell was not properly balanced. A temporary procedure has been developed to replenish acid to increase the specific gravity.

* The Unit 1 non vital 250VDC battery bank system needs to be replaced. Trending of these parameters shows that the battery will no longer hold a charge as evidence by the quarterly inspection results. Numerous cell replacements have occurred within the last two years. See executive summary comments.

* These items were reported on First Quarterly Report - 1989.