

**APPENDIX A**

**GOVERNANCE STRUCTURE COMPONENTS**



## **INFORMATION RESOURCE MANAGEMENT Commission (IRMC)**

**Summary.** The IRM Commission replaces the Information Technology Commission, with broader responsibilities and greater authority over the use of information resources throughout the executive branch. Through the State Controller, it directs the Deputy Controller for IRM in his capacity as Executive Branch CIO.

**Primary responsibilities.** The IRMC is generally responsible to assure that technology strategy and plans are coordinated across State agencies for maximum benefit and to assure that technology investments are effectively managed. Its specific responsibilities include those associated with the ITC as well as new responsibilities as follows:

- Existing ITC responsibilities

- Approve State technology policy

- Approve SIPS billing rates

- Approve material expenditures requested by the CIO for SIPS or the IRM Office

- New IRMC responsibilities

- Approve statewide technology strategy

- Approve and sponsor statewide technology initiatives

- Approve agency technology plans

- Recommend relative priorities across agency technology plans to the Governor

- Establish a quality assurance policy to enforce accountability through budget action on major/critical technology projects

- Administer a separately appropriated Computer Reserve Fund for statewide benefit

**Composition.** The IRMC's size and composition should facilitate monthly meetings of the full commission and should provide reasonable representation of agencies among the largest users of information resources. The following composition is proposed as a basis for discussion:

- Four members from the Council of State, appointed by the Governor to two-year terms on a rotational schedule

- Four members from the Governor's cabinet and/or commissions:

Secretary of Administration, designated, serves as Secretary

State Budget Officer, designated

Two additional members appointed by the Governor to two-year terms on a rotational schedule

- Appointee of the Speaker of the House
- Appointee of the President Pro Tempore of the Senate
- Chair, Governor's Committee on Data Processing
- State Controller
- No member is authorized to vote on an action affecting his own State agency

## **CHIEF INFORMATION OFFICER, EXECUTIVE BRANCH (CIO)**

**Summary.** This is the senior position for management of technology in the executive branch. It is the role of the Deputy Controller for Information Resource Management. The position reports to the State Controller and is responsible for SIPS and for the Office of IRM.

**Primary responsibilities.** The CIO serves as Director for the IRM Commission for administrative and support functions. The CIO coordinates sharing of technical expertise across agencies, and has other responsibilities as follows:

- **Planning and policy**

- Coordinates technology strategy and plans across executive branch agencies for maximum statewide benefit

- Coordinates technology components of program plans with individual agency management

- Coordinates with directors of information services in the legislative and judicial branches to promote cross-branch technology strategies and initiatives in the best interests of the State

- Recommends technology strategy to IRMC for approval

- Recommends statewide technology initiatives to IRMC for approval

- **Quality assurance**

- Reviews quality of performance of major/critical technology projects through Quality Reviews function and recommend enforcement actions to IRMC when appropriate

**Composition.** This position is filled by one person.

## **INFORMATION RESOURCE MANAGEMENT ADVISORY BOARD**

**Summary.** The IRM Advisory Board creates and maintains the linkage between agency technology plans and agency programs and service delivery needs. At the agency level, each member holds these responsibilities in his own agency. At the State level, the board has the comparable function and performs it through oversight of the planning performed by the IRM Office.

**Primary responsibilities.** The board's specific responsibilities are as follows:

- Within each agency, requires technical components of agency plans to satisfy specific program objectives
- With the IRM Office, requires the statewide IRM plan to support short term needs common across agency programs
- With the IRM Office, adjusts agency technology plans to support statewide technology strategy
- Protects program requirements by appealing IRM Office change requests on agency technology plans to the CIO and the IRMC
- Recommends to the IRMC long range agency needs to be supported by IRM strategies
- Creates IRM support for common long range agency needs

**Composition.** Composed of senior personnel from executive branch agencies, for example, one senior manager, deputy secretary or division head (but not the IRM manager) from each agency.

## **SIPS ADVISORY BOARD**

**Summary.** This board advises the CIO with respect to keeping SIPS' services and performance focused on supporting agency needs for program operation and service delivery, and to approve SIPS' actions that will have an effect on its client agencies. This board also participates in the technology planning process performed by the IRM Office and the IRM Advisory Board.

**Primary responsibilities.** The SIPS Advisory Board's responsibilities are as follows:

- Sets direction and performance goals for SIPS' operations and services
- Assures that SIPS' services effectively support user agency needs
- Approves SIPS' strategic and operating plans
- Approves SIPS' acquisition of major/critical technology products and services
- Approves SIPS' billing rates
- Assures that the statewide IRM plan supports the technical requirements of the agency IRM divisions

**Composition.** The board consists of the IRM managers from all of the executive branch agencies.

## OFFICE OF INFORMATION RESOURCE MANAGEMENT

**Summary.** This body was identified as part of the Controller's reorganization of SIPS in February, however, it is not yet staffed and operating. It reports to the CIO and is responsible for technology planning and policy. It operates with the advice of the IRM Advisory Board through the CIO.

**Primary responsibilities.** In addition to its planning and policy roles, the IRM Office provides staff support to the IRM Commission and conducts special projects (information gathering and analysis, including obtaining information from agencies) at the request of the committee. Its planning and policy responsibilities are as follows:

### ■ Planning

- Review agency technology plans to ensure compliance with policies, guidelines, and statewide strategies

- Identify opportunities and requirements for the effective coordination of agency technical plans

- Recommend common support needs for centralization

- Publish a consolidated IRM plan for the State including agency technology plans, SIPS' plan, and statewide technology initiatives

### ■ Policy and strategy

- Recommend technology strategies based on trends in agency plans

- Recommend technology policies to support statewide strategies

### ■ Quality assurance

- Execute quality reviews to assure the quality of results of major/critical technology projects

**Composition.** The IRM Office consists primarily of senior level technical staff with strong technology backgrounds, knowledge of current technology offerings and trends, substantial experience interacting with program managers and users, and experience in planning. The required complement remains to be determined. It may need to contract for appropriate experts to conduct quality reviews.



**APPENDIX B**  
**SAMPLE GLOSSARY**



## **APPENDIX B**

### **SAMPLE GLOSSARY**

- **MIPS** - A unit measure of computing power, Millions of Instructions Per Second
- **Installed MIPS** - The processing capacity of a computer, e.g., the new ES/9000 has a capacity of 239 installed MIPS
- **Used MIPS** - The total amount of processing capacity of a computer that is utilized to perform all processing for all users at any point in time, or the average utilization over any specified period of time
- **Cost per installed MIPS** - The average cost per unit of available computing capacity; the total cost to SIPS of the computer divided by its installed MIPS. This is the lowest possible cost per unit of productive computer processing that would be achieved if the computer were 100 percent utilized. Given the normal economies of scale, the larger the computer, the lower this cost will be.
- **Cost per used MIPS** - The average cost per unit of utilized computing capacity; the total cost to SIPS of the computer divided by used MIPS; the effective actual cost per unit of productive computer processing given the actual level of utilization.
- **Service units** - The units of computing service that SIPS measures as the basis for its billing, e.g., a certain amount of on-line processing or a certain quantity of data storage.
- **Billing rates** - SIPS' price per service unit that it charges to its users
- **Agency usage** - The number of service units that an agency consumes in running its systems at SIPS during the month.
- **Billing amount** - The dollar amount of SIPS' bill to an agency for a given category of service and equal to the applicable billing rate multiplied by the agency's usage of that service.
- **Agency cost of SIPS' service** - The total of the agency's billing amounts for all categories of services used.



**APPENDIX C**  
**SIPS' PEER GROUP COMPARISON**



## PEER GROUP COMPARISON

The SIPS data center was compared in terms of resource utilization to other public and private sector IBM mainframe data centers of similar size. Size is measured in terms of utilization of processing capacity, i.e., the total amount of processing performed.

Approximately 10 other data centers were in the comparison group used for this analysis. The SIPS data center is somewhat larger, in these terms, than the average data center in the Peat Marwick data base. The capacity of the SIPS mainframe is approximately 68 percent greater than the average in the data base.

The comparison is predominantly quantitative in nature, and much of it is based on statistical data recorded directly by the mainframe computer itself through:

- Resource Management Facility (RMF)
- System Management Facility (SMF)
- Disk data storage directories (DASD VTOCs)
- Tape library catalog

The raw data were rationalized based upon used processor capacity to make them comparable with equivalent statistics for other data centers of similar size. The remaining data for organization, staffing, and expenditures were obtained from interviews and observation.

Our comparative analysis produced the following findings regarding the SIPS data center.

***SIPS CPU utilization statistics are better than average for five federal government data centers in Peat Marwick's data base but are below the averages for private sector data centers.***

One of the measurements of effective utilization of the data center resource is the average percentage of the CPU time being used during the period of comparison. Overall CPU utilization is the average CPU-busy statistic over the 30 day data collection period. Prime shift utilization is the average CPU-busy statistic between the hours of 7:00 a.m. and 6:00 p.m., Monday through Friday. SIPS' CPU utilization for overall usage, prime shift, and non-prime shift compares favorably to federal government data centers but is significantly below our data base averages for private sector data centers of similar size. Note that government data centers tend to have less influence over user demand patterns than private sector data centers. The SCC comparisons are applicable to the 3090/600 and the ES/9000.

***SIPS' clients total demand for disk storage is higher than the average for comparable data centers.***

Utilization of the disk storage (DASD) resource is an indicator of the effectiveness of data file migration and archiving policies as they are implemented. Since SIPS' client agencies have the direct responsibility for managing their DASD utilization, these statistics reflect the aggregate effect of all these agencies' practices. The comparison of several different statistics provides mixed results:

- SIPS has approximately 22 percent more DASD installed than average for comparable data centers (possibly as a result of its larger than average workload)
- The percentage of allocated space not referenced in more than 30 days is about five percentage points greater than average.
- However, the percentage of installed DASD that is allocated and used is notably better than average.

Taken together, the statistics indicate that the total demand for DASD is greater than average, and that the data file migration and archiving practices across the agencies are producing better results than average.

***SIPS' clients utilize tape resources more than average, but SIPS handles it more cost-effectively.***

The level of tape resource utilization is measured in total number of tape mounts in a month. For purposes of this analysis, tape and cartridge are considered as totally equivalent.

- SIPS uses approximately 50 percent more tape mounts per month than other data centers of similar size. This is most likely a reflection of the many agency application systems that are old and have not been modified to replace tape with disk where appropriate.
- In response to this heavy dependency on tapes, SIPS has highly automated its tape library management and physical handling. The result is that SIPS' average cost to mount a tape is approximately 25 percent less than the average cost at other data centers of similar size.
- The efficiency of tape resource utilization is affected by blocking. Blocking refers to the grouping of multiple data records together for reading or writing the tape. Higher blocking factors generally make more efficient use of the data communication path. SIPS' percentage of optimally blocked tapes is more than twice as high as the average for other data centers. This reflects well on this particular aspect of the agency application systems.



- There are two types of tape mounts. Specific mounts request a certain tape volume number, typically for input. Non-specific mounts request a scratch volume, which is always for output. The ratio of specific to non-specific tape mounts is an indicator of the type of tape processing being performed. The higher this percentage, the more activity is involved in the management and handling of the tape library. Also, tape input in batch processing lengthens execution time as compared to disk input.

SIPS' ratio of specific to non-specific tape mounts is approximately 18 percent higher than average. Given SIPS' highly automated handling of tapes, this high ratio probably has no appreciable impact on tape library management. However, it probably does lengthen the batch window for some application systems.

In summary, SIPS makes very heavy, but efficient use of tapes. The associated handling costs are low on a per tape basis, but still somewhat high in total because of the volume. For example, SIPS has approximately 33 percent more staff in tape operation and library management than comparable data centers despite its substantial automation of the process. There is also significant potential for substantial reductions in elapsed processing time for many batch job streams through replacing tape input files with disk, but this is under the control of the using agencies.

***The rate of production job failures of agency applications run at SIPS and their causes are of concern.***

Production job failure refers to a batch job stream in an application system terminating in an abnormal fashion, which typically necessitates its being rerun. The failure rate is simply the percentage of production batch jobs that terminate abnormally.

- The failure rate of application systems is approximately 6.5 percent. This means that on average, one job out of every 16 fails to reach normal completion. This failure rate is more than four times as great as the average failure rate for other data centers of similar size. Indeed, it is the highest failure rate of any data center in our data base. In this regard, the SIPS data center is a victim of the agencies' application portfolios, as explained below.

Production jobs fail primarily for the following reasons:

- The computer's operating system cancels the job because it has exceeded some constraint such as a time limit or the storage capacity of a data file.
- The computer system (hardware or software) malfunctions, for example, a power surge or outage disrupts processing, a disk crashes, or the operating system itself causes a problem.
- The application program encounters an error condition that it cannot resolve.

The predominant reason for production job failures is itself a cause for concern:

- Over 50 percent of the production job failures at the SIPS data center are caused by program errors. We do not have sufficient data to specify an average for failure rates at other data centers, but the percentage of program related failures that we currently find is only about 5 percent.

This failure rate is an indictment of the age and currently inferior quality of many of the agency application systems that cause these problems.

The agencies bear the burden of their applications' program errors in two ways:

- Since the agencies (with the exception of the Department of State Transportation) are responsible for providing their own production support, their IRM staff have to recover from all production job failures, including those caused by program errors. However, the recovery from application failures can be very time consuming and resource intensive, especially in terms of staff resources.
- Production job failures can cause agency service level targets to be missed. Sometimes they can also affect the processing of other applications.

***SIPS' data center staffing for direct operations to support user agencies' software and applications is higher than the average for the comparison group data centers.***

The comparison of staffing at SIPS versus other data centers in the Peat Marwick data base is as follows:

- The number of people in technical support at SIPS, which includes systems programmers, is equal to the average for similar data centers. However, since SIPS is shared by many agencies, each with its own software packages, SIPS has to support more software products than the typical data center. SIPS currently plans to hire for its systems programming staff, which would raise the technical support staff level above the average.
- The number of people in direct operations is approximately 25 percent higher than the average for similar data centers. Virtually all of the incremental staff appear to be associated with tape management and printed output handling. Again, this is at least partly a function of the heavy usage of tape and print by the agencies' older applications.