



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

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PROCUREMENT, LOGISTICS,  
AND READINESS DIVISION

FEBRUARY 25, 1982

B-206300

The Honorable Donald J. Mitchell  
House of Representatives

Dear Mr. Mitchell:

Subject: Constituent's Allegation Concerning the  
Production of Artillery Barrels at the  
Watervliet Arsenal, New York (PLRD-82-48)

In response to your October 14, 1981, request, we have evaluated a constituent's allegation concerning the Nation's capability to produce artillery barrels in time of need. Your constituent--Mr. Robert Selwood of Oriskany, New York--alleged that production from the rotary forge integrated line at the Army's Watervliet Arsenal, Watervliet, New York, was limited because of the arsenal's decision to use conventional band saws to cut artillery tubes after forging rather than the latest automated hot abrasive cut-off machine proposed by Mr. Selwood in an unsolicited proposal to the arsenal.

In accordance with your request and in a November 1981 discussion with your Office, we made preliminary inquiries at the Watervliet Arsenal to determine (1) whether the present saws create a bottleneck in the production process which, in effect, limits the rotary forge output and (2) the Army's rationale for using conventional saws. Our inquiries included a review of files and discussions with Army representatives at the arsenal concerning the rotary forge integrated line, which is comprised of the following major equipment components:

- A Cheston induction preheat furnace.
- The rotary forge.
- Press equipment.
- Two conventional band saws.
- A Selas heat treat system.
- A metal cut (circular) saw.
- A materials handling system.



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On January 20, 1982, we discussed the preliminary results of our review with your Office. As agreed, we do not plan to pursue this matter further and are summarizing the facts obtained.

Our review of the rotary forge integrated line flow process indicated that three saws--two band saws and one metal cut (circular) saw--are used on the integrated production line. These saws are used for two distinct and separate operations. Although your constituent seemed concerned about the trimming operation of the band saws, we decided to obtain information on all sawing operations performed on the line.

The first cutting operation performed following forging and cool down is a trimming process. Two band saws are used to perform this operation. The muzzle end of the tube is cut on one saw and the breech end of the tube is cut on the other saw. The trimming operation is required after forging to "square up" the ends of the tube for processing through the Selas heat treat. It should be noted that the cooling down requirement prior to saw cutting does create a delay which limits the production capability for the first day of continuous operation. However, the band saws' capacity would eliminate this delay on the second day of continuous operation.

The second cutting operation is performed following the Selas heat treat process at the end of the integrated line. The metal cut saw performs this operation. The tube ends (muzzle and breech) each require two cuts for test discs used for quality control testing. The tubes are then placed in storage pending test results. Following completion of the required tests and final acceptance by quality control personnel at the arsenal, the tubes are cut to length (one cut from muzzle and one cut from breech) for final machine processing.

Our review of the maximum capacity and standard processing times for each major component of the integrated line indicated that on one hand, the saws do delay the production process in relation to the fastest component of the line, which is the rotary forge. On the other hand, the saws do not create a delay in relation to the slowest component of the line, which is the Selas heat treat process. Army representatives at the arsenal told us that the processing time required of the saws is more than adequate to meet both the peacetime and mobilization requirements of gun tube forgings, and our limited inquiries confirmed this.

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Because the current capacity of the Selas heat treat process cannot heat treat forgings commensurate with the rotary forge capability, Watervliet has an ongoing manufacturing methods and technology project to increase gun tube heat treatment capacity. During this project, the arsenal is investigating the use of induction heating and the possible use of the residual heat from forging to increase the limited capacity of the Selas heat treat system. The anticipated benefit from this project is the ability to heat treat gun tube forgings at a faster rate during mobilization without substantially increasing equipment acquisition and construction costs required to install additional capacity similar to that in place now.

Regarding the two conventional band saws currently in use, we found that they were originally purchased in 1968 at a total cost of about \$38,000. They were installed in the rotary forge integrated line because the equipment was available at Watervliet and was not being fully used. Moreover, at the time of installation, the process time required of the band saws in relation to the Selas heat treat system was more sufficient to meet production requirements. Utilization of this equipment reduced the overall costs of the rotary forge integrated line.

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As agreed with your Office, we are sending copies of this report to Congressman Samuel S. Stratton and the Secretaries of Defense and the Army. Copies will also be available to other interested parties upon request.

Sincerely yours,



Donald J. Horan  
Director