

ATTACHMENT B - Table 1: LIST OF MANAGEMENT-APPROVED PROJECTS UNDER \$50M

Project Name	Description of Need	Required In-service Date	Project Scope	Estimated Cost	Other Alternatives Considered	Expected In-Service Date	Interim Mitigation
Projects in PG&E Service Territory							
Mare Island – Ignacio 115 kV Reconductoring Project	NERC Category B/C Overloads	2010	Reconductor the limiting 19 Miles section with 715 Al conductor.	\$19M	Connect Highway substation with Lakeville-Sobrante 230 kV Line	May 2012	Line re-rates and operating procedures
Stockton “A”-Weber #1 and #2 60 kV Line Reconductor	NERC Category A , B/C overloads	2010 (B/C) 2018 (A)	Reconductor 9 miles between the two lines	\$5-10M	Rerate. (Does not cover the % overload expected)	May 2011	NERC compliant load management procedure for overlapping contingencies
Mountain View/Whisman-Monta Vista 115 kV Reconductoring	NERC Category B/C overloads	2013	Reconductor both the Whisman-Monta Vista and Mountain View-Monta Vista 115 kV Lines	\$10-15M	Alternative 1: Status Quo	May 2014	Develop operating plan to mitigate overload. Details to be determined before the 2013 need date
Reedley-Orosi 70 kV Line Reconductor	NERC Category B/C overloads	2011	Reconductor the Reedley-Orosi 70 kV line. Install 20 MVARs of shunt capacitors	\$4M	None. (limited scope)	May 2013	Rely on short-term rating in 2011 and 2012 followed by NERC compliant load managementfor Category C outage
Reedley-Dinuba 70 kV Line Reconductor	NERC Category B/C overloads	2013	Reconductor approximately 8 miles of the Reedley-Dinuba 70 kV Line,	\$8M	None. (limited scope)	May 2014	Rely on short-term rating in 2013 followed by NERC compliant load managementfor Category C outage
Ashlan-Gregg and Ashlan-Herndon 230 kV Line Reconductor	NERC Category B/C overloads	2010	Reconductor a total of 13.5 miles on the Herndon-Ashlan (6.5 miles) and Gregg-Ashlan (7 miles) 230 kV lines,	\$15 -\$20M	Convert Herndon-Sanger 115 kV lines to 230 kV. This alternative is between \$30 million and \$45 million.	May 2015	Rely on short term rating followed by NERC compliant load management for Category C outages in 2010-2014

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Pit 3-Pit 1 and Pit3-Round Mountain 230 kV Line Relays Replacement	NERC Category B/C overloads	2010	Upgrade terminal equipment	\$1M	None. (limited scope)	Dec 2010	Congestion management
Weber 230/60 kV Transformer #2&2A Replacement	NERC Category B/C Overloads	2010	Replace 230/60 kV transformer and bus tie	\$8-15M	None (limited scope)	May 2013	Don't operate transformers in parallel during summer
Dumbarton-Newark 115 kV Line Capacity Upgrade	NERC Category B/C overloads	2010	Upgrade limiting substation equipment at Dumbarton substation	\$1M	None. (limited scope)	May 2010	
Corcoran 115/70 kV Transformer Replacement Project	NERC Category A overloads	2010	Replace the current 115/70 kV Transformer at Corcoran substation and installing a new 70 kV regulator both rated to handle up to 90 MVA.,	\$10M-\$20M	Convert the Corcoran-Angiola 70 kV Line to 115 kV operation (higher cost)	May 2012	Transfer distribution load in 2010 and 2011
Morro Bay 230/115 kV Transformer Project	NERC Category B/C overloads	2010	Install a new 230/115 kV transformer rated to handle up to 270 MVA at the Morro Bay Substation-	\$8M - \$10M	Reconductor 115 kV Lines. (does not protect against NERC category C3 contingencies)	May 2013	San Luis Obispo - Callender 115 kV Line will be re-rated to handle projected loads in 2010-2012 periods
West Sacramento Transmission Project	NERC Category C overloads	2010	Install SPS to trip 90 MW of load for DCTL	\$1-2M	None (limited scope)	Dec 2010	Develop operating plan to mitigate overload. Details to be determined before summer 2010
Moraga-Oakland "J" SPS Project	NERC Category C overloads	2010	Drop 33 MW load for loss of two out of the four 115 kV lines from Moraga serving San Leandro "U" and Oakland "J" Substation	\$1-3M	None. (limited scope)	May 2011	Develop operating plan to mitigate overload. Details to be determined before summer 2010
Pittsburg-Lakewood SPS Project	NERC Category C overloads	2010	Drop 64 MW load for loss of two out of the three Pittsburg-Clayton 115 kV lines	\$1-3M	None. (limited scope)	May 2011	Develop operating plan to mitigate overload. Details to be determined before summer 2010

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Los Padres Transmission Project	NERC Category C voltage collapse and overloads	2010	Special Protection Scheme (SPS) at the Mesa and Santa Maria Substations to drop 250 MW of load. Addresses voltage collapse upon loss of both 230 kV lines into Mesa substation	\$1M - \$2M	Add a new Morro Bay - Mesa 230 kV #3 Line (\$40-\$50M)	Dec 2010	Develop operating plan to mitigate overload. Details to be determined before summer 2010
Divide Transmission Project	NERC Category C voltage collapse and overloads	2010	Installs Special Protection Scheme (SPS) to drop 80 MW of load at the Divide Substation for the loss of both Mesa-Divide 115 kV Lines	\$1M - \$2M	Build a new 15 mile Mesa-Divide 115 kV #3 Line (Costs - \$20M-\$25M)	May 2011	Develop operating plan to mitigate overload. Details to be determined before summer 2010
Projects in SCE Service Territory							
East Kern Wind Resource Area (EKWRA) 66 kV Reconfiguration Project	NERC Category A/B/C Overloads	2011	Reconductor the limiting 19 Miles section with 715 Al conductor.	Under \$20M (TAC) Under \$100M (non-TAC)	1) Construct new Antelope-Lancaster 66kV line, SPS and operating procedure 2) Reconductor the above line, SPS and operating procedure	12/31/2013	Utilize existing operating procedure (generation curtailment) from SCE to mitigate overloading concerns (OP-068) as interim solution until the project is completed.
Projects in SDG&E Service Territory							
Upgrade Los Coches 138/69kV banks 50 & 51	NERC Category B/C Overloads	2018	Replace the existing 138kV transformer bank #51 with new 224 MVA transformer	\$31.1M	Dispatch El Cajon peaker (not sufficient for mitigating overload)	12/31/2010	N/A

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Upgrade TL680A (San Luis Rey-Melrose Tap 69kV Line)	NERC Category B/C Overloads	2010	Upgrade San Luis Rey-Melrose Tap 69kV line section to a minimum 137 MVA continuous/emergency rating	\$5M	1) Loop TL694A (San Luis Rey-Monserate) into Melrose, 2) Open Melrose Tap and construct additional transmission 3) Open Melrose Tap, serve San Marcos from Escondido and conversion of TL13811	6/1/2010	N/A
Upgrade TL6952 (Penasquitos-North City West 69kV)	NERC Category B Overloads	2010	Upgrade Penasquitos-North City West 69kV line to minimum of 136MVA continuous rating; replace/readjust all existing limiting equipment at both terminals	\$4.6M	Open TL674A	6/1/2010	N/A
New TL ES-AS #2 (TL681C Felicita-Ash violation mitigation)	NERC Category B/C Overloads	2012	Construct second 69kV line that is approximately 3 miles between Escondido and Ash substations	\$8.8M	Upgrade 6 miles of TL681C with 2-636kcmil	2012	N/A
TL6913 Upgrade Pomerado - Poway 69kV	NERC Category B/C Overloads	2014	Upgrade Pomerado-Poway 69kV line from 136 MVA to 148 MVA, replace breakers and disconnects	\$11.4M	Dispatch Encina, Palomar and Otay Mesa (insufficient to mitigate overloads)	2014	N/A

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TL13821B Removal of Carlton Hills Tap	NERC Category B/C Overloads	2012	Remove Carlton Hills Tap and create Sycamore-Santee and Sycamore-Calton Hills 138kV; upgrade looped-in portion of the lines; rearrange existing ring bus at Sycamore Canyon to a standard one and a half scheme	\$33M	Reconductor Carlton Hills Tap-Sycamore 138kV line	2012	N/A
New and/or Upgrade of 69kV Capacitors	NERC Category B/C voltage violations and overloads	2010 - 2014	Install shunt capacitors at Lilac, Rincon, Santa Ysabel and Warners in 2010 - 2011, and at Barrett and Crestwood (2014) substations	\$5.3M (total)	Install Static VAR Compensator (SVC), upgrade overloaded lines	2010-2011, 2014	N/A

ATTACHMENT B - Table 2: LIST OF MANAGEMENT-APPROVED PROJECTS UNDER \$50M THAT WERE APPROVED AS EARLY DECISION

Project Name	Description of Need	Required In-Service Date	Project Scope	Estimated Cost	Other Alternatives Considered	Expected In-Service Date	Interim Mitigation
Projects in SDG&E Service Territory							
Upgrade TL13802D Encina - Calavera Tap 138kV (EARLY DECISION)	NERC Category B Overloads	2010	Construct two new 138kV lines: Encina-Calavera Tap-Shadowridge and Cannon-Calavera Tap-San Luis Rey; re-energize existing Escondido transformer bank # 50	\$16.3M	1) Re-dispatch Encina generation; 2) Install Encina230/138kV transformer bank #60	6/1/2010	N/A
Upgrade TL667 Penasquitos - Del Mar # 2 69kV Line (EARLY DECISION)	NERC Category B/C/D Overloads	2010	Upgrade 1.5-mile of the Penasquitos-Del Mar #2 69kV line with higher capacity	\$3.3M	Transfer load to other substation (short-term mitigation)	6/1/2010	N/A
Upgrade TL6927 Eastgate-Rose Canyon (EARLY DECISION)	NERC Category B Overloads	2010	Upgrade 4.9-mile Eastgate-Rose Canyon 69kV line to higher rating conductor (900 ACSS)	\$6.49M	1) Dispatch Kearny peaking units. These units were scheduled for retirement in 2014.	6/1/2010	N/A

ATTACHMENT B - Table 3: LIST OF PROJECTS WITH COSTS GREATER THAN \$50 MILLION THAT WERE APPROVED BY THE ISO BOARD OF GOVERNORS

Project Name	Description of Need	Required In-Service Date	Project Scope	Estimated Cost	Other Alternatives Considered	Expected In-Service Date	Interim Mitigation
Projects in SCE Service Territory							
Alberhill Substation Project (ALREADY APPROVED BY THE ISO BOARD IN DEC. 2009)	NERC Category A/B Overloads	2014	Construct a new 500/115kV substation with two 560 MVA transformer banks and two 1.5-mile 500kV lines to loop into Serrano - Valley 500kV line	Total: Under \$350M (TAC cost: under \$200M)	Five alternatives: (1) Transfer load, (2) Expansion of existing Valley substation, (3) Construct new 230/115kV substation, (4) Construct of new Auld substation, (5) Generation option	6/1/2014	N/A
Projects in SDG&E Service Territory							
Bayfront Substation Transmission Project (ALREADY APPROVED BY THE ISO BOARD IN FEB. 2010)	NERC Category B/C Overloads	2010-2012	Construct a new 230/69kV substation with two 224 MVA transformers; loop in Miguel-Silvergate 230kV line; transfer 69kV line from South Bay to Bayfront substation; reconfigure 138kV lines	\$129.2M	Rebuild South Bay 138/69kV substation in a new location and upgrade individual overloaded facilities; install Special Protection System	12/1/2012	Utilize emergency rating limit for Miguel 230/138kV and Old Town 230/69kV transformers