POWER OUTAGE RESPONSE
EMERGENCY PROCEDURE

APPLICATION

For use by Facilities Division Electrical Engineers and Electricians. This procedure is part of the operations manual for the Site Electrical Distribution system. See ADMN-056 for an overview of the manual's contents, including related procedures.

PURPOSE

Response to power outages (failures) and power restoration.

SCOPE

A. Low Voltage Failure (600V or Less).

B. 115 kV Outage Caused by PG&E.

C. 12.47 kV Outage Caused by LBNL System Failure.

D. Outage from Other Causes.

SPECIAL INSTRUCTIONS

Training Required: Personnel performing this procedure must be:

- Qualified electricians instructed and trained to work on the low voltage and 115 kV/12.47 kV systems, and
- Familiar with the general operating and information procedures regarding these systems.

Equipment Required:

- High voltage gloves, flash suit, or other protective clothing as required by LBNL.
- Switching tag, LBNL locks & tags.

REFERENCES

1. ADMN-056, 12.47kV System Operations Manual Binder Document Control.
2. Drawing 5R-7285, 115 kV/12.47 kV One Line Diagram.
3. 12.47kV Electrical Power System Operational Safety Procedure.
4. Circuit Disconnect Lists.

WORK STEPS

A. Low Voltage Failure (600 V or Less).

1. Correct problem and restore power.

B. 115 kV Outage Caused by PG&E.

1. **Electricians** to coordinate with the UC Berkeley Campus and PG&E.
2. Develop switching procedure to restore power.
3. Electric Shop should not restore power without the approval of the Electrical Engineer / Utility Manager.
4. Electricians notify the following:
   - Fire Station (x6015)
     - Makes PA announcement (message #1: "PG&E power is off").
   - Utility Manager.
   - ONE of the following Electrical Engineering personnel:

- Larry Domansky, (707) 447-1348;
- Virgil Alonzo, (510) 232-4521.

- UC Berkeley Campus, Physical Plant, Campus Services (510/642-1032).
- PG&E.

5. **Electricians** restore power, with PG&E approval, in coordination with UC Berkeley Campus:
   - Fire Station (x6015)
     - Makes PA announcement (message #2: "12kV Switching").
   - Follow developed switching plan to restore power.
   - Call Fire Station (x6015) when power have been restored;
     - Makes PA announcement (message #3: "Restored to Normal").

C. 12.47 kV Outage Caused by LBNL System Failure.

1. **Electricians** notify one person from the Electrical Shop and one person from Electrical Engineering, as follows:
   - **Electrical Shop:**
     - Jim Murphy, Maintenance Supervisor, (925) 672-7036;
     - Andrew Tyrrell, Lead Electrician, (510) 376-9167.
   - **Electrical Engineering:**
     - Larry Domansky, (707) 447-4234;
     - Virgil Alonzo, (510) 232-4521.
2. **Electricians** notify the following:
   - Fire Station (x6015)
     - Makes PA announcement (message #1: "PG&E power is off");
   - Utility Manager.
   - ONE of the following Electrical Engineering personnel:
     - Larry Domansky, (707) 447-1348;
     - Virgil Alonzo, (510) 232-4521.
   - UC Berkeley Campus, Physical Plant, Campus Services (510/642-1032).
   - PG&E.
3. **IF** a section of line must be isolated:
   - **Electricians** OPEN, LOCKOUT, and TAG all circuit breakers that could feed into that section.
4. Restore power as follows:
   a. **Electrical Engineer** troubleshoots according to:
      - Drawing 5R-7285, 115 kV / 12.47 kV One Line Diagram.
      - 12.47kV Electrical Power System Operational Safety Procedure.
   b. **Electrical Engineer** programs rerouting of power and makes necessary PA announcements.
   c. **Electricians** reset relay targets according to **Electrical Engineer's instructions ONLY**.

D. Outage from Other Causes.

1. **Electricians** De-energize area according to Fire Department instructions or EOC.
   - Refer to:
     - 12.47 KV Electrical Power System Operational Safety Procedure.
     - Location on Circuit Disconnect Lists.

RESPONSIBILITIES AND CONTROLS

Completion of the following signature lines constitutes approval of this procedure:

REV NO.	SME	REVIEWED BY	APPROVED BY / DATE	REVISION DATE
2	James Murphy Elec Shop Supv	Lawrence D. Domenici Chief Elec Eng	Dennis Nielsen / 5/30/07 Plant Ops Mgr	5/29/07
	James Murphy (Print Name)	LAWRENCE D. DOMENICI (Print Name)	DENNIS NIELSEN (Print Name)	EMRG-048

BLANK
LBNL SWITCHING TAG

PURPOSE: _____

STEP NO.	SUBSTATION OR LOCATION	OPERATION	SWITCH OR DEVICE NO.	INSTRUCTIONS	TIME EXECUTED
1				**Personal Protective Equipment Required While Performing Switching Operations** **Switchman** **Flash Suit/ 40 cal** **Safety Glasses & Hearing Protection** **Voltage Rated Gloves With Protectors** **Safety Watch** **Safety Glasses**	
2	Bldg. 48	Page	Bldg. 48	Hill Page	
3	Bldg. 48	Notify	ALCO FD	Call ALCO FD @ x6015	
4					
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SWITCHING PREPARED BY	DATE	SWITCHING CHECKED BY	DATE
SWITCHING EXECUTED BY	DATE	ELECTRICIAN IN CHARGE	DATE

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SAMPLE

LBNL SWITCHING TAG

PURPOSE: Maintenance for BANK 513

STEP NO.	SUBSTATION OR LOCATION	OPERATION	SWITCH OR DEVICE NO.	INSTRUCTIONS	TIME EXECUTED
1				**Personal Protective Equipment Required While Performing Switching Operations** **Switchman** **Flash Suit/ 40 cal** **Safety Glasses & Hearing Protection** **Voltage Rated Gloves With Protectors** **Safety Watch** **Safety Glasses**	
2	Bldg. 48	Notify		Hill Page #1	:
3	BANK 513	Verify Open	513A4, 513A5, 513A6	Verify Open	:
4	Bldg. 55	Open	513A7A-4	Open	:
5	EG-069-55	Verify	EG-069-55	Verify Start and Transfer @B55 & B56	:
6	BANK 513	Open	513 Main	Open Bank 513 Main Breaker & RACK-OUT to retrieve Kirk Key for step #9	:
7	SW-A6	Open	A605	Open A605 Rack Out , Lock & Tag	:
8	SW-A6	Open	A615	Open A615 Rack Out , Lock & Tag	:
9	BANK 513	Open	ADF-001-55	Open, Lock & Tag	:
10	BANK 513	TEST	Meter	Test High Voltage Meter	:
11	BANK 513	Probe	ADF-001-55	Verify Dead Line 1 & 2, Load side of ADF	:
12	BANK 513	TEST	Meter	Test High Voltage Meter	:
13	BANK 513	Ground	ADF-001-55	Ground Lines 1 & 2 and Load Side of ADF	:
14	BANK 513	TEST	Meter	Test Low Voltage Meter	:
15	BANK 513	PROBE	BANK 513	Probe Bank 513 480 volt sections	:
16	BANK 513	TEST	Meter	Test Low Voltage Meter	:
17	BANK 513	Remove	Bank 513	Remove CPT Fuses	:
18	BANK 513			CLEARANCE AUTHORIZED TO BEGIN WORK	:
19	Bldg. 48	Notify		Hill Page #2	:
20					:
21	BANK 513			MAINTENANCE WORK COMPLETED	:
22	Bldg. 48	Notify		Hill page #3	:
23	BANK 513	Verify	BANK 513	Verify all work complete and 480-volt section clear of all test equipment and all feeder breakers are open. 513 Main Open & Locked. Lock all doors.	:
24	BANK 513	Remove	ADF-001-55	Remove all grounds Lines and Load. Check ADF to be clear and clean. LOCK	:
25	BANK 513	Verify	ADF-001-55	Verify ADF-001-55 in Line 1	:
26	BANK 513	Close	ADF-001-55	Close ADF & Remove Kirk Key for Step #30 THEN CLEAR PAD	:
27	SW-A6	Close	A605	Rack-in and close A605.	:
28	SW-A6	Close	A615	Rack-in and close A615.	:

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29	BANK 513	Verify	513A1, 513A2, 513A3, 513A7, 513A8	Verify Closed, Feeder Breakers 1, 2, 3, 7, 8 & CPT Fuses Installed	:
30	BANK 513	Close	Bank 513	Rack-in & Close Bank 513 Main	:
31	EG-069-55	Verify	EG-069-55	Verify generator transfer (B55 & 56) and stopped and B55A, 60, 63, 67 Trailers, 71F, 71J, & 71T power restored	:
32	Bldg. 48	Notify		Hill Page #2	:
33					:
34					:
35					:
36					:
37					:
38					:

J. Murphy	4/06/2007		
SWITCHING PREPARED BY	DATE	SWITCHING CHECKED BY	DATE
SWITCHING EXECUTED BY	DATE	ELECTRICIAN IN CHARGE	DATE