

ANALYTICAL SUPPORT FOR CALIFORNIA ISO
GRID MANAGEMENT CHARGE

PREPARED APRIL 1999

CALIFORNIA ISO

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INDEX

| | |
|--|-----------|
| BACKGROUND AND OVERVIEW OF COST ALLOCATION..... | 3 |
| FUNCTIONAL CATEGORY DESCRIPTIONS | 9 |
| ALLOCATION DESCRIPTIVE DETAIL | 13 |
| COST ALLOCATION MATRIX..... | 58 |

APPENDICES

- 1. SOFTWARE DEVELOPMENT CONSTRAINTS & PRIORITIES**
- 2. GLOSSARY**

BACKGROUND AND OVERVIEW OF COST ALLOCATION

A description of the method used to analyze the cost allocations for the current grid management charge.

Background

The current Grid Management Charge (GMC) rate structure is the result of an extension of a settlement reached at the startup of the California Independent System Operator Corporation (CAISO).¹ It provides for:

- (1) a 50% exclusion for Existing Contract (E.C.) volumes (those transported using the ISO Controlled Grid under contracts with the IOUs in effect at startup);
- (2) a 100% exclusion for volumes in the ISO Control Area but not on the ISO Controlled Grid; and
- (3) a 100% exclusion for volumes located within the service areas of municipal and governmental utilities (e.g., Sacramento Municipal Utility District (SMUD)), which are served with generation located within those service areas, along with the California Department of Water Resources (CDWR) volumes served by CDWR generation in the same hour, even if the electricity is transported across the ISO Controlled Grid.

As directed by our Board, and as we have committed to in the settlement offer approved by the Federal Energy Regulatory Commission (the Commission) on June 1, 1998, CAISO has been working with stakeholders to examine various unbundling options.

Until late in 1998, we were proceeding on a path with stakeholders that we expected to lead to an unbundled rate to be effective July 1, 1999. With stakeholders, we developed and gathered initial cost data for five service offerings, and had begun to discuss appropriate billing determinants for these offerings.

However, the formulation of a proposal was complicated by an assessment of CAISO software development priorities. Unfortunately, it was noted that the need to perform pre-existing, higher-priority work (e.g., essential Year 2000-related work, Ancillary Services redesign items, firm transmission rights auction) precluded the development of the software that would be required to implement any complex GMC formulation before January 1, 2001. Our software development and implementation schedule is extremely aggressive. Both internal and external resources have been employed on an overtime basis to put into place the software that is critical to the continued operation of the CAISO, necessary to correct significant design issues, and considered most important to the needs of our participants. No desire was expressed by stakeholders or Board members to displace higher priority projects that were being worked on during the first six months of 1999, nor those high priority projects during the year after that period, to devote resources to develop software for unbundling.

Current CAISO software projects include over 170 initiatives classified into Priorities 1 through 3, with Priority 1 items considered most essential. Y2K efforts are considered Priority 0, as they must precede all other system changes. These software priorities are

¹ Capitalized terms not otherwise defined herein are defined in the Master Definitions Supplement, ISO Tariff Appendix A, as filed August 15, 1997. Other abbreviated terms are defined in the glossary that appears at the end of this document.

set by the CAISO Board of Governors and management, with significant stakeholder involvement, and in large part respond to priorities established by the Commission. Schedules for 1999 software implementation are presented frequently to the Board of Governors and stakeholders. The most recent discussion of the software priority calendar took place at an April 7, 1999, Market Issues Forum. An Appendix to this report contains documents related to the CAISO software development constraints and priorities.

Given these constraints, and with a view to attempting to meet our commitment to use every effort possible to provide for some form of unbundling, CAISO management presented for stakeholder and Board review a more limited form of unbundling that would include five service offerings, all billed on a volumetric, demand-based billing determinant. This proposal would have resulted in various customer classes based on deemed usage of the five service offerings. For various reasons, stakeholders did not support this proposal. Instead, stakeholders expressed almost unanimous and strong support for a continuation of the current settlement until further research can be performed on more complex and complete billing determinants, and software can be implemented to support any unbundling proposal decided upon.

Based on these circumstances, our Board voted March 25, 1999 to continue the existing settlement structure and not to pursue a limited form of unbundling. CAISO has used the results of the work performed in its unbundling analysis, with updates where necessary, to assess the appropriateness of the various exclusions provided under the current settlement.

The analysis presented here indicates that the 50% exclusion provided to Existing Contracts in the current settlement structure shows a reasonable relationship to the costs incurred by CAISO to provide services to Existing Contract holders. The continued appropriateness of excluding volumes not passing over the ISO Controlled Grid and load netted against internal generation inside non-participating utility service territories is a separate matter. We believe we could establish the reasonableness of assessing GMC charges to those volumes, but believe that the evidence to establish the appropriate charge levels will be better developed after the unbundling study is complete. Moreover, any "cost shifting" to other customers is negligible, given the relatively small volumes in these two categories compared to overall GMC volumes. For that reason, we submit that continuing the exclusion on an interim basis is within the zone of reasonableness.

Overview of Cost Allocation Methodology

CAISO has developed a cost allocation matrix that allocates the costs contained in our 1999 Operating Budget to five functional categories that were developed by our Unbundling Working Group. The Unbundling Working Group is a stakeholder committee that has investigated various options for the potential unbundling of our services.

The five functional categories are:

1. Control Area Operations
2. Scheduling
3. Congestion
4. Market Operations
5. Settlements, Billing, and Metering

A description of these service categories follows in the next section, "Functional Category Descriptions."

The cost allocation matrix lists all CAISO costs that are elements of the grid management charge, including operating costs and debt service. The overall revenue requirement for 1999 of \$158,734,000, consists of the following:

| | |
|-------------------------------------|--------------------|
| 1999 Operating & Maintenance Budget | \$113,062,000 |
| 1999 Finance Budget (debt service) | 48,820,000 |
| Less: Expense Recovery Budget | <u>(3,148,000)</u> |
| Total Revenue Requirement | \$158,734,000 |

Operating costs include a listing of the costs associated with each of the CAISO's "cost centers," which are groupings used by our accounting system to record costs on a department by department basis. The responsible managers and directors of each cost center reviewed their costs and provided ratios that directly allocate their costs to the five functional categories listed above. A description of the tasks and responsibilities of each cost center, the results of their allocations, and any commentary related to these allocations is provided below in the section entitled "Allocation Description Detail." In general, most operating costs were allocated based on these ratios provided by the appropriate CAISO staff. Certain costs related to either department overhead, overall corporate overhead, or services that benefit multiple departments and functions. These costs were allocated based on the results of the direct allocations. The cost allocation matrix and the descriptive text which is included for each cost center explains the methodology used for allocating all operating costs.

Debt service costs also are allocated to the functional categories. The debt service costs related to the CAISO's May 1998 bond issuance of \$301,400,000 are recovered through the GMC in an amount sufficient to cover principal, interest, and operating reserve payments, which for 1999 total \$48.8 million. The borrowing provided funding for initial infrastructure costs, future capital expenditures, working capital, and other items. The costs related to these items are allocated to the five functional categories using various methods, including a direct cost assignment for the infrastructure and capital expenditure costs, and applying the results of the allocation ratio developed with respect to certain operating costs to other categories, such as working capital costs.

The cost allocation matrix summarizes these results and produces ratios that show the percentage of total CAISO costs associated with the provision of each of the five function classifications of services offered by CAISO. The ratios developed are as follows:

| | <u>Ratios:</u> |
|---------------------------------------|----------------|
| 1. Control Area Operations | 35.6% |
| 2. Scheduling | 10.8% |
| 3. Congestion | 6.8% |
| 4. Market Operations | 22.7% |
| 5. Settlements, Billing, and Metering | 24.1% |

These ratios are then applied to the CAISO's overall Revenue Requirement for 1999, resulting in a revenue requirement for each of the five functional categories.

| | <u>Revenue Requirement:</u> |
|---------------------------------------|-----------------------------|
| 1. Control Area Operations | \$56,452,000 |
| 2. Scheduling | \$17,150,000 |
| 3. Congestion | \$10,815,000 |
| 4. Market Operations | \$36,096,000 |
| 5. Settlements, Billing, and Metering | <u>\$38,220,000</u> |
| Total | \$158,733,000 |

After the determination of the revenue requirement associated with each of the five functional categories, the transmission volume associated with each category is calculated. The volume forecast is the same used for setting the 1999 GMC rate of \$.7781 per MWh. This volume forecast considered the load volumes in the territories of the three IOUs, and the Existing Contract volume of several entities. The following volumes are used:

| | <u>'000 MWh</u> |
|---------------------------------------|-----------------|
| 1. Control Area Operations | 215,400 |
| 2. Scheduling | 215,400 |
| 3. Congestion | 192,000 |
| 4. Market Operations | 192,000 |
| 5. Settlements, Billing, and Metering | 198,300 |

All of the above categories include the volume associated with the IOU territories. Control Area Operations and Scheduling volume includes the volume associated with the Existing Contract load. Volume for Congestion and Market Operations excludes Existing Contract volume. Settlements, Billing, and Metering includes 25% of Existing Contract volume: as explained in the discussion of the five functional categories, Existing Contracts place some burden on the Settlements, Billing, and Metering group, and should be assessed costs, but data is not available to establish the exact degree to which Existing Contracts impose costs. CAISO analysts assumed a 25% burden as clearly within the range of reasonableness.

Next, a unit charge per MWh is developed to recover the costs for the five functional categories by dividing the revenue requirement for each of the five categories by the associated transmission volumes.

| | <u>Unit Charge per MWh</u> |
|-----------------------------------|----------------------------|
| 1. Control Area Operations | \$0.262 |
| 2. Scheduling | \$0.080 |
| 3. Congestion | \$0.056 |
| 4. Market Operations | \$0.187 |
| 5. Settlements, Billing, Metering | \$0.193 |

Finally, these unit charges are applied to each of the volume classes. Transmission volume not covering Existing Contracts is assessed a charge for all of the five functional categories. Existing Contract transmission volume is assessed a charge for Control Area Operations, Scheduling, and 25% of the costs of Settlements, Billing, and Metering.

| | | Non E.C. Volume Unit Charge per MWh | E.C. Volume Unit Charge per MWh |
|----|------------------------------------|--|------------------------------------|
| 1. | Control Area Operations | \$0.262 | \$0.262 |
| 2. | Scheduling | \$0.080 | \$0.080 |
| 3. | Congestion | \$0.056 | |
| 4. | Market Operations | \$0.187 | |
| 5. | Settlements, Billing, and Metering | <u>\$0.193</u> | <u>\$0.048</u> |
| | Total | \$0.778 | \$0.3899 |
| | Rate under Settlement | \$0.7781 | \$0.3891 |

Conclusion

Based on this methodology, we find that the existing settlement, (which excludes 50% of Existing Contract volumes from the GMC) produces a rate structure that is approximately reflective of the costs for providing services to these two classes of customers. We recognize that other rate proposals could also appropriately reflect the costs of providing services to these classes of customers. In light of the circumstances, however, including the computer software constraints and the need for further study of unbundling, we believe that the existing GMC settlement provides a reasonable rate structure while the CAISO continues to uphold its commitment to develop an unbundled rate that will recover the CAISO's operating costs.

FUNCTIONAL CATEGORY DESCRIPTIONS

A description of five functional categories of services performed by the California Independent System Operator and explanations as to why various classes of customers should pay for these services.

FUNCTIONAL CATEGORY DESCRIPTION

1. **Control Area Operations (Grid Reliability):** Manage the Control Area and controlled grid to "keep the lights on," i.e., ensure safe, reliable operation of the transmission grid and dispatch of bulk power supplies, including:

- performing operation studies;
- system security analyses;
- transmission maintenance standards;
- system planning to ensure overall reliability;
- integration with other Control Areas;
- emergency management;
- outage coordination; and
- transmission planning

CAISO Position: WSCC guidelines specify that the Control Area operator needs to oversee even "behind the meter generation." This includes COTP and CDWR volumes, which receive the same services as Existing Contracts on the ISO Controlled Grid. The CAISO believes that all volume in the ISO Control Area may use a portion of these services. As discussed above, however, we are not proposing at this time to change the current methodology for those volumes subject to the 100% exclusion.

2. **Scheduling:** Scheduling generation, imports, exports, and wheeling in the Day-Ahead and Hour-Ahead of actual operations.

CAISO Position: Everyone schedules or the CAISO must perform scheduling functions to accommodate their service. The CAISO believes that all volume in the ISO Control Area use all or a portion of these services. As stated above, however, we are not proposing at this time to change the current methodology for those volumes subject to the 100% exclusion.

3. **Congestion:** Congestion exists when power flowing on a transmission path exceeds the transmission path capacity. Congestion management is conducted by the CAISO during the scheduling process and results in the economic rationing of transmission service in order to prevent congestion.

CAISO Position: Existing Contracts and volumes subject to the 100% exclusion should not pay for these services.

- Existing Contracts have rights not subject to the CAISO's congestion process.
- Presently CAISO software accommodates the scheduling of existing contracts and settles correctly, if the Scheduling Coordinator (SC) for the Existing Contracts provides all of the correct information.

4. **Market Operations:** To provide open and non-discriminatory access for market making activities for participants through Ancillary Services auctions, provision of energy balancing services and market surveillance.

SC Related Market Activity:

- (1) Posting of market information
- (2) Real time energy balancing
- (3) Conducting Ancillary Services auction
- (4) Market surveillance.

CAISO Position: Existing Contract holders argue that their arrangements with the Transmission Owners predate the establishment of the CAISO and that because of these arrangements they do not require the market functions the CAISO offers. To the extent Existing Contracts holders purchase directly or indirectly services from these markets, their Scheduling Coordinator pays the GMC. The CAISO is not proposing to assess these cost to Existing Contract holders or loads subject to the 100% exclusion until as the result of further studies it is better able to establish the extent to which these entities impose costs on or obtain benefits from these CAISO functions.

5. **Settlements, Billing, and Metering:** Settlements, Billing, and Metering functions are performed for all transactions in the Control Area. This function uses information from Day-Ahead scheduling, Hour-Ahead scheduling, and Real Time operations, market clearing prices, bid prices, ex-post prices, and metered information from generators, loads, and inter-tie points, to ultimately balance the billing of and payments for energy, capacity, and transmission service in and out of the systems through the SCs. The related financial transactions involve billions of dollars each year. Statements and invoices are sent to SCs, (including SCs scheduling Existing Contracts), Participating Transmission Owners (PTOs), and non-SCs (i.e., other Control Areas), to collect and pay for use of ISO market and Control Area needs.

CAISO Position: The CAISO believes that all customers, even those who have their own generation and/or transmission, use CAISO Settlements, Billing, and Metering to some extent.

Existing Contracts affect the Settlements, Billing, and Metering function in the following ways:

1. Information flows from Scheduling and Market Operations are processed by the Settlements system. Such information includes contract reference numbers (CRNs), self-provision under Existing Contracts, changes to forward market energy and new schedules introduced in real time, etc.
2. Information processed by the Settlements system from Scheduling and Market Operations requires manual intervention to modify or remove certain information such as volumes exempt from wheeling and GMC charges.
3. Certain information must be manually incorporated into the Settlements system, including validation and auditing of bubble calculation for "net" meter read submittals plus retroactive changes whenever mistakes are made.

Accordingly, we believe it is clearly within the zone of reasonableness to assess Existing Contract volumes 25% of the charges related to the Settlements, Billing, and Metering function.

We expect to consider this issue with regard to both Existing Contracts and volumes currently subject to the 100% exclusion when we examine appropriate billing determinants for unbundling in the future. As stated above, however, we are not proposing at this time to change the current methodology for those volumes subject to the 100% exclusion.

ALLOCATION DESCRIPTIVE DETAIL

A description of the methods used to allocate specific operating and debt service costs to the five functional categories follows.

| Cost Center | | Allocation Method |
|-------------|--------------------------|--|
| 1111/1211 | Human Resources/CEO | Allocated based on total headcount |
| 1221 | Corporate Services | Allocated based on total headcount |
| 1231 | Facilities & Security | Allocated based on total headcount |
| 1300 | Finance/Acct. Department | Allocated based on overall Ops, IT, CS costs |
| 1411 | IT General | Allocated based on overall IT group costs |
| 1421 | Appl. Serv. (SI/SA/BBS) | Direct Allocation |
| 1431 | Computing Services | Direct Allocation |
| 1441 | Telecom. Services | Allocated based on overall headcount |
| 1451 | Information Security | Allocated based on overall IT group costs |
| 1461 | Op. System Support/EMS | Direct Allocation |
| 1511 | Operations - Indirects | Allocated based on cost of operations |
| 1521 | Planning | Direct Allocation |
| 1541 | O&E General | Overhead |
| 1542 | Outage Coordination | Direct Allocation |
| 1543 | Operations Engineering | Direct Allocation |
| 1544 | Operations Scheduling | Direct Allocation |
| 1545 | Operations Dispatch | Direct Allocation |
| 1546 | Security Coordination | N/A-Not part of allocation |
| 1547 | Dir. Eng. & Maintenance | Direct Allocation |
| 1548 | Op. Training/Maint. | Allocated based on headcount of Ops |
| 1549 | Manager of Training | Allocated based on headcount of Ops |
| 1551 | Market Ops | Direct Allocation |

| | | |
|--------------|---------------------------------|---|
| 1552 | Mgr. Markets | Direct Allocation |
| 1553 | Appl. Dev. | Direct Allocation |
| 1554 | Principal Engineer | N/A-Included with Op. Training. & Maintenance |
| 1611 | General Counsel | Overhead for General Counsel Direct Reports |
| 1621 | Communications | Allocated based on overall Ops, IT, CS costs |
| 1631 | Legal & Regulatory | Allocated based on overall Ops, IT, CS costs |
| 1641 | Market Surveillance | Direct Allocation |
| 1651 | Board Liaison | Allocated based on overall Ops, IT, CS costs |
| 1711 | Client Services-Indirects | Overhead for Client Relations |
| 1721 | Billing, Settlements & Metering | Direct Allocation |
| 1722 | Applications Support | Direct Allocation |
| 1723 | UTS Metering | Direct Allocation |
| 1724 | PSS | Direct Allocation |
| 1725 | FSS | Direct Allocation |
| 1731 | Contracts & Compliance | Direct Allocation |
| 1741 | Client Relations | Direct Allocation |
| Debt Service | Debt Service | See detailed explanation following |

Notes:

- The allocation percentages and descriptions of responsibilities that follow are based on responses from a questionnaire distributed to Directors and Managers of CAISO. These individuals were provided with descriptions of the five functional service categories (previous section of this report) and asked to allocate their departmental costs as appropriate, to provide any available supporting assumptions, and general descriptions of departmental responsibilities.
- Cost Center Directors and Managers were provided with the option of providing different allocation ratios for 1) salary/labor costs and 2) other operating costs, should this be necessary to provide a more accurate allocation.

CEO/Human Resources
CEO and Human Resources
Cost Center 1111/1211

Cost Allocation Methodology and Percentages:

The costs related to the CEO and Human Resources group are allocated to the five ISO functional categories based on the results of the allocation of the headcount of all other CAISO departments, including Operations, IT, Client Services, Legal, and Finance.

Description:

The Human Resources Department is responsible for health and welfare benefits administration, payroll, employee relations, recruiting, and training.

The CEO oversees and directs all operations of the CA ISO and reports to the Board of Governors.

CEO/Human Resources Corporate Services Cost Center 1221

Cost Allocation Methodology and Percentages:

The costs related to the Corporate Services group are allocated to the five ISO functional categories based on the results of the allocation of the headcount of all other CAISO departments, including Operations, IT, Client Services, Legal, and Finance.

Description:

The Corporate Services group is responsible for three functions:

1. Security – Responsible for providing physical protection of ISO personnel and property. This includes workplace violence prevention, investigations of criminal acts, executive protection, risk management, and threat assessment.
2. Safety – Responsible for overseeing risk assessment and management, workers compensation administration, ergonomic program management, and other related safety programs. Ultimately responsible for ensuring that the ISO is in compliance with all applicable local, state, and federal safety laws and regulations.
3. Administration – Responsible for coordinating corporate support functions including, mail services, reception desk, procurement administration, office automation equipment, conference room set-up, and management. Additionally, responsible for ensuring consistent policies and procedures are in place for corporate administrative staff.

CEO/Human Resources Facilities Group Cost Center 1231

Cost Allocation Methodology and Percentages:

The costs related to the facilities group are allocated to the five ISO functional categories based on the results of the direct cost allocation for the Operations, IT, and Client Services groups as a whole.

Description:

Maintains and provides for the necessary physical infrastructure of the California ISO. This includes, but is not limited to: all property lease agreements, such as payments, negotiations, etc.; all physical upgrades, maintenance, and modification to building structures housing both control centers, including all raised floor computer room areas and Dispatch; planning, design, and maintenance support to accommodate ISO personnel in all administrative office areas; planning and oversight of acquisition, build-out, and transition into all newly acquired rental or leased properties for the ISO; all maintenance, furnishings, modifications, and upgrades of HVAC/Mechanical systems and electrical distribution for all control center operations, computer rooms, and administrative areas for all leased or rented ISO facilities.

Finance
Finance and Accounting
Cost Center 1300-1331

Cost Allocation Methodology and Percentages:

The costs related to the Finance group are allocated to the five ISO functional categories based on the results of the direct cost allocation for the Operations, IT, and Client Services groups as a whole.

Description:

The Finance & Accounting group is responsible for the following:

- Financial reporting
- Corporate accounts payable and receivable
- Payroll
- Treasury/Cash Management
- Risk Management
- Debt administration
- Budgeting/Financial Planning
- Benchmarking
- Audits-Financial/Operational
- Internal controls
- Rates/Unbundling
- Market close

Information Technology
IT General
Cost Center 1411

Cost Allocation Methodology and Percentages:

The costs related to the IT General cost center are allocated to the five ISO functional categories based on the results of the cost allocation for groups that report to the Chief Information Officer:

- 1421 Application Services
- 1431 Computing Services
- 1441 Telecommunications
- 1451 Information Security
- 1461 Operating System Support

Description:

This cost center contains the costs associated with the activities of the Chief Information Officer, who oversees and directs the activities of the groups listed above.

Information Technology Application Services Cost Center 1421

Cost Allocation Methodology and Percentages:

| | | <u>Overall Dept. Cost Allocations:</u> |
|-------|------------------------------------|--|
| 1. | Control Area Operations | 10% |
| 2. | Scheduling | 15% |
| 3. | Congestion | 5% |
| 4. | Market Operations | 35% |
| 5. | Settlements, Billing, and Metering | <u>35%</u> |
| Total | | 100% |

Costs for support of infrastructure were spread across the groups above.

Description:

The ISO organization works as a cooperative whole in identifying and effectively and efficiently applying information technology to: 1) meet business requirements, and 2) create new business opportunities. This requires a close alignment of business and IT strategies and investments. Application Services manages the IT business relationship with the customers (internal and external) to provide information technology based products, services, and strategies that are cost effective; add value to the business; and contribute to meeting the business objectives of the company in the marketplace.

Specific goals include:

- Provide processes, procedures, tools, and services to support enterprise-wide application of information technology and information delivery.
 - ⇒ Information Management, including Data Warehousing and Electronic Document Management
 - ⇒ Web Administration – Intranet and Internet
 - ⇒ Data Base Administration
 - ⇒ Project Management, Business Analyst, and Programming (HR, Finance) support to Business Units
 - ⇒ Year 2000 Program including Project Management and System Inventory, Assessment, and Testing
- Ensure reliability of business functions through implementation of programs and policies to preserve computer application and data integrity. Components include:
 - ⇒ Change Management
 - ⇒ Software Release Management
 - ⇒ Integration System Testing
 - ⇒ Scheduling Coordinator Testing
 - ⇒ Backup/Recovery Procedures

- Actively facilitate communication and understanding of system integration issues by leadership/sponsorship of:
 - ⇒ Technical Change Board
 - ⇒ Technical Standards Work Group
 - ⇒ Development of Enterprise Business Model

Information Technology Computing Services Cost Center 1431

Cost Allocation Methodology:

| | <u>Overall Dept. Cost Allocation:</u> |
|---------------------------------------|---|
| 1. Control Area Operations | 28% |
| 2. Scheduling | 5% |
| 3. Congestion | 5% |
| 4. Market Operations | 30% |
| 5. Settlements, Billing, and Metering | <u>32%</u> |
| Total | 100% |

Description:

IT Computing Services provides corporate wide computing infrastructure support including the following:

Platform Support – Computing hardware, operating system, and layered product configuration, installation, testing, and maintenance, along with regular system administration duties to ensure the reliability and effective performance of the computer platforms.

System Management – Regular monitoring of computing infrastructure hardware and software, along with database and application processes to ensure 7 day a week and 24-hour a day availability of platforms and business systems. This function includes the escalation, notification, and documentation of system failures. In addition, system engineers analyze system activity and performance to provide capacity management, including the recommendation for short and long term computing infrastructure enhancements.

Disaster Recovery Support – Corporate wide backup and recovery support for computing platforms and corporate electronic data, including the management and administration of regular system backups and applicable recovery processes.

Help Desk and Desk Side Support – Installation, maintenance, and support of the office automation infrastructure including support to internal users in the use of office automation tools. In addition, the Help Desk provides central call logging and issue management for office automation, internal communication infrastructure, and facility related problems and issues.

Remedy (Issue Management System) configuration, installation, training, support, and administration.

Asset Management – Central procurement for computing infrastructure components, including lease management. In addition, Computing Services has accountability for the inventory of all computing hardware, software, and documentation.

Information Technology Telecommunications Cost Center 1441

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocations:</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 41% |
| 2. Scheduling | 12% |
| 3. Congestion | 7% |
| 4. Market Operations | 23% |
| 5. Settlements, Billing, and Metering | 17% |
| Total | 100% |

Cost Allocation Methodology and Percentages:

The method used to allocate costs related to Telecommunications relies mainly on the headcount (FTEs) associated with the five ISO services. See Analysis which follows.

Description:

The Telecommunications Department is responsible for providing reliable data and voice communications infrastructure for the ISO, PX and all market participants. The group manages a contract with MCI for the Energy Communication Network (ECN) which includes a high speed and high availability fiber optic statewide network connecting the Folsom and Alhambra ISO sites, the Area Control Centers, regional security coordinators, and all market participants. The network is utilized to control the transmission systems, generators, and Ancillary Service providers. It provides the “marketplace” for the direct market participants. In addition, it integrates all power revenue metering points and supports the consolidation of metering data.

The Telecommunications Department provides corporate support for ongoing network development, including expertise for resolving complex connection and computer issues. Additional responsibilities include design engineering for both voice and data communications, remote communications access, redundant voice communications including cell phones, paging, and vendor management, and oversight for the MCI and other service provider contracts.

Allocation Methodology:

The MCI Contract costs comprise approximately \$31.7 million, which are most of the costs in the Telecommunications group.

CAISO has relied on the cost information that MCI has provided us, and developed a methodology to allocate these costs to the various functional categories.

Provided below is a summary of the various MCI charges and the method of allocating these charges. This method allocates costs based mainly on the headcount for each functional category that utilizes MCI services.

Under our allocation methodology, we view the MCI charges as falling under two broad categories: charges that are assessed for services utilized by all ISO employees, and those that are assessed for utilization by users in specific groups such as Operations, Client Services, and Market Surveillance. The first category includes the Voice Premises and Shared Network Services costs, totaling approximately \$4 million per year. These MCI costs were allocated to the five ISO service categories based on the total ISO headcount related to each cost category.

The second, totaling approximately \$27.7 million, was allocated, where possible, based on usage factors. The following steps were used for the allocation.

First, about \$2 million, or 22% of the Bandwidth and WAN infrastructure costs (that is, data backbone) were allocated directly to the Market Function, as this capacity is set aside for connected entities. We then determined what major functional groups in the ISO were utilizing the Bandwidth & WAN, Usage (that is, access charges, internet, redundancy), and Data Premises cost categories. These functional groups were identified as Operations, Client Services, and Market Surveillance. For each functional group in these departments, the employee headcount was allocated to the five ISO service categories; the MCI Costs were then allocated to each service category based on the corresponding headcount.

We assumed that a large number of FTEs present in the Client Services group, were involved in mostly manual, non-MCI usage related activity. We therefore made

adjustments to prevent an inappropriately high level of MCI costs from being allocated to the Billing & Settlements service category by excluding all FTEs associated with manual work for Client Service functions like Contracts & Compliance and Client Relations. Similarly, the FTEs in Client Services for Applications Support were excluded. In addition, the FTEs for UTS Metering were reduced by half, to account for the semi-manual nature of this function. Thus, for Client Services, MCI costs were allocated based only on FTEs for Billings & Settlement, Balance of Business Systems-PSS/FSS, and UTS Metering (50% FTEs).

The results of the allocation procedure for MCI Costs are provided in the table below.

| Category | 1999 Budget Amt.(\$000) | Control Area Ops. | Scheduling | Congestion | Market Function | Billing & Settlements |
|-------------------------------|--------------------------------|--------------------------|-------------------|-------------------|------------------------|----------------------------------|
| Total MCI Costs | 31,706 | | | | | |
| Direct Allocation | 2,000 | | | | 100% | |
| Total Headcount Allocation | 4,000 | 38.3% | 12% | 6.4% | 19.3% | 24% |
| Specific Headcount Allocation | 25,706 | 43.9% | 12.9% | 7.2% | 18.3% | 17.7% |

Information Technology Information Security Cost Center 1451

Cost Allocation Methodology and Percentages:

The costs related to Information Security are allocated to the five ISO functional categories based on the results of the allocation for other IT Groups:

- 1421 Application Services**
- 1431 Computing Services**
- 1441 Telecommunications**
- 1451 Operating System Support/EMS**

Description:

Accurate and confidential information is critical for safe, reliable grid operations and efficient markets through secure e-commerce. The Information Security Services (ISS) Department is assigned the crucial responsibility of securing and safeguarding this information, whether in repository in the ISO computer systems or in transit via networks and communication systems. Activities that support this continuous process are information security policies, procedures and standards development for both internal users and market participants. ISS is also responsible for the education, awareness and compliance of these policies, procedures and standards. ISS also provides security design, engineering and implementation of security infrastructure for existing and new applications, communication systems, and e-commerce solutions. Other activities ISS provides are the monitoring and auditing of security logs, administration of remote access platforms and digital certificates, encryption technologies and responding and investigating security incidents. ISS also supports business continuity planning and testing for the ISO and external parties.

Information Technology

Operating System Support / Energy Management System

Cost Center 1461

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 96% |
| 2. Scheduling | 2% |
| 3. Congestion | 2% |
| 4. Market Operations | 0% |
| 5. Settlements, Billing, and Metering | <u>0%</u> |
| Total | 100% |

Description:

Control Area Operations: Support of the EMS to maintain, troubleshoot problems, and enhance applications requires the greatest amount of time in relation to Control Area activities. Functionality of the EMS corresponds mostly to Control Area functions which include SCADA, AGC, data archival, and data processing for transmission and generation monitoring (see glossary). Activities related to this functionality are:

1. data collection, archival, and retrieval;
2. maintain SPL calculation application and add calculations as required;
3. AGC functional support;
4. Operating reserve calculations – define and change as required;
5. system builds;
6. database builds;
7. database support; and
8. ICCP (Inter-Control Center Protocol) functionality.

This typically requires the greatest percentage of EMS staff time.

Scheduling: The SI system processes market driven schedules from the Power Exchange (PX) and transfers the final schedules to the EMS. These schedules are then used to operate the electric system along with spot market schedules. The EMS then processes the schedules for use by AGC. The activity required to maintain the scheduling application (Interchange Scheduler – IS), assure correct transfer of schedules from SI, and check processing of schedules for AGC functions is usually minimal. This typically requires approximately 2% of EMS staff time.

Congestion: This problem is initially rectified by the SI system when schedules are processed from the PX. After the schedules are transferred to the EMS, power flows are

monitored and an alarm is produced when congestion problems exist on the transmission grid. Alarm limits are entered and maintained in order to allow operations staff to take measures to mitigate any problems. These activities usually require approximately 2% of EMS staff time.

**Operations
Operations General
Cost Center 1511**

Cost Allocation Methodology and Percentages:

The costs related to the Operations General cost center are allocated to the five ISO functional categories based on the results of the cost allocation for the Operations group as a whole.

Description:

This cost center contains the costs associated with the activities of the Chief Operation Officer (VP Operations), who oversees and directs the activities of the Operations group.

**Operations
Grid Planning
Cost Center 1521**

Cost Allocation Methodology and Percentages:

| | | <u>Overall Dept. Cost Allocation</u> |
|----|------------------------------------|--|
| 1. | Control Area Operations | 100% |
| 2. | Scheduling | 0% |
| 3. | Congestion | 0% |
| 4. | Market Operations | 0% |
| 5. | Settlements, Billing, and Metering | <u>0%</u> |
| | Total | 100% |

Grid Planning is 100% related to Control Area Operations.

Description:

The ISO Grid Planning Department is charged with reviewing the Participating Transmission Owners (PTOs) Bulk Power Program (a five-year Program is filed with the ISO every year) and reviewing the studies the PTOs perform for connecting new generators or load to the ISO controlled grid. The ISO recommendations (if any) are either implemented by the PTOs or the problem is resolved via dispute resolution processes.

Additionally, Grid Planning does studies to determine Reliability Must-Run contract requirements, dual fuel generator requirements and provides support to Operating Engineering. Grid Planning has been involved in the preparation of the new ISO Reliability criteria, and is working toward common facility ratings (when feasible).

Additionally, Grid Planning leads or supports several Regional and National technical/engineering groups including the Western Systems Coordinating Council, the Western Interconnection Coordination Forum and the North American Electric Reliability Council.

Operations Operations & Engineering General Cost Center 1541

Cost Allocation Methodology and Percentages:

The costs related to the Operations & Engineering General cost center are allocated to the five ISO functional categories based on the results of the allocation for the Operations group as a whole.

Description:

The cost center contains the budgeted costs for the VP of Operations, who oversees the activities of all Operations functions. The costs in this area consist primarily of fees for consultants for the performance of a variety of operations related consulting projects.

Operations Outage Coordination Cost Center 1542

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|--------------------------------------|--|
| 1. Control Area Operations | 83% |
| 2. Scheduling | 5% |
| 3. Congestion | 12% |
| 4. Market Operations | 0% |
| 5. Settlements, Billing and Metering | <u>0%</u> |
| Total | 100% |

Description:

Outage Coordination performs activities related to the following:

Control Area operations: The majority of the outage coordinator's time is spent in this area. Ensuring accurate path ratings and integrated outages to ensure minimum reliability standards are adhered to. The coordinators work closely with Operating Engineers to help accomplish this.

Scheduling: Path ratings and allocation percentages are finalized by the Outage Coordinators, then passed on to the inter-tie scheduling group. Additionally, these allocations are passed on to Existing Contracts holders and posted on the internet as part of the Control Area responsibilities.

Congestion: When transfer paths are derated, congestion can occur. Although this process of mitigating congestion is similar to "scheduling" above, it differs in that by allocating the reduced percentages to the scheduling group, congestion is preempted by reducing schedules on a scheduled basis, which allows for better management of congestion.

**Operations
Operations Engineering
Cost Center 1543**

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 83% |
| 2. Scheduling | 2% |
| 3. Congestion | 3% |
| 4. Market Operations | 7% |
| 5. Settlements, Billing, and Metering | <u>5%</u> |
| Total | 100% |

Description:

The Operations Engineering group is responsible for the following activities:

- Performs power flow, transient stability, and post-transient stability analysis to evaluate scheduled outages to support the Outage Coordination Office;
- Evaluates system operations, including protection systems, load/resource sufficiency, etc.;
- Develops day-ahead RMR pre-schedules;
- Develops ISO operating procedures;
- Develops seasonal operating nomograms defining transmission path transfer limits;
- Provides training for operating procedures and contracts;
- Participates in WSCC committees and workgroups related to interconnected power system operations;
- Provides support for Existing Contract and Scheduling issues;
- Provides engineering support for ISO contracts issues (e.g., RMR contract, Participating Generator Agreement, etc.)
- Provides engineering support for ISO projects (e.g., ANALOPE, GCP, etc.)
- Investigates disturbances and prepares disturbance reports;
- Supports Energy Management System (EMS) application and screen development.

Operations Scheduling Cost Center 1544

Cost Allocation Methodology and Percentages:

| Headcount | | Percentage Allocation of Activities | | | | | |
|--------------------------|-----|-------------------------------------|------------|------------|---------------------|-------------------------|-----------|
| Category Allocations | | Control Area Operations | Scheduling | Congestion | Market Functions | Settlements/ Billing | |
| Headcount Breakdown | FTE | Weighting | | | | | |
| Manage/Admin | 2 | 7% | 5% | 85% | 0% | 5% | 5% |
| Prescheduling | 6 | 22% | 5% | 80% | 10% | 0% | 5% |
| Real-time | 17 | 61% | 15% | 65% | 15% | 5% | 0% |
| Scheduling Support/ATF | 3 | 11% | 10% | 70% | 0% | 0% | 20% |
| Dept Weighted Avg | | 100% | 12% | 70% | 11% | 3% | 4% |

Description:

Operations Scheduling is the primary interface between the ISO and its 11 adjacent Control Areas as a part of the WSCC interconnection. Metered and scheduled interchange is coordinated on a pre-schedule, real time, and after-the-fact basis with the neighboring Control Areas. Direct and distinct functions are also performed to enable the ISO markets, congestion and settlements process. All of these functions require accommodations to assure that Existing Contracts are honored.

All interchange transactions must be coordinated with adjacent and external Control Areas within the limits of the ISO jurisdictional transmission system. This includes implementing and monitoring all interchange schedules into and out of the ISO Control Area regardless if they are scheduled on ETC or NFU transmission. Interchange scheduled on behalf of all SCs must be reconciled to meet WSCC and NERC criteria.

Operations

Grid Operations/Dispatch

Cost Center 1545

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 75% |
| 2. Scheduling | 0% |
| 3. Congestion | 5% |
| 4. Market Operations | 15% |
| 5. Settlements, Billing, and Metering | <u>5%</u> |
| Total | 100% |

Description:

The Grid Operations group is responsible for the following:

- Oversee and perform all Real Time Operations of the ISO Electrical Grid and Control Area.
- Ensure reliable and safe operation of the California ISO Electrical Grid.
- Reliable operation includes any authority needed to maintain control of the Grid, including authority over all PTO's and UDC's in regards to system reliability and system emergencies, and ability to order must run generating units on-line, and manual load shedding as needed.
- Coordinate load and system restoration after a major system disturbance in cooperation with the WSCC Security Coordinator.
- Has authority to declare a System Emergency as detailed in the Dispatch Protocol, to suspend market operations, and set Administrative prices for Ancillary Services needed to resolve the emergency.
- Ensure compliance with all WSCC, NERC criteria, and ISO protocols and procedures.
- Work with the WSCC Security Coordinator to ensure compliance with all policies and operating procedures applicable to the Western Interconnection.
- Control applicable generation to meet inter-tie obligations, emergency responses, and WSCC and NERC criteria to support the transmission system and operation of the energy market in the most reliable manner.
- Maintain documentation for generation operations.
- Procure additional Ancillary Services as necessary.
- Manage operation of eligible Regulatory Must-Take, Must-Run, and Reliability Must Run generation.
- Dispatch curtailable demand.
- Coordinate generation resources to meet system load requirements and satisfy contractual obligations.

**Operations
Engineering & Maintenance
Cost Center 1547**

Cost Allocation Methodology and Percentages:

Allocation is based on that of 1542 and 1543, otherwise 98% Control Area, 1% each market, billing & settlements.

Description of Activities:

The Director of Engineering & Maintenance is responsible for overseeing Outage coordination (cost center 1542), Operations Engineering (cost center 1543), satellite operations manager, and transmission maintenance.

Operations Operations Support and Training (OSAT) Cost Center 1548, 1549, 1554

Cost Allocation Methodology and Percentages:

The costs related to the OSAT group are allocated to the five ISO functional categories based on the results of the headcount allocation for the Operations group.

Description:

OSAT provides training and support to all groups within the Operations Department, to other departments within the ISO and to Market Participants, to ensure and enhance system reliability as well as to facilitate and expand workably competitive markets. The primary role of OSAT is to provide support to all departments within the Operations Division, including the development of training programs, dispatch support and development of tools for operations (special projects). OSAT consists of three cost centers: Operations Training & Maintenance, Manager of Training, and the Principal Engineer (costs contained in cost center 1548).

Specific roles and responsibilities include:

- Development and delivery of training programs for all areas of Operations and for Market Participants
- Management & Update ISO Operating Procedures
- Reporting of Operating Data to WSCC & NERC (RMS Reporting)
- Development of Board Documents and Tariff language for proposed changes in ISO Operations & Markets
- Emergency Operations Planning and Procedures
- Management of Special Projects that support Operations
- Transmission Information Display System (Mapping Project)
- Board Presentation Process Project
- R&D - Installation of tools to improve grid reliability
- Participate in NERC and WSCC committees and task forces relating to Operations and Scheduling

**Operations
Market Operations
Cost Center 1551, 1552, 1553**

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 10% |
| 2. Scheduling | 10% |
| 3. Congestion | 20% |
| 4. Market Operations | 50% |
| 5. Settlements, Billing, and Metering | <u>10%</u> |
| Total | 100% |

The above percentages apply to cost centers 1551-1553 overall.

Description:

The Market Operations Group is made up of 30 ISO employees. The group consists of three cost centers:

| | |
|-------------------------|------|
| Market Operations | 1551 |
| Manager of Markets | 1552 |
| Manager of Applications | 1553 |

Seven employees directly report to Director, Market Operations, including the Manager of Markets and Manager of Application Development, 2 Senior Market Design Engineers and 3 Application and Database Engineers. Seven employees report to the Manager of Applications consisting of 2 Senior Market Design Engineers, 2 Market Support Engineers and 3 Application and Database Engineers. Fifteen employees report to the Manager of Markets consisting of 3 Day-Ahead Grid Resource Coordinators, 5 Hour-Ahead Grid Resource Coordinators, 5 Real Time Grid Resource Coordinators and 3 Relief Grid Resource Coordinators.

The Market Operations as a whole is responsible for conducting Day-Ahead, Hour-Ahead and Real Time Markets, including:

- Manage inter- and intra-zonal congestion and makes changes (via Adjustment Bids).
- Re-dispatch schedules to resolve congestion at the lowest possible cost to customers.
- Manage the Ancillary Service and imbalance energy markets; and calculate the market clearing prices for spinning, non-spinning, replacement and regulation.

- Ensure that the Scheduling Coordinators (SCs) posting of requirements regarding congestion, losses and Ancillary Services, etc., is reliable.
- Ensure continuous interface between the ISO and the SCs that will allow SCs to make best use of transmission resources.
- Providing technical expertise on the design of the California market related to the bidding, scheduling, and settlement systems.
- Review market design and prices on a daily basis.
- Provide engineering analysis to support SCs, settlements, and daily operations.
- Provide technical analysis, input, and review of vendor supplied design documents for compliance with ISO-defined requirements.
- Ensure thorough testing of vendor supplied applications by creating test objectives, conditions, and scripts to be used for module.
- Design and perform integration testing. Document and manage vendor-supplied scheduling application software changes in accordance with release management procedures.
- Conduct SC training and SC certification testing.
- Performing software life cycle activities in support of in-house scheduling software requirements necessary for market reliability and accuracy as detailed in the FERC filing and ISO protocols.
- Administer all interface applications between the SI database and all other subsystems.
- Provide system administration support for test and development environments.
- Provide an advisory role to ISO Market Surveillance group on market power issues.

**General Counsel
General Counsel-General
Cost Center 1611**

Cost Allocation Methodology and Percentages:

The costs related to the General Counsel are allocated to the five ISO functional categories based on the results of the cost allocation for groups that report to the General Counsel:

- 1621 Communications
- 1631 Legal & Regulatory
- 1641 Market Surveillance

Description:

The General Counsel oversees the activities of the Legal & Regulatory group, Market Surveillance, and Communications.

General Counsel Communications Cost Center 1621

Cost Allocation Methodology and Percentages:

The costs related to the Communications group are allocated to the five ISO functional categories based on the results of the direct cost allocation for the Operations, IT, and Client Services groups as a whole.

Description:

The Communications group is responsible for the Corporate Communications and Governmental Relations function of the ISO, including internal and external communications, media relations, and the relationship with legislators, Board of Governors, stakeholders, and governmental regulators, including:

- Preparation and distribution of corporate internal information, news releases, media relations, and lobbying activities.
- Plan and execute corporate special events.
- Review and analyze the expenditures, operations, and workflow of the unit to maximize operational efficiency of the organization.
- Coordinate the development of business plans, processes, and procedures to manage internal communications, government, and media relations.
- Coordinate the external communications and governmental relations plans with managers and executives at various levels of the organization and the Power Exchange.

General Counsel Legal & Regulatory Cost Center 1631

Cost Allocation Methodology and Percentages:

The costs related to the Legal & Regulatory group are allocated to the five ISO functional categories based on the results of the cost allocation for the Operations, IT, and Client Services groups as a whole.

Description:

Legal & Regulatory is responsible for the preparation all FERC filings and for monitoring and participating in all ISO-related FERC proceedings. Such responsibilities include preparation of amendments to the ISO Tariff, the Transmission Control Agreement (including provisions related to Existing Contracts), all filings and proceedings related to our *Pro Forma* Agreements, including the RMR agreements, and all generic FERC rulemakings and other proceedings. The Legal and Regulatory department is also charged with monitoring and participating in proceedings and other matters involving relevant state agencies such as the California Energy Commission and California Public Utilities Commission. The Legal and Regulatory group is responsible for shaping and monitoring electric restructuring initiatives and legislative proposals, both on the state and federal level. The Legal and Regulatory group also formulates and helps implement the ISO's regulatory policies and positions. The Legal group is responsible for the production and negotiation of all general corporate legal documents and matters, including all vendor contracts, confidentiality agreements, employment matters, dispute resolution (related to Tariff matters). The Legal group is also responsible for negotiating and drafting all pertinent financial/legal documents and maintenance of all corporate minutes and bylaws. The Legal and Regulatory group interfaces frequently with Market Operations, Planning, the Contracts and Compliance department, Client Services, and the Billing and Settlements department, to provide legal advice and regulatory guidance.

**General Counsel
Market Surveillance
Cost Center 1641**

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 15% |
| 2. Scheduling | 0% |
| 3. Congestion | 10% |
| 4. Market Operations | 75% |
| 5. Settlements, Billing, and Metering | <u>0%</u> |
| | 100% |

The Market Surveillance Unit is the organization within the ISO that keeps a close watch on the efficiency and effectiveness of the Ancillary Service, congestion management and real-time spot markets. In 1998, the Market Surveillance Unit's function was expanded beyond the market monitoring function originally envisioned for the unit. The unit currently provides economic analysis to support decisions in a wide range of ISO decision-making processes. Specific functions of the Market Surveillance Units include:

1. Monitoring the market and developing indicators of market performance, including:
 - Prices
 - Ancillary Service Bid Efficiency
 - Congestion
 - Competitiveness of the Market
2. Identifying and reviewing deliberate or inadvertent violations of market rules or contracts that affect the efficiency of the market.
3. Identifying and investigating potential gaming and market power abuses.
4. Performing special studies of the impacts of current and potential ISO protocols on market efficiency and performance.
5. Reviewing ISO rules and protocols from a market performance perspective, and recommending specific changes in market rules and protocols.
6. Working with other areas of the ISO to implement these changes affecting market performance.
7. Supporting the Market Surveillance Committee, by completing special analysis to support reporting and recommendations of the MSC to ISO management.
8. Coordinating Monitoring Activities with the PX Compliance Unit.
9. Reporting to FERC and other agencies.

Client Services
Client Services General
Cost Center 1711

Cost Allocation Methodology and Percentages:

The costs related to the Client Services General cost center are allocated to the five ISO functional categories based on the results of the cost allocation for groups that report to this one:

- 1721 Settlements, Billing, and Metering
- 1731 Contracts & Compliance
- 1741 Client Relations

Description:

The VP of Client Relations, the costs of which are contained here, oversees and directs the activities of the above groups.

Client Services Settlements, Billing, and Metering Cost Center 1721

Cost Allocation Methodology and Percentages:

The costs related to the Settlements, Metering & Billing Directorate are allocated to the five ISO functional categories based on the results the allocation for the cost centers which report to this one, which are:

- 1722 Application Services
- 1723 Metering
- 1724 Preliminary Settlements
- 1725 Final Settlements

Description:

Settlement, Billing, and Metering functions are performed for all transactions in the Control Area. Information regarding these transactions is forwarded, on a regular basis to the ISO. Scheduling information for Day-Ahead and Hour-Ahead is validated prior to Real Time operations to insure compliance with ISO tariffs and protocols. Subsequent to the Settlement Period, operating and billing data is compiled by the Settlements & Metering department in order to publish, in accordance with the ISO's payment calendar, a preliminary settlement statement for each market participant. Examples of major billing and price components necessary for determining final billing are as follows: market clearing prices, bid prices, ex-post prices, and metered information from generators, loads, and inter-tie points. These financial transactions involve billions of dollars each year. Preliminary Statements and Final Bills are transmitted daily in accordance with the ISO calendar to each market participant. Final Billing Statements along with the monthly Grid Management Charges are summarized on monthly invoices sent to each market participant in order to collect and pay for use of ISO market and Control Area needs.

Client Services Settlements, Billing, and Metering: Applications Support Cost Center 1722

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 0% |
| 2. Scheduling | 0% |
| 3. Congestion | 0% |
| 4. Market Operations | 0% |
| 5. Settlements, Billing, and Metering | <u>100%</u> |
| Total | 100% |

Description:

Under the general direction of the Director of Settlements & Metering, the Applications Support group has the overall accountability and responsibility for the correct implementation, daily operation, availability and effectiveness of the company's Settlement, Billing & Credit, and EDI Systems. The group's primary functions include:

- Perform daily settlement processing. This includes executing and monitoring the daily settlement runs, generating Settlement Statements, and issuing invoices to the Market Participants.
- Provide end user support for the Settlement Analysts.
- Diagnose settlement errors, determine sources of problems, and make corrections as necessary.
- Assume overall accountability in maximizing and improving system availability.
- Proactively pursue system improvements to promote an efficient and effective computing environment that will meet the division's business needs.
- Provide technical support on issues related to Settlement.
- Identify any software enhancements that are required to support the Division's business needs and determine whether these enhancements should be performed in house or through an external vendor.
- For in house software projects, the group is responsible for the definition, design, coding, testing, and deployment of the new software.

- For software enhancements performed by external vendor, the group will manage the project throughout the entire implementation cycle. The group will prepare the requirements specification, work with the vendor throughout the design phase, approve the detail system design and test plan, perform acceptance tests, and ultimately deploy the software to the production environment.

Client Services Settlements, Billing, and Metering: Metering & MDAS Cost Center 1723

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 10% |
| 2. Scheduling | 0% |
| 3. Congestion | 0% |
| 4. Market Operations | 10% |
| 5. Settlements, Billing, and Metering | <u>80%</u> |
| Total | 100% |

Description:

Metering & MDAS is responsible for providing Settlement Ready metering data for the ISO billing system, including:

- Audit the ISO meter inspection process and provide engineering judgement related to proposed and existing metering systems.
- Operate and maintain meter data acquisition systems (MDAS) that directly acquire metering data from ISO metered entities and receive metering data from SCs.
- Audit metering data collection, storage and processing systems of the scheduling coordinators.
- Maintain the metering standards and specifications for approved meters and metering systems.
- Coordinate and approve proposed metering system engineering designs.
- Verify and process raw meter data into Settlement Ready data, which the ISO uses for generating preliminary and final financial settlement statements for the market participants.

**Client Services
Settlements, Billing, and Metering: Preliminary Settlements
Cost Center 1724**

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 0% |
| 2. Scheduling | 0% |
| 3. Congestion | 0% |
| 4. Market Operations | 0% |
| 5. Settlements, Billing, and Metering | 100% |

Description:

Responsible for the accuracy and timeliness of Preliminary Settlement Statements, and correct implementation of the necessary manual work-arounds to the existing Settlements software. Coordinates w/ Operations to obtain information necessary for production of correct Settlement Statements, and investigates the Settlement impact of proposed operating conditions, and client suggestions. Works with Application Support group and software vendors to design, test, and enhance Settlement software. Manages the authorized credit limit for ISO customers. Responsible for Settlements' specific review of the tariff and making recommendations for changing the tariff and protocol. Supports Settlement Improvement Team, and Grid Management Charge Unbundling Team.

Client Services
Settlements, Billing, and Metering: Final Settlements
Cost Center 1725

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept.</u> <u>Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 0% |
| 2. Scheduling | 0% |
| 3. Congestion | 0% |
| 4. Market Operations | 0% |
| 5. Settlements, Billing, and Metering | 100% |

Description:

Responsible for the accuracy and timeliness of Final Settlement Statements, and correct implementation of the necessary manual work-arounds to the existing Settlements software. Supports Client Relations group in resolving market participant issues and correct implementation of the approved disputed items. Maintains the Master File. Responsible for maintaining and operating a dedicated billing system for market participants, ensuring timely and accurate bills and payment processing. Coordinates with Operations to obtain information necessary for production of correct Settlement Statements. Supports Transmission Access Charge Team, and Firm Transmission Rights Team.

Client Services Contracts & Compliance Cost Center 1731

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 20% |
| 2. Scheduling | 15% |
| 3. Congestion | 10% |
| 4. Market Functions | 30% |
| 5. Settlements, Billing, and Metering | 25% |

Description of Activities:

The Contracts and Compliance Section is tasked with:

- Developing and negotiating contracts with Market Participants.
- Developing and implementing the penalties and sanctions for the ISO Tariff, including the Protocols, and the ISO Agreements.
- Assisting other Departments and Sections regarding contracts, compliance, FERC matters, and other projects.

CONTRACTS WORK RESPONSIBILITIES

Development of Agreements with New Clients and Existing Clients:

- Develop new agreements, execute revisions as needed for: expanding participation in the ISO, ICAOAs with other Control Area operators that have not yet executed the ICAOA, and others.
- Assist in enhancing client understanding of ISO agreement terms.

Contract Activities Based on Regulatory Directives:

- Amend agreements as needed and file with FERC.
- Revise and maintain the standard pro forma agreements.
- If FERC sets the agreement for hearing, negotiate settlement of all interventions. If settlement cannot be reached, participate in litigation proceedings.

Special Agreements:

- Develop for qualifying facilities (QFs) a PGA and MSA to facilitate their unique operating requirements.
- Determine if changes needed to special agreements, such as the TCA.
- Short-term RMR agreements.
- Assist in RMR settlements and obtain executed agreements resulting thereof.
- Black Start Agreements, Voltage Support Agreement, Emergency Assistance Agreement.

Administration of Contracts:

- Contract administration.
- Obligations and deadlines tracking, and records management system.
- Administer RMR agreements.
- Review operating procedures and operating instructions for consistency with the ISO agreements and ISO Tariff.

Special Projects:

- Administering the ADR requirements.

COMPLIANCE WORK RESPONSIBILITIES

Compliance Program:

- Develop and implement penalties on Scheduling Coordinators, Participating Generators and other Market Participants for events of non-compliance with the ISO Tariff, protocols, and agreements.

Special Projects:

- Develop and maintain a generator registry, monitor metering staff exemption requests.
- Determine compliance requirements for AB1890, NERC, WSCC, WSCC MORC, WSCC RMS and Local Reliability Criteria and implement as necessary.
- Coordinate with other ISO staff to implement Ancillary Services certification and develop procedures for monitoring compliance with ISO Tariff requirements for certification.
- Monitor failure to meet testing requirements for Ancillary Services and assessment of penalties.

OTHER PROJECTS WORK REQUIREMENTS

Support of Other Departments:

- Including Legal and Regulatory Department, Other Client Service Sections, Operations, Market Surveillance and IT.

Special Projects:

- Support or lead teams on Existing Contracts, policy regarding changing plant names, Registry for Firm Transmission Rights, library of all FERC orders impacting agreements and compliance, ISO Tariff amendment summary, agreement tracking system, Data Quality and Integrity Work Group (DQIWG), Y2K compliance, AGC requirements for generators, Voltage Support Agreements, Transmission Access Charge.

Client Services
Client Relations
Cost Center 1741

Cost Allocation Methodology and Percentages:

| | <u>Overall Dept. Cost Allocation</u> |
|---------------------------------------|--|
| 1. Control Area Operations | 3% |
| 2. Scheduling | 10% |
| 3. Congestion | 2% |
| 4. Market Functions | 30% |
| 5. Settlements, Billing, and Metering | 55% |

The same allocations apply to the overall budgeted dollars as to headcount.

Key roles of client relations:

- Certification of SCs.
- Training of SCs.
- Day-to-day resolution of settlement disputes, often involving extensive research in settlements, and operations.
- Answer inquiries from any market participants on settlements, operations, billing, etc.
- Monitor financial security of SCs.
- Participate in and lead client forums regarding market redesign, market issues forum, client meetings (communications).
- Business interface between the ISO and clients.
- Leadership in settlement-related good faith negotiations.
- Coordination of Existing Contracts relative to settlements, etc.
- Support internal project teams in market redesign, market issues, stakeholder inputs, etc.

Debt Service

Cost Allocation Methodology and Percentages:

Total Debt Service costs for 1999 are \$48,820,000, representing the principal, interest and operating reserve payments related to our May 1998 bond issuance of \$301,400,000. The proceeds of this offering were for the following four broad categories:

- Infrastructure
- Capital Expenditures
- Delayed Start
- Working Capital

The method of allocating these costs to the five functional categories is as follows:

Infrastructure:

Consists of Phase I costs necessary to bring the ISO on-line by March 31, 1998:

| Description | Cost | Allocation Method |
|--|--------------|---|
| Energy Management System (EMS): Performs real-time monitoring, control and analyses of the ISO-coordinated power system. | \$11,383,000 | Allocated entirely to Control Area operations |
| ISO Systems (SI/SA/BBS): See description below. | \$56,255,000 | See detail below. |
| Communication Infrastructure: Contract with MCI to provide voice and data communications that allow the ISO to communicate with market participants, control and monitor the power grid, and transport metering data. | \$27,447,000 | Based on allocation of communication operating costs for 1999. |
| Metering and Data Acquisition Infrastructure: System used to collect metering data from all generators and others connected directly to the transmission lines, tie points and zonal interface points. Refers to the metering standards, data servers, interface equipment, databases, and software that allow the ISO to collect the data. | \$5,541,000 | Based on allocation of metering operating costs for 1999. |
| Computing Management Infrastructure: Contractually provided computing environment, including office automation hardware and software, Help Desk support, and system management tools. | \$7,329,000 | Based on allocation of computing services operating costs for 1999. |
| Facilities: Cost of set up for primary and satellite ISO operation centers in Folsom and Alhambra. | \$14,442,000 | Based on allocation of total operating costs for 1999. |

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| User Groups: Temporary ISO staff to work with vendors on system development from an end-user perspective before permanent ISO staff was available. | \$977,000 | Based on allocation of total operating costs for 1999. |
| Project Management: Costs of consultants who performed project management and system integration functions for the development of subsystems and infrastructure necessary to operate the ISO. | \$23,241,000 | Based on allocation of overall infrastructure costs. |
| ACC Upgrades/Generator Control: Redundant ICCP nodes, software (AGC modifications and ICCP), and labor to allow the ISO EMS system to communicate with these IOU control centers on a temporary basis. | \$1,367,000 | 100% allocation to Control Area Operations |
| Trust Administration & Regulatory Expenses: Trustee and staff costs, legal counsel, accounting support, meetings, audit expenses for ISO Restructuring Trust. | \$5,743,000 | Based on allocation of overall infrastructure costs. |
| Interest and Fees through March 31, 1998: Interest paid on development capital. | \$5,475,000 | Based on allocation of overall infrastructure costs. |

The allocation of the Scheduling Infrastructure (SI), Scheduling Applications (SA) and Balance of Business Systems (BBS) costs was based on a detailed assessment of the contract for this area. Individual contract milestones, with associated costs payable to the vendor for completion thereof, were assessed and classified into one or more of the five functional categories. A brief description of the SA/SI/BBS systems follows:

- SI provides the information management services needed by the scheduling system. It refers to the hardware, software and databases that allow the ISO to collect, validate, store, transfer, archive, and audit the energy and Ancillary Services schedules nominated or accepted by the ISO from scheduling coordinators.
- SA are the applications used by the ISO's scheduling personnel to assess the state of the transmission system, to evaluate the Preferred Schedules submitted by SCs and to establish committed operating schedules. Includes Congestion/Transmission Management software necessary to assist in congestion management and to determine the transmission price associated with the use of congested inter-zonal transmission paths.
- BBS refers to the computer and other systems to support the following business processes: 1) Settlements to calculate payments owed between the ISO and Scheduling Coordinators for imbalances, congestion and Ancillary Services; 2) Billing and Credit to support accounting, invoicing,

payment and collection of these payments; 3) General accounting systems and administrative functions associated with daily ISO operations.

Capital Expenditures:

Capital expenditures include Phase II items and general capital expenditures.

Phase II items are enhancements and modifications to initial infrastructure systems referred to above, and other new hardware and software items. The allocation of these costs to the five functional categories was based on a line by line review of items on the Phase II project listing. Phase II items affect all CAISO systems, including SA, SI, BBS, EMS, IT, and Metering. The current cost of work items included in the Phase II project listing exceeds the funding available from our 1998 Bond issuance. Accordingly, the cost of Phase II items included in the cost allocation matrix is limited to that for which funds are currently available. All projects on this listing were reduced ratably due to this constraint, so the overall percentage allocations to the five functional classifications is unaffected.

Capital Expenditures also include general 1998 and 1999 capital expenditures, which consist of items that are deemed to benefit the corporation as a whole. These costs include shared systems software, facilities upgrades, computing equipment, financing charges, and other items. The allocation of these costs to the five functional categories is based on the results of the overall operating cost allocation.

Startup Costs and Delayed Start:

Startup costs are those costs incurred prior to December 31, 1997, which would have been included in an operating budget, had CAISO started operations. These costs include salaries & benefits, insurance, building & facility costs, consultants, etc. Such costs totaled \$27,071,000.

Delayed start costs consist of operating costs incurred from the period of January 1, 1998, to startup, March 31, 1998. Such costs totaled \$20,817,000.

These costs have been allocated to the five functional categories based on the results of the operating cost allocation for 1999.

Working Capital:

Working capital costs represent bond-funded operating costs for the period after startup on March 31, 1998 until the receipt of April 1998's grid management charge funds in early July 1998. The budgeted amount for funded working capital was \$31,829,000 while actual spending was only \$21,692,000. The lesser amount has been included in this allocation, with the remainder available for future capital expenditures.

This cost has been allocated to the five functional categories based on the results of the operating cost allocation for 1999.

COST ALLOCATION MATRIX

Analytical support for the cost figures developed for CAISO services

SOFTWARE DEVELOPMENT CONSTRAINTS AND PRIORITIES

Information related to resource constraints on software development, and prioritization of projects discussed by Management, Board of Governors and Stakeholders.