5 Inter-Zonal Congestion Management Market

5.1 Summary of 2006 Inter-Zonal Congestion Management Market

5.1.1 Overview

Under the current zonal model, the CAISO manages congestion in the forward market only on major inter-ties and two large internal paths (Path 15 and Path 26). It uses adjustment bids to mitigate the congestion while minimizing the cost of schedule adjustments and keeping each Scheduling Coordinator's (SC) schedule in balance. The marginal SC establishes the usage charge for the inter-zonal interface. All SCs pay this charge based on their accepted, scheduled flow on the interface. The CAISO pays the net amount of congestion charges it collects to the Transmission Owners (TOs) and the owners of Firm Transmission Rights (FTRs). Figure 5.1 shows the active congestion zones and major inter-zonal pathways (branch groups) in the CAISO grid. The new footprint of the CAISO grid reflects several operational changes that became effective on December 1, 2005, including:

- Transition of COTP and MID to the SMUD Control Area,[1]
- TID becoming an independent control area,[2]
- The new Plumas-Sierra Interconnection,
- The new and converted metered sub-systems, and
- A Pilot Pseudo Tie for Calpine's Sutter Plant.

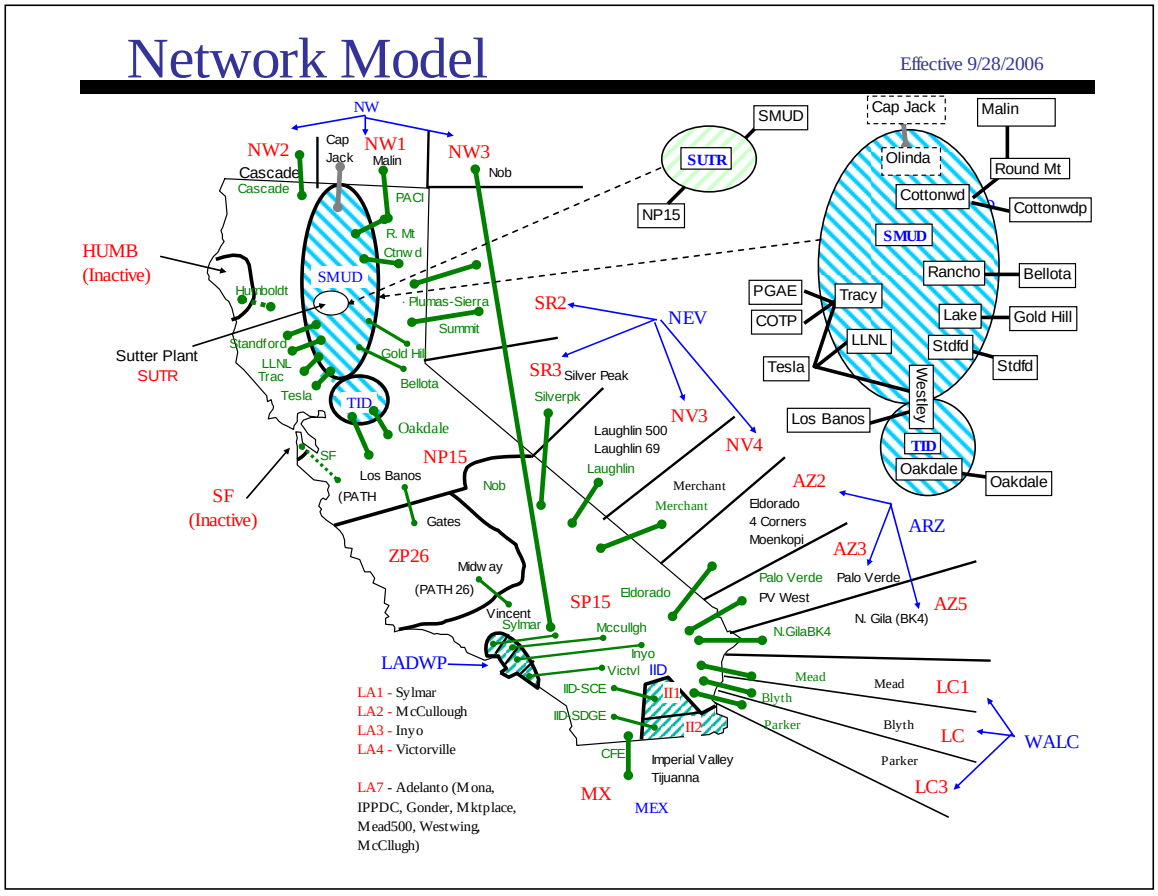
Total inter-zonal congestion cost for both the Day Ahead and Hour Ahead Markets in 2006 was $56 million, which is quite consistent with annual costs for the two previous years. Table 5.1 shows the historical annual total inter-zonal congestion cost since the year 2000. The majority of 2006 inter-zonal congestion cost (93 percent) can be attributed to 7 branch groups (Palo Verde, PACI, Eldorado, IPP (DC) – Adelanto,[3] NOB, Mead, Path 26), with Palo Verde constituting the largest share. The next section provides a more detailed breakdown of congestion frequency and cost by individual branch group.

[1] COTP = California-Oregon Transmission Project, MID = Modesto Irrigation District, SMUD = Sacramento Municipal Utility District.
[2] TID = Turlock Irrigation District
[3] IPP-Adelanto is a 500kv DC transmission line owned by the Los Angeles Department of Water and Power (DWP).

Table 5.1 Historical Inter-Zonal Congestion Cost

Year	Total Inter-Zonal Congestion Cost ($ M)
2000	$391
2001	$107
2002	$42
2003	$26
2004	$56
2005	$55
2006	$56

Figure 5.1 Active Congestion Zones and Branch Groups



5.1.2 Inter-Zonal Congestion Frequency and Magnitude

This section summarizes frequencies and average congestion prices for major inter-zonal interfaces (branch groups) in 2006. Table 5.2 lists all active inter-zonal branch groups managed by the CAISO in its forward congestion management market in 2006.

Table 5.2 Summary of Active Branch Groups in the CAISO Market (2006)

Branch Group	From Zone	To Zone	Interconnecting Control Area	Tie Point	Effective Date	Comments
PACI _BG	NW1	NP15	BPA	MALIN_5_RNDMTN	12/1/2005	Previously COI
PATH15 _BG	ZP26	NP15	N/A		2/1/2000	
CASCADE _BG	NW2	NP15	PACW	CASCAD_1_CRAGVW		
SUMMIT _BG	SR2	NP15	SPP	SUMITM_1_SPP		
SYLMAR-AC_BG	LA1	SP15	LDWP	SYLMAR_2_LDWP		
NOB _BG	NW3	SP15	BPA	SYLMAR_2_NOB		
CFE _BG	MX	SP15	CFE	IVALLY_2_23050		
PARKER _BG	LC3	SP15	WALC	PARKR_2_GENE		
LAUGHLIN _BG	NV3	SP15	NPC	MOHAVE_6_69KV		
SILVERPK _BG	SR3	SP15	SPP	SLVRPK_7_SPP		
BLYTHE _BG	LC2	SP15	WALC	BLYTHE_1_WALC		
PALOVRDE _BG	AZ3	SP15	SRP	PVERDE_5_DEVERS		
				PVERDE_5_NG-PLV		
IID-SDGE _BG	II2	SP15	IID	IVALLY_2_230S		
IID-SCE _BG	II1	SP15	IID	MIRAGE_2_COCHLA		
				DEVERS_2_COCHLA		
ELDORADO _BG	AZ2	SP15	APS	ELDORD_5_PSUEDO		
				FCORNR_5_PSUEDO		
				MOENKO_5_PSUEDO		
INYO _BG	LA3	SP15	LDWP	INYOS_2_LDWP		
N.GILABK4_BG	AZ5	SP15	APS	NGILA_5_NG4		
PATH26 _BG	SP15	ZP26	N/A		2/1/2000	
MERCHANT _BG	NV4	SP15	NPC	MRCHNT_2_ELDORD	10/15/1999	
RNCHLAKE _BG	SMDE	NP15	SMUD	RANCHO_2_BELOTA	6/18/2002	
		NP15	SMUD	LAKE_2_GOLDHL	6/18/2002	
MEAD _BG	LC1	SP15	WALC	MEAD_2_WALC	4/1/1998	
MCCULLGH _BG	LA2	SP15	LDWP	ELDORD_5_MCLLGH	4/1/1998	
VICTVL _BG	LA4	SP15	LDWP	LUGO_5_VICTVL	4/1/1998	
CTNWDWAPA_BG	SMD2	NP15	SMUD	CTNWDW_2_CTTNWD	1/1/2005	SMUD-WAPA
CTNWDRDMT_BG	SMD3	NP15	SMUD	CTNWDW_2_RNDMTN	1/1/2005	SMUD-WAPA
TRACYPSDO_BG	SMD5	NP15	SMUD	TRCYPP_2_TESLA	1/1/2005	SMUD-WAPA
LLNLTESLA_BG	SMD8	NP15	SMUD	LLNL_1_TESLA	1/1/2005	SMUD-WAPA
WSTWGMEAD_BG	AZ6	LC5	ARIZ	WSTWNG_5_MEAD	1/1/2005	South PTO
MKTPCADLN_BG	LC4	LA7	LDWP	MKTPLC_5_ADLNTO	1/1/2005	South PTO
IPPDCADLN_BG	LA5	LA7	LDWP	IPPDC_5_ADLNTO	1/1/2005	South PTO
MONAIPPDC_BG	PC1	LA5	PACE	MONA_5_IPPDC	1/1/2005	South PTO
GONDIPPDC_BG	SR4	LA5	SRRA	GONDER_5_IPPDC	1/1/2005	South PTO
MEADMKTPC_BG	LC5	LC4	WALC	MEAD_5_MKTPLC	1/1/2005	South PTO
MEADTMEAD_BG	LC6	LC5	WALC	MEADT_5_MEAD	1/1/2005	South PTO
MCCLMKTPC_BG	LA6	LC4	LDWP	MCCLUG_5_MKTPLC	1/1/2005	South PTO
ADLANTOSP_BG	LA7	SP15	LDWP	ADLNTO_5_LUGO	1/1/2005	South PTO
ADLANTOSP_BG	LA7	SP15	LDWP	ADELNT_2_SYLMAR	1/1/2005	South PTO
SUTTRNP15_BG	SUTR	NP15	N/A		12/1/2005	Sutter Pseudo Tie
WSLYTESLA_BG	SMDJ	NP15	SMUD	WESTLY_2_TESLA	12/1/2005	SMUD-MID
STNDFDSTN_BG	SMDK	NP15	SMUD	STNDFD_1_STNCSF	12/1/2005	SMUD-MID
TRACYPGAE_BG	SMDL	NP15	SMUD	TRACY5_5_PGAE	12/1/2005	SMUD-COTP
TRACYCOTP_BG	SMDH	NP15	SMUD	TRACY5_5_COTP	12/1/2005	SMUD-COTP
MARBLESUB_BG	SR5	NP15	SPP	MBLSPP_6_MARBLE	12/1/2005	SPP
OAKDALSUB_BG	TDZ1	NP15	TID	OAKTID_1_OAKCSF	12/1/2005	TID
WSTLYLSBN_BG	TDZ2	NP15	TID	WESTLY_2_LOSBNS	12/1/2005	TID

Table 5.3 shows annual congestion frequencies and average congestion prices by branch group, direction (import or export), and market type (Day Ahead or Hour Ahead). The frequency of congestion in 2006 was highest on several of the main branch groups between the CAISO and neighboring Control Areas outside California. In the Day Ahead Market, the Mead and Palo Verde branch groups, the Pacific DC Inter-tie (also known as the North-of-Oregon Border Inter-tie, or NOB, as listed in the table), and the Pacific AC Intertie (PACI), all were congested in at least 10 percent of hours. In the Hour Ahead Market, the Pacific AC and DC Inter-ties were also congested in at least 10 percent of the total annual hours. The most frequently congested branch group in 2006 was the Pacific AC Inter-tie, at 18 percent and 17 percent of hours in the Day Ahead and Hour Ahead Markets, respectively with all of the congestion being in the import direction. The high frequency of congestion on the Pacific AC Inter-tie was due to strong hydroelectric production from the Pacific Northwest being imported to and through the CAISO Control Area during the spring and early summer of 2006. Congestion prices on the Pacific AC averaged $5/MW in the Day Ahead Market and $18/MW in the Hour Ahead Market, which was comparable to average prices on the Pacific-DC (NOB) branch group. Average day-ahead congestion prices on two major Southwest branch groups (Palo Verde and Eldorado) were higher than the Northwest, averaging $9/MW and $11/MW, respectively.

Table 5.3 Inter-Zonal Congestion Frequencies (2006)[4]

	Day-Ahead Market				Hour-ahead Market			
	Percentage of Hours Being		Average Congestion Price ($/MWh)		Percentage of Hours Being Congested		Average Congestion Price ($/MWh)	
Branch Group	Import	Export	Import	Export	Import	Export	Import	Export
ADLANTOSP_BG	4	0	$4	$0	2	0	$28	$0
BLYTHE _BG	4	0	$2	$3	0	0	$9	$30
CASCADE _BG	1	0	$0	$0	0	0	$3	$0
CFE _BG	0	0	$0	$0	0	0	$20	$0
ELDORADO _BG	9	0	$11	$0	4	0	$14	$0
IID-SCE _BG	0	0	$2	$0	0	0	$50	$0
IID-SDGE _BG	0	0	$0	$30	0	0	$0	$30
IPPDCADLN_BG	6	0	$12	$0	4	0	$34	$0
MEAD _BG	13	0	$4	$0	8	0	$20	$0
MELONPLNT_BG	0	0	$0	$0	0	0	$0	$30
MERCHANT _BG	0	0	$0	$0	0	0	$0	$0
MKTPCADLN_BG	4	0	$1	$0	2	0	$3	$0
MONAIPPDC_BG	0	0	$0	$1	0	0	$0	$29
NOB _BG	10	0	$4	$0	10	0	$23	$5
PACI _BG	18	0	$5	$0	17	0	$18	$3
PALOVRDE _BG	15	0	$9	$0	8	0	$29	$0
PARKER _BG	4	0	$3	$0	0	0	$20	$3
PATH15 _BG	1	0	$10	$0	0	0	$11	$0
PATH26 _BG	0	5	$0	$3	0	4	$22	$15
RNCHLAKE _BG	0	0	$0	$30	0	0	$0	$0
SILVERPK _BG	0	0	$0	$0	1	0	$1	$0
SUMMIT _BG	6	0	$0	$0	3	0	$1	$0
SUTTRNP15_BG	0	0	$0	$0	0	0	$19	$0
TRACYCOTP_BG	0	0	$0	$0	0	0	$5	$0
TRACYPSDO_BG	0	0	$0	$0	0	0	$0	$0
TSLASTDFD_BG	0	1	$0	$30	0	0	$0	$0
VICTVL _BG	0	0	$0	$0	0	0	$0	$5
WSLYTESLA_BG	0	0	$30	$0	0	0	$30	$0
WSTLYLSBN_BG	0	0	$30	$0	0	0	$30	$30
WSTWGMEAD_BG	2	0	$3	$0	1	0	$5	$0

5.1.3 Inter-Zonal Congestion Usage Charges and Revenues

Table 5.4 shows the annual congestion revenues for the major CAISO branch groups in 2006. The total congestion revenue of approximately $56.4 million represents a 3.2 percent increase above the 2005 total. Thirty (30) percent of congestion costs were incurred on the Palo Verde branch group in the import direction in 2006, compared to 36 percent in 2005. Another 21 percent was incurred on the Pacific AC Inter-tie (PACI), nearly all in the import direction, which is a substantially higher proportion than the 12 percent of total congestion cost on COI incurred in 2005. Other branch groups having significant increases in congestion costs from 2005 include: the Pacific DC Inter-tie, also referred to and shown in the table as the North-of-Oregon Border (NOB) branch group, which had a threefold increase in congestion costs in 2006

[4] In all tables, North-to-South congestion on Path 26 is represented as “Exports”. South-to-North congestion on Path 15 is represented as “Imports”.

(increasing from 3 to 10 percent of total costs); the IPP(DC)-to-Adelanto (IPPDCADLN) branch group (increasing from 3 to 8 percent of total costs); and the Mead branch group (increasing from 2 to 6 percent of total costs). One branch group that experienced a sharp decline in congestion costs from 2005 was Blythe, which incurred approximately $8.75 million of congestion costs in 2005 but declined to $.12 million in 2006.

Table 5.4 Inter-Zonal Congestion Revenue (2006)[5]

Branch Group	Day-ahead		Hour-ahead		Total Congestion Cost		Total Congestion Cost		Total Congestion Cost	Total Cost Percent
	Import	Export	Import	Export	Import	Export	Day-ahead	Hour-ahead		
ADLANTOSP	$1,433,657	$0	$127,817	$0	$1,561,474	$0	$1,433,657	$127,817	$1,561,474	3%
BLYTHE	$112,032	$42	$10,574	$901	$122,607	$943	$112,074	$11,475	$123,550	0%
CASCADE	$0	$0	$604	$0	$604	$0	$0	$604	$604	0%
CFE	$0	$0	$2,812	$0	$2,812	$0	$0	$2,812	$2,812	0%
ELDORADO	$6,650,407	$0	$25,289	$0	$6,675,696	$0	$6,650,407	$25,289	$6,675,696	12%
IID-SCE	$1,338	$0	$3,260	$0	$4,598	$0	$1,338	$3,260	$4,598	0%
IID-SDGE	$0	$1,711	$0	$150	$0	$1,861	$1,711	$150	$1,861	0%
IPPDCADLN	$4,152,752	$0	$128,818	$0	$4,281,569	$0	$4,152,752	$128,818	$4,281,569	8%
LAUGHLIN	$0	$0	$0	$8	$0	$8	$0	$8	$8	0%
MEAD	$2,977,319	$0	$253,438	$0	$3,230,757	$0	$2,977,319	$253,438	$3,230,757	6%
MELONPLNT	$0	$0	$0	$451	$0	$451	$0	$451	$451	0%
MERCHANT	$26	$0	$0	$0	$26	$0	$26	$0	$26	0%
MKTPCADLN	$123,057	$0	$27,371	$0	$150,428	$0	$123,057	$27,371	$150,428	0%
MONAIPPDC	$0	$2,580	$0	$48,230	$0	$50,810	$2,580	$48,230	$50,810	0%
NOB	$5,151,724	$0	$377,001	$23,468	$5,528,726	$23,468	$5,151,724	$400,469	$5,552,194	10%
OAKDALSU	$0	$0	$0	-$14	$0	-$14	$0	-$14	-$14	0%
PACI	$12,169,213	$0	-$113,867	$1,991	$12,055,346	$1,991	$12,169,213	-$111,876	$12,057,337	21%
PALOVRDE	$16,974,558	$0	$95,990	$0	$17,070,548	$0	$16,974,558	$95,990	$17,070,548	30%
PARKER	$158,489	$0	$1,887	$449	$160,376	$449	$158,489	$2,336	$160,825	0%
PATH15	$1,853,557	$0	$69,257	$0	$1,922,814	$0	$1,853,557	$69,257	$1,922,814	3%
PATH26	$0	$3,209,426	$23,679	$123,558	$23,679	$3,332,984	$3,209,426	$147,237	$3,356,663	6%
RNCHLAKE	$0	$26,582	$0	-$1,772	$0	$24,810	$26,582	-$1,772	$24,810	0%
SILVERPK	$102	$0	$72	$0	$174	$0	$102	$72	$174	0%
STNDFDSTN	$0	$0	$0	$2	$0	$2	$0	$2	$2	0%
SUMMIT	$13,514	$0	$2,420	$0	$15,935	$0	$13,514	$2,420	$15,935	0%
SUTTRNP15	$0	$0	$3,787	$0	$3,787	$0	$0	$3,787	$3,787	0%
TRACYCOTP	$0	$0	$610	$0	$610	$0	$0	$610	$610	0%
TRACYPSDO	$0	$0	$121	$0	$121	$0	$0	$121	$121	0%
TSLASTDFD	$0	$5,062	$0	-$5,062	$0	$0	$5,062	-$5,062	$0	0%
VICTVL	$0	$0	$0	$10,112	$0	$10,112	$0	$10,112	$10,112	0%
WSLYTESLA	$12,844	$0	$963	$0	$13,806	$0	$12,844	$963	$13,806	0%
WSTLYLSBN	$6,271	$0	$272	$13,203	$6,543	$13,203	$6,271	$13,475	$19,745	0%
WSTWGMEAD	$56,157	$0	$9,235	$0	$65,392	$0	$56,157	$9,235	$65,392	0%
Total	**$51,847,018**	**$3,245,403**	**$1,051,408**	**$215,676**	**$52,898,426**	**$3,461,079**	**$55,092,421**	**$1,267,084**	**$56,359,504**	**100%**

Exports from the CAISO Control Area resulted in only $128,095 in congestion costs – nearly half on the Mona - IPP (DC) branch group, which connects to the Intermountain Power Project and is physically located in Utah.

Hour-ahead congestion accounted for 2.2 percent of congestion costs, or approximately $1.3 million. This small proportion is due to the fact that hour-ahead congestion typically occurs after SCs have adjusted their day-ahead schedules or as the result of changes in line ratings after the closure of the Day Ahead Market. Only those SCs that change their schedules in the Hour Ahead Markets are required to pay hour-ahead congestion charges. Thus, the volume of transactions in the Hour Ahead Market is much lower than that in the Day Ahead Market.

[5] In all tables, North-to-South congestion on Path 26 is represented as “Exports”. South-to-North congestion on Path 15 is represented as “Imports”.

Figure 5.2 compares congestion costs in 2005 and 2006 on selected major paths. Congestion costs decreased on Palo Verde and Path 26, due in part to increased ratings on these paths, which are discussed in Chapter 1. Congestion costs increased on the Pacific AC Inter-tie (PACI) and the Pacific DC Intertie (NOB), due to strong hydroelectric production in the Pacific Northwest during the spring and summer and numerous transmission de-rates, which are discussed below. Congestion costs also increased on Eldorado and Mead, which transmit power between the Las Vegas and Los Angeles areas. Congestion costs on the IPP (DC) – Adelanto (IPPDCADLN) and Adelanto-SP26 (ADLANTOSP) also increased due to a single incident (discussed below).

Figure 5.2 Congestion Revenues on Selected Paths (2005 vs. 2006)

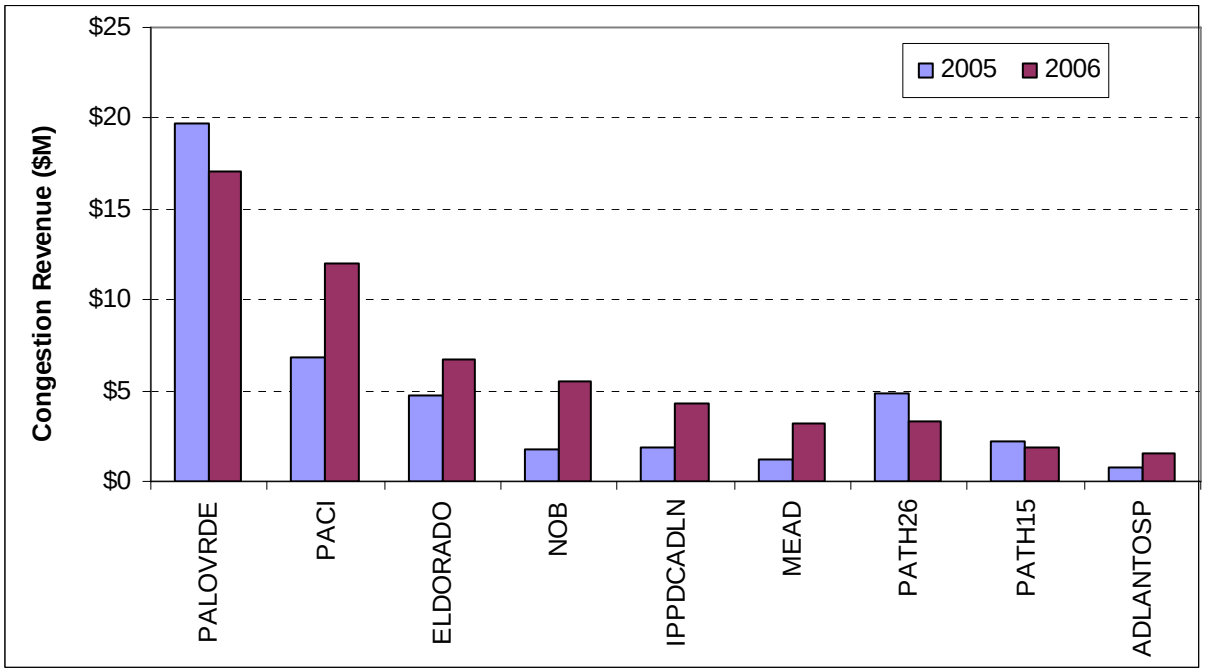


Figure 5.3 shows the seasonal pattern of congestion costs on major paths. The bulk of congestion costs were incurred from the Pacific Northwest into California in the spring and early summer months, notably April, the highest-cost month of the year. High north-to-south power flows coupled with various transmission de-rates during this period contributed to the high congestion costs.

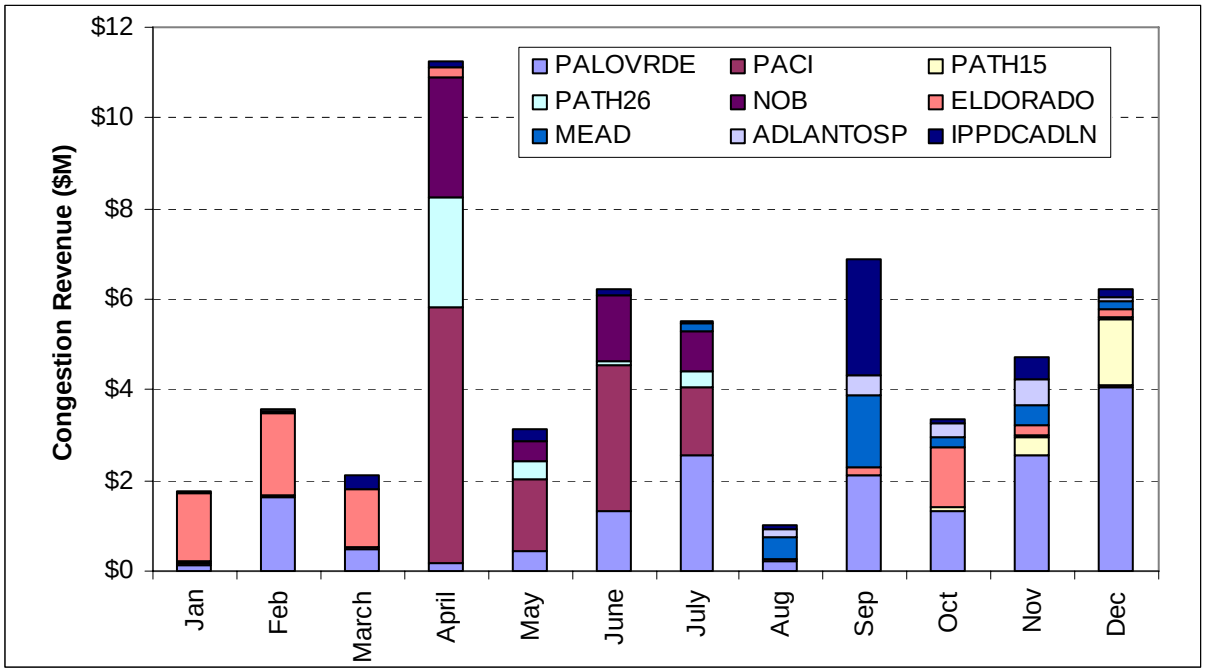
In April, congestion on PACI was largely due to high north-to-south flows and capacity de-rates caused by significant Northern California stream flows resulting in a considerable amount of hydroelectric generation, and transmission line outages from Midpoint to Summer Lake, which impacted the west of Borah flows. For instance, from April 10 to April 24 the path capacity on the PACI was de-rated due to the forced outage of Fort Rock Cap Group #2, in conjunction with the Midpoint-Summer Lake 500 kV and Ashe-Marion #2-500 kV line outages. From April 17 to April 20, the PACI was further de-rated due to the forced outage of the Olinda-Tracy 500 kV line to bypass series capacitors, in conjunction with the outage of the Malin-Round Mountain #2 line to bypass the series capacitor bank. The NOB was also heavily congested in April due to a combination of planned and unplanned transmission line work. For example, Ashe-Slatt 1 500 kV line and Celilo converters #3 and #4 were removed from service from April 4-7. The Celilo

converters were again removed from service on April 17, 18, and 19. Additionally, between April 20-30, NOB had capacity de-rates due to several planned and unplanned outages. Major transmission lines out-of-service during this period included: Slatt-Buckely 1-500 kV line, Midpoint-Summer Lake 500 kV line, Schultz-Raver 4-500 kV line, and Malin-Round Mountain #1-500 kV line series capacitors at Malin.

High congestion costs on Path 26 in April were also attributable to high north-to-south flows and transmission de-rates due to scheduled maintenance on the 500 kV lines, Midway-Vincent No. 1 and 2. The Midway-Vincent No. 1 line was removed from service from April 1-7 to install new relays, new controls, and transfer trip and breaker failure schemes, and then again on April 23 and 24 to remove the wave traps. This resulted in the capacity being de-rated from 3,700 MW to 2,600 MW. The outage of Midway-Vincent No. 2 from April 26-30 to replace old wave traps and structures also resulted in a de-rate to 2,600 MW that contributed to an increase in congestion costs for that path.

In Southern California, flows from east of the Colorado River were also limited by clearances associated with upgrades to series capacitors on the Palo Verde-Devers and Moenkopi-Eldorado transmission lines, which occurred throughout the winter and spring of 2006. Congestion charges on Palo Verde increased between May and July as California loads increased but receded in August due to relatively moderate California loads and higher demand for power in the Southwest, which limited the availability of power for export to California.

Figure 5.3 Monthly Congestion Charges on Selected Major Paths (2006)



On Saturday, July 1, 2006, a utility tower supporting the Palo Verde-Devers 500 kV line was toppled by a storm in that region, causing a system frequency disturbance and a curtailment of power imports from the Southwest into Southern California of approximately 1,500 MW. Because this occurred over a long holiday weekend, Southern California Edison was not able to get the line restored until Wednesday, July 5, at which time SCE installed a temporary tower known as a Lindsey emergency replacement tower to replace the toppled tower. This outage resulted in approximately $1.5 million in congestion costs on the Palo Verde branch group until

the line was restored. The temporary tower was replaced with a permanent structure on December 19-22, requiring another service outage. During this outage, an additional $2 million in congestion costs were incurred.

Congestion in September totaled approximately $6.9 million and was heavily concentrated in the first week of the month, due largely to concurrent de-rates of transmission into Southern California. Beginning September 1, the Pacific AC and DC inter-ties, which bring power to California from Oregon, had been de-rated for scheduled maintenance in Oregon. This contributed to import congestion on Palo Verde beginning September 1. Between September 3 and 5, the Pacific DC Intertie, which connects generation in Oregon directly to SP15, was de-energized after a truck apparently struck a guy wire, in an unrelated incident elsewhere in Oregon. As this event occurred during the Labor Day holiday weekend, day-ahead schedules had been established on the previous Friday, September 1, through the entire period including operating day Tuesday, September 5. This resulted in approximately $2.2 million in import congestion on Mead, Eldorado, and Palo Verde.

There were also some significant congestion costs in September on the IPPDCADLN (IPP-Adelanto 500 kv DC line), which was attributed to a single day event. On September 6, the IPP-Adelanto 500 kv DC line, which connects the Intermountain Power Project in Utah to Los Angeles, was overscheduled, and had schedules curtailed by 0.03 MW in off-peak hours. No scheduling coordinator using this line apparently had submitted adjustment bids, so the price on the line stood at approximately $398/MWh for all of the off-peak hours on that day. This resulted in $2.1 million in congestion costs. However, most of the impacted schedules were hedge by FTRs.

Congestion in the fall of 2006 (October-December) was primarily on Palo Verde and was also exacerbated by transmission work. Beginning October 19, an Imperial Valley-North Gila 500 kv series capacitor was bypassed due to high flows and remained out of service for the rest of the year, affecting SCIT limitations and causing impedance on the Southwest Power Link. This resulted in an increase in power flows over Palo Verde, causing congestion. A few days later, the Eldorado-Yavapai, Eldorado-Moenkopi, and Moenkopi-Navajo 500 kv transmission lines were a derated or out for work through the end of the month. These issues resulted in de-rates of the Eldorado and Palo Verde branch groups and contributed to most of the congestion costs on Palo Verde between October and December. Finally, between December 11 and 21, switch upgrades at the Gates substation resulted in a de-rate of Path 15. On December 12, congestion on this line incurred costs of $1.4 million.

5.1.4 Existing Transmission Contracts and Phantom Congestion

An Existing Transmission Contract (ETC) is an encumbrance, established prior to the start-up of the CAISO, in the form of contractual obligation of a CAISO Participating Transmission Owner (PTO) to provide transmission service to another party, in accordance with terms and conditions specified in the contract, utilizing transmission facilities owned by the PTO that have been turned over to the CAISO operation control. There are two main aspects of the CAISO's current treatment of ETCs – a scheduling aspect and a settlement aspect – whereby ETC's schedules are accorded different treatment than the treatment accorded other schedules. With respect to scheduling, since start-up the CAISO has accommodated ETCs by (1) "setting-aside" transmission capacity on inter-ties and inter-zonal interfaces (i.e., Path 15 and Path 26) on a day-ahead basis for the sole use of ETC rights holders, and (2) holding that capacity off the market, irrespective of whether or not it was fully scheduled by the ETC right holders, up until 20 minutes before the start of the operating hour in real-time. With respect to the settlement aspect,

ETC schedules are exempt from all Transmission Access Charges, the Congestion Management component of the Grid Management Charge (GMC), and any Usage Charges for congestion.

The CAISO's current treatment of ETCs in scheduling has created market inefficiencies and has been reported on in previous annual reports. It remained a problem in the congestion market in 2006. Under the current market rules, ETC holders have the full amount of their ETC capacity reserved for them in the Day Ahead and Hour Ahead Markets whether they actually use it or not. The unused capacity is only released 20 minutes before the operating hour. Often this capacity cannot be fully utilized with such short notice due to factors such as ramping limits of generating facilities or that market participants have already made other arrangements to meet their load obligations. The term "phantom congestion" refers to new firm use schedules that are curtailed because of reserved, but not used, ETC capacity[6] on congested branch groups.

Figures 5.6 through 5.8 show the amount of new firm use schedules that were curtailed due to phantom congestion on the Mead, Palo Verde, and PACI branch groups. Phantom congestion was quite prevalent on the Mead branch group through the second half of 2006 (Figure 5.6). However, it was less prevalent on the Palo Verde and PACI branch groups (Figures 5.7 and 5.8, respectively). As evident in Figure 5.7, almost all of the ETC capacity reserved on the Palo Verde branch group was utilized. ETC reservations and phantom congestion on the PACI branch group declined significantly from prior years due to the control area changes that occurred on this branch group in December 2005 – specifically, the transition of the California-Oregon Transmission Project (COTP) from the CAISO to the SMUD control area. Phantom congestion on the former California Oregon branch group (COI), which was comprised of both the COTP and PACI, was very prevalent in prior years due to the under-utilization of Transmission Ownership Rights on the COTP. With COTP no longer part of the CAISO, its under-utilization cannot be assessed.

[6] This analysis considers Transmission Ownership Rights (TORs) to be the same as Existing Transmission Contracts in that they are treated similarly by the CAISO and can both result in phantom congestion.

Figure 5.4 Phantom Congestion on the Mead Branch Group (2006)

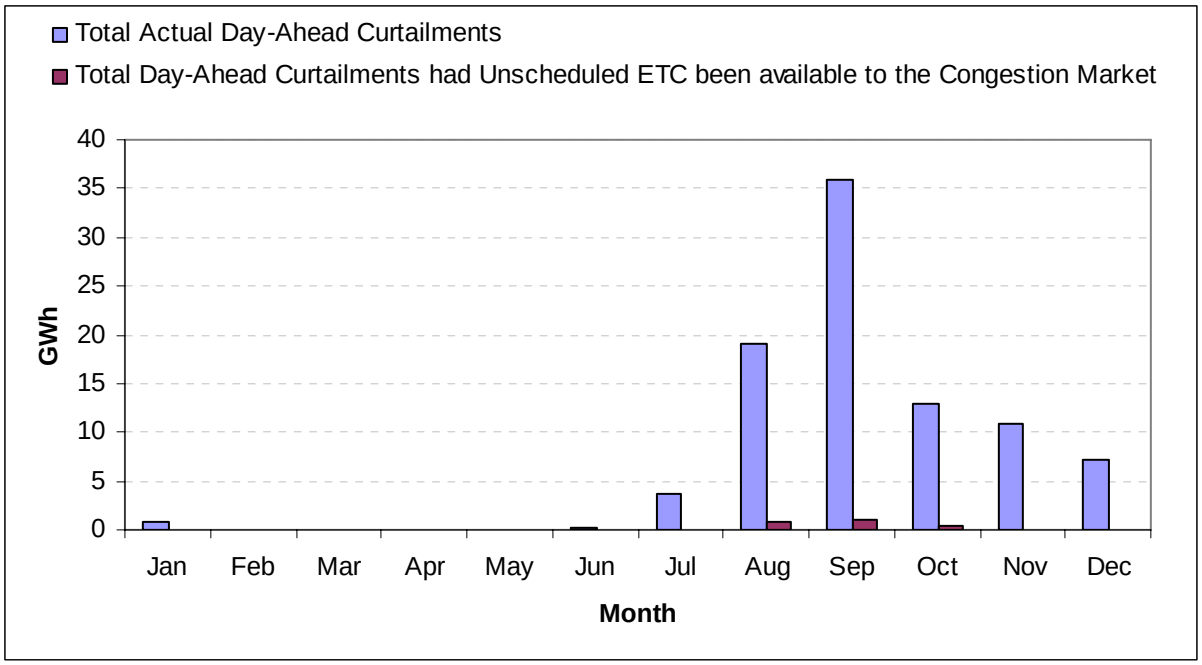


Figure 5.5 Phantom Congestion on the Palo Verde Branch Group (2006)

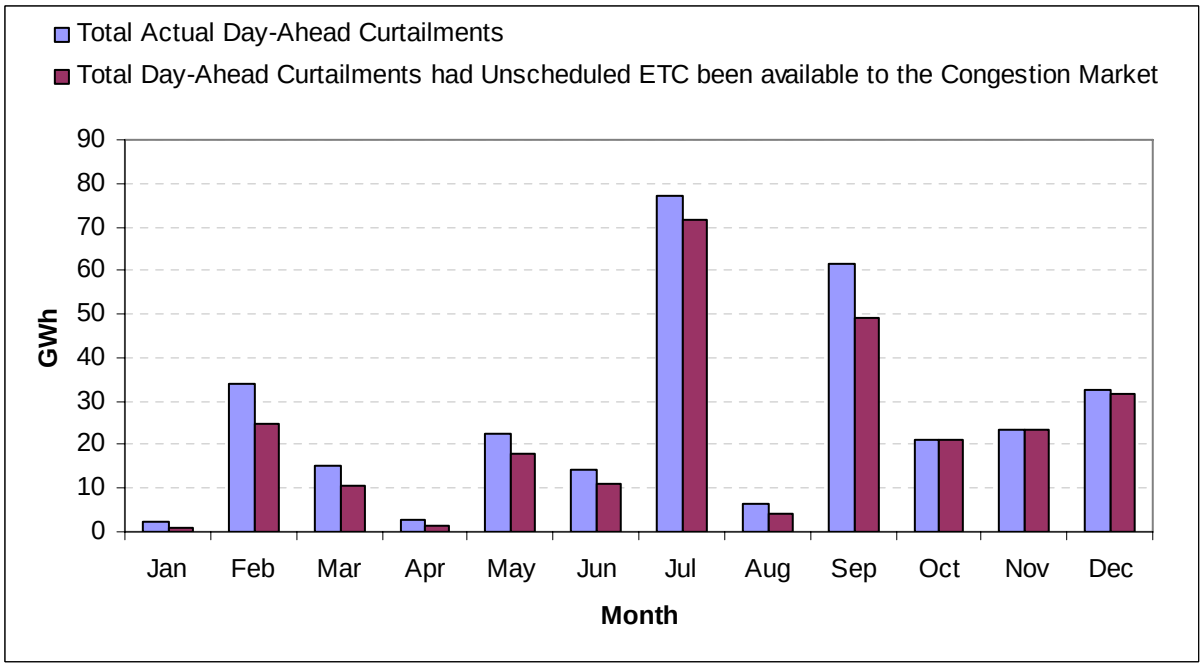
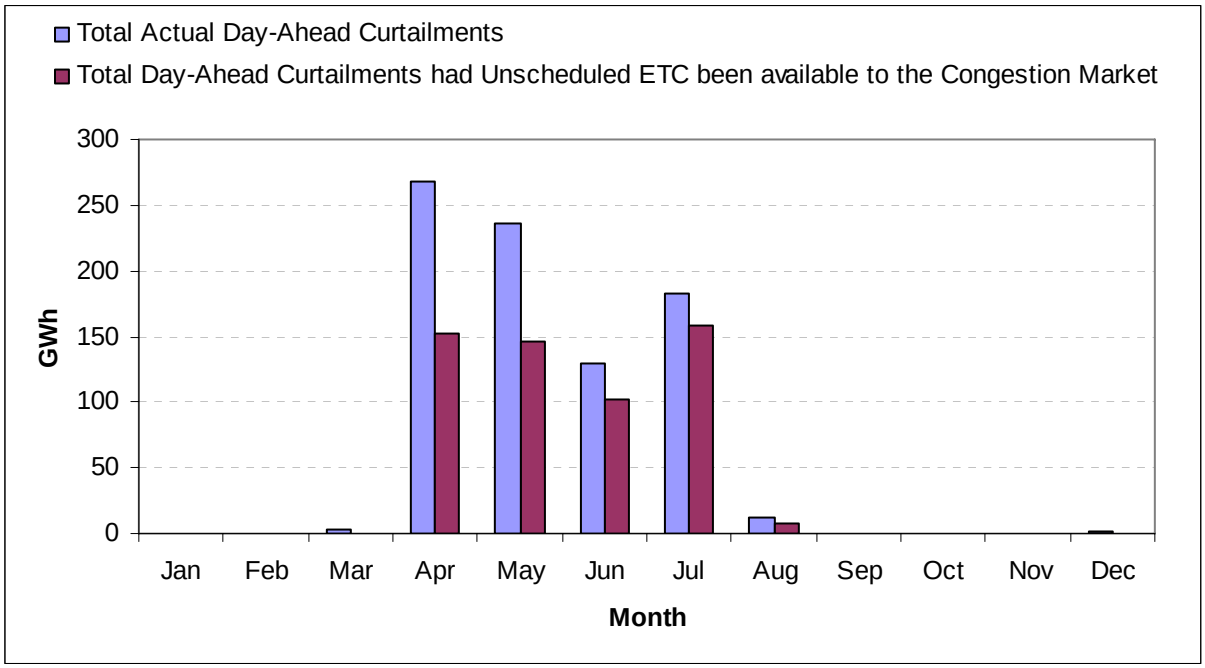


Figure 5.6 Phantom Congestion on the Pacific AC Inter-tie (2006)



Phantom congestion in recent years (2005-2006) has also been reduced from prior levels due to several ETCs that expired in 2005 and late 2004. Specifically, for SCE, 1,568 MW of ETC capacity expired on December 31, 2004, 900 MW expired on January 1, 2005, and 110 MW expired on May 14, 2005.

Treatment of ETCs under MRTU

The CAISO has long recognized the phantom congestion problem created by unscheduled ETCs in the Day Ahead Market and has tried to address this issue in its market re-design effort. Treatment of ETCs under the CAISO's Market Redesign and Technology Upgrade (MRTU) is an especially important issue since some ETCs will remain in effect upon implementation of MRTU in February of 2008. In sum, these encumbrances represent transmission capacity of approximately 16,000 MW, or capacity sufficient to meet 32 percent of the CAISO's 2006 peak load of 50,270 MW. Following an extensive stakeholder process in 2004, the CAISO filed with the FERC on December 8, 2004, its Proposed Conceptual Treatment of Existing Transmission Contracts under the CAISO's Amended Comprehensive Market Design Proposal. The proposal resolved how ETCs would be scheduled, validated, and settled under LMP. Responding to the CAISO's proposal, the FERC issued a "Guidance Order on Conceptual Proposal for Honoring of Existing Transmission Contracts" on February 10, 2005. In this order, the FERC approved in principle certain elements of the ETC proposal, provided guidance and requested additional information and explanation of other elements. More specifically, the FERC accepted the CAISO's conceptual proposal to set aside capacity associated with an ETC within the CAISO's control area to the extent that it is scheduled in the Day Ahead Market and to fully honor all valid schedule changes in post-day-ahead markets. Also the FERC accepted the CAISO's proposal to continue to set aside unscheduled capacity over the inter-ties, but not for internal interfaces. The FERC agreed that this will make additional capacity available in the Day Ahead and subsequent markets for use by other users of the system, reduce the likelihood and magnitude of phantom congestion, and promote the convergence of day-ahead and real-time prices. The

FERC reaffirmed this decision in its September 21, 2006 MRTU Order on the CAISO MRTU Tariff filing.

5.2 Firm Transmission Rights Market Performance

A Firm Transmission Right (FTR) is a right that has the attributes of both financial and physical transmission rights. FTRs entitle their owners to share in the distribution of Usage Charge revenues received by the CAISO (in the Day Ahead and Hour Ahead Markets) in connection with inter-zonal congestion during the period for which the FTR is issued. FTRs also entitle registered FTR Holders to certain scheduling priorities (in the Day Ahead Market) for the transmission of energy across a congested inter-zonal interface.

The CAISO does not require that FTR owners be CAISO Scheduling Coordinators (SCs). FTRs may be purchased by any qualified bidder purely as an investment to enable the owner to receive a stream of income from the congestion usage revenues. In order to be used in scheduling, however, an FTR must be assigned to one of the SCs. In addition, an owner may resell the FTR or the scheduling rights may be unbundled from the revenue rights and sold or transferred to another party. All these sales, transfers or assignments are considered "secondary market transactions" and must be recorded in the CAISO Secondary Registration System (SRS).

5.2.1 Primary Auction Results

The CAISO creates a primary market for FTRs by auctioning them each year for a 12-month period beginning in April and ending in March. The primary FTR auction for the 2005/2006 FTR auction year (from April 1, 2005, to March 31, 2006) occurred in February 2005. The primary FTR auction for the 2006/2007 FTR auction year (from April 1, 2006, to March 31, 2007) occurred in February 2006. The FTR Auction is a simultaneous, multi-round clearing price auction conducted separately and independently across specified CAISO inter-zonal interfaces. The FTR Auction proceeds are distributed to Participating Transmission Owners (PTOs), based upon their respective ownership interest in each auctioned path.

Owners of FTRs can use their FTRs as a hedge against congestion costs. The FTRs also entitle the owners to share in the distribution of Usage Charge revenues received by the CAISO (in the Day Ahead and Hour Ahead Markets) in connection with inter-zonal congestion during the period for which the FTR is issued. FTRs also entitle the registered FTR Holder to certain priorities (in the Day Ahead Market) for the scheduling of energy across a congested inter-zonal interface.

Table 5.5 and Table 5.6 provide summaries of the 2005-2006 and 2006-2007 FTR primary auction results, respectively. Total revenue earned in the 2006-2007 primary auction was approximately $104 million, compared to $94 million in the 2005-2006 primary auction.

In the 2006-2007 primary auction, FTRs on 29 directional branch groups were auctioned. In total, the CAISO successfully auctioned 14,452 MW of FTRs, compared to 12,063 MW of FTRs auctioned in 2005-2006 primary FTR auction. On the branch group level, auction revenue on Palo Verde in the import direction increased from $25 million in 2005-06 to $27.2 million in 2006-07. Other notable changes from the 2005-06 primary auction included an increase in auction revenues on PACI from $16.5 million to $28 million and an increase in auction revenues on NOB from $3.5 million to $9.4 million. The auction clearing price for PACI also increased

dramatically in the 2006-07 auction to $41,052/MW compared to $18,609/MW in the prior year. These increases likely reflected expectations of high imports into California from the Pacific Northwest - given the abundance of snow pack that was evident at the time of the auction (February 2006). Conversely, auction revenues on two major southwest branch groups, Mead and Eldorado declined in the 2006-07 primary auction.

Table 5.5 Summary of 2005-2006 FTR Auction Results (FTRs - April 1, 2005 through March 31, 2006)

Branch Group	Direction	Total FTRs Sold (MW)	Auction Clearing Price ($/MW)	Auction Revenue ($)
BLYTHE BG	Import (LC2-SP15)	177	$6,714	$1,188,452
BLYTHE BG	Export (SP15-LC2)	38	$100	$3,800
CFE BG	Import (MX-SP15)	200	$265	$53,000
ELDORADO BG	Import (AZ2-SP15)	743	$27,701	$20,581,962
ELDORADO BG	Export (SP15-AZ2)	445	$100	$44,500
IID – SCE BG	Import (II1-SP15)	600	$295	$177,000
IID - SDGE BG	Import (II2-SP15)	62	$190	$11,780
IID - SDGE BG	Export (SP15-II2)	62	$145	$8,990
MEAD BG	Import (LC1-SP15)	597	$18,174	$10,850,093
MEAD BG	Export (SP15-LC1)	637	$210	$133,770
NOB BG	Import (NW3-SP15)	169	$20,790	$3,513,483
NOB BG	Export (SP15-NW3)	173	$1,840	$318,320
PACI BG	Import (NW1-NP15)	890	$18,609	$16,562,330
PACI BG	Export (NP15-NW1)	573	$240	$137,520
PALOVRDE BG	Import (AZ3-SP15)	910	$27,425	$24,957,041
PALOVRDE BG	Export (SP15-AZ3)	683	$100	$68,300
PARKER BG	Import (LC3-SP15)	130	$705	$91,650
PATH 15 BG	Import (ZP26-NP15)	1807	$3,056	$5,522,626
PATH 26 BG	Export (ZP26-SP15)	1,464	$6,637	$9,716,641
SLVRPK BG	Import (SR3-SP15)	10	$540	$5,400
SLVRPK BG	Export (SP15-SR3)	10	$180	$1,800
VICTRVL BG	Export (SP15-LA4)	439	$100	$43,900
VICTRVL BG	Import (LA4-SP15)	1244	$100	$124,400
Total		**12,063**		**$94,116,759**

Table Column Definition:
Auction Clearing Price: This is the market-clearing price in $/MW per year. For the paths with seed price > $100/MW per year, the comparison of the Auction Clearing Price and Seed Price* 5 indicates the extent to which the bidders value the FTRs on the particular path and direction compared to the congestion revenues generated last year.
Total FTR Sold: This is the final MW clearing the auction. The difference between Total FTR Auctioned and Final MW sold can be either due to some FTRs not sold or the residual FTR allocation option exercised in the auction.
Auction Revenue: This is equal to the product of Auction Clearing Price and Final MW Sold.

Table 5.6 Summary of 2006-2007 FTR Auction Results (for FTRs valid April 1, 2006 through March 31, 2007)

Branch Group	Direction	Total FTRs Sold (MW)	Auction Clearing Price ($/MW)	Auction Revenue ($)
BLYTHE	Import	140	$24,498	$3,429,720
BLYTHE	Export	122	$100	$12,200
CFE	Import	345	$130	$44,850
CTNWDRDMT	Import	285	$100	$28,500
CTNWDRDMT	Export	235	$100	$23,500
CTNWDWAPA	Import	498	$100	$49,800
CTNWDWAPA	Export	498	$100	$49,800
ELDORADO	Import	536	$24,531	$13,148,616
ELDORADO	Export	536	$245	$131,320
IID-SCE	Import	600	$330	$198,000
IID-SDGE	Import	62	$145	$8,990
IID-SDGE	Export	31	$100	$3,100
MEAD	Import	597	$6,535	$3,901,395
MEAD	Export	543	$100	$54,300
NOB	Import	472	$19,850	$9,369,200
NOB	Export	454	$250	$113,500
PACI	Import	684	$41,052	$28,079,568
PACI	Export	399	$100	$39,900
PALOVRDE	Import	1,230	$22,114	$27,200,220
PALOVRDE	Export	749	$100	$74,900
PARKER	Import	160	$280	$44,800
PATH15	South to North	1,730	$5,779	$9,997,670
PATH26	North to South	1,315	$5,692	$7,484,980
RNCHLAKE	Import	310	$100	$31,000
RNCHLAKE	Export	261	$100	$26,100
SILVERPK	Import	17	$100	$1,700
SILVERPK	Export	8	$100	$800
VICTVL	Import	1,355	$100	$135,500
VICTVL	Export	280	$100	$28,000
Totals		**14,452**		$103,711,929

5.2.2 Concentration of FTR Ownership and Control

As in the previous auction, one discernible pattern in the FTR auction results was that Investor Owned Utilities (IOUs) acquired most FTRs on branch groups that are likely to be congested. For instance, Pacific Gas & Electric won 78 and 99 percent of FTRs on PACI (import) and Path 15 (south-to-north), respectively. Similarly, Southern California Edison won 100 and 97 percent of FTRs on El Dorado (import) and Palo Verde (import), respectively. As the principal transmission owners of these paths, the utilities are also the recipients of the auction revenues. This allows them to bid very aggressively to ensure they acquire the quantity of FTRs they

require to serve their retail customers without significant exposure to the spot congestion markets. This may have an inflationary effect on FTR auction clearing prices.

Table 5.7 FTR Concentration as of April 2006*

Branch Group	Direction	Owner Name	Percent Conc.	Max FTRs Owned (MW)	Total FTRs Auctioned (MW)
ADLANTOSP_BG	Export	City of Pasadena	32.3%	162	502
BLYTHE _BG	Export	Morgan Stanley Capital Group, Inc.	59.0%	72	122
BLYTHE _BG	Export	Susquehanna Energy Products-SEPC	41.0%	50	122
CTNWDRDMT_BG	Export	Morgan Stanley Capital Group, Inc.	68.1%	160	235
CTNWDWAPA_BG	Export	Morgan Stanley Capital Group, Inc.	79.9%	398	498
ELDORADO _BG	Export	Morgan Stanley Capital Group, Inc.	27.1%	145	536
ELDORADO _BG	Export	Public Service Company of Colorado	63.6%	341	536
GONDIPPDC_BG	Export	City of Anaheim	46.2%	6	13
GONDIPPDC_BG	Export	City of Pasadena	53.8%	7	13
IID-SDGE _BG	Export	Morgan Stanley Capital Group, Inc.	100.0%	31	31
IPPDCADLN_BG	Export	City of Anaheim	52.4%	247	471
IPPDCADLN_BG	Export	City of Riverside	30.1%	142	471
MCCLMKTPC_BG	Export	City of Anaheim	33.2%	228	686
MEAD _BG	Export	Morgan Stanley Capital Group, Inc.	55.1%	318	577
MEADMKTPC_BG	Export	City of Anaheim	41.8%	110	263
MEADMKTPC_BG	Export	City of Vernon	28.5%	75	263
MEADTMEAD_BG	Export	City of Anaheim	60.4%	110	182
MEADTMEAD_BG	Export	City of Vernon	25.8%	47	182
MKTPCADLN_BG	Export	City of Anaheim	27.9%	118	423
MKTPCADLN_BG	Export	City of Riverside	27.9%	118	423
MONAIPPDC_BG	Export	City of Anaheim	54.4%	249	458
MONAIPPDC_BG	Export	City of Riverside	29.5%	135	458
PACI _BG	Export	Morgan Stanley Capital Group, Inc.	56.1%	224	399
PALOVRDE _BG	Export	Morgan Stanley Capital Group, Inc.	80.6%	624	774
PATH26 _BG	North-to-South	Pacific Gas & Electric Company-PCG2	28.7%	377	1315
PATH26 _BG	North-to-South	San Diego Gas & Electric, Merchant	35.4%	465	1315
RNCHLAKE _BG	Export	Morgan Stanley Capital Group, Inc.	90.4%	236	261
SILVERPK _BG	Export	Morgan Stanley Capital Group, Inc.	100.0%	8	8
SYLMAR-AC_BG	Export	City of Azusa	40.0%	10	25
SYLMAR-AC_BG	Export	City of Banning	60.0%	15	25
VICTVL _BG	Export	Morgan Stanley Capital Group,	100.0%	280	280

Branch Group	Direction	Owner Name	Percent Conc.	Max FTRs Owned (MW)	Total FTRs Auctioned (MW)
		Inc.			
WSTWGMEAD_BG	Export	City of Anaheim	37.3%	47	126
WSTWGMEAD_BG	Export	City of Pasadena	26.2%	33	126
ADLANTOSP_BG	Import	City of Anaheim	43.3%	449	1036
ADLANTOSP_BG	Import	City of Riverside	30.2%	313	1036
BLYTHE _BG	Import	FPL Energy Power Marketing, Inc.	57.1%	80	140
BLYTHE _BG	Import	Morgan Stanley Capital Group, Inc.	42.9%	60	140
CFE _BG	Import	Coral Power, LLC - CRLP	29.0%	100	345
CFE _BG	Import	Morgan Stanley Capital Group, Inc.	46.7%	161	345
CTNWDRDMT_BG	Import	Morgan Stanley Capital Group, Inc.	56.1%	160	285
CTNWDRDMT_BG	Import	British Columbia Power Exchange	35.1%	100	285
CTNWDWAPA_BG	Import	Morgan Stanley Capital Group, Inc.	79.9%	398	498
ELDORADO _BG	Import	Southern California Edison Company	100.0%	536	536
GONDIPPDC_BG	Import	City of Anaheim	57.1%	28	49
GONDIPPDC_BG	Import	City of Pasadena	26.5%	13	49
IID-SCE _BG	Import	Southern California Edison Company	76.7%	460	600
IID-SDGE _BG	Import	Morgan Stanley Capital Group, Inc.	50.0%	31	62
IID-SDGE _BG	Import	Susquehanna Energy Products-SEPC	50.0%	31	62
IPPDCADLN_BG	Import	City of Anaheim	52.4%	339	647
IPPDCADLN_BG	Import	City of Riverside	30.1%	195	647
MCCLMKTPC_BG	Import	City of Anaheim	33.2%	228	686
MEAD _BG	Import	Southern California Edison Company	36.9%	246	667
MEADMKTPC_BG	Import	City of Anaheim	41.8%	110	263
MEADMKTPC_BG	Import	City of Vernon	28.5%	75	263
MEADTMEAD_BG	Import	City of Anaheim	60.4%	110	182
MEADTMEAD_BG	Import	City of Vernon	25.8%	47	182
MONAIPPDC_BG	Import	City of Anaheim	54.3%	280	516
MONAIPPDC_BG	Import	City of Riverside	29.7%	153	516
NOB _BG	Import	British Columbia Power Exchange	26.6%	176	661
PACI _BG	Import	Pacific Gas & Electric Company-PCG2	78.1%	534	684
PALOVRDE _BG	Import	Southern California Edison Company	97.3%	1221	1255
PARKER _BG	Import	FPL Energy Power Marketing, Inc.	99.4%	159	160
PATH15 _BG	South-to-	Pacific Gas & Electric	98.6%	1705	1730

Branch Group	Direction	Owner Name	Percent Conc.	Max FTRs Owned (MW)	Total FTRs Auctioned (MW)
	North	Company-PCG2			
RNCHLAKE _BG	Import	Morgan Stanley Capital Group, Inc.	91.9%	285	310
SILVERPK _BG	Import	Morgan Stanley Capital Group, Inc.	47.1%	8	17
SILVERPK _BG	Import	British Columbia Power Exchange	52.9%	9	17
SYLMAR-AC_BG	Import	City of Azusa	57.1%	20	35
SYLMAR-AC_BG	Import	City of Banning	42.9%	15	35
VICTVL _BG	Import	Morgan Stanley Capital Group, Inc.	49.2%	666	1355
WSTWGMEAD_BG	Import	City of Anaheim	37.3%	47	126
WSTWGMEAD_BG	Import	City of Pasadena	26.2%	33	126

* Only FTR ownership concentrations at or more than 25 percent are reported in this table.

5.2.3 2006-07 FTR Market Performance

FTR Scheduling

FTRs can be used to hedge against high congestion prices and establish scheduling priority in the Day Ahead Market. As shown in Table 5.8, a high percentage of FTRs were scheduled only on a few paths (95 percent on Eldorado, 72 percent on IID-SCE and 73 percent on IPPDCADLN). SCE and municipals primarily own the FTRs on these paths. In the 2006-07 FTR cycle, the average amount of FTRs scheduled was low. On average, only 23.4 percent of the total FTRs were scheduled in the Day Ahead Market, slightly lower than the 24.3 percent in the 2005-06 FTR cycle.

Table 5.8 FTR Scheduling Statistics, April 1 – December 31, 2006*

Branch Group	Direction	MW FTR Auctioned	Avg MW FTR Sch	Max MW FTR Sch	Max Single SC FTR Scheduled	% FTR Schedule - Dir
BLYTHE _BG	Import	140	0	80	80	0%
ELDORADO _BG	Import	536	508	536	536	95%
IID-SCE _BG	Import	600	435	468	443	72%
IPPDCADLN_BG	Import	647	470	558	307	73%
MEAD _BG	Import	667	92	318	128	14%
MEADTMEAD_BG	Import	182	12	57	38	6%
MKTPCADLN_BG	Import	423	14	102	85	3%
MONAIPPDC_BG	Import	544	61	107	55	11%
NOB _BG	Import	661	93	328	83	14%
PALOVRDE _BG	Import	1255	449	649	615	36%
PARKER _BG	Import	160	0	159	159	0%
VICTVL _BG	Import	1355	1	75	75	0%
WSTWGMEAD_BG	Import	126	30	57	28	24%
GONDIPPDC_BG	Export	15	2	13	13	11%
MEAD _BG	Export	577	0	25	25	0%
MKTPCADLN_BG	Export	423	0	25	25	0%
MONAIPPDC_BG	Export	478	4	85	85	1%
NOB _BG	Export	632	26	145	108	4%
PALOVRDE _BG	Export	774	0	25	25	0%
PATH26 _BG	North-to-South	1315	494	842	465	38%

* Only those paths on which 1 percent or more of FTRs were attached are listed.

FTR Revenue

The current FTR market cycle begins on April 1, 2006, and ends on March 31, 2007. Table 5.9 summarizes the FTR revenues from April 1, 2006, to January 31, 2007.

During the current FTR cycle, six paths (Mead (import), NOB (import), Palo Verde (import), Parker (import), Path 26 (north-to-south), and Ranch Lake (export)) had total pro-rated FTR revenue greater than their auction prices. Most notably, Mead (import) and Parker (import) had pro-rated revenues equal to 769 percent and 846 percent of the auction price. However, pro-rated FTR revenues on most paths were well below the auction price. This is not surprising. As mentioned earlier, the FTR holders of major paths are also transmission owners. The FTR auction revenues are used to reduce the Transmission Revenue Requirement (TRR). As a result, the FTR purchase cost for these entities is to a large extent offset by a corresponding reduction in the TRR. Also, besides the FTR revenue, the FTR provides additional benefits to the holders. Schedules with FTR rights are entitled to scheduling priority in the Day Ahead Market and FTRs can serve as insurance to hedge against possible high congestion charges.

Table 5.9 FTR Revenue Statistics ($/MW) (April 2006 – January 2007)

Branch Group	Direction	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Cum. Net $/MW FTR Rev.	Prorated Net $/MW FTR Rev.	Primary Auction Price	Value Ratio
ADLANTOSP	Import	$ -	$ -	$ -	$ 0	$ 880	$ 2,562	$ 1,806	$ 3,245	$ 300	$ 1,311	$ 10,104	$ 12,124	N/A	N/A
BLYTHE	Import	$ -	$ -	$ -	$ 6	$ 251	$ 315	$ 26	$ 649	$ 37	$ 0	$ 1,284	$ 1,541	$ 24,498	6%
CFE	Import	$ -	$ -	$ -	$ -	$ -	$ 21	$ -	$ -	$ -	$ -	$ 21	$ 25	$ 130	19%
ELDORADO	Import	$ 244	$ 0	$ -	$ -	$ 7	$ 140	$ 1,955	$ 206	$ 135	$ 394	$ 3,082	$ 3,698	$ 24,531	15%
IID-SCE	Import	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3	$ 51	$ 26	$ 79	$ 95	$ 330	29%
IPPDCADLN	Import	$ 473	$ 1,212	$ 630	$ 148	$ 499	$ 11,867	$ 477	$ 2,223	$ 814	$ 469	$ 18,812	$ 22,574	N/A	N/A
MEAD	Import	$ 227	$ 15	$ 34	$ 1,928	$ 6,366	$ 18,489	$ 2,676	$ 5,460	$ 2,368	$ 4,319	$ 41,883	$ 50,259	$ 6,535	769%
MKTPCADLN	Import	$ -	$ -	$ -	$ -	$ 214	$ 685	$ 509	$ 709	$ 360	$ 831	$ 3,308	$ 3,970	N/A	N/A
NOB	Import	$ 21,580	$ 2,935	$ 7,577	$ 4,634	$ 46	$ -	$ -	$ 0	$ 61	$ 817	$ 37,650	$ 45,180	$ 19,850	228%
PACI	Import	$ 10,598	$ 2,942	$ 5,987	$ 2,066	$ 4	$ 4	$ 1	$ 15	$ 72	$ 442	$ 22,132	$ 26,558	$ 41,052	65%
PALOVRDE	Import	$ 393	$ 1,214	$ 4,158	$ 7,968	$ 513	$ 3,431	$ 2,210	$ 4,121	$ 9,595	$ 6,875	$ 40,479	$ 48,575	$ 22,114	220%
PARKER	Import	$ -	$ -	$ -	$ 52	$ 0	$ 128	$ 109	$ 1,603	$ 82	$ -	$ 1,975	$ 2,370	$ 280	846%
PATH15	South-to-North	$ -	$ -	$ -	$ -	$ -	$ -	$ 54	$ 234	$ 1,097	$ 113	$ 1,498	$ 1,797	$ 5,779	31%
SILVERPK	Import	$ -	$ 12	$ 8	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 20	$ 25	$ 100	25%
WSTWGMEAD	Import	$ 502	$ 89	$ 1	$ 230	$ 325	$ 600	$ 1,086	$ 249	$ 32	$ 111	$ 3,224	$ 3,869	N/A	N/A
BLYTHE	Export	$ -	$ -	$ 13	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 13	$ 15	$ 100	15%
IID-SDGE	Export	$ -	$ -	$ -	$ 30	$ 30	$ -	$ -	$ -	$ -	$ -	$ 60	$ 72	$ 100	72%
MONAIPPDC	Export	$ -	$ -	$ -	$ 33	$ 15	$ -	$ -	$ -	$ -	$ -	$ 48	$ 57	N/A	N/A
NOB	Export	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 128	$ -	$ -	$ 128	$ 153	$ 250	61%
PATH26	North-to-South	$ 5,596	$ 882	$ 185	$ 649	$ 0	$ 49	$ -	$ -	$ -	$ -	$ 7,361	$ 8,833	$ 5,692	155%
RNCHLAKE	Export	$ -	$ -	$ 120	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 120	$ 144	$ 100	144%
VICTVL	Export	$ -	$ -	$ 15	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 15	$ 18	$ 100	18%

FTR Trades in the Secondary Markets

In California, the successful bidders in the FTR primary auctions are allowed to conduct further FTR trades in the secondary markets. However, as shown in Table 5.10, the FTR transactions in the secondary markets have been minimal during the past FTR cycle. One notable exception was a 128 MW trade of Mead-import FTRs on March 28, 2006. There were a total of 18 cases of changes in ownership of FTRs in the 2006 cycle (determined by different SC_ID association over time). However, all but one of these exchanges (128 MW Mead exchange) occurred between Southern Participating Transmission Owners (SPTOs) (i.e., the City of Pasadena, the City of Anaheim, the City of Azusa, the City of Banning, or the City of Riverside) and the CAISO, due to either the transfer of FTRs owned by SPTOs to the CAISO, or the revision of the SPTOs' entitlements.

Table 5.10 FTR Trades in the Secondary Market (April 2006 - December 2006)

Branch Group	Direction	Date of Trade	Buyer	Seller	Quantity Sold (MW)	First Effective Date	Last Effective Date
GONDIPPDC_BG	Export	14-Sep-06	ANHM	CISO	1	25-Sep-06	31-Mar-07
MEADMKTPC_BG	Export	26-Jan-07	ANHM	CISO	45	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Export	29-Jan-07	RVSD	CISO	5	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Export	29-Jan-07	AZUA	CISO	1	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Export	29-Jan-07	BAN1	CISO	1	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Export	29-Jan-07	VERN	CISO	30	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Export	29-Jan-07	PASA	CISO	24	1-Feb-07	31-Mar-07
MONAIPPDC_BG	Export	11-Sep-06	RVSD	CISO	6	25-Sep-06	31-Mar-07
MONAIPPDC_BG	Export	13-Sep-06	ANHM	CISO	11	25-Sep-06	31-Mar-07
NOB _BG	Export	16-Mar-06	RVSD	CISO	23	1-Apr-06	31-Mar-07
GONDIPPDC_BG	Import	14-Sep-06	ANHM	CISO	1	25-Sep-06	31-Mar-07
MEAD _BG	Import	28-Mar-06	MNEV	MRNT	128	1-Apr-06	31-Mar-07
MEADMKTPC_BG	Import	26-Jan-07	ANHM	CISO	45	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Import	29-Jan-07	RVSD	CISO	5	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Import	29-Jan-07	AZUA	CISO	1	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Import	29-Jan-07	BAN1	CISO	1	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Import	29-Jan-07	VERN	CISO	30	1-Feb-07	31-Mar-07
MEADMKTPC_BG	Import	29-Jan-07	PASA	CISO	24	1-Feb-07	31-Mar-07
MONAIPPDC_BG	Import	11-Sep-06	RVSD	CISO	9	25-Sep-06	31-Mar-07
MONAIPPDC_BG	Import	13-Sep-06	ANHM	CISO	15	25-Sep-06	31-Mar-07
NOB _BG	Import	16-Mar-06	RVSD	CISO	23	1-Apr-06	31-Mar-07
PALOVRDE _BG	Import	16-Mar-06	AZUA	CISO	10	1-Apr-06	31-Mar-07
PALOVRDE _BG	Import	28-Mar-06	BAN1	CISO	15	1-Apr-06	31-Mar-07