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REPORT BY THE U.S.



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# General Accounting Office

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## Army Plans To Modernize The Rock Island Arsenal May Be Inappropriate

Modernizing old and obsolete manufacturing facilities and equipment increases an installation's ability to satisfy projected needs in a timely manner. This report identifies actions the Army should take before the proposed modernization plan for the Rock Island Arsenal is fully implemented.



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LCD-79-418  
JUNE 6, 1979



UNITED STATES GENERAL ACCOUNTING OFFICE

WASHINGTON, D.C. 20548

LOGISTICS AND COMMUNICATIONS  
DIVISION

B-159896

The Honorable Clifford L. Alexander, Jr.  
The Secretary of the Army

Dear Mr. Secretary:

This is our report on Army plans to modernize manufacturing equipment and facilities at the Rock Island Arsenal. The report identifies actions your Department should take before making extensive investments to modernize the arsenal's facilities and equipment.

Matters addressed in this report were discussed with Army officials and their comments were included where appropriate.

The report contains recommendations to you on page 9. 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 taken on our recommendations to the House Committee on Government Operations and the Senate Committee on Governmental Affairs not later than 60 days after the date of the report and to 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.

We are sending copies of this report to the Chairmen, Senate Committees on Appropriations, Armed Services, and Governmental Affairs and House Committees on Appropriations, Armed Services, and Government Operations; the Director, Office of Management and Budget; and the Secretary of Defense.

Sincerely yours,

A handwritten signature in black ink, appearing to read "R. W. Gutmann".

R. W. Gutmann  
Director

D I G E S T

Old and obsolete facilities and equipment at the Rock Island Arsenal coupled with an insufficient capacity to satisfy projected mobilization production requirements in a responsive manner, motivated the Department of the Army to initiate actions to modernize the arsenal's manufacturing equipment and facilities.

In January 1977 the Rock Island Arsenal submitted, and the Army subsequently approved, a 2-year planning project to analyze existing facilities and develop recommendations for improving the facilities' use. This project is being accomplished with the help of a contractor and is expected to be completed in August 1979. Preliminary estimates indicate that modernization may cost \$101 million for fiscal years 1981-85. Total modernization costs, however, may be substantially higher.

FINDINGS AND CONCLUSIONS

Although the Army used a credible approach and method to develop its modernization plan for Rock Island, mobilization production requirements are questionable because:

- The Army's methods for calculating combat consumption rates for major end items contained shortcomings.
- The U.S. Army Armament Materiel Readiness Command's mobilization requirements computation for secondary items was based, in part, on unsupported assumptions.
- Projected wartime overhaul and rebuild requirements lacked foundation.

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In 1975 and 1976 GAO recommended that the Army identify the extent to which private industry could satisfy projected arsenal mobilization requirements and the Army agreed to do so. The Armament Command determined private industry's willingness to satisfy the requirements, but not its capability and capacity. While GAO could not identify the specific impact these conditions had on the arsenal's need to modernize its facilities and equipment, it may be substantial.

#### RECOMMENDATIONS

Except for completing the ongoing planning effort, the Secretary of the Army should defer extensive investments to modernize the arsenal's manufacturing facilities and equipment until

- the arsenal's mobilization requirements are reexamined to insure that only valid requirements are considered and
- private industry's capability to do work currently assigned to the arsenal has been clearly established.

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## CHAPTER 1

### INTRODUCTION

Old and obsolete manufacturing facilities and equipment at the Rock Island Arsenal coupled with insufficient capacity to satisfy projected mobilization production requirements in a responsive manner, motivated the Army to initiate actions to modernize the arsenal's manufacturing facilities and equipment.

In January 1977 the arsenal submitted, and the Army subsequently approved, a 2-year planning project entitled "Analysis for Modernization of Industrial Operations." During the first phase of this project, data was collected and a data base to analyze the arsenal's manufacturing processes was established. The second phase is to provide a program for more efficient use of existing facilities by plant rearrangement, renovation of buildings, new construction, and equipment replacement. 1/

A contractor, A. T. Kearney, Inc., located in Chicago, Illinois, was awarded a \$320,000 contract to participate in this effort. By April 25, 1979, the contract price had increased to about \$447,000. The increase was caused by delays encountered because of data inaccuracies, cost overruns, and recently negotiated modifications to complete the contracted portion of the planning effort. The contractor is expected to complete its facilities analysis and make recommendations for improvements by August 1979.

### SCOPE OF REVIEW

We reviewed the Rock Island Arsenal's modernization effort and concentrated on determining (1) the validity of the workload requirement projections used to develop the modernization plan and (2) the amount of consideration given to private industry's capability and capacity available to satisfy these requirements. Additionally, we examined and evaluated, to the extent possible, the credibility of the study's approach and the reasonableness of the contractor's analyses.

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1/The current Army estimate for arsenal modernization for the fiscal year 1981-1985 time period is \$101 million. The total modernization effort may cost substantially more.

Our review was made at the following locations:

--Headquarters, Department of the Army, Washington, D.C.

--Headquarters, U.S. Army Material Development and  
Readiness Command, Alexandria, Virginia.

--Headquarters, U.S. Army Armament Materiel Readiness  
Command, Rock Island, Illinois.

--Rock Island Arsenal, Rock Island, Illinois.

## CHAPTER 2

### MOBILIZATION REQUIREMENTS ARE QUESTIONABLE

A key factor in planning for modernization at any defense installation is the reasonableness of mobilization requirements. Overstated requirements could lead to excess capacity, while understated requirements could result in insufficient capacity. We found that mobilization requirements for the Rock Island Arsenal were questionable because:

- The Army's methodologies for calculating combat consumption rates for major end items contained shortcomings.
- The U.S. Army Armament Materiel Readiness Command's mobilization requirements computation for secondary items was based, in part, on unsupported assumptions.
- Projected wartime overhaul and rebuild requirements lacked foundation.

Although we could not identify the specific impact these conditions had on the arsenal's need to modernize its facilities and equipment, it may be substantial.

### MAJOR END ITEM REQUIREMENTS

Major end items make up the bulk of the Rock Island Arsenal's projected mobilization requirements. Mobilization requirements for these items are the sum of combat consumption requirements and mobilization training requirements 6 months after the start of a war.

A key factor influencing major end item mobilization requirements is the combat consumption rate. Two recent classified Army Audit Agency reports (HQ 78-205, dated Sept. 29, 1978, and HQ 79-208, dated Apr. 6, 1979) identified several conditions which led the agency to question the validity of the current rates. Conditions identified included:

- Some of the methodologies used in the computer models which generated the combat consumption rates lacked consistency and support. For example, no adjustments for enemy artillery losses were made. This resulted in overstated U.S. losses.



--The assumptions used in the various computer models were questionable. Some were unrealistic while others were outdated.

--Some of the models' input data was out-of-date and differed from such source documents as intelligence estimates.

Because of the interactive nature of the various factors considered, the Army Audit Agency was unable to determine whether these conditions resulted in overstated or understated equipment combat consumption rates.

We made similar observations in two recent reports 1/ related to combat consumption rates. For example, in our report on the need for the new Mississippi ammunition plant, such conditions as (1) failing to decrease artillery pieces and (2) continuing to fire on targets after they had been destroyed resulted in overstated Army artillery requirements. We were, however, also unable to quantify the degree of overstatement.

Army officials agreed that there were problems with the methodologies the Army used to determine combat consumption rates. They noted, however, that the rates used to compute the Rock Island Arsenal's mobilization requirements, as well as the rates discussed in our reports, were based on dated methodologies and do not reflect current conditions. Army officials added that a new study conducted in preparation for fiscal years 1981-85 programs corrected many of the deficiencies noted by us and the Army Audit Agency. Further efforts, such as a new study for fiscal years 1982-86 programs and continuing work on a new computer model called WARRAMP (Wartime Requirements for Ammunition, Materiel, and Personnel) are expected to overcome the remaining deficiencies. Unfortunately, results of these efforts will not be available before the end of calendar year 1980.

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1/"Evaluation of the Need for and Cost of the Proposed New Ammunition Plant in Mississippi" (LCD-78-410, Mar. 17, 1978).

"Methods Used for Determining Conventional Ammunition Requirements" (LCD-77-401, July 10, 1977).

## SECONDARY ITEM REQUIREMENTS

According to existing Army criteria, such items as gun mounts, recoil mechanisms, and cannons which are currently manufactured at Army arsenals are considered secondary items. About 36 percent of the Rock Island Arsenal's total projected mobilization requirements fall into this category.

Mobilization requirements for these items are computed by means of an elaborate process which considers such factors as expected combat usage and amount of equipment available when war breaks out. One of the key factors which determines the combat usage of an item is the "X-factor." This factor translates the average peacetime usage rate for an item into an expected wartime usage rate. For the Rock Island Arsenal items, the value of the X-factor ranges from 4.0 for gun mounts and related items to 10.0 for recoil mechanisms. In other words, during wartime these items are expected to be used from 4 to 10 times as frequently as in peacetime.

Because of the significance of the X-factor, we looked at the basis for the values assigned to it. We found that for arsenal items no policy, historical data, or scientific studies existed which could be used to support the X-factor values. We were told that in place of such information, the values assigned are based on the Armament Command's best "corporate" judgment.

Army officials agreed that a better basis for the X-factor values needs to be established. They noted that the Army has two pilot projects underway which are expected to generate methodologies for predicting for selected weapon systems: secondary item usage due to battle damage and item failures due to increased tempo of operations. <sup>1/</sup> Work on one of the weapon systems, the AH-1S helicopter, is scheduled to be completed by December 1979. Work on five additional systems is expected to begin during fiscal year 1980. Other systems are to follow in subsequent years provided that appropriately trained personnel and sufficient funds are available.

We believe the above efforts are steps in the right direction and further work in this area should be encouraged.

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<sup>1/</sup>The two projects are called "SPARC" (Sustainability Predictions for Repair Part Requirements for Combat) and "PRECOMP" (Prediction of Contingency Maintenance and Parts Requirements).

## OVERHAUL AND REBUILD REQUIREMENTS

Guidance provided to the Rock Island Arsenal by the Armament Command identified a limited mobilization requirement for the overhaul and rebuild of three types of gun mounts and three types of recoil mechanisms. About 68 individual types of manufacturing equipment would be required to satisfy this requirement.

Since the arsenals are not normally involved in overhauling and rebuilding Army weapon systems--maintenance facilities have this responsibility--we asked the Armament Command for the basis of this requirement. We were told that the reason for the requirement was to have the Rock Island Arsenal as an alternate/second source for gun mounts and recoil mechanisms. Armament Command officials noted that the results of a 1974 Army study on the retention of in-house production capability identified such a requirement. Further, they stated that a check of related overhaul and rebuild programs developed during 1976 through 1977 and available depot capacities showed that there might be a capacity shortfall.

Our analysis of more recent (Mar. 1979) mobilization requirements and available depot capacities showed that retaining the Rock Island Arsenal as an alternate source for overhauling and rebuilding gun mounts and recoil mechanisms is questionable. First, we found that for two of the six items in question--the M2A5 and the M6A2/M45 recoil mechanisms--there was no mobilization requirement because available assets exceeded projected needs. Second, officials from the U.S. Army Depot Systems Command--the command responsible for overhauling and rebuilding Army weapon systems--provided us with capacity data which showed that for the remaining four items existing Army depot capacity was more than sufficient. Finally, guidance provided by Headquarters, U.S. Army Materiel Development and Readiness Command, in June 1978, to the Depot Systems Command on how and where projected mobilization requirements are to be satisfied makes no provisions for arsenals as an alternate source.

In view of the above situation, we believe that the Armament Command's assumption that the Rock Island Arsenal is needed as an alternative is questionable and should be reexamined.

### CHAPTER 3

#### CONTRACTOR SUPPORT NEEDS TO BE IDENTIFIED

Army Regulation 235-5 states that it is Army policy to give first consideration to private industry to satisfy Army requirements unless there is no economical or reasonable alternative. However, we found that for the Rock Island Arsenal this has only been done for peacetime requirements.

In two earlier reports, 1/ we recommended to the Army that before extensive equipment modernization efforts are undertaken at the Rock Island Arsenal, private industry's willingness and capability to meet arsenal production requirements for peacetime and wartime should be identified. The Army agreed and stated that " \* \* \* efforts would be intensified to identify private industry capacity, thereby restricting planning for Rock Island Arsenal to the minimum essential to mobilization requirements."

Our current review disclosed that this was not the case. While the command continuously identifies private industry's capability and capacity for peacetime work, screening for wartime work has only been partially done. To illustrate this point, in 1978 the Armament Command screened private industry (its first screening effort since 1974) and identified 20 potential producers for the 16 items currently planned for production at Rock Island. As many as 12 producers were willing to manufacture one of these items. Notwithstanding this favorable response, the command made no attempt to establish the producers' capability and capacity. We contacted one of the potential producers, Aerojet Company located in California, and they told us since no attempt was made to contact them it appears that the Army is not interested in pursuing the matter at this time.

Armament Command officials agreed that assessing private industry's production capability and capacity is necessary to determine how much needs to be produced in-house. They commented, however, that staffing limitations prevented them from doing so. However, our review indicated that the problem may not be a lack of staff but one of low priority

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1/"Survey of Industrial Management Activities at Rock Island Arsenal" (LCD-75-427, Jan. 20, 1975) and followup report on the same subject matter, dated Aug. 26, 1976.

assigned to the screening effort. For example, we were told that three persons could accomplish the entire follow-up effort in about 6 months. Although the responsible division--the Weapons/Fire Control Division--did lack properly trained staff due to turnover in personnel and vacancies in its authorized personnel strength, other options, such as temporarily obtaining the services of other qualified command personnel, contracting out the effort, or a combination of the above were not considered.

Subsequent to the completion of our fieldwork, the Armament Command performed a preliminary analysis of the capability of the 20 companies which indicated interest in becoming planned producers. Command officials stated that six companies would probably be eliminated due to the lack of capability, lack of adequate facilities, or the need to maintain their capability for other planned items. However, according to command officials, the remaining 14 companies will require detailed followup action to evaluate their capability and continued interest in becoming producers during mobilization.

The preliminary analysis performed by the command is a step in the right direction. In our opinion, the detailed followup of private industry's capacity and capability needs to be completed before any extensive in-house investments are made.

## CHAPTER 4

### CONCLUSIONS AND RECOMMENDATIONS

The Rock Island Arsenal is in the process of developing a plan to modernize its manufacturing equipment and facilities. While the approaches and methodology used to develop such a plan appear generally credible, potentially unwise investments in plant facilities and equipment are likely unless the Army takes actions to (1) better define mobilization requirements and (2) adequately identify private industry's capacity and capability to satisfy these requirements. Previous Army assurances that private industry's capacity would be identified have not yet been carried out.

We recommend that, except for completing the ongoing planning effort, the Secretary of the Army defer extensive investments to modernize the arsenal's manufacturing facilities and equipment until

- the arsenal's mobilization requirements are reexamined to insure that only valid requirements are considered and
- private industry's capability to do work currently assigned to the arsenal has been clearly established.

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