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Final Report, for Period 11 June 1979 -- 29 March 1980

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Prepared For:

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This task was authorized to create an Extra-Large sized DPE Outergarment. Patterning and tooling were performed. Prototype units passed fit check, endurance and burst testing. Final configuration included enlarged vertical trunk circumference, enlarged torso circumference, and a crotch patch.		

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FOREWARD

The work reported herein was conducted by ILC DOVER, Frederica, Delaware, for ARRADCOM, CML/Ballistics Procurement, APG (Edgewood Area), Maryland in accordance with Contract DAAK11-79-C-0066, Task Order Number 1. Mr. Donald R. Cohee was the Program Manager for ILC DOVER. Mr. Wayne Davis was the Contract Monitor for the Chemical Systems Laboratory. This work was accomplished between 11 June 1979 and 29 March 1980.

This technical report has been reviewed and is approved.

Mr. David M. English, Chief
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INTRODUCTION

Task Order Number 1, Extra-Large Outergarment, of Contract DAAK11-79-C-0066 was authorized in order to create a larger size DPE that would fit personnel over the 95th percentile. Criteria outlined were that:

- (a) The suits would be sized to fit personnel over the 95th percentile at the CAMDS facility who would be using the DPE.
- (b) The suits would use the standard heat sealed closure method.
- (c) The suits would conform to all DPE Outergarment specification requirements except size.

COMPLETED ACTIVITY

The following work was performed during the completion of this task order:

- (1) A sizing study of CAMDS personnel over 95th percentile was performed.
- (2) Repatterning to establish an Extra-Large size was completed. The sizing changes include an increase in chest circumference, and an increase in torso length.
- (3) Seven (7) prototype Extra-Large Outergarments were fabricated. It was found that the Extra-Large patterns would require 42" wide rolls of CPE, rather than the 39" wide rolls used for the Large sized suits. Repair tools and a prototype crotch tool were utilized in the manufacture of the seven (7) prototype units.

- (4) A trip to the CAMDS site, Tooele, Utah was made by ILC DOVER personnel to evaluate the Extra-Large fit on CAMDS maintenance personnel over the 95th percentile. Four (4) men at CAMDS donned the Extra-Large Outergarment and simulated various maintenance activities to make their evaluation. The Extra-Large size was well received by all four men. They all indicated that their sizing problems would be solved by it, and that they could work well in it. On this basis, ILC DOVER concluded that the Extra-Large prototype needed no alterations in any of its dimensions.
- (5) The production tooling design was completed. Four (4) new production tools were required. They were the front and rear crotch tools, the suit center top closure tool, and a straight bar for leg closure.
- (6) The new tools were fabricated, and drawings made for each. Seam samples made by these tools were tested and found adequate. ECP Number 80-0058-003 includes the tool drawings and seam sample test results.
- (7) Seven (7) final Extra-Large Outergarments were fabricated. Five (5) were sent to CSL for their evaluation, and two (2) were reserved for testing at ILC DOVER. During their manufacture and testing, a problem arose from crotch seams blowing out at overpressure testing. The cause was determined to be increased loading on the crotch due to the increased torso volume. The new loading exceeds the seam strength of the crotch when overpressure tested. As a

result, crotch patches were added to reinforce the crotch. The two-inch diameter annular heat sealed patches were successful in preventing these crotch failures, and were incorporated into the Extra-Large configuration.

(8) Endurance and burst testing of the Extra-Large Outergarments were completed.

(a) The burst pressure of the unit tested was 19.5 iwg. This burst strength is considered more than adequate.

(b) A six-hour mini-endurance test was conducted to verify the reliability of the Extra-Large configuration. ECP Number 80-0058-003 includes the endurance test report.

The results indicate that the Extra-Large Outergarment performed very well, and that changes made to create the Extra-Large configuration do not compromise the reliability of the DPE.

(9) All changes in the Specification and Table of Operation, tool drawings and test results have been submitted to CSL for approval. See ECP Number 80-0058-003 for this documentation.

CONCLUSION

An approved Extra-Large DPE Outergarment configuration is now available for production and use at the CAMDS facility.