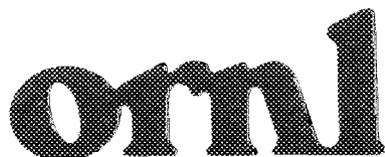




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**Instrumentation and Controls Division  
Technical Support Section  
1997 Business Management Review  
Self-Assessment**

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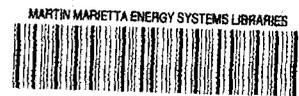
ORNL/TM-13473

Instrumentation and Controls Division

**INSTRUMENTATION AND CONTROLS DIVISION TECHNICAL  
SUPPORT SECTION: 1997 BUSINESS MANAGEMENT  
REVIEW SELF-ASSESSMENT**

Date Published—July 1997

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## **EXECUTIVE SUMMARY**

### **DESCRIPTION OF FUNCTIONAL AREA**

The Instrumentation and Controls Division Technical Support Section (TSS) has the primary responsibility for the technical support and maintenance of instrumentation and computing equipment at Oak Ridge National Laboratory (ORNL). TSS responds to applicable mission elements of the ORNL Strategic Plan to further the national interest through the application of science and technology. This mission is performed by a staff of instrument technicians that during FY 1996 was organized into eight technical specialty groups assisted by a management and technical staff. Through a reorganization effort in early FY 1997, TSS was realigned into six technical specialty groups. The staff's expertise supports a wide spectrum of engineering and scientific disciplines at ORNL.

### **MAJOR ACCOMPLISHMENTS AND CONCERNS (OUTCOMES/PROCESSES)**

TSS has reduced future operational costs through the FY 1997 reorganization. Two groups that performed personal computer services and network support were consolidated into one group. Additionally, one other group that provides support for researchers was merged into another group performing similar work within TSS. Through these efforts, TSS eliminated two supervisor positions and reduced the organization from eight specialty areas to six. Another cost savings will result from another reduction in the TSS management staff that was made during the first half of FY 1997. The total annual cost savings for salary and fringe in future years for these positions will be approximately \$190,000.

TSS uses an analytical approach in conducting daily business and in supporting the ORNL customer base. TSS has ensured that their staff are appropriately trained by identifying and performing a needs analysis, job analysis, and task analysis. This overall process resulted in approval from the U.S. Department of Energy (DOE) and acknowledgment of compliance with DOE orders.

TSS has either met or exceeded all applicable objectives identified in the FY 1996 Business Management Oversight Pilot as well as the FY 1997 Business Management Review. This includes meeting the measure pertaining to costs, or the TSS rate, and exceeding the measure for preventive and predictive maintenance jobs.

### **IDEAS FOR IMPROVEMENT**

The TSS computing system has continued to meet the section's demands over the last year but continues to decrease in performance. For many years this system enhanced the overall capability and efficiency of TSS by maintaining instrument history and data. However, the age and capacity of the system limit its efficiency, which cannot be improved without major upgrades. Although this is not perceived as a major weakness at present, it is recognized as a potential limitation in the future. If this system is not upgraded, TSS will not be able to keep pace with future demands.

### **CONTINUOUS IMPROVEMENT INITIATIVES**

Life-Cycle Assessment Management (LCAM) performance measures were developed to evaluate the effectiveness of Maintenance and Operations. In addition, measures for maintenance backlog and the type of

maintenance hours worked are being developed. These LCAM performance measures are reported monthly and are available at the Plant and Equipment Division's home page on the World Wide Web.

TSS received the level-two (entitled the Quality Commitment level) award of the Tennessee Quality Award. This is an intermediate level and includes organizations that have progressed to the point of demonstrating serious commitment to the use of total quality principles. This award follows receipt of the level-one award in October 1994. The award process involved performing an internal assessment using seven areas of the Baldrige criteria.

TSS began using a revised customer appraisal form. This form includes an expanded work description that provides detailed information to the customer. This improvement was made to a vital Customer Appraisal Program that is used to determine the effectiveness of maintenance and services performed by TSS.

TSS is currently involved with the Make or Buy Study for the Automatic Data Processing Equipment Systems and Services. This study will identify the most effective method for obtaining this type of service. Information collected during this study is being used by TSS to improve service. TSS has also identified new services as a result of this study.

# 1. FUNCTIONAL AREA SELF-ASSESSMENT

## 1.1 DESCRIPTION OF FUNCTIONAL AREA

### 1.1.1 Specific Outputs

- Audiovisual services
- Metrology and testing services [U.S. Department of Energy (DOE) user facility]
- Maintenance support for programmatic research equipment and systems
- Chargeout rate
- Technical support and maintenance areas:
  - Electronics
  - Pneumatics
  - Computer science equipment
  - Metrology instrumentation
  - Radiation instrumentation
  - Chemical instrumentation
  - Analytical and process instrumentation

### 1.1.2. Major Processes

- Calibration
- Compliance assurance
- Corrective maintenance
- Fabrication
- Installation
- Preventive maintenance
- Training
- User assistance

### 1.1.3. Drivers

- Atomic Trades and Labor Council
- Business practices
- Customer requirements
- U.S. Department of Transportation regulations
- DOE orders, contracts, terms, and conditions
- U.S. Environmental Protection Agency regulations
- Nuclear Regulatory Commission regulations
- Toxic Substance Control Act regulations
- Clean Air Act regulations
- National Environmental Protection Act regulations
- Occupational Safety and Health Act regulations

#### **1.1.4. Key Quality Requirements**

- Accuracy
- Compliance
- Consistency
- Customer satisfaction
- Reliability
- Safety
- Timeliness

#### **1.1.5. Principal Customers**

- DOE
- Site, program, facility, and division managers
- Senior management

### **1.2. PERFORMANCE EVALUATION—1996 BUSINESS MANAGEMENT OVERSIGHT PILOT (BMOP) SELF-ASSESSMENT**

#### **1.2.1 Description**

In the 1996 BMOP, the Technical Support Section (TSS) identified concerns about the aging computing system and transportation problems.

#### **1.2.2 Actions**

To address the computing system deficiency, TSS identified the system requirements and submitted those to the division for consideration as a general-purpose equipment item. Because of the importance of this system, funding was planned and included in the FY 1997 TSS budget.

A TSS Transportation Steering Committee was formed in 1996 to study and make recommendations for improving transportation use within the section. Several recommendations have been implemented to improve transportation including assigning portable radios to improve communication, increasing the use of the Oak Ridge National Laboratory (ORNL) taxi, and use of a specified vehicle as a TSS service vehicle for meetings, training, medical visits, general transportation, and material and personnel transportation. TSS also worked with the ORNL fleet manager to have a damaged vehicle from another division reassigned to TSS for the cost of the vehicle repair bill.

#### **1.2.3 Current Status**

Procurement of a new computing system is anticipated during the last half of FY 1997. Programming requirements have also been identified, and the TSS computing staff have received training in critical areas in anticipation of the replacement system.

Although the TSS Transportation Steering Committee has made significant improvements in transportation use, the committee recognized that transportation issues will be a continuing issue for maintenance. To minimize customer down time, TSS personnel must continue to seek solutions to this problem. The newly formed committee will play a vital role in maintaining a balance between staffing needs and vehicle resources.

### **1.3 PERFORMANCE EVALUATION—1997 BUSINESS MANAGEMENT REVIEW (BMR)**

#### **1.3.1 Objective**

The maintenance management program is efficient and includes, as a minimum, (1) a work management system; (2) a configuration management program; and (3) a system for management and conduct of preventive, corrective, and predictive maintenance.

##### **1.3.1.1 Performance Measure**

The general maintenance rate expressed as a percentage of the target maintenance rate for the fiscal year.

###### **1.3.1.1.1 Performance Expectation**

Exceeds: <95%, Meets: 95–105%, Needs improvement: >105%

###### **1.3.1.1.2 Result**

During FY 1996, TSS met the performance expectation by operating below the annual budgeted rate. The cost to the customer during FY 1996 was \$45.15/hour, which was \$0.45 less than the budgeted rate of \$45.60/hour, or 99% of the projected budget. TSS continues to operate below the FY 1997 budgeted rate of \$46.70/hour. However, because of commitments for the remainder of FY 1997, it is anticipated that TSS will complete the FY 1997 budget on target.

##### **1.3.1.2 Performance Measure**

The percentage of preventive and predictive maintenance jobs completed by the originally scheduled completion date.

###### **1.3.1.2.1 Performance Expectation**

Exceeds: >90%, Meets: 75–90%, Needs improvement: <75%

###### **1.3.1.2.2 Result**

TSS has consistently exceeded this expectation by completing an average of 91.2% of all preventive or predictive maintenance jobs on time during FY 1996, and that trend continues during FY 1997. One of the significant factors enabling this accomplishment is the TSS computing system that is continuously updated by the organization. This system is used to track and schedule program maintenance and alerts management to maintenance problems and/or concerns. The system also provides statistical information for performance feedback and analysis.

##### **1.3.1.3 Performance Measure**

The percentage of commitments detailed in the maintenance project plan that are fully implemented by the end of FY 1997. Note: the maintenance project plan will define those measures and develop a baseline that will provide a mechanism to make the maintenance management program more efficient by developing performance measures in the areas of preventive, predictive, and corrective maintenance and maintenance-related work. The plan will be prepared by October 1, 1996, for DOE review and concurrence.

#### **1.3.1.3.1 Performance Expectation**

Exceeds: Not applicable, Meets:  $\geq 95\%$ , Needs improvement:  $<95\%$

#### **1.3.1.3.2 Result**

The performance expectation for this measure was met. The maintenance project plan was developed and submitted to DOE for review and concurrence before October 1, 1996. The performance measures that are developed from the project plan will be implemented by the end of FY 1997.

#### **1.3.1.4 Successes/Strengths**

To date, TSS has consistently operated below the target maintenance rate for FY 1996 and 1997. Also, the TSS general maintenance rate compares well with other sites.

#### **1.3.1.5 Shortfalls/Weaknesses**

None identified.

#### **1.3.1.6 Supporting Data**

See the Appendix for supporting data.

### **1.4 PERFORMANCE EVALUATION—OTHER KEY INDICATORS**

#### **1.4.1 Description of Key Indicators**

The following metrics and activities support the objective and performance measures described in Sect. 1.3 as well as the overall purpose and key quality requirements of the functional area:

- Achievement of the second level of the Tennessee Quality Award
- Analysis of cost accounting system data
- Baseline Evaluation Testing and Training (BETT) Program
- Customer satisfaction surveys and feedback
- Monthly progress reports
- Open work order reports
- Procedure validations
- Technical Improvement Notice Program
- Weekly reports on productivity ratios (by group)

The development of new metrics to measure performance continues. Currently, I&C and the Plant and Equipment Division are meeting regularly to jointly develop metrics that will help both organizations better understand their performance.

## **1.4.2. Results**

### **1.4.2.1 Successes/Strengths**

TSS redesigned the customer satisfaction survey program to ensure widespread representation of customer feedback. Customer satisfaction survey results are evidence of TSS's focus on customer needs and requirements. Overall, 82.9% of survey responses between April 1996 and March 1997 rated TSS as excellent (categories are excellent, satisfactory, and unsatisfactory). Survey results and other customer feedback provide valuable information used to adjust policies and procedures as needed. Increased customer satisfaction levels and positive customer feedback are recognized as a success.

In addition to the information derived from the metrics and activities identified in Sect. 1.4.1, individual employees have been recognized for their performance. One example is an employee who was recognized through the Bargaining Unit Awards Night Nomination as a member of a project team. The employee was noted for providing excellent service that made her an indispensable part of the successful completion of the Acoustic Measurement Facility Improvement Program for the U.S. Navy.

TSS continues to analyze data in an effort to decrease costs and increase efficiency. The need to improve methods for qualifying instrument technicians and technical support personnel to perform work in nonreactor nuclear facilities required revamping of the TSS BETT Program. An analysis was performed by a committee of subject matter experts to assess training needs based on functional areas of assignment and the type of work performed. Personnel requiring qualification were identified, trained, and evaluated to provide documentation in accordance with DOE Orders 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*, and 5480.25, *Safety of Accelerator Facilities*. A tracking and reports generation system within I&C allows management and first-line supervisors to monitor personnel with greater accuracy to ensure compliance with oversight agency rules, procedures, and guidance documents. DOE has issued a letter of approval for this process.

TSS also analyzes multiple sources of data such as cost accounting data, weekly productivity reports, and training information to better understand the organization's processes and outputs. This analysis allows for adjustments for maximum efficiency. Additionally, through this data TSS has begun to compare itself to other organizations and to compare performance. More in-depth analysis is projected for the last half of FY 1997.

### **1.4.2.2 Shortfalls/Weaknesses**

Because of the age of the TSS computing system platform, efficiency is limited by the capacity of the present system and cannot be improved without major upgrades. Although this is not perceived as a major weakness at present, it is recognized as a potential limitation in the future. A general-purpose equipment funding request for replacement of this system has been submitted to the division for consideration. If this system is not upgraded, TSS will not be able to keep pace with future demands.

## **1.5 AREAS NEEDING IMPROVEMENT**

### **1.5.1 Observations**

The problem of an aging computer system should be addressed before it affects the organization's ability to advance.

### **1.5.2 Actions Necessary To Improve Performance**

The action necessary to improve the performance of the TSS organization is procurement and installation of an upgraded computer platform for the maintenance information system.

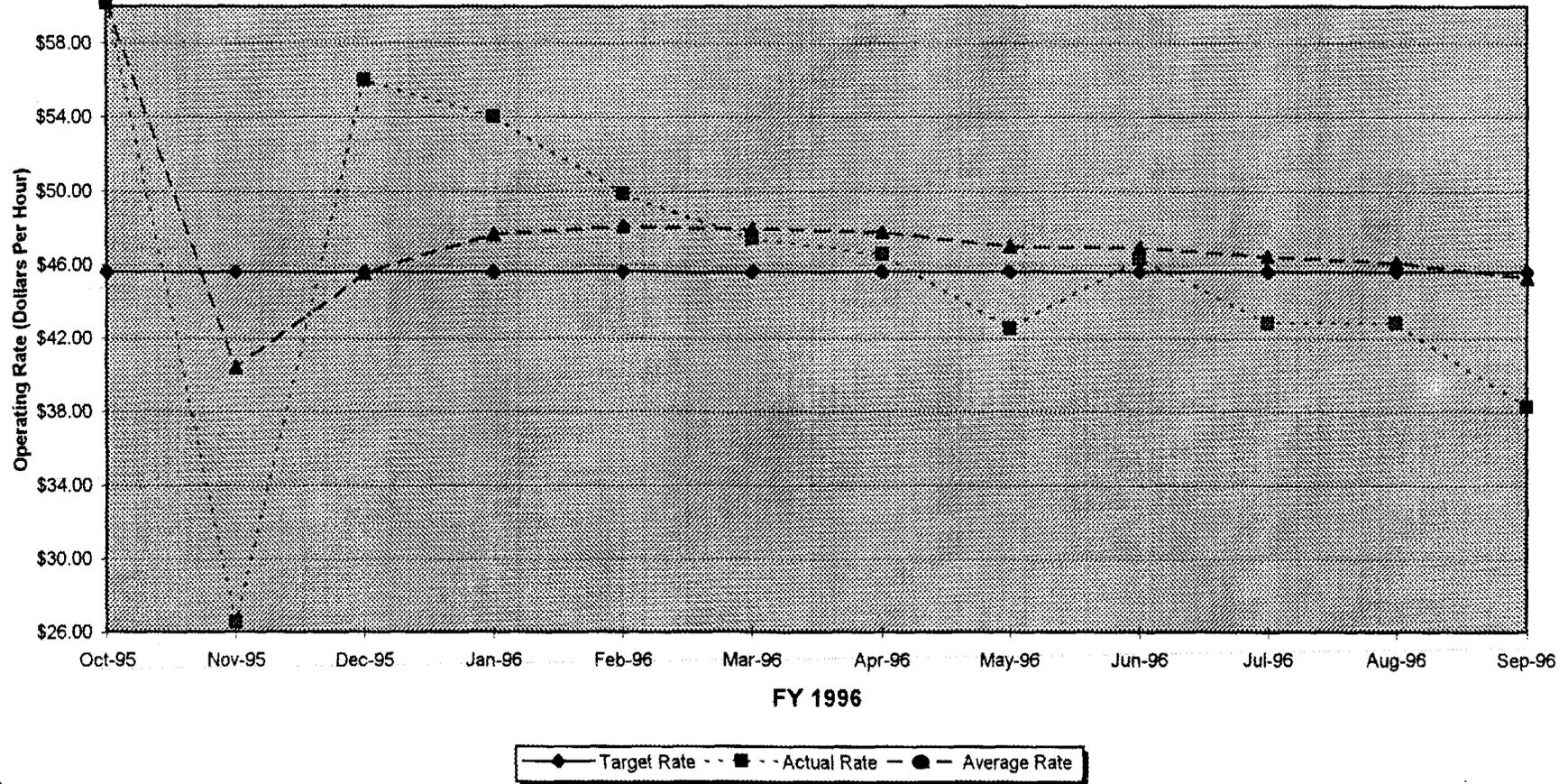
## **2. SUGGESTED CHANGES TO PERFORMANCE OBJECTIVES AND/OR MEASURES**

TSS has no suggested changes to its performance objective and/or measures.

## **APPENDIX**

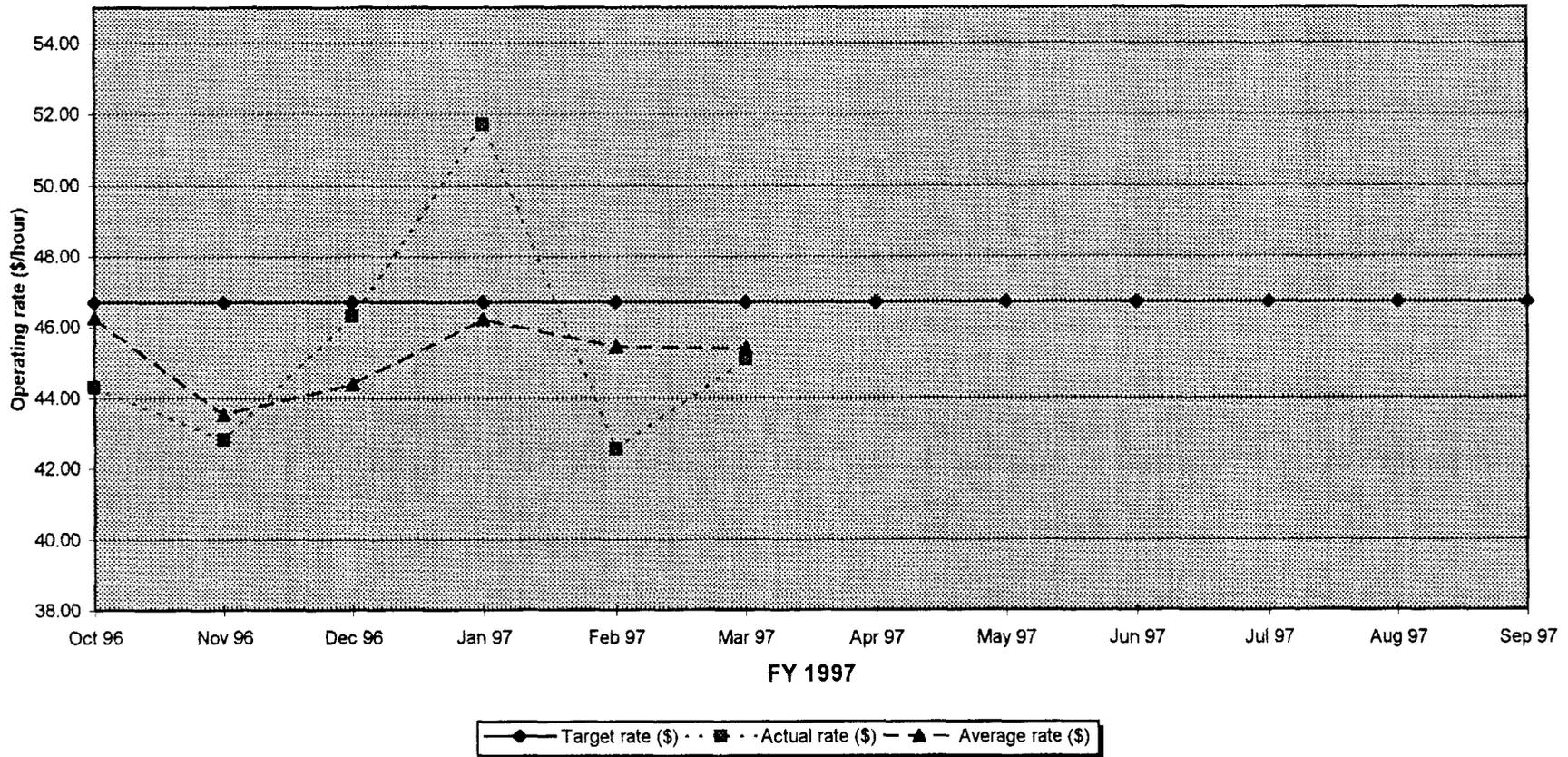


### Target Vs Actual Operating Rate ORNL Instrumentation & Controls Division



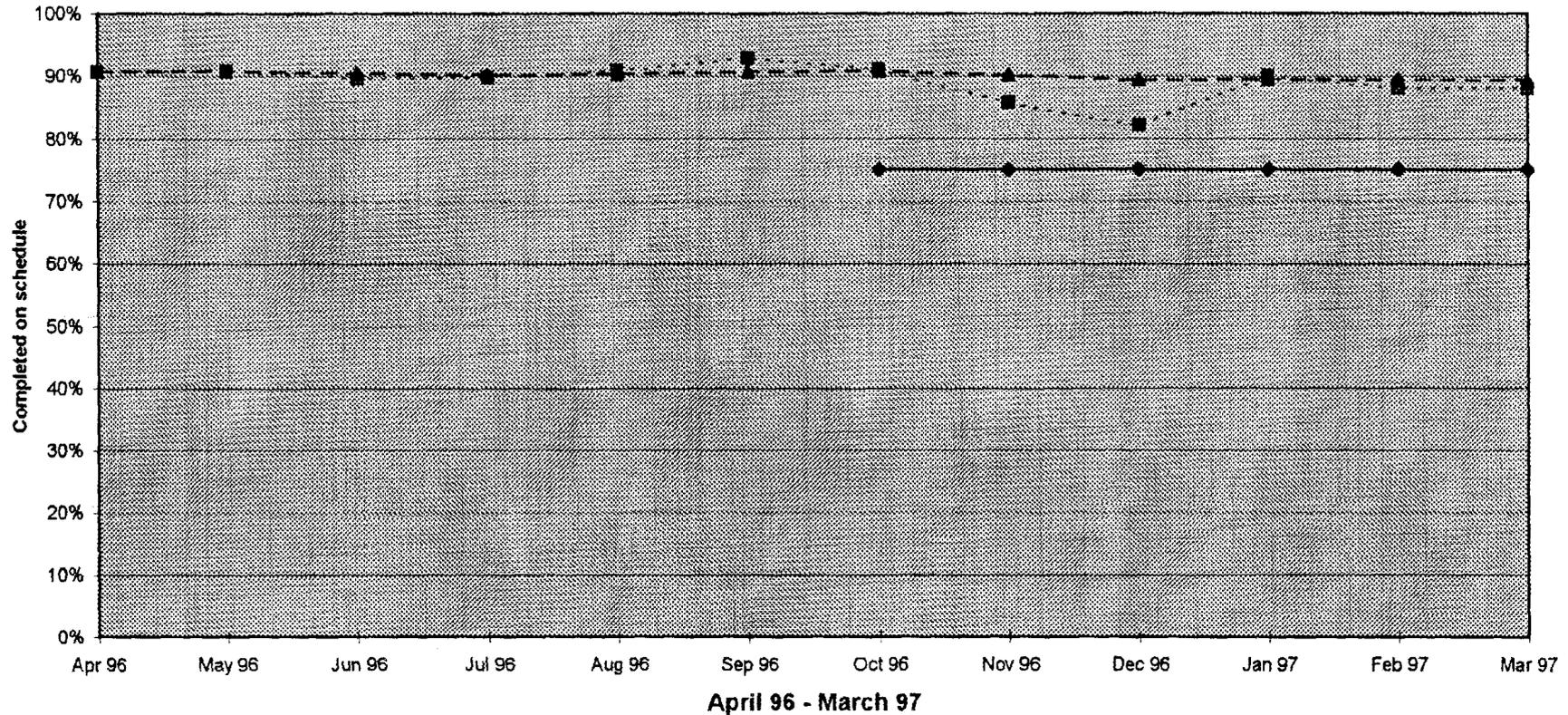
Measure 2.1 (I&C)	Oct-95	Nov-95	Dec-95	Jan-96	Feb-96	Mar-96	Apr-96	May-96	Jun-96	Jul-96	Aug-96	Sep-96
Target Rate	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60	\$45.60
Actual Rate	\$60.19	\$26.55	\$56.01	\$54.04	\$49.87	\$47.42	\$46.56	\$42.54	\$46.35	\$42.82	\$42.82	\$38.25
Average Rate	\$60.19	\$40.38	\$45.54	\$47.68	\$48.09	\$47.97	\$47.77	\$46.97	\$46.90	\$46.45	\$46.12	\$45.28
Total Operating Cost	\$808,302	\$510,822	\$902,298	\$885,121	\$764,426	\$826,875	\$760,337	\$881,806	\$752,640	\$810,171	\$729,263	\$857,418
Total Productive Mhrs	13,430	19,240	16,109	16,380	15,328	17,437	16,332	20,730	16,239	18,919	17,031	22,415

**Target vs Actual Operating Rate**  
**ORNL Instrumentation & Controls Division**



Measure 2.1 (I&C)	Oct 96	Nov 96	Dec 96	Jan 97	Feb 97	Mar 97	Apr 97	May 97	Jun 97	Jul 97	Aug 97	Sep 97
Target rate (\$)	46.70	46.70	46.70	46.70	46.70	46.70	46.70	46.70	46.70	46.70	46.70	46.70
Actual rate (\$)	44.30	42.81	46.31	51.71	42.55	45.09						
Average rate (\$)	46.26	43.53	44.39	46.22	45.44	45.38						
Total operating cost (\$)	684,154.00	696,315.00	658,568.00	791,239.00	701,542.00	719,596.00						
Total productive hours	15,445	16,267	14,222	15,300	16,489	15,958						

**Preventive and Predictive Maintenance Jobs Completed on Schedule  
ORNL Instrumentation & Controls Division**



—◆— Target    - - ■ - - Actual    - ● - Average\*

Measure 2.2 (I&C)	Apr 96	May 96	Jun 96	Jul 96	Aug 96	Sep 96	Oct 96	Nov 96	Dec 96	Jan 97	Feb 97	Mar 97
<b>Target</b>							75%	75%	75%	75%	75%	75%
<b>Actual</b>	91%	91%	90%	90%	91%	93%	91%	86%	82%	90%	88%	88%
<b>Average*</b>	91%	91%	90%	90%	90%	91%	91%	90%	89%	89%	89%	89%
Jobs scheduled	2482	2431	2300	2061	1974	2056	2,571	2,107	1,897	1,871	1,801	1,909
Jobs completed	2251	2208	2060	1849	1793	1909	2,341	1,807	1,557	1,685	1,585	1,679

\*Average is based on number of preventive and predictive maintenance jobs.



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