



CALIFORNIA ISO

CAISO 2001/02 Winter Assessment And Summer 2001 Post-season Summary

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Executive Summary

This report was prepared in response to the North American Electric Reliability Council (NERC) request for a Winter Assessment. The report includes forecasted monthly peak demand levels, a resource adequacy assessment, and an assessment of the CAISO transmission system for the 2001/02 winter season.

Demand Forecast

This winter assessment is influenced significantly by a number of factors that began early in the winter of 2000/01. The first of these factors led to the supply deficiencies experienced by the CAISO during the 2000/01 winter season leading to firm load curtailments 7 times between January and May of 2001. The key factors include:

- Extensive use of peaking resources during the 2000 summer season as a result of high loads, and reduced import levels due to below normal hydro conditions in the Pacific Northwest. The extensive use of these peaking resources resulted in several units reaching their maximum allowable emissions limits resulting in units shutting down due to environmental restrictions.
- Reduced levels of Qualifying Facility (QF) generation as a result of these resources not being paid.
- High levels of scheduled and forced outages due to excessive wear and tear during the prior summer season and units scheduled off to install Selective Catalytic Reduction (SCR) systems.

As a result of the widely publicized energy crisis, voluntary conservation, various conservation programs, and a downward trend in economic growth, the overall peak demand requirements for the CAISO Control Area in 2001 were significantly below historic CAISO monthly peak load levels.

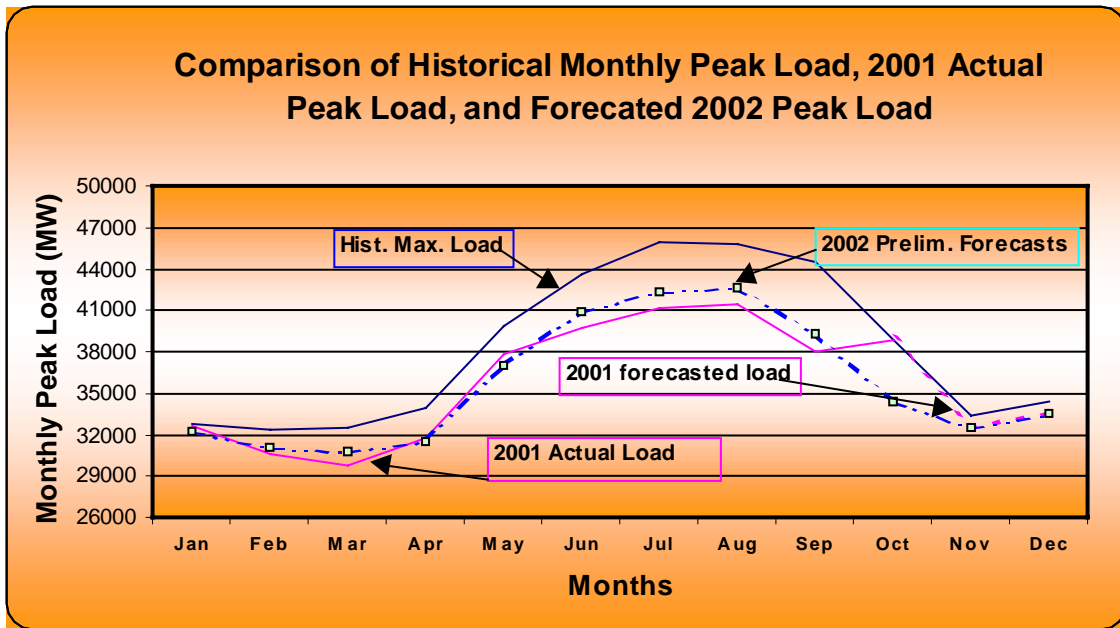


Figure 1: Comparison of Historical Monthly Peak Load, 2001 Actual Peak Load, and Forecasted 2002 Peak Load

Note: The load forecasts were based on a set of economic, demographic and weather assumptions. Actual loads may vary.

The CAISO October 2001 through May 2002 monthly peak load forecasts are based on normal weather patterns and recessionary economic conditions. The CAISO foresees that there will be some lasting effects due to conservation efforts, but anticipates that the magnitude of conservation may decrease over time. As such, the CAISO expects that the forecasted monthly peaks will typically be less than the historical monthly peak load level except under extreme weather conditions. In addition, with the exception of May 2002, the CAISO monthly peak forecasts are greater than monthly peak load levels observed in 2001. Figure 1 compares the historical monthly peak load levels with the 2001 peak load levels and with the CAISO forecasted 2001/02 monthly peak load for normal weather conditions.

Resource Assessment

The combination of reduced load levels, the addition of new generating resources, and the expectation that forced outage rates will be less than the levels observed last year should result in an increase in operating margins during the 2001/02 winter season as compared with the previous winter. An additional 2,231 MW of generating capacity was added to the CAISO's control area as of September 30, 2001. In preparing these forecasts, it is noted that ongoing changes are occurring in the economic situation for the major PTOs in California as well as the overall economic climate in California. Therefore, the increase in operating margins will be somewhat offset by the current poor hydrological conditions.

Table 1 summarizes the forecasted monthly peak load and resource balance for the 2001/02 winter season. This resource adequacy assessment was prepared assuming financial conditions will not have an impact on generation availability. Estimated capacity limitations due to various reasons are explained in detail in the report.

	EXPECTED CAISO CONTROL AREA DEMAND (MW)	Oct-01 (MW)	Nov-01 (MW)	Dec-01 (MW)	Jan-02 (MW)	Feb-02 (MW)	Mar-02 (MW)	Apr-02 (MW)	May-02 (MW)
1	Forecast Peak Load (Oct. 01 through May 02)	34,359	32,524	33,586	32,250	31,090	30,737	31,555	36,970
2	Operating Reserve Requirement	2,062	1,951	2,015	1,935	1,865	1,844	1,893	2,218
3	Estimated Total Control Area Capacity Requirement	36,421	34,475	35,601	34,185	32,955	32,581	33,448	39,188
4	Dependable Total Control Area Capacity <September 2001>	44,291	44,291	44,291	44,291	44,291	44,291	44,291	44,291
5	Capacity Limitations	-10,849	-11,850	-9,963	-11,284	-12,009	-11,924	-11,092	-9,664
6	Estimated Control Area Resources (at Peak)	33,442	32,441	34,328	33,007	32,282	32,367	33,199	34,627
7	EXCESS / DEFICIENCY (BEFORE IMPORTS)	-2,979	-2,034	-1,273	-1,178	-673	-214	-249	-4,561
8	Expected Import	3,000	3,000	2,500	2,500	2,500	2,500	2,500	3,000
9	EXCESS / DEFICIENCY (AFTER IMPORTS)	21	966	1,227	1,322	1,827	2,286	2,251	-1,561

Table 1: Peak Load & Resource Forecast Summary for October 2001 through May 2002

The CAISO anticipates that fuel supply will be adequate given the recent trends in load levels and the addition of new generation. However, the CAISO does not have information detailing whether or not generator owners have firm fuel contracts in place.

CAISO control area resources in the San Diego Gas and Electric service territory have experienced natural gas delivery curtailments which impacted generation capacity levels in past years. Gas curtailment procedures have since been modified and the CAISO does not anticipate natural gas delivery limitations will impact the CAISO's ability to meet peak loads.

The CAISO assumed net imports of 2,500 MW to 3,000 MW during peak load conditions in this analysis. This estimated net import level is lower than actual net import levels observed in prior years. Over the last several years, net imports into the CAISO control area have declined steadily. The CAISO believes the estimated net import level is reasonable given the general downward trend in net imports combined with below normal hydro conditions in the Pacific Northwest.

Based on currently available data (namely planned generator outages), with the possible exception of May 2002, the CAISO anticipates sufficient capacity margins throughout the winter season to account for reasonable deviations in day to day operations barring extremely high forced outage rates or significantly lower net import levels than forecasted. Operating margins for May 2002 are slim with the current level of planned outages, however, the May peak generally occurs late in the month and planned outage levels in May usually decline significantly throughout the month.

Transmission Assessment

The CAISO does not anticipate that transmission constraints will limit our ability to meet system peak loads. Historically, during winter months, actual flows on major transmission paths are well within the operating limits for the path with the exception of Path 15. Historically, Path 15 is often heavily loaded during the winter season and particularly during off-peak hours. Several major new generation additions in Northern California (Sutter, Los Medanos, etc.) will help in minimizing overloads on Path 15. However, depending on actual Pacific Northwest import levels and Northern California hydro levels, potential overloads on Path 15 could occur again this winter as a result of south to north power transfers. Also depending on local generation conditions, Humboldt and the Bay Area may encounter some operating challenges this winter.

I. Peak Load & Resource Forecast Summary

Overall Load and Resources Balance

The Table I-1 provides an itemized breakdown of the expected peak load and resource forecast summary for October 2001 through May 2002. The generation resource forecast is based on historical data, scheduled outages as of September 26, and an estimate of forced or unplanned outages through May 2002.

	EXPECTED CAISO CONTROL AREA DEMAND (MW)	Oct-01 (MW)	Nov-01 (MW)	Dec-01 (MW)	Jan-02 (MW)	Feb-02 (MW)	Mar-02 (MW)	Apr-02 (MW)	May-02 (MW)
1	Forecast Peak Load (Oct. 01 through May 02)	34,359	32,524	33,586	32,250	31,090	30,737	31,555	36,970
2	Operating Reserve Requirement	2,062	1,951	2,015	1,935	1,865	1,844	1,893	2,218
3	<i>Estimated Total Control Area Capacity Requirement</i>	<i>36,421</i>	<i>34,475</i>	<i>35,601</i>	<i>34,185</i>	<i>32,955</i>	<i>32,581</i>	<i>33,448</i>	<i>39,188</i>
CAISO GEN RESOURCES									
4	Dependable Total Control Area Capacity <Sept. 01>	44,291	44,291	44,291	44,291	44,291	44,291	44,291	44,291
5	Accumulative New Gen. addition through Dec. 01	0	757	1,424	1,612	1,612	1,612	1,612	1,612
6	Dynamic Schedules into CAISO	1,604	1,604	1,797	1,481	1,481	1,481	1,857	1,857
7	Planned & Unplanned Scheduled Outages (Thermal)	-4,241	-5,999	-4,972	-6,024	-6,749	-6,664	-6,408	-5,480
8	Estimated Forced Outages (Thermal)	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500	-2,500
9	Estimated Hydro Limitations (Forced & Scheduled)	-4,500	-4,500	-4,500	-4,500	-4,500	-4,500	-4,500	-4,000
10	QF Limitations/Outages	-1,000	-1,000	-1,000	-1,000	-1,000	-1,000	-800	-800
11	Retirements and Limitations	-212	-212	-212	-353	-353	-353	-353	-353
12	<i>Estimated Control Area Resources (at Peak)</i>	<i>33,442</i>	<i>32,441</i>	<i>34,328</i>	<i>33,007</i>	<i>32,282</i>	<i>32,367</i>	<i>33,199</i>	<i>34,627</i>
13	EXCESS / DEFICIENCY (BEFORE IMPORTS)	-2,979	-2,034	-1,273	-1,178	-673	-214	-249	-4,561
14	<i>Expected Import</i>	<i>3,000</i>	<i>3,000</i>	<i>2,500</i>	<i>2,500</i>	<i>2,500</i>	<i>2,500</i>	<i>2,500</i>	<i>3,000</i>
15	EXCESS / DEFICIENCY (AFTER IMPORTS)	21	966	1,227	1,322	1,827	2,286	2,251	-1,561

Table I-1: Peak Load & Resource Forecast Summary for October 2001 through December 2001

Note: For 2002, as shown in Table I-1, there are approximately 40 generating projects totaling 6,490 MW that are in different phases of paralleling to the CAISO control grid. At this time, it's not clear what percentage of this generation capability would be operational prior to May 2002, however it is highly likely that the deficiency shown for May 2002 could be eliminated by new generation, reduction in scheduled outages, high import, etc.

The following notes fully describe the line items given in Table I-1.

1. **Forecast Peak Load** – The forecasted peak load demand including transmission losses. The CAISO cannot accurately predict the peak demand for each month, but was able to estimate the ranges shown in Table III-1 through a statistical estimation method based on historical load levels, economic and weather data.
2. **Operating Reserve Requirement** – Estimated minimum WSCC Operating Reserve Requirement based on the current WSCC criteria. In the CAISO's control area, Operating Reserve as required by WSCC is equal to 5% of the load served by hydro generation and 7% of the load served by thermal generation. At least half of the operating reserve must be spinning reserve. Operating Reserves include:

Regulating Reserve: Generation that is on-line and synchronized with the CAISO controlled grid which can be increased or decreased instantly through automatic generation control (AGC), directly by the ISO EMS. Regulation is used to maintain continuous balancing of resources and load within the CAISO controlled grid as well as maintain frequency during normal operating conditions.

Spinning Reserve: Generation that is on-line and synchronized with the CAISO controlled grid with additional capacity that is capable of delivering additional energy within 10 minutes and supplying that additional energy for at least 2 hours.

Non-Spinning Reserve: Generation that is available but not on-line and that is capable of being synchronized and loaded within 10 minutes and then capable of producing the dispatched energy for at least 2 hours.

3. **Estimated Total Control Area Capacity Requirement** – Sum of the Forecasted Peak Load Demand and the Operating Reserve Requirement.
4. **Dependable Total Control Area Capacity <Sept. 01>** - This is the estimated net dependable generating capacity located within the CAISO control area. Net Dependable Capacity is not obtained by simply summing each resource nameplate capacity. It takes into account Municipal resources, retired or de-rated unit capabilities, capacity factor of wind generation and reduced capacity levels of geothermal resources. This total also includes SCE's share (56%) of Mohave. The remaining portion of Mohave is dynamically scheduled out of the CAISO control area.
5. **Accumulative New Generation Addition through Dec. 01** – All new generating facilities that paralleled to the CAISO control area between March 2001 and the end of September 2001.
6. **Dynamic Schedules into CAISO** – This is the estimated dynamic scheduled capacity into the CAISO Control Area from generating facilities geographically located outside the CAISO control area. The Dynamic Schedules include both IOU and Municipal shares of Palo Verde, Four Corners, and Hoover.
7. **Planned & Unplanned Scheduled Outages (Thermal)** – All thermal unit outages scheduled through the CAISO Outage Coordination Department as of September 26, 2001.
8. **Estimated Forced Outages (Thermal)** – This is an estimation of all unplanned forced thermal unit outages and/or capacity limitations that may occur in real-time.

9. **Estimated Hydro Limitations (Forced & Scheduled)** – This is the expected forced and scheduled hydro capacity limitations based on historical data. Also, on any given day, only a finite amount of water storage (energy) is available for hydro resources.
10. **QF Limitations/Outages** – The average amount of QF generation that is expected to be unavailable from October 2001 through May 2002.
11. **Retirements and Limitations** – Capacity lost due to retirement of units during the forecast period and due to units that are curtailed as a result of environment constraints.
12. **Estimated Control Area Resources (at Peak)** – The estimated resource capacity available to the CAISO control area during peak load periods. The forecasted total available generation capacity includes dynamic schedules and is adjusted for estimated outages and other capacity limitations.
13. **Excess / Deficiency (Before Imports)** – The estimated control area resources less the estimated control area capacity requirement.
14. **Expected Import** – The estimated level of net imports into the CAISO control area that are deemed available (excluding dynamic schedules) based on recent trends of import levels observed.
15. **Excess / Deficiency (After Imports)** - The estimated surplus or deficiency in capacity during peak load period based on the assumptions detailed above. This capacity does not take into account load conservation, demand relief measures, or operating reserve reductions.

Resources

Resource Breakdown for August 7, 2001

The CAISO peak load demand for 2001 was 41,419 MW, which occurred on August 7, 2001 at 16:16. The CAISO was able to secure adequate operating reserves, thus no load curtailment had to be initiated. Figure I-1 is a breakdown of the resources (by type) used to meet the load demand during the day of August 7. Clearly depicted in Figure I-1, the hydro resources were judiciously operated to ensure adequate capacity was available to cover the peak hours. Hydro resources are energy limited, whereby only a finite amount of water storage is available to be converted into energy on any given day.

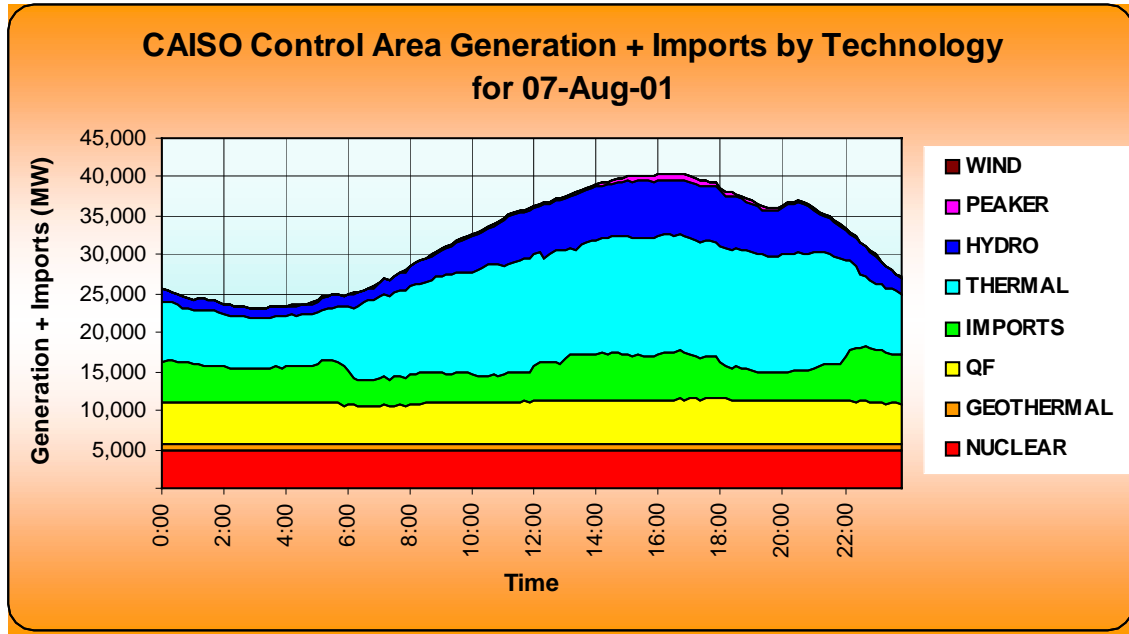


Figure I-1: CAISO Control Area Generation + Imports by Technology for August 7, 2001

Historical Generation

The maximum generation recorded within the CAISO Energy Management System (EMS) from October 1, 2000 through the end of May 2001 was 30,904 MW. This was 1,162 MW lower than the maximum generation recorded during October 1, 1999 through the end of May 2000. The reduction is mainly attributed to the mechanical failures of thermal resources caused by high usage, reduced QF generation levels, and environmental constraints including emission limits of peaking resources. The maximum expected generation within the CAISO from October 1, 2001 through the end of May 2002 is expected to be slightly higher than the 2000 level, primarily due to the new generation additions already on-line.

Available Generating Resources as of September 2001

As shown in Table I-2, the maximum Dependable Generating Capability as of September 30, 2001 is 44,291 MW. The Maximum Dependable Capacity differs from the summation of each resource nameplate capacity. It accounts for Municipal resources, retired or de-rated unit capabilities, capacity factor of wind generation and reduced capacity levels of geothermal resources. Also, the maximum net dependable capacity was not adjusted to account for reduced energy production as a result of generators not receiving payments for supplied energy, environmental restrictions or reduced hydro levels.

Maximum "Dependable" Generating Capacity as of September 2001		MW
1	Maximum CAISO "Dependable Generating Capability – 2001 CAISO Summer Assessment (March 22, 2001)	42,113
2	New Generation Addition (Excluding Wind)	2,164
3	New Wind Generation	67
4	Wind De-rate (80%)	-53
5	Maximum "Dependable" Generating Capability as of September 2001	44,291

Table I-2: Expected Available Resources as of September 2001

The following notes fully describes the line items shown in Table I-2

1. **Maximum “Dependable” Generating Capability** - The Maximum “Dependable” Generating Capability as of March 2001 was 42,113 MW. The derivation and breakdown of the “Dependable “ Capability is outlined in the CAISO 2001 Summer Assessment Report issued on March 22, 2001.
2. **New Generation Addition (Excluding Wind)** – Total non-wind generation additions. A breakdown is shown in Table I-3.
3. **New Wind Generation** – Total new wind generation additions. A breakdown is shown in Table I-3.
4. **Wind Generation Derate** - Based on historical data, an expected unavailability factor of 80% [or 53 MW] is applied due to wind generation's relatively low availability.
5. **Maximum “Dependable” Generating Capacity as of September 2001** – The estimated maximum dependable generation capacity of resources located within the CAISO Control Area excluding capacity of resources dynamically scheduled out of the CAISO Control Area (e.g. it only includes SCE’s share of the Mohave Powerplant). It does not include contractual or ownership rights in resources located outside the CAISO Control Area.

New Generation through September 2001

Within the CAISO control area, the generation capacity additions (through the end of September) totaled approximately 2,231 MW. The CAISO had originally forecasted approximately 3,414 MW of new capacity would be operational by the end of summer 2001. The difference is primarily due to construction delays, and most likely these delayed projects will become operational by the end of the year. Of the new capacity already installed, 1,358 MW is located in NP-15, 553 MW is located in SP-15 and 320 MW is located within ZP-26 zone. Table I-3 provides a list of the new generating facilities and their corresponding capacities that became operational through the end of September 2001. It is expected that the CAISO will have a maximum of 44,291 MW (Table I-2) of “dependable” generating capacity as of September 30.

Facility	Capacity (MW)	Plant Fuel	Coggestion Zone	PTO	Developer
Alliance Drews	40	Natural Gas	SP-15	SCE	Alliance Power
Badlands Landfill Site	2.4	Methane Gas	SP-15	SCE	RCWMD
California Portland Cement	28.5	Coal	SP-15	SCE	California Portland Cement
Century	40	Natural Gas	SP-15	SCE	Alliance Power
Chowchilla Peaker	48.6	Natural Gas	NP-15	PG&E	NEO Corporation
Chula Vista	44	Natural Gas	SP-15	SDG&E	Ramco
Dinuba	12	Natural Gas	NP-15	PG&E	Yankee Energy
Enterprise	49	Natural Gas	SP-15	SDG&E	Cal Peak
Escondido Peaker	44	Natural Gas	SP-15	SDG&E	Ramco
Fresno Cogen	18	Natural Gas	NP-15	PG&E	Fresno Cogen/Wellhead
GWF Hanford Peaker	96	Natural Gas	NP-15	PG&E	GWF Power Systems
Harbor Cogen	17.9	Natural Gas	SP-15	SCE	Harbor Cogen
Indigo Energy 1	45	Natural Gas	SP-15	SCE	Wildflower Energy
Indigo Energy 2-3	90	Natural Gas	SP-15	SCE	Wildflower Energy
Larkspur 1	43	Natural Gas & Oil	SP-15	SDG&E	Wildflower Energy
Larkspur 2	43	Natural Gas & Oil	SP-15	SDG&E	Wildflower Energy
Los Medanos	540	Natural Gas	NP-15	PG&E	Calpine
Madera	26	Bio mass	NP-15	PG&E	Energy Product of Idaho
Mountain View I	44.4	Wind	SP-15	SCE	Seawest
Mountain View II	22.2	Wind	SP-15	SCE	Seawest
Red Bluff Peaker	45	Natural Gas	NP-15	PG&E	NEO Corporation
Proctor & Gamble Unit #4 (SMUD)	44	Natural gas	NP-15	SMUD	Proctor & Gamble Cogen
Soledad	13	Biomass	NP-15	PG&E	Yanke Energy
SPI-Standard	7	Biomass	NP-15	PG&E	Sierra Pacific Industry
Sunrise Power Project	320	Natural Gas	ZP-26	PG&E	Edison Mission Energy
Sutter Power Plant	500	Natural Gas	NP-15	WAPA	Calpine
WES Shasta Energy	8	Biomass	NP-15	PG&E	Wheelabrator Environmental
Total	2,231				

Table I-3: Generation Capacity Additions within the CAISO control area through September 2001

Expected Future Generation

An additional 1,612 MW of new capacity is expected to become operational by the end of 2001 (Table I-4). Approximately 720 MW will be located within NP-15, 794 MW will be located in SP-15, and 98 MW within ZP-26. During 2002, an additional 6,490 MW of new generation capacity is expected to be added based on currently announced plans. This additional generation is in varying phases of development, and it is uncertain how much of this new capacity will become available during the January through May 2002 period. However, it is expected that sufficient new generation will become available such that the projected deficiency for May 2002 (Table I-1) can be avoided.

Facility	Capacity (MW)	Congestion Zone	PTO	Developer	Expected Commercial Date
Applied Energy	49	SP-15	SDG&E	AEI	10/10/01
Applied Energy	49	SP-15	SDG&E	AEI	10/11/01
Applied Energy	49	SP-15	SDG&E	AEI	10/12/01
Border	49	SP-15	SDG&E	Cal Peak	10/17/01
El Cajon	49	SP-15	SDG&E	Cal Peak	11/1/01
Gilroy Peaker 1 & 2	97.4	NP-15	PG&E	Calpine	10/15/01
Gilroy Peaker 3 & 4	48.7	NP-15	PG&E	Calpine	12/15/01
Hanover	49.9	SP-15	SDG&E	Hanover	11/1/01
Herndon Peaker	194	NP-15	PG&E	DG Power	10/1/01
Huntington Beach 3	225	SP-15	SCE	AES	10/15/01
Huntington Beach 4	225	SP-15	SCE	AES	11/15/01
Ione Energy Rower	16.3	NP-15	PG&E	Capitol Power	12/1/01
Kings City	48.7	NP-15	PG&E	Calpine	11/30/01
Midsun Generation Facility	24.5	NP-15	PG&E	Hanover	12/1/01
Midway	49	ZP-26	PG&E	Cal Peak	12/31/01
Mission	49	SP-15	SDG&E	Cal Peak	12/1/01
Panda West 1	49	NP-15	PG&E	Panda West	11/15/01
Panda West 2	49	NP-15	PG&E	Panda West	11/15/01
Panda West 3	49	NP-15	PG&E	Panda West	11/15/01
Panoche	49	NP-15	PG&E	Cal Peak	11/08/01
Vaca-Dixon	49	NP-15	PG&E	Cal Peak	11/26/01
Wellhead/Gates	49	ZP-26	PG&E	Wellhead	11/15/01
Wellhead/Panoche	45	NP-15	PG&E	Wellhead	10/15/01
Total	1,612				

Table I-4: Expected Generation Capacity Additions from September through the end of December

Expected New Generation Forecast for 2002 through 2006

Currently, within the CAISO control area, 112 projects totaling approximately 41,436 MW of capacity have indicated their desire to become operational between 2002 and 2006. Of the forecasted new capacity, 19,442 MW would be located in NP-15, 19,213 MW in SP-15 and 2,910 MW would be located within ZP-26 zone. Table I-5 delineates these projects and their corresponding capacities by PTO's service area or Municipal Utility District service area.

Year	No. of Proj.	PG&E (MW)	SCE (MW)	SDG&E (MW)	MUNI Areas (MW)	Total (MW)	NP15 (MW)	SP15 (MW)	ZP26 (MW)
2002	40	5,321	770	400	0	6,490	4,411	1,298	910
2003	29	3,624	4,898	2,160	550	11,232	2,424	7,608	1,200
2004	31	9,113	7,457	1,636	1,673	19,879	9,386	9,693	800
2005	9	2,161	442	0	1,060	3,663	3,221	442	0
2006	3	0	172	0	0	172	0	172	0
Total	112	21,219	13,739	4,196	3,283	41,436	19,442	19,213	2,910

Table I-5: Proposed New Generation Projects in the CAISO Control Area (2002-2006)

QF Generation

The average expected net dependable QF generation capacity is 5,800 MW (2001 CAISO Summer Assessment). Of this amount approximately 800 to 1,000 MW may not be available during the forecasted period. The QF generation in the fall 2000 and spring 2001 months were significantly less than 5,000 MW, which was primarily due to gas supply issues and non-payment for energy by the PTOs. Since these issues are not expected to be a problem in fall 2001 and spring 2002, the average QF generation recorded for October 1999 through May 2000 was used as the benchmark for this report. Thus, the expected QF generation capacity from October 2001 through March 2002 is 4,800 MW and 5,000 MW for April and May 2002.

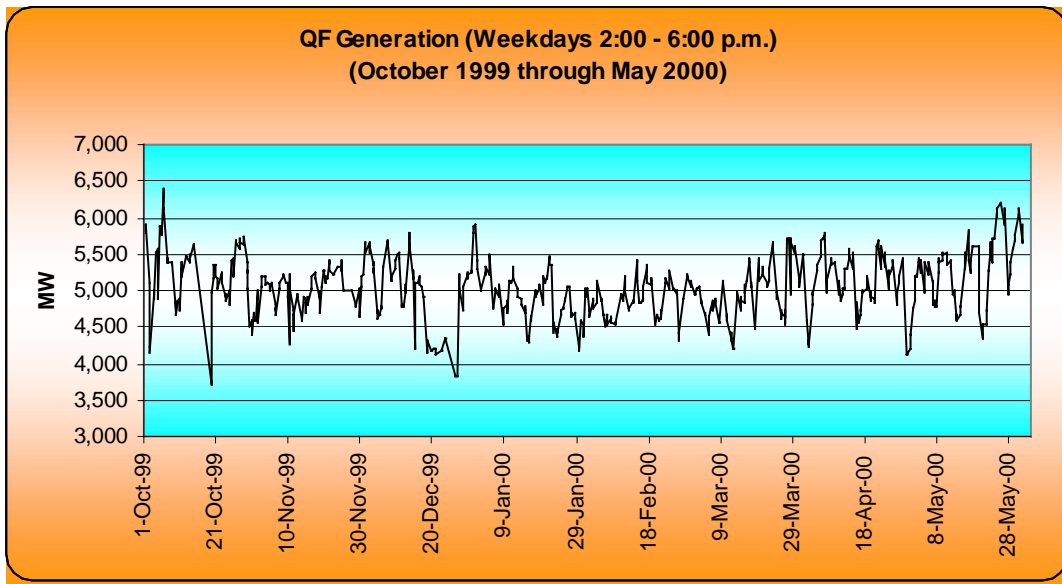


Figure I-2: Weekdays QF Generation Output

Generating Resources Over 30 Years Old

Within the CAISO control area, there is approximately 15,110 MW of thermal generating capacity that was installed prior to 1970. This is approximately 34% of the net dependable generation within the CAISO. Of this amount, 5,370 MW is located within the PG&E's service area, 7,840 MW is located within the SCE's service area and approximately 1,900 MW is located within the SDG&E's service area. With such a high percentage of thermal resources over 30 years old, the CAISO expects that these units will require more frequent maintenance and have a higher forced outage rates as time progresses.

Retirements and Limitations

The CAISO expects that a total of 212 MW of generation will not be available for the rest of 2001 due to environmental constraints. Beginning in January 2002, it is expected that 353 MW of generation will not be available due to environmental issues.

Scheduled & Forced Outage Rates

As of September 26, 2001, between 4,000 and 8,000 MW of generation has been scheduled to be out-of-service from October 2001 through May 2002. These outage levels are expected to increase over the next few months as generating facility owners encounter unplanned outages as a result of mechanical failures or other problems associated with the aforementioned aging facilities. Historically, the CAISO experiences approximately 2,500 MW of forced outages on thermal units at any given time and it is expected that this amount would most likely continue through May 2002.

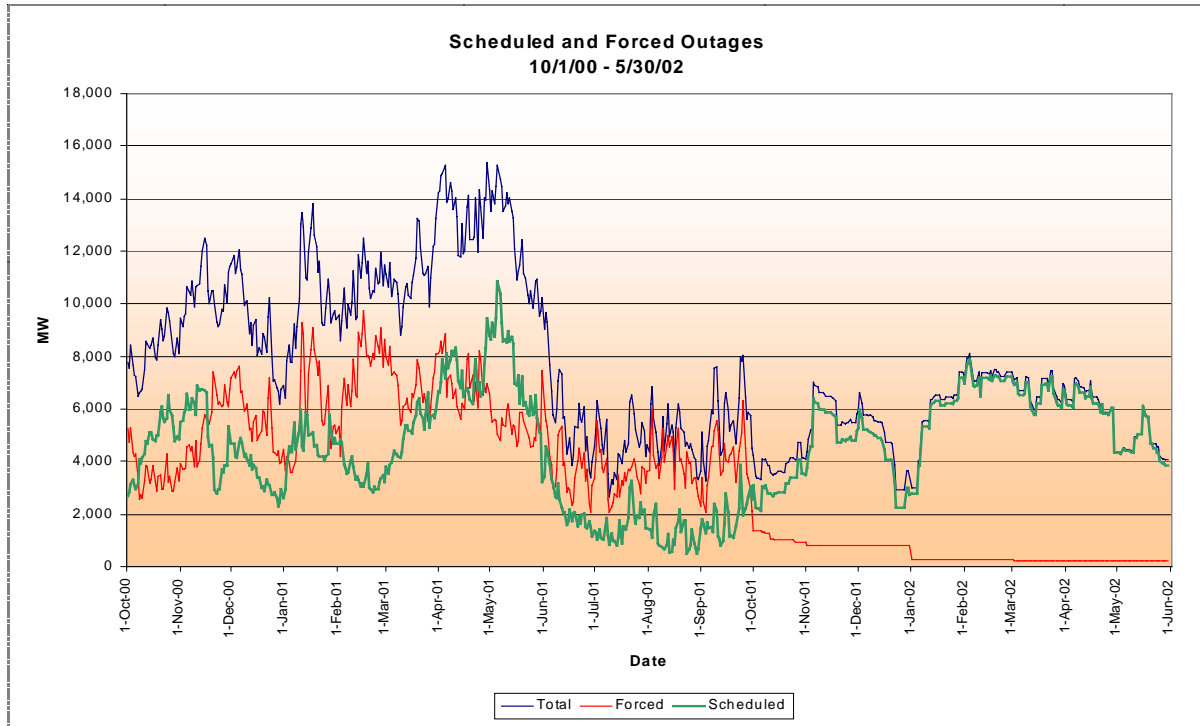


Figure I-3: Planned and Unplanned Generating Scheduled Outages (Thermal and Hydro) as of September 26, 2001

The hydro generation output level varies on a daily basis due to factors such as snow pack conditions, water availability, river system issues and unit outages. Based on the current hydro scheduled outages and the low reservoir storage levels, it is expected that from October 2001 through May 2002 the CAISO will experience approximately 4,500 MW of total hydro capacity limitation including forced and scheduled outages due to maintenance and water constraints. The hydro capacity limitation for May 2002 is estimated to be 500 MW less (4,000 MW) in anticipation of spring runoff.

Breakdown of Existing Generating Resources

Figure I-4 provides a graphical breakdown of the generation capabilities. Major units account for 62% of the capacity while QFs and Agency Units account for 21% and 17% respectively. It should be noted that this capability breakdown is not representative of the actual generation breakdown seen on any given day.

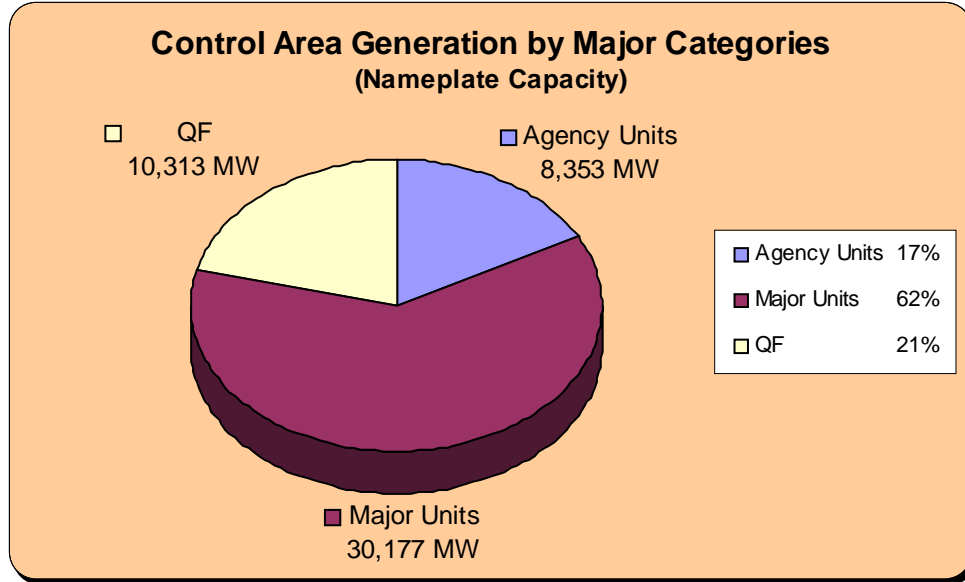


Figure I-4: Generation Breakdown by Major Categories

Figure I-5 provides a graphical breakdown of the generation capabilities by technology. As shown, thermal and hydro generation account for approximately 62% of the generating resources while the remaining 38% is comprised of various other technologies.

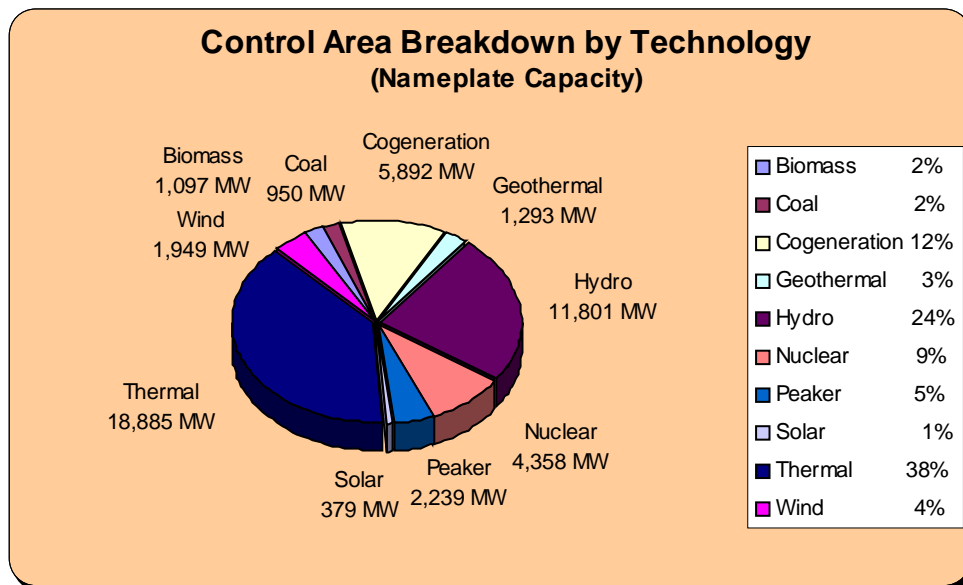


Figure I-5: Control Area Generation Breakdown by Technology

Figure I-6 provides a graphical breakdown of the generation capabilities by congestion zone. As shown, the generation capability in SP-15 is slightly higher than that in NP-15; 48% versus 45%.

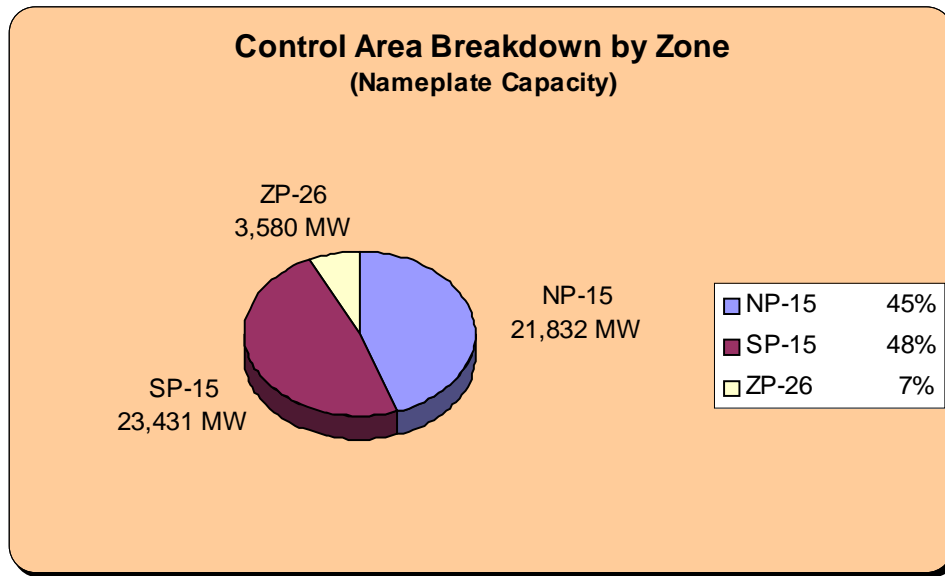


Figure I-6: Control Area Generation Breakdown by Congestion Zone

II. Control Area Net Interchange and Dynamics

The CAISO Control Area is typically a net importer of power during peak load periods. Net import levels during peak load periods have steadily declined over the past several years because generation additions throughout the western US have not kept pace with load growth. Recent low hydro conditions have also contributed to a decline in net imports. Figure II-1 illustrates typical net import levels during the peak load hour over the last three years for May through September. The net import levels shown in Figure II-1 do not include dynamically scheduled resources.

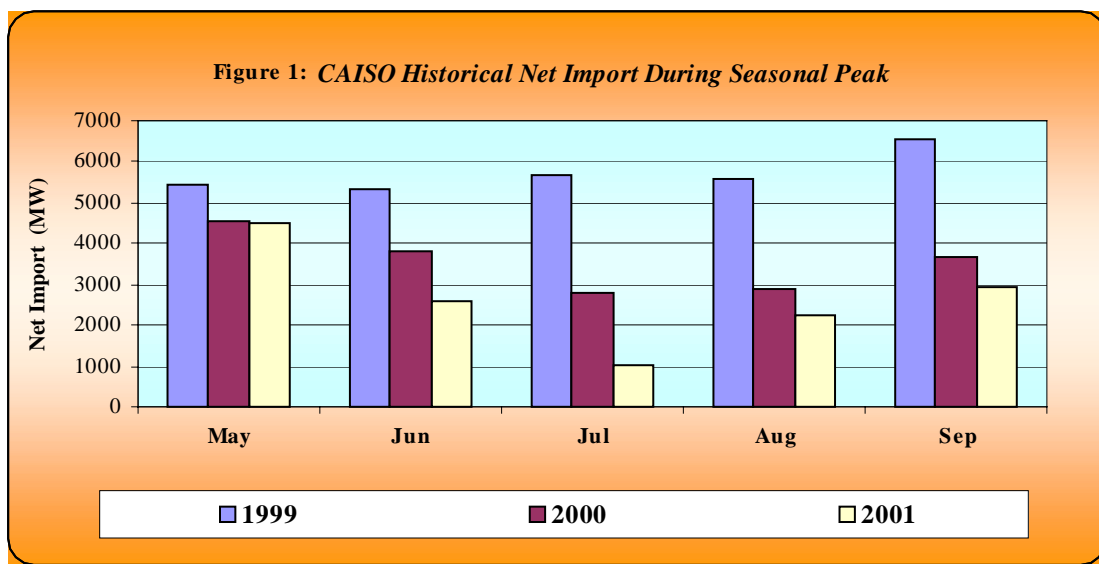


Figure II-1: CAISO Historical Net Import During Seasonal Peak

The CAISO anticipates that net import levels will continue to decline relative to recent years. The CAISO assumed a net import level of 2,500 MW to 3,000 MW under normal conditions in the supply adequacy analysis in Section I. The CAISO does not have any prior knowledge on bi-lateral contracts involving exports out of the control area. At present, the CAISO only receives control area export schedules in the Day-Ahead Market. The forecasted peak hours import level for the 2001/2002 winter months relative to the last two seasons are shown in the Figure II-2. It is important to note that the estimated net import level is based solely on recent historical levels and a downward trend in net imports.

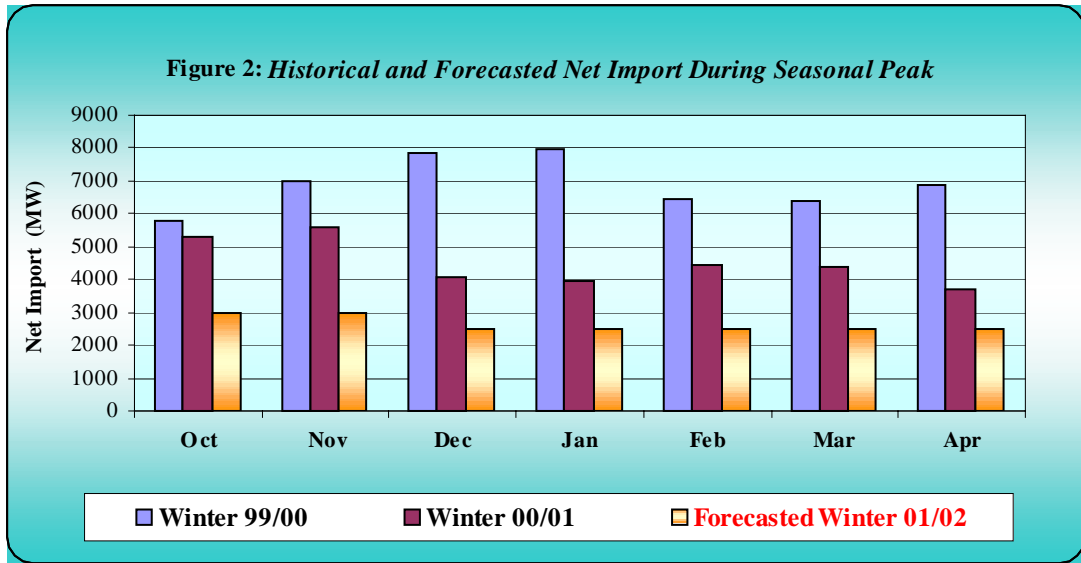


Figure II-2: Historical and Forecast Net Import During Seasonal Peak

Dynamics

Dynamics generally refer to generation resources geographically located in a control area, which are dynamically scheduled by a second and separate control area.

The dynamic schedules into the CAISO Control Area are a combination of the following units:

- SCE's share of Hoover (14.2%) 277 MW
- SCE's share of Four Corners 4 & 5 (48%) 753 MW
- SCE's share of Palo Verde (15.8%) 579 MW
- Metropolitan Water District's share of Hoover (12.7%) 248 MW

III. Control Area Load Forecast

Analysis of 2001 Load Levels

In California, the general load characteristics and the energy consumption pattern in 2001 represent a significant departure from recent historic trends. Peak load levels and overall energy consumption in 2001 are running significantly lower than levels observed over the last several years. Figure III-1 shows the monthly percentage reduction in monthly peak load in 2001 relative to 2000.

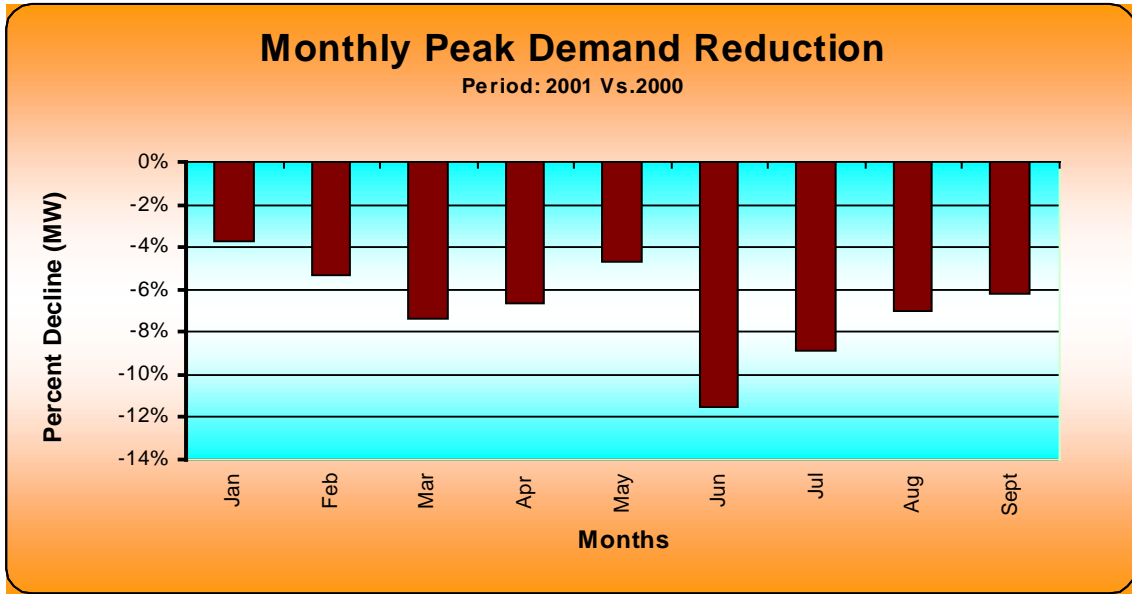


Figure III-1: Monthly Peak Load Reduction

Conservation, the overall economic slow down, greater public awareness during resource deficiencies, rate increases, and psychological factors associated with potential blackouts have all played major roles in determining the 2001 demand. The CAISO does not attempt to quantify the magnitude of reductions in load levels attributable to each of the factors noted.

Figure III-2 shows the actual daily maximum loads of 2001 as compared to daily maximum loads of 2000. On average, peak load levels in 2001 were approximately 7% less than the levels observed in 2000 without any adjustments for weather conditions or load growth.

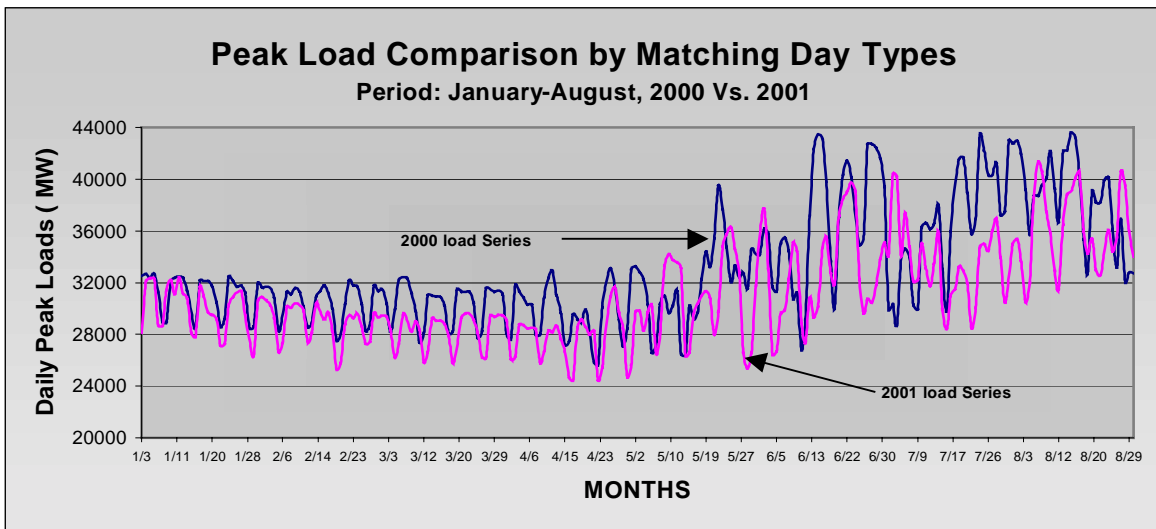


Figure III-2: Peak Load Comparison by Matching Day Types

Figure III-3 shows the maximum weighted average summer month temperatures in the CAISO service area at the time of daily peak based on the load forecasting model developed by the CAISO. Weighting factors were applied to account for location, climate, and population density. The 2001 summer season has been represented as a “mild” summer in several news articles. However, the CAISO analysis and modeling of load and weather conditions indicate that 2001

summer weather conditions were representative of normal summer conditions for the State as a whole with the exception of May 2001, which was much hotter than normal.

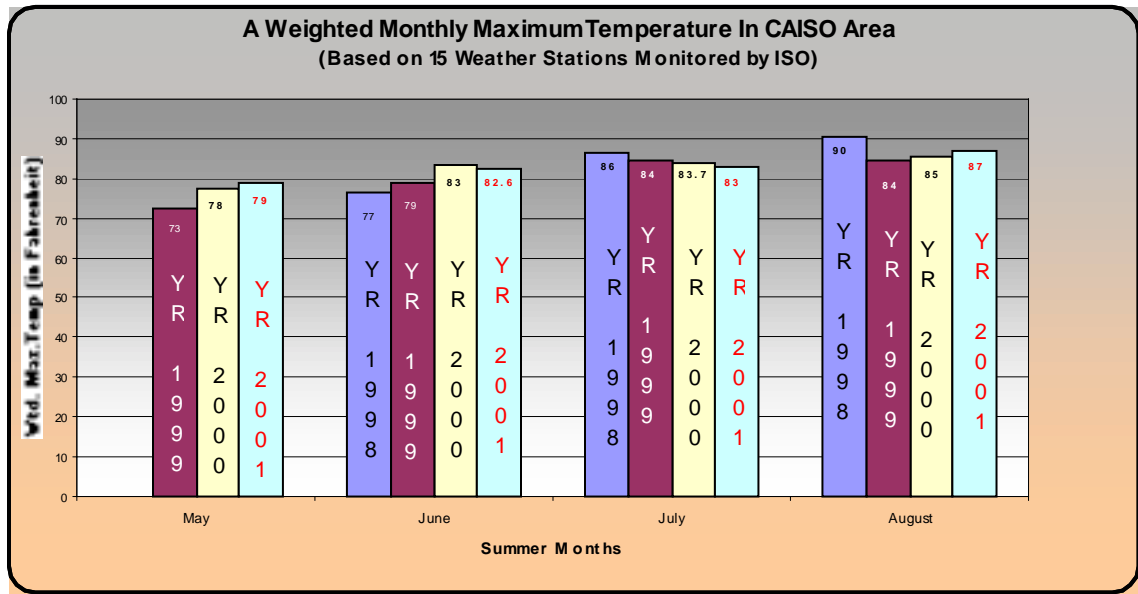


Figure III-3: A Weighted Monthly Maximum Temperature in CAISO Control Area

The National Climatic Data Center (NCDC) estimated a 0.5 °F lower average temperature for the month of July 2001 as compared to a ten year average temperature for the State of California. July 2001 was cooler than any July temperature since the inception of CAISO. The NCDC data shows that the statewide average temperature in May 2001 was 7.3 °F warmer than the 1895-2001 average temperature, the warmest May in 107 years. The average temperature in June 2001 was 1.9 °F warmer than the ten-year average temperature. According to NCDC, the average temperature in August 2001 was 1.1 °F warmer than the 1895-2001 average temperature.

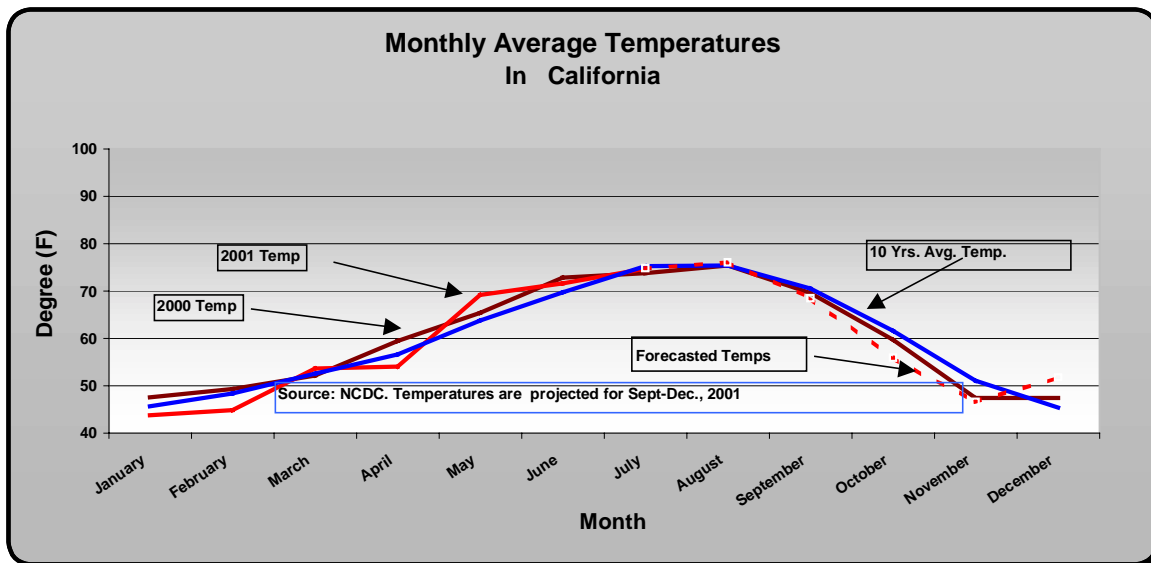


Figure III-4: Monthly Average Temperatures in California

The monthly average temperature chart (Figure III-4) derived from NCDC data displays monthly average temperatures for the year 2000, 2001 and the ten-year average for a comparative analysis. Figure III-4 also includes predicted average temperatures for the month of September through December of 2001 based on the NCDC trend analysis model derived from 107 years of temperature data for the State of California. According to the NCDC trend analysis, the Fall 2001 is likely to be cooler than normal, whereas the winter season may be slightly warmer than normal. It is not apparent from the weather statistics that the summer 2001 was cooler than normal. This analysis does not account for the differences in temperature variation in local areas.

The 2002 monthly peak load forecasts are based on average maximum weather patterns and recessionary economic conditions. However, during the summer months load varies significantly with temperature variations due to air conditioning loads. Generally speaking, CAISO Control Area daily peak loads during the fall and winter seasons do not vary significantly with changes in temperature. But, an abnormally high temperature during the fall season could increase loads significantly (e.g. daily peak temperatures in the first week of October 2001 rose to a twenty year record level – see discussion below). The CAISO does not anticipate that 2002 monthly peaks will exceed historic peak load levels except under extreme summer weather scenarios.

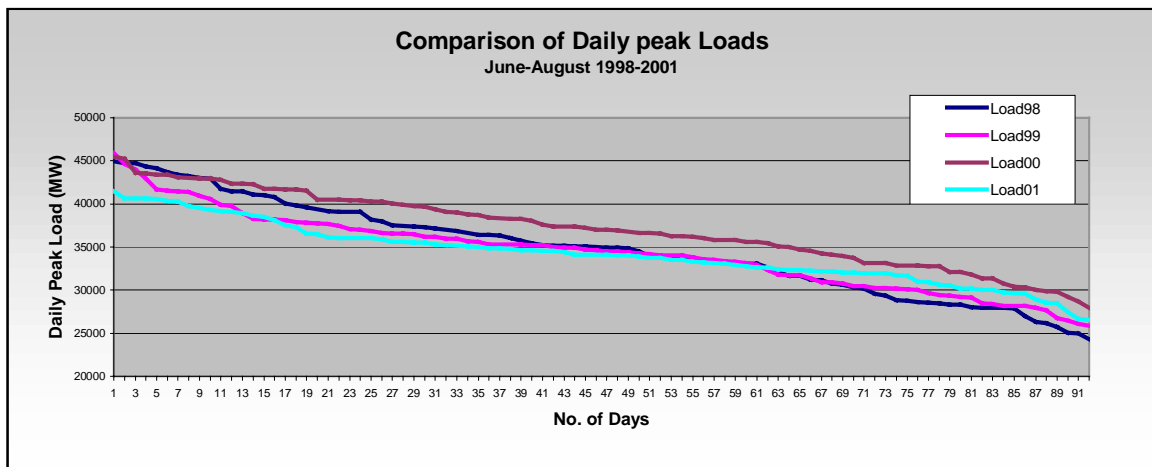


Figure III-5: Comparison of Daily Peak Loads

Figure III-5 compares the daily peak loads during June, July and August for the years 1998 through 2001. The 2001 summer peak was 41,419 MW and occurred on August 7, 2001. As shown, 2001 had the fewest days of peak loads above 35,000 MW. During this three-month period in 2001, there were only 39 days in 2001 when peak load exceeded 35,000 MW as compared to 64 days in 2000. There were only 7 days when the peak load exceeded 40,000 MW, as compared to 27 days in 2000.

2001/02 Winter Peak Load Forecasts

Electricity, being a derived demand, is influenced by various factors. It is difficult to break down the magnitude of reduced load levels attributable to any one of the major contributing factors. Recent energy related events, declining trends in economic conditions, and the widely publicized energy crisis in California have introduced a great deal of uncertainty in long range load forecasting. A baseline load forecast was developed using a set of weighted average weather conditions where weather stations were assigned differentiated weights based on location in the CAISO territory. Given the uncertainty in predicting demand-determining factors such as weather patterns, conservation efforts and economic outlooks, the actual load in any given period can vary significantly. Thus, a range forecast for the expected load is more meaningful. The range forecast is based on a statistical tolerance interval estimation technique. The CAISO believes that

there is a 95% probability that the actual monthly peak would likely to fall within the estimated range under the assumed recessionary economic and weather conditions. This forecast is presented in Table III-1.

Month	Preliminary Peak Load Forecasts (MW)			Historical Peak Load (1998-2001) (MW)	
	Low Case	Base Case	High Case	Avg. Peak Load (1998-2001)	Historical Maximum (1998-2001)
October, 2001	31,594	34,359	37,123	36,625	38,806
November, 2001	31,227	32,524	33,820	32,348	33,338
December, 2001	32,402	33,586	34,770	33,937	34,432
January, 2002	30,814	32,250	33,686	32,262	32,744
February, 2002	29,413	31,090	32,767	31,536	32,394
March, 2002	29,378	30,737	32,096	31,159	32,552
April, 2002	30,144	31,555	32,966	32,285	33,911
May, 2002	34,446	36,970	39,493	37,438	39,808

Table III-1: Preliminary Peak Load Forecasts for CAISO Service Area

Note: Load forecasts are estimated figures derived from outputs of several complex polynomial statistical models and exogenous sets of economic, weather, and market conditions. Monthly actual loads are likely to vary from the estimates should there be any change in the assumptions and institutional factors that are external to the forecasting models, but are the conditional constraints in the load forecasting efforts.

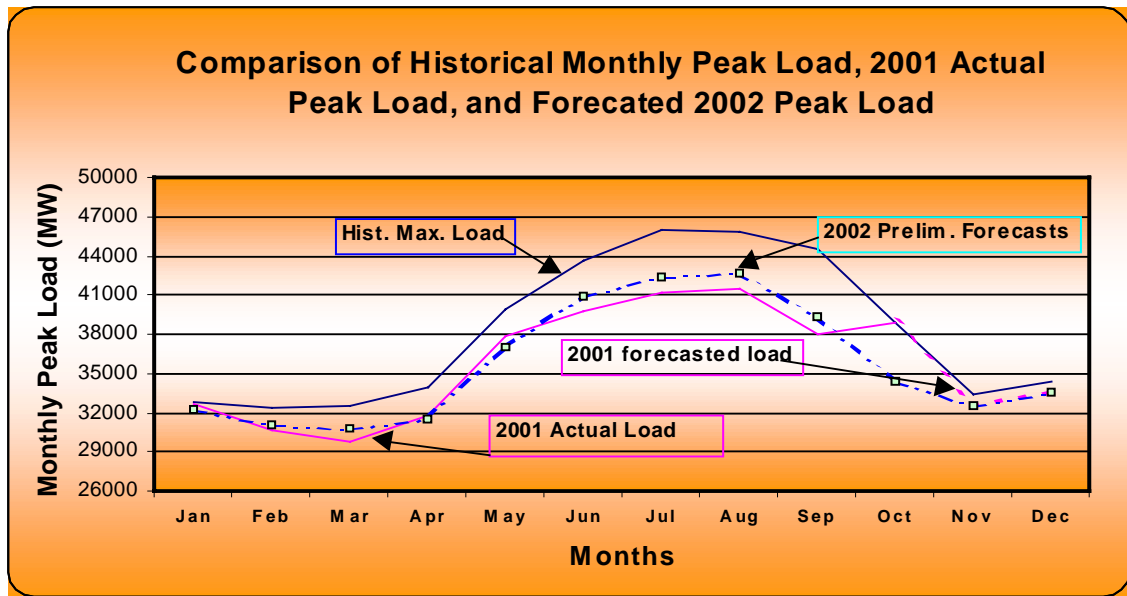


Figure III-6: Comparison of Historical Monthly Peak Load, 2001 Actual Peak Load, and Forecasted 2002 Peak Load

Figure III-6 represents the historical maximum monthly peak loads for CAISO during the 1998-2001 period, the 2001 monthly actual plus forecasted loads and the preliminary load forecasts for 2002. The preliminary system peak load for 2002 under the base case is expected to be 42,640 MW, which is about 3% higher than that of 2001, but 7.6% lower than that of the CAISO system's maximum peak. The historic peak was 45,884 MW and occurred in July 1999.

The long-range base peak load forecasting model used by the CAISO is predicated on the assumption of average temperature conditions existing in the forecast period. There is no statistical basis for assuming other than normal temperatures. However, loads are known to vary with temperature, and a statistical relationship for temperature versus peak load variation has been developed which indicates that the peak load will increase above the forecasted base peak load by 2.5 percent for every 10 percent increase in temperature above the normal temperature. The statistical relationship is defined as follows:

Temperature Adjusted Base Peak Load = (Forecast Base Peak Load)*(1 + Temperature Adjustment Factor).

The temperature adjustment factor is a product of the load adjustment coefficient (2.5%) multiplied by one-tenth of the percent deviation of weighted maximum peak hour temperature from the normal temperature.

For example, the October 1, 2001 peak load (38,806 MW) was the result of an unseasonably extreme heat wave that produced the weighted maximum temperature of 94 °F for the CAISO service area as compared to a ten-year average of 62 °F temperature for the month of October. The temperature adjusted forecasted base peak load as calculated by this relationship is 38,792 MW (34,359 X (1+0.12903)) which is within 0.9996% of the peak load recorded for October 2001.

Some of the factors (namely, the California 20/20 conservation program, energy efficiency policies, rate increases, and slow economic growth, noted above) are likely to have some continuing effects on system loads. However, the magnitude of conservation may diminish as the publicity surrounding the energy crisis wanes. In order to address the various elements of uncertainties, we believe that high and low sensitivity cases should be evaluated. The CAISO does not expect 2002 peak load levels to exceed the historic monthly peak levels of the last several years except possibly under extreme weather conditions. However, we expect that 2002 monthly peak loads will likely exceed 2001 monthly peak levels with the exception of May, as May 2001 was extremely hot relative to historic weather conditions.

IV. Load Reduction Programs

The ISO has historically had available about 2800 MW of load in interruptible programs which could be shed during emergency conditions to offset resource deficiencies. Heavy utilization of this interruptible load during the summer 2000 period reduced customer interest and participation in these programs such that by the beginning of 2001, only about 1600 MW of interruptible load remained. Continued heavy utilization of these interruptible loads during the early part of 2001 has exhausted the utilization limit of a significant portion of the interruptible load.

Through the remainder of 2001, only about 799 MW of interruptible load remains accessible in real-time under emergency conditions. In addition to this interruptible load, about 74 MW of emergency back-up generation is available to be brought on-line in real-time if and when the CAISO initiates firm load interruptions within the Control Area. All of this interruptible load and emergency back-up generation which remains in 2001 exists in the Southern California services areas of SCE and SDG&E. However, the majority of the interruptible capacity (about 750 MW) will only be useable for seven events during the remainder of the year.

There also exists about 40 to 120 MW of additional load under optional curtailment programs which may be available to assist in offsetting resource deficiencies. The load reduction available under these optional curtailment programs is distributed over the entire CAISO control area. However, the load in these optional curtailment programs must be scheduled for reduction in the day ahead time frame based on forecasts of emergency conditions in the following operating day and cannot be triggered in real time. Thus, this additional load reduction will only be of benefit in offsetting resource deficiencies in situations where the CAISO can reasonably forecast the potential for a resource deficiency in the next operating day.

The above level of load reduction is expected to remain available through May 2002. However, the level of additional interruptible load which may become available in January remains uncertain. The interruptible program offered through PG&E returns to usable status in January 2002. However, this program allows an opt-out option during the November 2001 time period where customers can select whether or not to remain in the programs during the following year. It is unclear at this time as to the number of customers, and the associated MW, that may opt-out of this interruptible program and thus may not be available in 2002. It has been estimated that the program may lose as much as 60% of the existing customers.

V. Environmental Issues

In early 2001, California was experiencing a severe electric supply deficiency. This deficiency was driven by an extensive number of generator maintenance outages, and other limitations. The growth of electric demand outside of the state and drought conditions in the Northwest also reduced the imports into California well below normal levels. These conditions resulted in an increased dependence on the energy produced by both base load and gas-fired peaking generators inside the State. Numerous generators were also scheduled out during the winter 2000/01 season to install SCR systems. The number of units scheduled out for SCR system installations during the winter 2001/02 is significantly less than last year.

All power plants in California are required to operate in accordance with strict air quality environmental regulations. These regulations are primarily for Nitrogen Oxide (NOx) emissions and limit the number of annual operating hours of most thermal generators in the State. As a result of the supply deficiencies during the winter 2000/01 period, low QF generation levels, and poor hydro conditions, peaking resources were dispatched to prevent curtailing firm load. This emergency situation minimized the immediate problem of load curtailments, but resulted in exhausting the allowable air emission credits for many of the peaking units.

The CAISO is working with the California Air Resource Board (CARB), California Energy Commission (CEC), Environmental Protection Agency (EPA), local Air Pollution Control Districts (APCD's), and plant owners to improve coordination of activities impacting environmental issues. The objective of this effort was to develop mechanisms, interim rules, and regulations to temporarily relax or remove some of the constraining environmental restrictions that would force some of the power plants in the State to shut down. These actions were specifically designed to permit maximum availability of these resources to reduce the number and duration of rolling blackouts which could be experienced the rest of the year.

Also, as part of the process to improve air quality concerns in the State, several of the large power plants were scheduled to be out of service for extended periods in 2001 to install emissions control equipment. This equipment greatly reduces the emissions output of the plant, but the extended outages associated with installing the new equipment partly contributed to the supply deficiencies that occurred during the winter 2000/01 season. The CAISO, CEC, CARB, local APCD's and plant owners collaborated to develop a revised coordinated outage schedule that ensures that the equipment will be installed as soon as possible, but with maximum availability of these resources. A coordinated effort on behalf of the agencies noted above will

result in reducing the likelihood that supply deficiencies will occur similar to that experienced during the winter 2000/01 season.

Further collaboration between the power plant owners, the environmental agencies and the CAISO can possibly give advance warning to prevent unforeseen plant shutdowns due to environmental reasons. Currently, the CAISO does not monitor generator environmental constraints and the power plant owners or environmental agencies are not obligated to provide this information. Certain power system emergencies and rolling blackouts may be averted with this advance information.

V. Transmission System Assessment

Bulk Transmission Operating Transfer Capability

In WSCC, Operating Transfer Capability (OTC) limits are established on a seasonal basis through a process administered by the WSCC OTC Policy Group. The critical paths in the California-Mexico (CA-MX) sub-region and in the 2001/02 winter Operating Transfer Capabilities are:

- COI – 4,350 MW North-to-South and 3,675 MW South-to-North
- PDCI – 3,100 MW North-to-South and 3,100 MW South-to-North (2,200 MW Scheduling Limit)
- SCIT – 13,600 MW
- Path 26 – 3,000 MW bi-directional
- Path 15 – 3,950 South-to-North
- Path 45 (408 MW North-to-South, 800 MW South-to-North²)

The COI, PDCI and SCIT OTCs limit imports into the CA-MX sub-region. Path 45 OTC limits transfers between SDG&E and CFE in Mexico. Path 15 OTC limits South-to-North flow within the PG&E area while the Path 26 OTC limits flow on the Midway-Vincent Lines (between SCE and PG&E Areas). The CAISO expects most of these OTCs to be adequate for the anticipated import level during the 2001/02 winter peak.

Due to recent reductions in the Aluminum manufacturing in the Pacific Northwest, the scheduling capability of the PDCI in the South-to-North direction has been reduced from 3,100 MW to 2,200 MW. The reason for the reduction is that the PDCI capability is dependent on protection schemes which interrupt the manufacturing load in the Pacific Northwest to control intertie transfers. This reduction could affect the Northern California load serving capability under certain conditions if there are constraints on Path 15 in the South-to-North direction. The PDCI is used to circulate power from Southern California to Northern California to control Path 15 flow.

The Path 15 capability has been increased by 596 MW from the 2000/01 winter capability. Even with this increase, Path 15 mitigation is expected to continue in real-time operations. With the low levels of hydro availability in both the Pacific Northwest and Northern California, and any potential de-rates on Path 15 due to equipment outages, Path 15 mitigation could be significant this winter operating season.

CFE and SDG&E upgraded the Imperial Valley–La Rosita 230KV circuit for the 2001/02 winter operating season. WSCC approved the South-to-North non-simultaneous rating of 800 MW. Operating studies are currently undergoing, and revised operating procedures will be in place for winter operation.

² The increased rating from 408 to 800 MW, South-to-North, is awaiting approval from WSCC. Approval expected in November, 2001

Forecasted Local Area Grid Conditions

The CAISO Operations Engineering team continues to analyze the seasonal grid conditions for local areas, and update operating procedures (as needed) to address special seasonal conditions, constraints, and/or recent changes in the local area systems. Operating procedures are reviewed and revised with the objective of improving system reliability, minimizing the complexity of operation, maximizing operational flexibility and minimizing operating costs. The winter 2001/02 status for known constrained areas is summarized below.

In general, the local subsystems of the ISO grid are facing two challenges for the winter season: 1) scheduled outages of transmission elements to accommodate new construction, and 2) the recent upsurge of new generation and its accompanying congestion. In some cases these two challenges are inter-related, with the generation being constructed faster than the transmission system can be reinforced. In many instances, these obstacles can be overcome through higher winter-based transmission line ratings and lower loads (California is predominantly a summer-peaking area; furthermore, the recent energy crisis has resulted in significant conservation). However, it should be noted that especially within local systems, low loads can actually contribute to more frequent and higher levels of transmission congestion.

Northern California 500/230 kV Transformation

It is not anticipated that the CAISO will experience any 500/230 kV transformation limitations in the northern California region during the 2001/02 winter operating season. Construction work is expected through this season to finish the installation of Tesla 500/230 kV, 1,122 MVA transformer #6 (overdue from its originally-estimated 6/1/01 completion date due to transformer failure), and to begin the installation of the Metcalf 500/230 kV, 1,120 MVA transformer #13 (expected 6/1/02). In addition, the Western Area Power Administration (WAPA) will begin work to install a second new Tracy 500/230 kV, 850 MVA transformer (expected 5/02).

Humboldt Area

The Humboldt Area is a winter peaking area and is fast approaching its import capability. Humboldt faces stability, voltage collapse, and thermal overload issues. These problems are compounded by the age and availability of existing thermal generation, scheduled generator maintenance outages, and potential shortages or limitations of fuel (natural gas, oil). ISO and PG&E continue to explore automatic switching and high speed protection schemes to alleviate some of the low voltage and stability concerns. PG&E completed an upgrade of the high-speed 115 kV transmission line protection in October 2001.

San Francisco and the Bay Area

For winter 2001/02, the local San Francisco Peninsula area will be facing some new reliability challenges. San Francisco tends to be a winter peaking area, and winter peak loads could reach 950 MW or more under extreme temperatures. The area has benefited from some recent transmission/generation upgrades, including:

- 200 MVar capacitor bank at Martin substation
- Hunters Point Units 2 and 3 converted to synchronous condensers (160 MVar total)

The San Francisco system also remains dependent upon local generation at Hunters Point and Potrero Power Plants. For winter 2001/02, San Francisco generation is facing two primary issues: 1) a 10 week scheduled maintenance outage of Hunters Point 4 (160 MW), and 2) exhaustion or severe limitation of allowable run-times on SF's four combustion turbines (50 MW each). In this sense, the state of the SF system is slightly weakened from, previous winters. As a preventative measure during this season to guard against the potential of a larger outage, PG&E

has installed a remedial action scheme (RAS) to initiate the tripping of selected firm load under severe contingency scenarios.

The winter 2001/02 outlook for the Greater San Francisco Bay Area (the Bay Area) is slightly better than that of the San Francisco Peninsula area. The Bay Area is a summer peaking area. While the all-time summer peak demand exceeded 9,000 MW, peak loads for winter 2001/02 are generally not expected to exceed 7,000 MW. However, the winter season also brings additional transmission clearances and generator outages/overhauls, heightening the importance of proper outage coordination. For winter 2001/02, the Bay Area is undergoing a number of 115 kV and 230kV transmission line reinforcements to accommodate the new generation output of the Los Medanos Energy Center (540 MW, completed September 2001) and the Delta Energy Center (880 MW, expected April 2002). Also anticipated is the addition of the Gilroy Peaker Project (290 MW, March 2002). All these projects face transmission congestion, which can be especially pronounced as local area transmission lines are scheduled out-of-service for reinforcement.

Sacramento Valley Area

No major problems are anticipated in the Sacramento Valley Area.

Fresno Area

No significant thermal overloads or under-voltage problems are anticipated for the Fresno Area, since load levels significantly drop during the winter months. Like the Bay Area, the winter season also brings additional transmission clearances and generator outages/overhauls, heightening the importance of proper outage coordination. The Fresno Area is also dependent upon a large amount of hydroelectric generation, and low water levels typically limit this generation's winter output. For winter 2001/02, a number of 115 kV transmission line reinforcements are required in the Fresno Area, in preparation for Summer 2002. This reinforcement work is also needed to help accommodate the output of multiple new Fresno generation projects (recent addition of at least six new gas turbines, 20-50 MW each).

Southern California Edison (SCE) Area

Except for the Big Creek and North of Lugo corridors where generation in excess of load may result in higher power flows, the winter load conditions are typically less critical than the summer peak load conditions for the LA basin area. With the return of the Serrano 500/230 kV transformer # 3, which was taken out of service for investigation as a precaution following the failure of the Mira Loma #3 500/230 kV transformer (of the same design) last November, the load carrying capability of the Serrano 500/230 kV bulk power station and the reliability of the 230 kV system in Orange County are significantly improved. In addition, a new 500/230 kV transformer is expected to be placed in service this fall at the Mira Loma 500/230 kV Substation, replacing the previously damaged one. This new transformer will add additional transformer capacity to Mira Loma, which is located in the eastern area of the LA basin.

During low load and high import conditions, the LA basin may experience low system voltages, particularly in the western area, for certain critical double contingencies. With the addition of 1,275 MVar of shunt capacitors last year, the need for on-line generation for voltage support is greatly reduced. In the Big Creek and North of Lugo corridors where potential thermal loading and stability problems exist under contingency conditions due to excess generation, there are existing remedial action schemes (RAS) already in place to mitigate previously identified system problems. Note that these two 230 kV corridors are radially connected to SCE's main transmission grid in the north and northeast.

San Diego Gas & Electric (SDG&E) Area

The Imperial Valley-Rosita 230 kV line to CFE Mexico is being upgraded. Once the upgrade is completed, the rating for Path 45 can be increased from 408 MW to 800 MW from South-to-North (CFE to SDG&E). SDG&E has applied to WSSC for an approval of the increased rating of Path 45 in the South-to-North direction. Completion of the upgrade work and the WSSC approval are expected in November 2001. The South-of-Songs import limit has increased from 2,400 MW to 2,500 MW with any section of SWPL out. Also, the total import into SDG&E Area (not counting exports to CFE) can be increased from 2,750 MW to 2,850 MW if necessary. These upgrades will allow more imports into SDG&E Area than last winter, if necessary. No other major upgrades are anticipated this winter.