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Industrial Management  
Review Of U.S. Mint,  
Philadelphia, Pennsylvania

B-114877

Bureau of the Mint  
Department of the Treasury

UNITED STATES  
GENERAL ACCOUNTING OFFICE

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SEPT. 19, 1974



UNITED STATES GENERAL ACCOUNTING OFFICE  
WASHINGTON, D.C. 20548

GENERAL GOVERNMENT  
DIVISION

B-114877

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1 The Honorable  
The Secretary of the Treasury

Dear Mr. Secretary:

This is our report on an industrial management review 41  
of the U.S. Mint, Philadelphia. The report identifies opportunities for the Mint to improve the productivity of men, materials, and machines at the Philadelphia Mint and suggests that the Bureau of the Mint evaluate potential economies of discontinuing certain in-house operations and measure the effect this would have on the operation of the entire Mint complex.

We are sending copies of this report to the Director, Office of Management and Budget; the Chairman, Senate and House Committees on Appropriations and Government Operations; and the Director of the Mint.

We want to direct your attention to the fact that this report contains recommendations to you which are set forth on page 15. As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions he has taken on our recommendations to the House and Senate Committees on Government Operations no later than 60 days after the date of the report, and the House and Senate Committees on Appropriations with the agency's first request for appropriations made more than 60 days after the date of the report.

Sincerely yours,

*Victor L. Lowe*

Victor L. Lowe  
Director

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U.S. GENERAL ACCOUNTING OFFICE  
REPORT TO THE SECRETARY  
OF THE TREASURY

INDUSTRIAL MANAGEMENT REVIEW  
OF THE U.S. MINT, PHILADELPHIA,  
PENNSYLVANIA B-114877

D I G E S T

WHY THE REVIEW WAS MADE

Industrial management reviews are useful in determining an organization's efficiency and how it affects the cost of items being produced. These reviews evaluate the organization's total system of operation, management and cost control, and procedures used to achieve efficiency and economy.

GAO reviewed the U.S. Mint in Philadelphia because (1) it is a major industrial activity, (2) it is a new facility having the latest in coinage methods and equipment, (3) it has a major financial investment in manufacturing facilities and equipment, and (4) a new facility is being planned for Denver.

FINDINGS AND CONCLUSIONS

The Mint needs to improve its productivity measurements to provide management with data to measure operating efficiency.

Equipment was not fully used, and data was not adequate. The Mint recently tried to correct the latter problem by developing a downtime reporting system for the strip production line.

However, the Mint still has no formal machine standards for comparing actual with expected equipment output.

Labor standards for both production and maintenance work are needed. Developing such standards would help improve workload planning and overall Mint productivity. (See ch. 2.)

An expected increasing demand for coins will require an increase in total mint production capacity. The Mint could increase its production by changing its product mix to one which maximizes output of the entire strip production line. A further increase in coin production might be attained by purchasing a larger proportion of coining strip and converting to coining operations some or all of the space currently used to produce in-house strip. These measures might make it possible to defer construction of a proposed new mint in Denver. (See ch. 3.)

RECOMMENDATIONS

The Bureau of the Mint can improve the productivity of men, materials, and machines at the Philadelphia Mint by

--developing accurate measures of Mint productivity,

- developing labor and machine standards,
- developing a comprehensive program to evaluate equipment use,
- developing equipment justification procedures and verifying techniques, and
- determining the lowest cost product mix.

The Bureau stated that the Mint initiated an equipment downtime reporting system in November 1973 which will be used in conjunction with a scheduled maintenance, planning, and control system to evaluate equipment use.

In August 1973 the Bureau began to develop a facilities and equipment management system which is designed, among other things, to justify future facility and equipment expenditures.

#### AGENCY ACTIONS AND UNRESOLVED ISSUES

The Bureau of the Mint agreed that more accurate measures of Mint productivity can be developed.

The Bureau stated that it realized the need for developing machine standards and plans to provide the necessary technical talent to develop such standards.

The Bureau concurs that labor standards can contribute to more effective management decisionmaking and plans to carefully evaluate its approach to the development of labor standards.

The Bureau hopes to improve its product mix by using its automatic data processing capability in planning production.

The Bureau believes it must retain an in-house capability to produce at least 50 percent of the strip required for coinage. GAO suggests further study of the economics of in-house strip production after the cost effects of other current and planned improvement actions are determinable.

## CHAPTER 1

### INTRODUCTION

Industrial management reviews are useful in determining an organization's efficiency and how it affects the cost of items being produced. These reviews evaluate the organization's total system of operation, management and cost control, and procedures used to achieve efficiency and economy. We have made such reviews in a number of industrial activities in agencies of the Federal Government. We reviewed the U.S. Mint in Philadelphia because (1) it was a major industrial activity, (2) it is a new facility having the latest in coinage methods and equipment, (3) it has a major financial investment in manufacturing facilities and equipment, and (4) a new Mint is being planned for Denver (operational Jan. 1, 1980). Knowledge about the efficiency and economy of operations at the Philadelphia Mint would provide a basis for improving not only the plans for Denver but also the existing Philadelphia operations.

### MINT ACTIVITIES

The Philadelphia Mint is one of six field activities operated by the Bureau of the Mint. Other facilities include (1) a Mint at Denver, (2) assay offices in New York City and San Francisco, (3) and bullion depositories at Fort Knox, Kentucky, and West Point, New York.<sup>1</sup> As of June 30, 1973, the Philadelphia Mint had 717 employees. Total building and equipment costs amounted to about \$37 million.

The Mint's primary mission is to produce domestic coins of all denominations to satisfy expected demands. Other major activities include

- minting coins for foreign governments,
- producing coinage dies for the entire Bureau complex,
- producing various commemorative medals known as "list" medals and various medals and appendages on specific orders from other Government agencies, and
- managing various "nonlist" medal programs.

Total coin production at Philadelphia for fiscal years 1971-73 is shown in the table below.

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<sup>1</sup>Coins are manufactured only at the Denver and Philadelphia Mints and at the San Francisco Assay Office.

<u>Coin</u>	<u>1971 (millions)</u>	<u>Per- cent</u>	<u>1972 (millions)</u>	<u>Per cent</u>	<u>1973 (millions)</u>	<u>Per- cent</u>
1 cent	1,786.8	76.2	2,636.7	76.3	3,328.2	75.5
5 cent	53.2	2.3	79.9	2.3	349.2	7.9
10 cent	291.4	12.4	372.6	10.8	236.0	5.3
25 cent	126.3	5.4	85.5	2.5	382.6	8.7
50 cent	87.0	3.7	206.2	5.9	64.5	1.5
1 dollar	<u>-</u>	<u>-</u>	<u>76.4</u>	<u>2.2</u>	<u>49.3</u>	<u>1.1</u>
Total	<u>2,344.6</u>	<u>100.0</u>	<u>3,458.2</u>	<u>100.0</u>	<u>4,409.8</u>	<u>100.0</u>

The manufacturing processes required to produce the six coin denominations from various metal alloys include:

- Melting and casting: A predetermined mix of metals is melted and cast into ingots.
- Hot and cold rolling: Ingots are reduced to the proper dimensions and the resulting strip is rolled into coils.
- Blanking: Round pieces of metal (called blanks or planchets) are punched out of the coils of strip.
- Annealing: The blanks are softened by heating and then cleaned, polished, rinsed, and dried.
- Upsetting: Soft blanks are rolled on their edges through a machine which raises rims around the edges.
- Stamping or coining: The blanks receive the obverse and reverse impressions from coinage dies in heavy presses.

#### SCOPE OF REVIEW

We directed this review conducted from June to November 1973 toward measuring, analyzing, evaluating, and improving overall mint productivity, labor productivity, equipment use and justifications, maintenance operations, product mix, and operating philosophy. As the review progressed we worked very closely with Bureau and Mint personnel to insure that they were apprised of what we were finding and in a position to take appropriate action as quickly as possible.

## CHAPTER 2

### IMPROVEMENTS NEEDED IN MINT OPERATIONS

In earlier review of Mint operations,<sup>1</sup> we found that accounting and reporting procedures did not provide meaningful and reliable information for managing resources and operations. Although 4 years have passed since we made these observations, the Mint still has very limited data to evaluate overall Mint and labor productivity and equipment use and justifications. Therefore, in almost all cases, we had to create our own data base.

#### MINT PRODUCTIVITY

"Productivity" can be broadly defined as the ratio between the units produced or services provided by an organization (outputs) and the resources consumed during production (inputs) for a specified period. A productivity index measures the efficiency of the organization by comparing the current output-input ratio with that of a previous base period. Such a comparison can also indirectly show such factors as technological changes, use of productive capacity, managerial effectiveness, labor mix, flow of materials, labor-management relations, and economic trade-off among the factors of production.

The Philadelphia Mint had limited data on inputs and outputs for measuring overall productivity. However, we used available information in developing a data base to support measures of productivity for producing coins and metal strip for coining. We used pounds of coins and pounds of strip produced as the outputs. For the input, we used the amount of manpower resources consumed. The table below, which uses the first half of fiscal year 1972 as the base period, shows the productivity trends.

<sup>1</sup>"Financial Management of Bureau of the Mint Operations Needs Improvement" (B-114877, Jan. 1970).

Average output in pounds per person

Fiscal Year <u>(note a)</u>	Strip produc- tion <u>(direct labor)</u>	Coining <u>(direct labor)</u>	Total Mint work force
1972 (first half)	100	100	100
1972 (second half)	103	116	118
1973 (first half)	169	120	119
1974 (second half)	147	121	120

<sup>a</sup>Data for July was not included.

These trends showed that productivity of the strip production direct work force increased at a more rapid rate than that of the total work force. The increased productivity in the strip production division was due primarily to a change in the ratio of manufactured strip to purchased strip from about 21:79 to about 46:54. Assuming that it is cost effective to produce more strip in-house, the productivity trends are, indeed, favorable.

We also developed two intermediate productivity indexes for selected Mint production areas. The indexes relate deflated production costs to (1) each 100 pounds of raw material processed and (2) each 1,000 coins produced.<sup>1</sup> We used them in isolating problem areas.

For example, increasing production costs indicated that additional management attention was warranted, whereas constant or decreasing costs indicated that operations were under control.

Analysis of these two indexes showed diverging trends. For example, between fiscal years 1972 and 1973, the deflated cost per 100 pounds for the 1-cent melting operation decreased 73 percent, from \$7.77 to \$2.13, while the cost for the 25-cent blanking operation increased 85 percent, from \$2.46 to \$4.54 per 100 pounds when compared with the base period. The latter trend indicates that management should carefully analyze this area for possible cost reduction opportunities.

The Bureau stated that productivity measurement has been given high priority and that new studies dealing with productivity have already been started. It is anticipated that a new financial management system, planned for 1975, will further improve the measurement of productivity.

<sup>1</sup>Costs were deflated to eliminate the effects of inflationary forces, such as personnel wage increases and increases in other costs shown in consumer price indexes.

We support the Bureau's productivity efforts; with continued emphasis, the Bureau can improve the existing data base so that reliable analyses can be made. Such action will enable the Bureau to continuously monitor Mint performance and identify problems when unfavorable trends develop.

#### LABOR STANDARDS

Labor efficiency and requirements cannot be determined without some means for comparing actual accomplishments with planned (standard) accomplishments. Normally, labor standards form the basis for this comparison by indicating the time necessary for an experienced operator to do a job at a normal pace, in a predetermined manner, allowing adequate time for fatigue and personal needs. Labor standards have not been developed for either production or maintenance work at the Mint.

#### Production

Standards for production work can improve an operation's overall productivity. A recent engineering study<sup>1</sup> concluded that average labor productivity in industrial plants increased from 14.6 to 63.8 percent by establishing work standards and wage incentives.

Western Electric, in a 1970 study of Mint operations, pointed out that the Mint's lack of formal labor standards deprived management of a useful means for estimating costs and for determining machine manning requirements; production schedules; and daily, weekly, and monthly labor productivities. The study suggested that engineers with production and industrial engineering backgrounds be hired to develop such standards. Although Mint and Bureau officials agreed that such standards are desirable, they pointed out that hiring restrictions had hampered their efforts to bring engineers aboard. Renewed efforts should be made to obtain the resources to develop formal standards, which are essential to efficient Mint operations.

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<sup>1</sup>Fein, M. "Work Measurement and Wage Incentives," Industrial Engineering, vol. 5 No. 9 (Sept. 1973), pp. 49-51.

## Maintenance

Efficient planning, scheduling, and assigning of maintenance work depends on accurate time standards. The time for Mint maintenance jobs, which use about 25 percent of the total Mint appropriations, is estimated by maintenance foremen. Although such estimates can provide complete job coverage, they are generally "loose" and extremely difficult to verify.

Data on a variety of public and private maintenance activities indicates that foremen tend to intuitively estimate jobs in terms of 1/4, 1/2, 1, 1-1/2, and 2 man-days and often overestimate job length.

A sample of 100 Mint maintenance jobs showed that Mint foremen also estimate on the basis of even multiples of a man-day. Because actual job times were not recorded, however, there was no way to determine whether job lengths were overestimated.

On the basis of evidence from public and private maintenance activities, the development of appropriate maintenance standards<sup>1</sup> could help the Mint track maintenance performance, improve workload planning and scheduling, reduce the work backlog, and improve productivity. Historically, such improvements have resulted in an average productivity gain of about 35 percent during the first year after installation of maintenance standards. We have discussed these points with Bureau and Mint officials, and they agreed that maintenance operations could be improved.

The Bureau concurs that a work measurement system, including labor standards for both the production and maintenance area, can contribute to more effective management decisionmaking. However, since the cost of developing and maintaining engineered standards and an associated work measurement system may be considerable, the Bureau is carefully evaluating all possible alternatives. According to the Bureau, immediate installation of a work measurement system is not desirable, because future labor contract

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<sup>1</sup>The type of standard to be used should be determined by qualified industrial engineers.

negotiations and labor-management relationships may be adversely affected. However, a long-term postponement of such a system would not be in the best interest of the Bureau or the Mint. Instead, a phased work measurement system which establishes a comprehensive methods improvement program followed by appropriate standards development is preferable.

#### EQUIPMENT USE

High equipment use can (1) increase the amount of material which can be processed and thereby reduce unit production costs, (2) reduce capital expenditures for new equipment, (3) reduce manufacturing cycle time and consequently in-process inventories, and (4) improve labor efficiency.

Equipment use is usually computed by comparing the time a machine is productively operating with the total available machine time,<sup>1</sup> but the Mint's machine time data was either lacking or questionable. Therefore, management could not systematically identify causes for less-than-expected equipment use or output.

Because the Mint lacked adequate data, we developed another method of computing equipment use. We compared the outputs of selected machines with the maximum machine capacities for a randomly selected number of days in fiscal years 1970-73. Then, by analyzing the outputs, we developed the use figures shown below.

<u>Machine</u>	<u>Period covered</u>	<u>First day</u>	<u>Last day</u>
		(percent)	
Alligator shear	Oct. 1970 to June 1973	21.0	22.0
Furnace position 2	July 1970 to June 1973	15.4	27.7
Furnace position 4	July 1970 to June 1973	23.3	39.3
Bonding mill	Nov. 1971 to June 1973	3.4	7.4
Composite of 8 coin presses	Jan. 1972 to June 1973	45.8	66.5

<sup>1</sup>Total available machine time is the sum of the time the machine is operating, the time the machine is "down" for a variety of reasons, and the time for such factors as setup and tool changing.

Although use of all machines increased, even the improved last-day figures appear low. Much of the low use can be attributed to operating at less than three full production shifts.<sup>1</sup> Other contributing factors include (1) a less than ideal alloy mix which will be discussed later, (2) a large amount of machine downtime, and (3) a lack of trained personnel to operate sophisticated production equipment.

The Philadelphia Mint has realized the need for improvements in the use of production equipment and has initiated an equipment downtime reporting system which will be used in conjunction with the scheduled maintenance, planning, and control system to improve equipment use.

The Mint is planning to employ manufacturing engineering expertise and use it to solve equipment and process problems and improve equipment use. The Mint is also initiating improvements in equipment spare parts inventory management which will enable it to eliminate long leadtimes for major equipment parts. The Mint's training program in analytical trouble-shooting techniques has already produced improvements in reducing equipment downtime.

We concur with the actions the Mint is taking or is planning to take in this area. Continued emphasis should help to accomplish the objective of using available machine capacity and reduce cost of production.

#### EQUIPMENT JUSTIFICATIONS

Until August 1973, the Mint had no formalized equipment justification procedures. The Mint only informally provided information to the Bureau on new equipment to be purchased and old equipment to be replaced. This information was based on subjective judgments, since capacity and use data were either unreliable or nonexistent.

In August 1973 the Bureau began the development of a facilities and equipment forecasting, planning, and control procedural system. The system is designed to provide adequate

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<sup>1</sup>The Mint was recently authorized to work three full shifts and is planning to do so.

equipment justification and to monitor equipment expenditure subsequent to budgetary approval.

The Bureau's new system is a step in the right direction and should be further developed and followed.

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## CHAPTER 3

### INCREASING MINT CAPACITY

According to Bureau of the Mint coin requirements projections, the increasing demand for coins will necessitate an increase in the present total mint production capacity. Such an increase can be accomplished in a number of ways. First, the Bureau could construct new mint facilities. Second, the amount of overtime and/or the number of working shifts could be increased. Third, the Bureau could improve the current coinage output by developing a product mix which will yield more of the required output at the lowest cost. Finally, rather than produce as much coining strip as possible in-house, as is presently done, the Bureau could purchase all strip from commercial sources. The space currently used to produce in-house strip could then be converted to handle blanking and coining operations which would increase Mint coin production capacity.

Since the first two alternatives have been discussed in other studies,<sup>1</sup> we will not look at them further. The last two alternatives, however, offer immediate relief from existing production limitations. Each is discussed in the following sections.

#### PRODUCT MIX

Of importance to a multiproduct activity like the Mint is determining the product mix which will yield the required output at the lowest cost. Currently, coins are produced from three basic alloys.<sup>2</sup> Gilding metal is used for pennies; cupronickel is used for nickels; and copper in combination

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<sup>1</sup>The results of these studies indicated the need for a new Mint which will be in Denver. The studies also indicated that operations with third and fourth shifts are not the most economical and would present only a temporary solution to the increasing coin demand.

<sup>2</sup>An alloy is a substance composed of two or more metals. For example, gilding metal or bronze consists of 95 percent copper and 5 percent zinc, and cupronickel is 75 percent copper and 25 percent nickel.

with cupronickel is used to produce clad strip for dimes, quarters, half dollars, and dollars.

We analyzed the Mint's strip production line and individual machine capacities for a given product mix and found that, by changing the product mix to one which maximized individual machine output, additional capacity was identified. For example, the capacity of the hot rolling mill increased by as much as 30 percent and that of the bell annealing furnaces about 82 percent. To further illustrate, given the current product mix, the bonding mill can process clad strip at a rate of 142,000 pounds a week. However, if the current product mix were changed by producing more dimes and quarters, the mill could handle as much as 1.6 million pounds of clad strip a week. But such a change in product mix would affect the capacity of other machines in the strip production line. For example, it would decrease the capacity of the melting furnaces while it would increase the capacity of the bell annealing furnaces.

Consequently, product mix affects how much material a machine can handle and, as a result, how much the machine can produce. Although maximum output is, of course, desirable, each machine's maximum output must be determined by balancing the capacities of all machines in the strip production line and minimizing potential production bottlenecks.

Therefore, in determining the best product mix, the Mint would need to make economic trade-offs among the machines to balance the capacities and obtain the maximum output for the entire production line at the lowest cost. Then, comparison studies should be made and a balance drawn between the most economical product mix and the coin demand mix generated by the Bureau's coin requirement projections. Such studies would obviously affect the amount of the strip produced of the different alloys.

The Bureau stated that:

"external constraints such as the Federal Reserve Bank coin requirements, the location of that requirement, and seasonal coinage demand fluctuations prevent the Bureau from determining the lowest cost product mix accurately."

However, the Bureau hopes to improve its product mix by using its automatic data processing capability in planning production.

We agree that the determination of a lowest cost product mix for the entire Bureau complex is a difficult undertaking. However, comparison studies which include reasonable estimates of the external constraints could be developed and would prove useful in resolving this very difficult problem.

#### PRODUCTION OF COINING STRIP

Although developing the lowest cost product mix would, no doubt, increase current Mint production capacity, the additional capacity would still not be enough to meet the projected 1980 coinage requirements. However, if the Bureau changed its operating philosophy by discontinuing all in-house strip production and procuring all strip from commercial sources, total coin production would almost triple if the space currently occupied by the strip production line were totally converted to blanking and coining. This is based on the assumption that additional blanking and coining would be done in the same proportional space distribution as is done presently and that the present product mix would continue.

Although such conversion would require additional capital outlays<sup>1</sup> and would make the Mint totally dependent on commercial supplies, benefits could be realized. For example, tripling only the 1973 Philadelphia Mint output of about 4.5 billion coins would almost meet the entire Bureau's expected coinage requirement for 1980 of between 13 to 17.8 billion coins. But, if the Mint tripled its expected 1980 coinage production of 9.9 billion coins, which according to a Bureau official can be achieved by the addition of new and the replacement of old coin presses, the entire 1980 Bureau coin requirement would be met or even exceeded. Such

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<sup>1</sup>For example, a Bureau analysis of converting the cladding area to blanking and coining estimated the cost of conversion at \$3.25 million. The cladding area takes up about 15 percent of the total strip production area. The analysis furthermore stated that a 35-percent increase in the blanking and coining output could be expected by such action.

capacity increase, when added to the existing capacity of the old Denver Mint and San Francisco Assay Office, may make the construction of the new Denver Mint for the 1980 timeframe questionable. In light of these observations, we concluded that the Bureau may wish to reexamine both current strip manufacturing philosophy and its decision to build a new Denver Mint.

In commenting on this suggestion, the Bureau said it considers that in-house strip production capability for all denominations is mandatory. According to the Bureau:

- "A. Commercial suppliers of strip are unwilling or unable to devote \* \* \* their production facilities to totally support the needs of the Mint, \* \* \* particularly \* \* \* in the case of clad strip \* \* \* used to produce 10¢, 25¢, 50¢ and \$1 coins. The Mint is constrained to a single source for clad strip and is unable to meet constantly increasing demand. A substantial reduction in the receipt of clad strip from the supplier would seriously jeopardize the production of clad coins.
- "B. Prices charged by commercial strip manufacturing firms are subject to influence by in-house strip capability.
- "C. If completely dependent on commercially produced strip, the Mint would lose flexibility in production because of the inherent long leadtime associated with procurement.
- "D. Possibilities of strikes, natural calamities, or changes in other commercial product demands (which are more profitable) could affect the suppliers' capacity or desire to provide strip at a reasonable price \* \* \* or to provide it at all. Additionally, commercially supplied strip has not always been of acceptable quality, resulting in production delays.
- "E. The Mint should have an in-house capability to produce a minimum of 50 percent of the strip required for coinage. With this capability it

would be able to produce sufficient strip to meet essential coinage demand in the event of strikes or other external events that would interrupt the receipt of coinage strip. This will insure the performance of the Mint's mission to produce coins required to support the commercial activities of the United States."

We contacted Bureau officials to obtain documentation in support of their comments; the documentation was either unavailable or would require considerable time to compile.

We recognize the desirability of in-house strip production, but the decision to retain this production should be made on the basis of cost advantages. Since the Bureau cannot now make a precise determination of in-house costs, we suggest this be done after some of the earlier recommendations are implemented.

The Bureau said commercial suppliers cannot now produce enough clad strip or are unwilling to do so. We are confident negotiation with industry can resolve this problem. Many alternatives are available, including long-term agreements insuring industry of continued demand, making available or selling existing machinery to industry thus building up this capacity, and developing alternate sources of supply.

## CHAPTER 4

### CONCLUSIONS AND RECOMMENDATIONS

#### CONCLUSIONS

The Philadelphia Mint needs to improve its productivity measurements to provide management with data to measure operating efficiency. Such knowledge is necessary for management to pinpoint problems and correct them. The Mint also needs to study the lowest cost product and associated alloy mix and the effect a change in its operating philosophy would have on Bureau plans to increase total Mint production capacity.

Equipment was not fully used, and use data was not adequate. The Mint recently tried to correct this problem by developing a downtime reporting system for the strip production line. However, the Mint still has no formal machine standards for comparing actual with expected equipment output.

Finally, labor standards for both production and maintenance work are needed. Developing such standards would help to improve workload planning and overall productivity.

#### RECOMMENDATIONS

We recommend that the Secretary of the Treasury direct the Bureau of the Mint to:

- Develop better measures of productivity so that performance can be adequately monitored.
- Develop a continuing program to improve equipment use. Such a program should include establishing machine standards.
- Develop equipment justification procedures and verifying techniques.
- Install a work measurement system in which appropriate labor standards are developed and used for both production and maintenance work. The system should

be phased by establishing a comprehensive methods improvement program followed by appropriate standards development. Moreover, the system should be thoroughly integrated with the cost accounting system.

--Determine the lowest cost product mix.

AGENCY COMMENTS

On June 17, 1974, the Director of the Mint furnished, on behalf of the Treasury, comments on this report. (See app. I.)

The Director agreed that more accurate measures of Mint productivity can be developed.

The Director stated that the Bureau realized the need for developing machine standards and plans to provide the necessary technical talent to develop such standards.

The Director concurs that labor standards can contribute to more effective management decisionmaking and plans to carefully evaluate its approach to the development of labor standards.

She said the Mint initiated an equipment downtime reporting system in November 1973 which will be used in conjunction with a scheduled maintenance, planning, and control system to evaluate equipment use.

In August 1973 the Bureau began to develop a facilities and equipment management system which is designed, among other things, to justify future facility and equipment expenditures.

The Bureau hopes to improve its product mix by using its automatic data processing capability in planning production.

The Director did not agree that the Bureau should consider discontinuing in-house strip production. The Bureau believes it must retain an in-house capability to produce at

least 50 percent of the strip needed for coinage. This question should be reconsidered after the cost effects of other current and planned improvement actions are determinable.



OFFICE OF  
DIRECTOR OF THE MINT

DEPARTMENT OF THE TREASURY  
WASHINGTON, D.C. 20220

JUN 17 1974

Mr. Victor L. Lowe  
Director, General Government Division  
United States General Accounting Office  
Washington, D.C. 20548

Dear Mr. Lowe:

This is in response to the General Accounting Office's draft report to the Secretary of the Treasury on the industrial management review of the U.S. Mint, Philadelphia: the Bureau of the Mint desires to comment on each recommendation. However, before commenting on individual recommendations which GAO proposes, I wish to say that we consider the draft report to be very constructive in its recommendations. The areas that are covered in the recommendations are just some of the major issues facing the Mint today.

The recommendations will be commented upon in the order in which they appear on page 18 of the draft report.

1. RECOMMENDATION: Develop better measures of productivity so that performance can be adequately monitored.

COMMENT: As has been discussed with GAO officials, the measurement of productivity, with improvements in the data base, is high on the Mint's agenda. The Mint has instituted a productivity measurement system during 1973. It is anticipated that the new financial management system, planned to come on stream in 1975, will significantly improve the measurement of productivity.

2. RECOMMENDATION: Determine the lowest cost product mix.

COMMENT: Currently, product mix is determined at the Bureau level for all production facilities. This determination is made after considerable attention has been given to the Federal Reserve Banks coin requirements, the location of that requirement, cost of transportation and seasonal fluctuations. In addition to the present methods of assigning production the Mint is continuing to research the feasibility of utilizing its ADP capability in planning production.

3. RECOMMENDATION: Analyze the impact a change in the Bureau's current operating philosophy of producing coinage strip in-house and supplementing it with commercially procured strip may have on Mint capacity.



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## APPENDIX I

COMMENT: It is considered mandatory that the Mint retain in-house strip production capability for all denominations for the following reasons:

- A. The commercial suppliers of strip are unwilling or unable to devote that increment of their production facilities to totally support the needs of the Mint. This is particularly true in the case of clad strip that is used to produce 10¢, 25¢, 50¢ and \$1 coins. The Mint is constrained to a single source for clad strip and they are unable to meet constantly increasing demand. A substantial reduction in the receipt of clad strip from the supplier would seriously jeopardize the production of clad coins.
- B. Prices charged by commercial strip manufacturing firms are subject to influence by in-house strip capability.
- C. If completely dependent on commercially produced strip, the Mint would lose flexibility in production because of the inherent long-lead time associated with procurement.
- D. Possibilities of strikes, natural calamities or changes in other commercial product demands (which are more profitable) could affect the suppliers' capacity or desire to provide strip at a reasonable price and in a timely manner, or to provide it at all. Difficulty has been experienced in receiving commercial strip in the past. Additionally, commercially supplied strip has not always been of acceptable quality, resulting in production delays.
- E. The Mint should have an in-house capability to produce a minimum of 50 percent of the strip required for coinage. With this capability it would be able to produce sufficient strip to meet essential coinage demand in the event of strikes or other external events that would interrupt the receipt of coinage strip. This will insure the performance of the Mint's mission to produce coins required to support the commercial activities of the United States.

### 4. RECOMMENDATION: Re-examine the decision to build a new Denver Mint.

COMMENT: The continuing need for in-house production of coinage strip, as previously discussed, makes it mandatory that strip manufacturing capabilities be retained in the Philadelphia Mint. Therefore, it is essential that the New Denver Mint be constructed to meet predicted coin demand for the 1980 time frame. Additionally, it must be recognized that the present Denver Mint is 70 years old and the structural limitations relating to floor loads and work flow severely restrict the development of efficient production operations.

5. RECOMMENDATION: Develop a continuing program to improve equipment utilization. Such a program should include establishing machine standards.

COMMENT: The Philadelphia Mint realized the need for improvements in the utilization of production equipment and has initiated an equipment down-time reporting system which will be utilized in conjunction with the scheduled maintenance, planning, and control system to improve equipment utilization.

The Mint is planning to employ manufacturing engineering expertise to be utilized in solving equipment and process problems, improving equipment utilization thereby. It is initiating improvements in equipment spare parts inventory management which will enable it to eliminate the long lead-time for major equipment parts. A training program in analytical trouble shooting techniques has been instituted and has already produced significant improvements in reducing equipment down time.

6. RECOMMENDATION: Develop equipment justification procedures and verify techniques.

COMMENT: In 1973 the Mint began to develop, establish and administer a facilities/ equipment forecasting, planning and control procedural system. This system is to be designed to standardize equipment and facilities inputs from the field offices, assure accuracy in cost estimation, provide for adequate justification for equipment and to monitor equipment and facility expenditure subsequent to budgetary approval. The application of this system will permit greater control of the equipment replacement program. It will assure that the field offices make application to the Bureau to obtain equipment on a timely basis, and standardize methods for equipment replacement analysis. This system will allow application of the time-value-of money factors in cost estimating, and will also simplify equipment and facility planning approval and acquisition between field offices and the Bureau.

7. RECOMMENDATION: Install a work measurement system in which appropriate labor standards are developed and used for both production and maintenance work. The system should be phased by establishing a comprehensive method improvement program followed by appropriate standards development. However, the system should be thoroughly integrated with the cost accounting system.

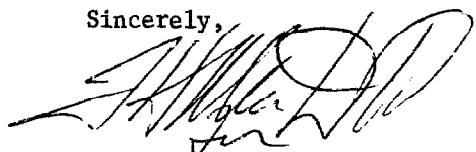
COMMENT: The Mint concurs that a work measurement system can contribute to more effective management decision making. Realizing that the cost of developing and maintaining engineered standards and an associated work measurement system is considerable, the Bureau is carefully evaluating its approach to this recommendation.

The standards/work measurement program if initiated at Philadelphia would most likely be applicable to all other field offices since it is expected that the pending labor contract will be Mint-wide. Therefore, the effects of such a program on future labor contract negotiations and labor-management relationships must be considered.

APPENDIX I

We shall be happy to discuss in detail any of our comments with GAO officials at their convenience.

Sincerely,

A handwritten signature in black ink, appearing to read "Mary Brooks".

Mary Brooks  
Director of the Mint

APPENDIX II

PRINCIPAL OFFICIALS OF  
THE DEPARTMENT OF THE TREASURY  
RESPONSIBLE FOR ADMINISTERING THE ACTIVITIES  
DISCUSSED IN THIS REPORT

	<u>Tenure of office</u>	
	<u>From</u>	<u>To</u>
SECRETARY OF THE TREASURY:		
William E. Simon	May 1974	Present
George B. Shultz	June 1972	May 1974
John B. Connally	Feb. 1971	June 1972
David M. Kennedy	Jan. 1961	Feb. 1971
DIRECTOR, BUREAU OF THE MINT:		
Mary T. Brooks	Sept. 1969	Present
SUPERINTENDENT OF THE PHILADELPHIA MINT:		
Nicholas G. Theodore	July 1969	Present

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