



SUMMER 2000 ASSESSMENT UPDATE

Provided by
California Independent System Operator (Cal-ISO)
Operations Engineering

SUMMER 2000 CAL-ISO CONTROL AREA LOAD FORECAST & RESOURCE ADEQUACY

The Cal-ISO has developed its load forecast for the 2000 summer season. Based on historical load and temperature data, the load forecast provides the basis for Cal-ISO's summer preparedness activities. The expected system-wide peak load for the 2000 summer season is 46,250 MW¹. Table 1 benchmarks the 2000 load forecast against the actual Cal-ISO system-wide peaks for 1998 and 1999.

With no major resource outages, Operations Engineering estimates that there will be approximately 41,000 MW of available generation capacity internal to the control area. Assuming operating reserves are supplied by internal generation, with an operating reserve requirement of 7%, the in-area generation available to serve load is approximately 38,000 MW. To support the expected summer 2000 peak load without load management, while maintaining minimum operating reserve requirements, the Cal-ISO controlled grid would require a minimum of 8,250 MW of net imports. At present, the availability all major resources in the region looks favorable. Furthermore, it is not anticipated that fuel supply, fuel supply infrastructure, or fuel delivery will impact the availability of resources during peak load periods.

Table 1. Historical & Projected California ISO Peak Loads and Resources

Year	Peak Load	In-Area Generation	Net Imports	Load Curtailment	Date
1998	44,927 MW	37,747 MW	7,180 MW	839 MW	8/3/98
1999	45,884 MW	37,506 MW	8,378 MW	None	7/12/99
2000	46,250 MW	38,000 MW	8,400 MW	NA	NA

As illustrated above, the ability to meet peak load conditions is largely dependent on the availability of internal resources and the ability to import power from outside our control area. Sensitivity load forecasts were also developed in the event that California experiences an extreme hot summer or an extreme cool summer. The extreme hot summer peak forecast is 48,940 MW. There exists a 5-10% probability a peak load level of this magnitude could be experienced. The challenge of meeting an extreme hot summer peak demand is compounded since during extreme hot summer peak conditions, loads throughout the West are also typically higher than expected. This results in a reduction in the availability of power to import into California. For these extreme conditions, we anticipate net imports could be as low as 7,000 MW. Under this worst case scenario, we will

¹ Forecast "Normal" Summer Peak Load

require significant levels of load management. The Cal-ISO will likely be able to manage these load levels with the available interruptible load programs/products.

OTHER SIGNIFICANT CAL-ISO ACTIVITIES FOR SUMMER 2000 PREPAREDNESS

In anticipation of slimmer than normal operating margins, the Cal-ISO initiated a number of projects to address and manage potential adverse system conditions. These projects include:

- Load Participation Products and Plans
- Bay Area Generation Proposals
- Public Awareness Campaign - POWER WATCH 2000
- Contingency Plans
- Operating Studies and Interim Procedures
- Market Impact Analysis
- ISO Applications for System Readiness
- Market Applications
- Periodic Updates to Summer Assessments
- Lessons Learned for Summer 2001

These projects are interdependent and the overall effort will require a coordinated approach to make sure that each project is on schedule and progressing as anticipated. To accomplish this, a Steering Committee was formed under Executive Sponsorship. If it becomes apparent that any individual project is not on schedule, or other unforeseen problems occur, that information will be brought to the Steering Committee to assure that additional resources are committed as needed to bring the project back in line with the overall schedule. There will be close coordination regarding market participant communications and activities associated with these projects.

For summer 2000, the Cal-ISO is proceeding with implementation of two Demand responsiveness programs on a trial basis for the summer of 2000. The first program involves Load participation in the Ancillary Service (Non-Spinning Reserve and Replacement Reserve) and Supplemental Energy markets - the Ancillary Service (A/S) Load Program. The primary aim of this program is to introduce demand responsive products into the California Energy Market. The program also has the added benefit of aiding the development of a truly competitive market where loads have the ability to respond to price signals.

The second program is the Demand Relief Program and involves the payment of Loads, not otherwise participating in another demand reduction program, to curtail when called by the Cal-ISO during Stage 1 System Emergency conditions. The primary objective of this program is to provide the Cal-ISO with additional tools to maintain the reliability of California's transmission network. In return for curtailing the load at their facilities at the request of the Cal-ISO, the participants of this program will receive a fixed price payment based on their approved bids, and an energy payment when called upon.

Both these programs are scheduled to run from June 15, to October 15, 2000, and have been approved by the Cal-ISO Board of Governors. Given below is a summary of the expected participation in the two programs.

Ancillary Service Load Program

- Six bids received, five accepted (subject to certain conditions)
- 118.5 MW – 152.5 MW of Non-Spinning Reserve
- 289.3 MW – 467.5 MW of Replacement Reserve
- 289.3 MW – 467.5 MW of Supplemental Energy
- Currently working with customers to establish telemetry and perform certification

Demand Relief Program

- 68 bids submitted
- 180.25 MW considered acceptable
- Capacity cost of \$26,111,329

We believe that we will successfully negotiate the summer 2000 season and that we are prepared for orderly response to extreme conditions and system contingencies.

CALIFORNIA IMPORT CAPABILITY - THE BIG PICTURE

The 2000 Summer Operating Transfer Capability (OTC) limits for all major interties into California have been submitted by the Cal-ISO, and approved by the Western Systems Coordinating Council (WSCC) OTC Policy Group on May 4, 2000. All associated procedures governing these OTCs have been submitted to the WSCC Operating Procedure Review Group (OPRG) for the 2000 Summer Operating Season, and acceptance is expected prior to June 1, 2000. Overall, the 2000 Summer OTCs have remained relatively constant from the previous summer season, or improved as in the case of SDG&E/CFE Total Import. These studies have been coordinated with the neighboring control areas to ensure a complete and thorough analysis of the bulk transmission system of the WSCC.

For the summer 2000 operating season, it has been determined that the Cal-ISO has sufficient import operating transfer capability (OTC). Table 2 summarizes summer 2000 OTC for major transmission paths. While ample capability to import power exists, it does not imply that resources in neighboring systems will be available to deliver the import power required to meet peak load conditions. The net imports for the summer of 2000 are expected to be in the range of 7,000 to 8,400 MW.

Table 2. 2000 Summer OTC

Path	Summer 2000 OTC	
Path 66 (California-Oregon Intertie)	4,600 MW	(N-S)
Path 65 (Pacific DC Intertie)	3,100 MW	(N-S)
Path 26 (Midway-Vincent)	2,800 MW	(N-S & S-N)
SCIT	13,000 MW	
Maximum SDG&E Import	2,750 MW	3,050 MW
Maximum CFE Import	400 MW	

California – Oregon Intertie (COI)/Northwest-Sierra and Pacific DC Intertie (PDCI)

The COI/NW-Sierra OTC is 4,600 MW, and the PDCI OTC is 3,100 MW for 2000 Summer Operating Season. These ratings have not changed from the previous summer season. However, for the last two years during summer peak conditions, the actual import capability into the Cal-ISO Control Area from the Northwest has been approximately 6,000 MW. These reductions in import capability are due to the stressed system conditions including high Northern California Hydro generation, Midpoint – Summer Lake 500 kV line flow (Oregon-Idaho transmission interface), and the Northern California Area Load. As the California electric grid becomes more stressed, the actual import capability decreases, and limits the ability to import from the Northwest. The planned for worst contingencies are loss of large generating units (two Palo Verde Units, two Diablo Canyon Units, and two Moss Landing Units), and the double-line 500 kV outage of the Table Mountain – Tesla and Table Mountain – Vaca-Dixon 500 kV lines. These contingencies may cause voltage collapse if the system is operated outside the two operating Nomograms, which have been developed to protect the Cal-ISO northern bulk transmission system.

Path 26 (Midway – Vincent)

The Path 26 OTC is 2,800 MW for both North-to-South and South-to-North directions. This rating has not changed for the last year. Recently, Southern California Edison replaced the series capacitors on the Midway – Vincent 500 kV line at the Vincent substation. The worst contingency is the loss of the two Midway – Vincent 500 kV lines in the same corridor. Path 26 is normally not congested during the Summer Operating Season, unlike the Spring Operating Season, and is not expected to be a limiting factor this summer.

Path 15 (Midway – Los Banos)

The Path 15 OTC is 1,275 MW for North-to-South, and ranges from 2800 – 3450 MW for South-to-North depending on the system conditions. These ratings have not changed from the previous summer season, and are not expected to be limiting factors during the Summer Operating Season. The planned for worst contingency is the loss of the double-line outage of the Los Banos – Gates and Los Banos – Midway 500 kV lines. This contingency is mitigated through a Remedial Action Scheme (RAS).

SCIT (Southern California Import Transmission)

The SCIT OTC is 13,000 MW for the Summer Operating Season. This is a slight decrease from the previous summer season. However, during the Summer Operating Season, the actual SCIT flow is normally well below the SCIT OTC due to the limited resources available from the East and additional on-line units in southern California. The actual SCIT operating limit may be reduced to 10,500 MW during summer peak conditions in Southern California in the event that there are adversely high loads in Southern California. The worst contingency is the loss of two San Onofre Nuclear Generating Station (SONGS) units, which may cause voltage collapse in San Diego area if the system is operated outside the SCIT Nomogram. An additional Nomogram has been developed to protect the southern bulk transmission system from voltage collapse.

SDG&E/CFE Total Import

The SDG&E/CFE Total Import OTC is 3,050 MW for the Summer Operating Season. The SDG&E Import OTC is 2,750 MW, and the CFE Import is 408 MW. The SDG&E/CFE Total Import OTC is a substantial increase from the previous summer season. A number of transmission grid improvements and a RAS modification have been made by SDG&E within the last year to increase this OTC. With this increase, SDG&E should be able to serve adverse summer load levels. The worst contingencies are loss of the North Gila – Imperial Valley 500 kV line, the Imperial Valley – Miguel 500 kV line, or the loss of two SONGS units. The resulting Nomogram protects the system against severe thermal overloads and voltage collapse in the SDG&E system.

FORECASTED LOCAL AREA CONDITIONS

The Cal-ISO Operations Engineering team is conducting its analyses of summer 2000 grid conditions. The department performs annual seasonal operating studies and develops procedures for transmission subsystems and/or transmission paths to mitigate system constraints. Operating procedures are reviewed and revised as necessary to reflect system changes, simplify system operation, maximize operational flexibility, improve and maintain system reliability, and minimize operating reliability costs. The following sections summarize Operations Engineering's present assessment and findings, of local area reliability concerns for summer 2000. All analyses described below were conducted using "1-in-5" temperature-based forecasts for peak load.

The status of known constrained "local" areas is summarized below.

Northern California 500/230 kV Transformers

For summer 2000, 500/230 kV transformer loadings at Tracy and Tesla are a concern under normal and/or outage conditions. In recent years, most 500/230 kV transformers in northern California have been heavily loaded during summer peak conditions; flows on the Tracy and Tesla 500/230 kV transformers have exceeded their normal ratings by as much as 5%.

System studies indicate the Tracy transformer loading may approach 950 MVA (112% of its normal 850 MVA rating) under forecasted summer 2000 peak load conditions. With extended unavailability of any major Bay Area generator (G-1), Tracy transformer loadings could reach 970-1,025 MVA (114-121% of its normal rating), and single line outages (such as the Tracy-Tesla 500 kV line) could increase loading of the Tracy transformer to 1,250 MVA (114% of its 1,100 MVA, 30-minute emergency rating). Cal-ISO staff has been working with northern California entities to develop a detailed procedure (*T-134, Tracy 500 kV Transformer Overload Mitigation*) to address these thermal overloads. These procedures include increasing generation that is most effective in reducing the overload. Load management under peak load conditions, when all generation in the area are exhausted, may be required. Up to 580 MW of load management may be required under normal conditions and up to 2,650 MW of load management may be required in the event of a contingency.

Owners of the Tracy transformer are presently investigating the feasibility of implementing a higher short-term rating (i.e. 4-6 hour rating), during peak loading periods. If this analysis indicates the

transformer can be loaded to higher levels for short periods, the probability of requiring load management to mitigate overloads will be greatly reduced.

Tesla 500/230 kV transformer #2 may also experience small thermal overloads (101% of its 1,122 MVA rating) under summer peak load conditions, with all other elements in service. Loss of any major Bay Area generator could increase these loadings to 102-106%. Tesla transformer #2 is expected to remain within 99% of its emergency rating (1,335 MVA, 4-hour rating) for single line outages such as the Tesla-Metcalf 500 kV line. Similar to the process applied to the Tracy transformer, Cal-ISO staff is working with PG&E to address these overloads; load management may be required as an overload mitigation measure. (In contrast, system studies did not show any overloads for the smaller Tesla #4 500/230 kV transformer (940 MVA normal rating) – even for outages of neighboring 500/230 kV transformers.)

Northern California 500/230 kV Transformer Outages

An outage of a 500/230 kV transformer is generally considered a low probability event when compared to other types of contingencies (loss of a generator, loss of a transmission circuit). Nonetheless, transformer outages are studied to recognize the possible consequences to the transmission system and to prepare mitigation and response plans for such events. For severe emergency overloads, quick operator action and load management will be required. All northern California 500 kV transformers banks are constructed as three single-phase units with a fourth spare phase; in the event that a single phase of the transformer is lost, the replacement spare can generally be switched in within 12-24 hours, and the transformer bank restored.

For northern California, 500/230 kV transformer outages can severely impact the remaining 500/230 kV transformers at Tesla, Tracy, and Metcalf substations. A short description of each transformer's risk is provided below. For summer 2000, Cal-ISO Operations Engineering will be working with PG&E and other stakeholders to develop response plans and load management actions for these transformer outages. As part of the PG&E 2001 System Assessment, the Cal-ISO Grid Planning team is working to identify recommended solutions for mitigating these overloads.

Metcalf substation features two 500/230 kV transformers, #11 and #12. In general, these transformers are expected to perform well under normal conditions and most single element outages. However, at peak load conditions, loss of either Metcalf 500/230 kV transformer will severely overload the remaining transformer: loss of Metcalf #11 drives #12 to 123% of its 1,360 MVA 4-hour emergency rating, and loss of Metcalf #12 causes #11 to approach 113% of its 1,455 MVA 4-hour emergency rating. For summer 2000, PG&E is implementing an automation project to shorten the time required to restore a failed Metcalf 500/230 kV transformer (in the event that a single phase of the transformer is lost).

The Tracy transformer would also suffer from outages of neighboring 500/230 kV transformers. An outage of Tesla 500/230 kV transformer #2 could load the Tracy transformer up to 1,230 MVA (112% of its 1,100 MVA, 30-minute emergency rating). For loss of Tesla transformer #4 or Vaca Dixon transformer #11, the Tracy transformer would experience similar overloads (107% and 100% respectively). As noted previously, Cal-ISO staff is working with northern California entities to develop a detailed procedure (*T-134, Tracy 500 kV Transformer Overload Mitigation*), revised ratings, and load management plans to address these overloads.

Tesla 500/230 kV transformer #2 could experience emergency overloads (101% of its 1,335 MVA, 4-hour rating) under summer peak load conditions, for loss of the Tesla transformer #4. Cal-ISO staff will be working with PG&E to address these overloads; load management may be required as an overload mitigation measure.

Greater San Francisco Bay Area (GSFBA)

In general, the Greater San Francisco Bay Area transmission network performs adequately under most normal and emergency conditions. Most reliability concerns in this area center around the 500/230 kV transformers, or outages involving the loss of large Bay Area generators. The remainder of the reliability concerns occur in the sub-transmission networks. These sub-transmission concerns have been discussed in three sub-sections: San Francisco / Peninsula, San Jose, and East Bay.

For summer 2000, the Greater San Francisco Bay Area (alternatively, "the Bay Area") is forecasted to reach a peak load of 8,900 MW (a "1-in-5" temperature-based forecast). By comparison, the Bay Area reached an estimated summer peak of 8,700 MW in 1999. Cal-ISO Operations Engineering has completed an initial screening of voltage and thermal-related concerns for the overall Bay Area and its subtransmission networks: the evaluation considered over 400 single contingencies, 600 "overlapping" outages (generator plus a transmission line), and 100 common towerline (N-2) outages. Continued analysis is being performed to identify and assess any voltage, reactive margin, and/or stability issues.

Recent transmission upgrades to the Greater Bay Area include 225 MVARs of capacitors at San Mateo substation, increased 230/115 kV transformer capacity at Eastshore substation, and increased circuit breaker capacity for the Tesla-Newark 230 kV line. In addition, PG&E has rerated a number of 230 kV transmission lines in the area, and is implementing an automation project to reduce the time required to restore a failed Metcalf 500/230 kV transformer.

As previously discussed, overloads are anticipated for the 500/230 kV transformer banks at Tracy and Tesla under "normal" summer peak conditions, with all lines and generators in service. In contrast to these transformer concerns, the overall Bay Area 230 kV transmission network is expected to generally perform fairly well under both normal and single-element outage conditions.

Unavailability or loss of area generators could weaken the Bay Area. If a Pittsburg Unit 7, Potrero Unit 3, or Moss Landing Unit 6 or 7 were unavailable during peak load conditions, the Bay Area could experience low voltages for outages such as loss of the Tesla-Metcalf 500 kV line, or loss of the Monta Vista capacitors (378 MVAR). Operations Engineering is continuing its studies to develop operator response actions and/or pre-contingency solutions under these conditions. In some cases, pre-contingency load management may be required. We are also evaluating the functionality of the existing Bay Area under-voltage load-shedding scheme. To prevent voltage collapse, this scheme sheds up to 485 MW of load if selected 230 kV voltages at San Mateo, Newark, or Monta Vista reach 212, 215, or 218 kV respectively.

San Francisco / Peninsula Area (GSFBA Subarea)

The San Francisco area (defined by the transmission network north of San Mateo substation) is expected to perform well under summer peak load, for normal conditions (all equipment in service), single-element outages, and even overlapping outages (loss of a line and a generator). It should be noted that the San Francisco / Peninsula Area is subject to the Greater San Francisco Bay Area and 500/230 kV transformer problems described in the previous sections.

Summer 2000 power flow studies were performed with a San Francisco "1-in-5" area load of 940 MW; this is consistent with 1999's real-time observations plus additional load growth. Studies of single transmission element outages north of San Mateo substation did not reveal any significant problems. Studies indicate that for outages of a Potrero or Hunters Point unit, the San Francisco transmission system is expected to perform well even during severe contingencies such as loss of the San Mateo-Martin 230 kV cable. Recent transmission upgrades and generation repairs have contributed to this outcome.

Transmission area upgrades include the addition of a 50 MVAR shunt capacitor bank at Martin substation, 225 MVARs of shunt capacitors at San Mateo substation and the reconductoring of the San Mateo-Martin #3 115 kV line. Recent generation repairs have included rebuilding the boiler for Hunters Point Unit 4.

An outage of the Ravenswood-Cooley Landing #2 115 kV line could potentially overload the 115/60 kV transformer at Cooley Landing to 107% of its emergency rating; Cal-ISO Operations Engineering is working with PG&E to develop a mitigation plan for this overload condition.

An outage of Jefferson 230/60 kV #1 transformer bank severely overloads local 60 kV lines, and essentially islands the Peninsula 60 kV network. Protection devices at Menlo and Martin substations would likely trip by over-current relays, dropping roughly 145 MW of Peninsula load. Similarly, a 230 kV towerline outage (N-2) of the Monta Vista-Jefferson 230 kV lines would result in the same effect. Cal-ISO Operations Engineering is working with PG&E to develop operating instructions and a restoration plan to manage these outage conditions.

A simultaneous outage of Newark-San Mateo and Tesla-Ravenswood 230 kV lines results in small emergency overloads (up to 109%) of the Ravenswood-Ames 115 kV lines. Operating instructions are currently being drafted to manage these resulting line overloads.

San Jose Area (GSFBA Subarea)

The San Jose area is comprised of the 115 kV transmission system between Newark and Metcalf substations. For summer 2000 peak load, this area is expected to reach 1,800 MW. Studies indicate a number of potential overloads for single element (line or transformer) outages. These outages may be aggravated by the unavailability or loss of a certain Bay Area generators. Cal-ISO Operations Engineering will be working with PG&E to develop operating and load management plans to address these concerns.

230/115 kV transformer overloads are a concern for the San Jose area. Under normal conditions (all elements in service), Newark transformer #9 is expected to reach 101% of its normal rating (403 MVA). For an outage of any Newark or Metcalf 230/115 kV transformer, the remaining transformers at that substation can expect to experience up to 114% overloads of the transformers'

emergency ratings. Cal-ISO Operations Engineering will be working with PG&E to develop response plans for these transformer concerns.

East Bay Area (GSFBA Subarea)

The East Bay Area is defined as the 230 kV and 115 kV transmission systems in western Contra Costa and Alameda counties. For summer 2000, the transmission system in this area is expected to perform well under normal (all lines in service) conditions. However, this area exhibits several overload concerns for single line or transformer outages.

For summer 2000, the primary concerns are in the 115 kV transmission corridor linking Moraga, San Leandro, and Oakland "J" substations. For loss of either of the Moraga-Oakland Station J and San Leandro-Oakland Station J 115 kV lines, the alternate transmission line loads to 104-112% of its emergency rating. These overloads could reach up to 115-117% if area generators such as Potrero 3 or Contra Costa Unit 6 or 7 are unavailable during the outage.

Sacramento Valley Area

The "Sacramento Area" is defined as SMUD and the City of Roseville. The projected peak Sacramento Area load for 2000 is 3,090 MW. During summer peak load conditions, the Sacramento Valley area experiences low voltage conditions and could be subject to voltage collapse for various double line outages. The Tracy - Hurley #1 & #2 230 kV lines or the Rancho Seco - Bellota #1 & #2 230 kV lines are the worst-case outages. To protect against voltage collapse, an under-voltage load shedding RAS scheme was put in service in 1996. The amount of load armed to protect against voltage collapse is approximately 300 MW and is reevaluated annually.

The Cal-ISO is working closely with the Sacramento Valley Study Group (SVSG) - which includes PG&E, SMUD, the City of Roseville, CDWR, NCPA, USBR and Lodi - to assess the performance of the local area system, reevaluate the under-voltage load shedding parameters, and to finalize procedures to mitigate voltage problems in the area for the upcoming summer season.

Fresno Area

The expected Fresno Area load for Summer 2000 is 2,800 MW, 120 MW higher than the 1999 summer peak demand of 2,680 MW. Two synchronous condenser units on the PG&E system, McCall Unit #2 and Herndon unit #2 are unavailable for voltage support in the San Joaquin Valley due to damper winding failures. These units are being repaired and have a 50% chance of availability for the latter half of Summer 2000. In anticipation of low operating voltages, PG&E is in the process of installing 150 MVARs of shunt capacitor banks on the 230 kV bus at Gregg Substation located north of Fresno.

PG&E is in the process of changing the taps on all three step-up transformer banks at Helms Pump / Generation Plant, a major source into the Fresno Area, in order to maximize the MVAR output of these generation units. These proactive measures are projected to ensure acceptable voltage levels during normal operating conditions. However, it is expected that for some hydro generation patterns combined with high temperatures, the Fresno Area could experience low voltages and/or

thermal overloads following the loss of a major transmission line (L-1) or generation unit (G-1). Several operating procedures to mitigate normal and post contingency overloads in the Fresno Area are being developed.

The Fresno Area is susceptible to voltage collapse for single transformer (T-1) or multiple equipment outages (N-2). In order to prevent cascading outages, the Fresno transmission network has several Remedial Action Schemes (RAS) all of which are expected to be operational and in-service for summer 2000. One of the RAS schemes arms 171 MW of load in the Fresno area and activates if the voltage drops to 207 kV at the McCall substation. The intent of this scheme is to prevent a complete voltage collapse of the Fresno Area following severe multiple contingencies.

Southern California Edison (SCE) Area

The expected SCE Area load for Summer 2000 is 20,925 MW, 1,703 MW higher than the 1999 summer peak demand of 19,222 MW (Note: 1999 was a mild year for SCE. By comparison, SCE's peak load for 1998 was 19,994 MW). Significant transmission system improvements are in progress for the SCE system. The SCE system will have in operation for the summer 2000 an additional 500/230 kV transformer bank at Serrano substation. The addition of the third 500/230 kV bank at Serrano will eliminate the need to maintain generation in Orange County equal to 15% of Edison's total load when all three banks are in service.

Seventeen additional 230 kV capacitor banks at twelve locations, for a total of 1,346 MVAR, are scheduled to be installed by June 1. The 230 kV shunt capacitor operation will be automatic and coordinated from Edison's Grid Control Center (GCC) with operator override options at the GCC or at the different switching-centers for adverse system conditions.

The SCE main 500 kV and 230 kV transmission systems are projected to be stressed under peak load conditions but well prepared to meet the forecasted demands of summer 2000. The Big Creek and San Joaquin Valley 230 kV systems, and North of Lugo, Antelope-Bailey and Devers-Mirage subtransmission systems are also well prepared for the forecasted conditions. Operations Engineering studies for the summer 2000 are nearly complete. The studies assess system performance and procedures with the planned capacitor additions, reduced RMR unit dispatch, and determine any necessary changes to RAS procedures. Two new interim operating procedures are on schedule to be complete by June 1. One of these new procedures will avoid overloading the Lugo-Serrano 500 kV line for loss of Lugo-Mira Loma 2 & 3, 500 kV lines and the other one will avoid a large voltage dip at the Santiago substation for loss of both San Onofre-Santiago 230 kV lines.

San Diego Gas and Electric (SDG&E) Area

The expected San Diego Area load for Summer 2000 is 4,267 MW, 667 MW higher than the 1999 summer peak demand of 3,600 MW (Note: 1999 was a mild year for San Diego. By comparison, SDG&E's peak load for 1998 was 3,972 MW). The SDG&E South of SONGS (Path 44) re-rate study has been approved by WSCC, and the rating increased from 1,800 MW to 2,200 MW with the 500 kV South West Power Link (SWPL) in service, and from 1,900 MW to 2,400 MW with SWPL out of service. The transmission upgrades required for this rating increase are on schedule for completion in June 2000. The SDG&E/CFE Cross-Trip RAS has been approved by the WSCC

and placed in service. The new Cross-Trip RAS scheme results in an increase in SDG&E import capability. Transmission shunt capacitor installation is in progress for completion in June 2000. These combined system reinforcements result in an increase in SDG&E/CFE import capability from 2,450 MW to 3,050 MW. With all generators and all planned transmission elements in service, SDG&E is positioned to reliably serve adverse forecast load. Nevertheless, preparations for summer include procedures to ensure orderly application of emergency measures in case of outages of transmission elements or generation units, including load management if necessary to maintain adequate reserve margins.