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REMINGTON ARMS COMPANY, INC.  
FIREARMS MODERNIZATION DIVISION  
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REMINGTON ARMS CO.  
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FIREARMS RESEARCH DIVISION

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RECEIVER FLEXIBLE MANUFACTURING SYSTEM

The Automation Review Committee recently completed the study of additional automation options that could be included in the Receiver FMS project scope. The following items were recommended at the July 25 Firearms Modernization Operations Meeting:

- o AUTOMATIC MATERIAL HANDLING
- o AUTOMATIC PRODUCTION SCHEDULING
- o MRP INTERFACING
- o AUTOMATIC PRODUCTION REPORTING
- o ADAPTIVE MACHINE CONTROL

High spot economics indicate these items are justified on a stand alone basis and will increase the total project economics approximately 2% on a \$850M additional capital investment.

The Automation Review Committee also recommended that the Receiver FMS computer control software and hardware design be altered to be more "transportable" to other proposed Modernization systems, such as Small Parts Manufacturing. The cost for the "transportability" option is estimated to be \$500M additional capital investment. This expenditure is easily justified due to the significant capital and software development costs that will be avoided in future Modernization projects.

A maximum 10 month implementation delay of the total ten machine system will be experienced if all the above recommendations are included in the Receiver FMS project.

The Firearms Modernization Operations Committee agreed to expand the project scope to include all the above automation options.

GFM AUTOMATION

The Strip/Assembly machine is complete and will be tested at EDL in August.

The Cincinnati Milacron robot has been delivered to Ilion. Plant site preparation on the #4 GFM will begin in August.

Complete system installation is currently scheduled for September.

FLEXIBLE ASSEMBLY SYSTEM FOR SMALL COMPONENTS

Basic project data has been recently developed by Remington and EDL personnel for the automatic assembly of the following parts.

SHOTGUN BREECH BOLTS

COMMON TRIGGERS

M/700-7 TRIGGERS HOUSINGS

SHOTGUN CARRIERS

Upon plant acceptance of the data, the design of the system can be finalized and the Construction Cost Estimate completed.

Initial project submission is scheduled for September with authorization anticipated by year-end.

Firearms Design has indicated that of the four components which may need to be changed to facilitate automatic assembly, only two require testing. Research has recently tested the modified extractor plungers and found them to operate satisfactorily. The proposed extractor spring modification will be tested in August.

MANUFACTURING SYSTEM - SMALL METAL COMPONENTS

Remington and Engineering Department personnel have determined that by modifying the Small Metal Components FMS slightly, a major portion of the computer control system designed for the Receiver FMS can be utilized in this system for a

substantial savings. Development is continuing utilizing this strategy.

Testing of the tooling, fixturing, and material handling concepts for breech bolts is scheduled for August and September.

WOOD COMPONENTS - FLEXIBLE MANUFACTURING SYSTEM

1. CNC LONG STOCK INLETING

The second fixture has been installed on the Heian machine and is in production.

Operator training is progressing well and the standard operating procedures and safety key points should be complete in August.

2. ROTARY BELL ATOMIZERS

The dryer for the main compressed air line for the electrostatic spray room has been installed. The air lines and rotary atomizer controls will be cleaned during the August shutdown. Additional testing will begin in late August.

Marshall Labs has supplied Remington with high solids Model III and RKW finishes to be evaluated with the rotary atomizers.

3. STOCK VENDOR STUDY

Firearms Modernization is investigating the feasibility of wood furniture manufacturers providing gun stocks for Remington.

The following furniture manufacturers have been contacted regarding possible plant visits by Remington personnel to discuss the technical feasibility and their interests in this venture.

ETHAN ALLEN INC.

BROYHILL FURNITURE CO.

BASSETT FURNITURE CO.

LANE COMPANY INC.

Preliminary investigation has yielded that furniture manufacturing varies from stocks in two areas:

- a. Furniture requires mostly planing and shaping operations while stocks require more turning and inletting processes.
- b. Furniture does not require the close tolerances necessary for stock manufacturing. Their main concern is that the furniture lot being produced can be assembled properly. They have no spare parts requirements needing future fitting.

Past studies have indicated the most economical location for stock manufacturing is in the Mid-West where the majority of our current wood supply is located. Freight costs are minimized since wood that becomes chips or scrap is not shipped to Ilion.

If the furniture manufacturers are not interested in becoming stock vendors, contacts will be pursued in the Mid-West including Remington's current wood blank suppliers.

SERIAL NO. RECORDING SYSTEM - PHASE II

A turnkey system has been ordered from Computer Identics. However, to obtain a guarantee of the system performance, Remington is obligated to purchase the DEC hardware from Computer Identics as well. Since Remington will now not realize the 17% corporate discount from DEC, the SNRS Phase II project is \$25M short in capital funds required to purchase the equipment.

A Part III of the project will be circulated to cover this additional expense.