


Image Cover Sheet

CLASSIFICATION UNCLASSIFIED	SYSTEM NUMBER 149590 
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TITLE
INTEGRATED PROTECTIVE ENSEMBLE

System Number:
Patron Number:
Requester:

Notes:

DSIS Use only: Deliver to: DK

Annex F

17 pages in total

IPCE TECH DEMO BRIEFING
TO BIOLOGICAL AND CHEMICAL DEFENCE
INDUSTRIAL CENTER OF EXPERTISE (CBDICE)
17 AUG 1994

SLIDE 1 ON INTRODUCTION

GOOD MORNING, I AM LCOL HELLEMANS. MY AIM TODAY IS TO BRIEF YOU ON THE R&D PROJECT D6378-INTEGRATED PROTECTIVE CLOTHING AND EQUIPMENT TECHNOLOGY DEMONSTRATION, OR IPCE TECH DEMO.

SLIDE 2 ON BRIEFING OUTLINE

NOW, THIS MORNING'S BRIEFING WILL COVER THESE POINTS.//PAUSE// THE PROJECT BEGAN WITH A STATEMENT OF REQUIREMENT (PROVISIONAL) WHICH WAS INITIATED IN 1986. IT SOON BECAME APPARANT THAT A SYSTEMS APPROACH WAS REQUIRED, AND A PRE-FEASIBILITY STUDY WAS CONDUCTED IN 1988. AMONG OTHER THINGS, THIS STUDY DETERMINED THAT, AS THERE WAS NOTHING AVAILABLE FOR PURCHASE "OFF THE SHELF", AN R&D PROJECT WAS NEEDED.

SLIDE 3 ON THE LONG RANGE PLAN

IN COLLABORATION WITH THE DIRECTORATE OF LAND REQUIREMENTS, A LONG RANGE PLAN WAS ESTABLISHED. THE NEEDS OF OUR SOLDIERS WILL BE ADDRESSED IN THREE PHASES. THE FIRST PHASE IS MAINLY THE DOMAIN OF THE ENGINEERING AND MAINTENANCE WORLD, AND CONSISTS OF PROVIDING FIXES TO KNOWN PROBLEMS. THE LAST PHASE RECOGNIZES THAT THERE WILL ALWAYS BE A NEED FOR AN "ENHANCED" PIECE OF KIT. THE MID TERM PHASE IS THE ONE BEING TACKLED BY THE CRAD BRANCH.

SLIDE 4 ON R&D PLAN

THE AIM OF THE R&D PLAN IS STATED HERE //PAUSE//

SLIDE 5 ON R&D PLAN (CONTINUED)

AND HERE IS THE APPROACH WE ARE USING //PAUSE//

AS CAN BE SEEN, WORK IS BEING DONE CONCURRENTLY IN THREE AREAS: TECH BASE WORK IN THE LABS, MINOR DEVELOPMENT PROJECTS IN UNIVERSITY AND INDUSTRY, AND THE MAIN PROJECT, WHICH IS THE INTEGRATED PROTECTIVE CLOTHING AND EQUIPMENT TECHNOLOGY DEMONSTRATION OR IPCE TECH DEMO PROJECT. THE INTENT IS THAT THIS MAIN PROJECT WILL BE DONE BY CANADIAN INDUSTRY. THIS MAJOR R&D PROJECT WILL, AMONG OTHER THINGS, IDENTIFY FOR THE FOLLOWING CAPITAL ACQUISITION PROJECT WHERE AND HOW OUR DWINDLING RESOURCES SHOULD BE SPENT IN ORDER TO GET THE BEST OPERATIONAL RETURN FOR OUR DOLLAR.

SLIDE 6 THE REQUIREMENT

A FEW WORDS ABOUT WHY THE PROJECT STARTED IN THE FIRST PLACE. AS AN ASIDE, OF THE THREE SERVICES, THE ARMY'S REQUIREMENTS FOR INDIVIDUAL PROTECTIVE CLOTHING AND EQUIPMENT ARE CONSIDERED TO BE THE MOST SEVERE. FOR THE IPCE R&D PROJECT, WE HAVE THEREFORE FOCUSED ON THE ARMY'S COMBAT SOLDIER, WITH THE SAILOR AND AIRMAN TO BE DONE LATER. // THE INDIVIDUAL SOLDIER IS CENTRAL TO THE ARMY. HIS PERSONAL CLOTHING AND EQUIPMENT MUST PERMIT THE SOLDIER TO SEE, HEAR, COMMUNICATE, MOVE, AND USE WEAPONS IN ALL ENVIRONMENTS. IT MUST THEREFORE PROVIDE MAXIMUM PROTECTION AGAINST ALL BATTLEFIELD THREATS.//

IN ORDER TO REDUCE THE SOLDIER'S BURDEN, HIS CLOTHING AND EQUIPMENT MUST BE INTEGRATED. AND FINALLY, SO AS TO ENABLE THE SOLDIER TO DETECT, ACQUIRE, IDENTIFY AND IF NECESSARY ENGAGE AND KILL AN OPPONENT BEFORE HE HIMSELF IS KILLED, IT MUST ENHANCE HIS CAPABILITIES.

SLIDE 7 ON PICTURE

AT PRESENT, OUR SOLDIER IS OVERBURDENED WITH EQUIPMENT, NEEDS BETTER PROTECTION FROM ALL BATTLEFIELD THREATS AND HAS MINIMAL SENSORY ENHANCEMENT. (THE OPTICAL SIGHT ON THE C7 RIFLE IS ABOUT ALL ENHANCEMENT HE HAS AT PRESENT)! SINCE IT IS EXPECTED THAT OUR SOLDIERS WILL CONTINUE TO BE CALLED UPON TO OPERATE IN HARSH CLIMATIC CONDITIONS, UNDER THREAT OF BOTH BALLISTIC AND DIRECTED ENERGY WEAPONS, AND WITH CHEMICAL AND BIOLOGICAL WEAPONS ALWAYS A POSSIBILITY FOR THEM, THE CLOTHING AND EQUIPMENT THEY WEAR MUST PROTECT THEM TO THE MAXIMUM EXTENT POSSIBLE.

IN THE PAST, THE SOLDIER'S VARIOUS CLOTHING ITEMS, HIS EQUIPMENT AND HIS WEAPON WERE ALL SEPARATE ITEMS, DEVELOPED SEPARATELY, AND PURCHASED SEPARATELY. THIS HAS LED TO UNCOORDINATED AND SOMETIMES INCOMPATIBLE ITEMS BEING ISSUED. THE CRAD R&D PLAN WILL ENSURE THAT INCOMPATIBILITIES ARE ELIMINATED EARLY, AND THAT THE SOLDIER AS A SYSTEM IS THE PRIME CONCERN. THE AIM OF THIS PROJECT IS TO PROVIDE THE SOLDIER WITH AN INTEGRATED ENSEMBLE SO THAT NOT ONLY DOES HE HAVE BETTER PROTECTION, BUT, WITH ENHANCED CAPABILITIES, HE WILL BE A MORE COST-EFFECTIVE WEAPON SYSTEM.

SLIDE 8 ON RELATED INTERNATIONAL ACTIVITIES

WE DO NOT INTEND TO DO ALL THIS ALONE. AS CAN BE SEEN FROM THIS VIEWFOIL, WE ARE IN CLOSE CONTACT WITH OUR ALLIES, AND ARE EXCHANGING INFORMATION ON SEVERAL LEVELS. SPECIFICALLY, WITH THE UNITED STATES, A BILATERAL STATEMENT OF INTENT AND A MASTER DATA EXCHANGE AGREEMENT ANNEX ARE BOTH BEING STAFFED. A BI-LATERAL MOU WITH THE UK HAS ALSO BEEN INITIATED AND WAS SIGNED OFF ON 24 APRIL OF THIS YEAR. AUSTRALIA ALSO HAS INDICATED AN INTEREST IN JOINING IN AN MOU, AND WE WILL TRY TO INCLUDE THEM IN A TRI-LATERAL MOU WITH THE UK. LASTLY, A TTCP (THE TECHNICAL COOPERATION PROGRAM) AD HOC STUDY GROUP ON IPCE IS BEING SET UP, AND WILL HAVE ITS FIRST MEETING NEXT WEEK. DR ACKLES FROM DCIEM, WHO IS THE R&D COORDINATOR FOR OUR PROJECT, IS ALSO THE CHAIRMAN OF THIS TTCP AD HOC STUDY GROUP.

SLIDE 9 ON MINOR PROJECTS

AS PART OF THE R&D PLAN, CANADA'S INDUSTRIAL CAPABILITIES WERE ASSESSED, AND IT WAS DETERMINED THAT SOME INDUSTRY SECTORS HAD TO IMPROVE EXISTING CAPABILITIES, WHILE OTHERS HAD TO DEVELOP NEW ONES. THEREFORE, IN ORDER TO ENSURE THAT KEY INFORMATION WOULD BE AVAILABLE IN A TIMELY MANNER, AND IN ORDER TO GET CANADIAN INDUSTRY SOMEWHAT GEARED UP, SOME MINOR DEVELOPMENT PROJECTS WERE INITIATED. THESE ARE SHOWN ON THIS SLIDE. //PAUSE//

MOST SIGNIFICANT OF THESE IS THE SYSTEM STUDY, WHICH HAS CAUSED THE CREATION OF A CONSORTIUM OF KEY CANADIAN FIRMS, SUCH AS COMPUTING DEVICES CANADA, SNC, AND META RESEARCH INC. THESE THREE FIRMS INCIDENTALLY ARE HEAVILY INVOLVED IN THE NATO INDUSTRIAL ADVISORY GROUP'S (OR NIAG'S) SUB-GROUP 48 ON THE SOLDIER MODERNISATION PROGRAMME MENTIONED ON THE PREVIOUS VIEWFOIL. OTHER MINOR PROJECTS MAY BE INITIATED IF A NEED IS IDENTIFIED.// PAUSE// NBC DEFENCE AND FUEL CELL POWER SOURCES ARE TWO AREAS WHERE CANADA IS RECOGNIZED TO HAVE A WORLD-WIDE TECHNOLOGICAL LEAD, SO THIS WORK WILL ALSO ALLOW US TO HORSE TRADE MORE EFFECTIVELY DURING ANY MOU NEGOTIATIONS.

SLIDE 10 IPCE TECH DEMO PROJECT

THE AIM AND WORK PLAN OF THE MAIN R&D PROJECT ARE AS STATED HERE// PAUSE// WE WILL INTEGRATE THE IDEAS FROM THE VARIOUS SOURCES, ACCOMPLISHING ANY NECESSARY TRADE-OFFS WITHOUT SACRIFICING IMPORTANT QUALITIES OR CAPABILITIES. //PAUSE// THE KEY CONCEPT IS A SYSTEMS APPROACH TO CLOTHING AND EQUIPPING THE SOLDIER. SOME TESTS AND TRIALS OF THE TECHNOLOGY DEMONSTRATOR WILL ALSO BE DONE AS PART OF THIS PROJECT. AS I STATED EARLIER, THE IMPLEMENTATION OF THE PROJECT IS INTENDED TO BE THROUGH A PRIME CONTRACTOR, WHO WILL LIKELY LACK EXPERTISE IN SOME AREAS OF TECHNOLOGY, AND WILL THEREFORE SUBCONTRACT. IT SHOULD BE NOTED THAT WE ARE SPEAKING OF THE INTEGRATION OF BALLISTIC, NBC, DIRECTED ENERGY, ENVIRONMENTAL PROTECTION, ELECTRONIC AND COMMUNICATION TECHNOLOGIES.

(VIDEO)??OVERHEAD???

SLIDE 11 ON MILESTONES

THE MILESTONES ASSOCIATED WITH THE R&D PLAN ARE SHOWN HERE. THE MAJOR PROJECT IS SCHEDULED TO START IN 1995 AND TO BE COMPLETED IN 1999. THIS PROJECT AT BEST WILL PROVIDE THE ARMY WITH A MODULAR SERIES OF OPTIONS; AND AT THE LEAST, WITH THE INFORMATION TO MAKE INFORMED DECISIONS, WITH A MINIMUM OF TECHNICAL AND FINANCIAL RISK, AS TO WHICH TECHNOLOGIES CAN BE PROCURED IN CANADA, AND WHICH SHOULD BE PROCURED OFF-SHORE.

EXPECTED COSTS FOR THESE PROJECTS ARE APPROX \$4M FOR THE MINOR PROGRAM AND \$14M (IN \$CY) FOR THE MAJOR PROJECT. IN VIEW OF THE FACT THAT THE IPCE CAPITAL ACQUISITION PROJECT IS FOR APPROXIMATELY \$350M (IN FY 93/94\$), THE CONCLUSION IS THAT THE R&D IS A WISE INVESTMENT.

THIS CONCLUDES MY PRESENTATION. ARE THERE ANY QUESTIONS?

**INTEGRATED PROTECTIVE
CLOTHING & EQUIPMENT (IPCE)**

**VÊTEMENTS ET ÉQUIPEMENT
DE PROTECTION INTÉGRÉS (VEPI)**

DPGS/DSEG 7

93-1944/07

D6378 - IPCE TECH DEMO

BRIEFING OUTLINE

- Long Range Plan
- The Requirement
- Related International Activities
- Related Minor Development Projects
- Main Project
- Milestones

PERSONAL CLOTHING & EOPT

The Long-Range Plan

- **NEAR TERM:**
 - Modifications, to fix known problems
- **MID TERM:**
 - R&D, for the integrated ensemble (IPCE)
- **FAR TERM:**
 - R&D, for the "Enhanced IPCE"

R&D PLAN

FOCUS ON MID-TERM ENSEMBLE

AIM:

To define concepts, develop components and conduct system integration studies. Hence provide basis for design, specification and development of mid-term ensemble.

R&D PLAN (Cont'd)

FOCUS ON MID-TERM ENSEMBLE

APPROACH:

Concurrent activity in 3 areas:

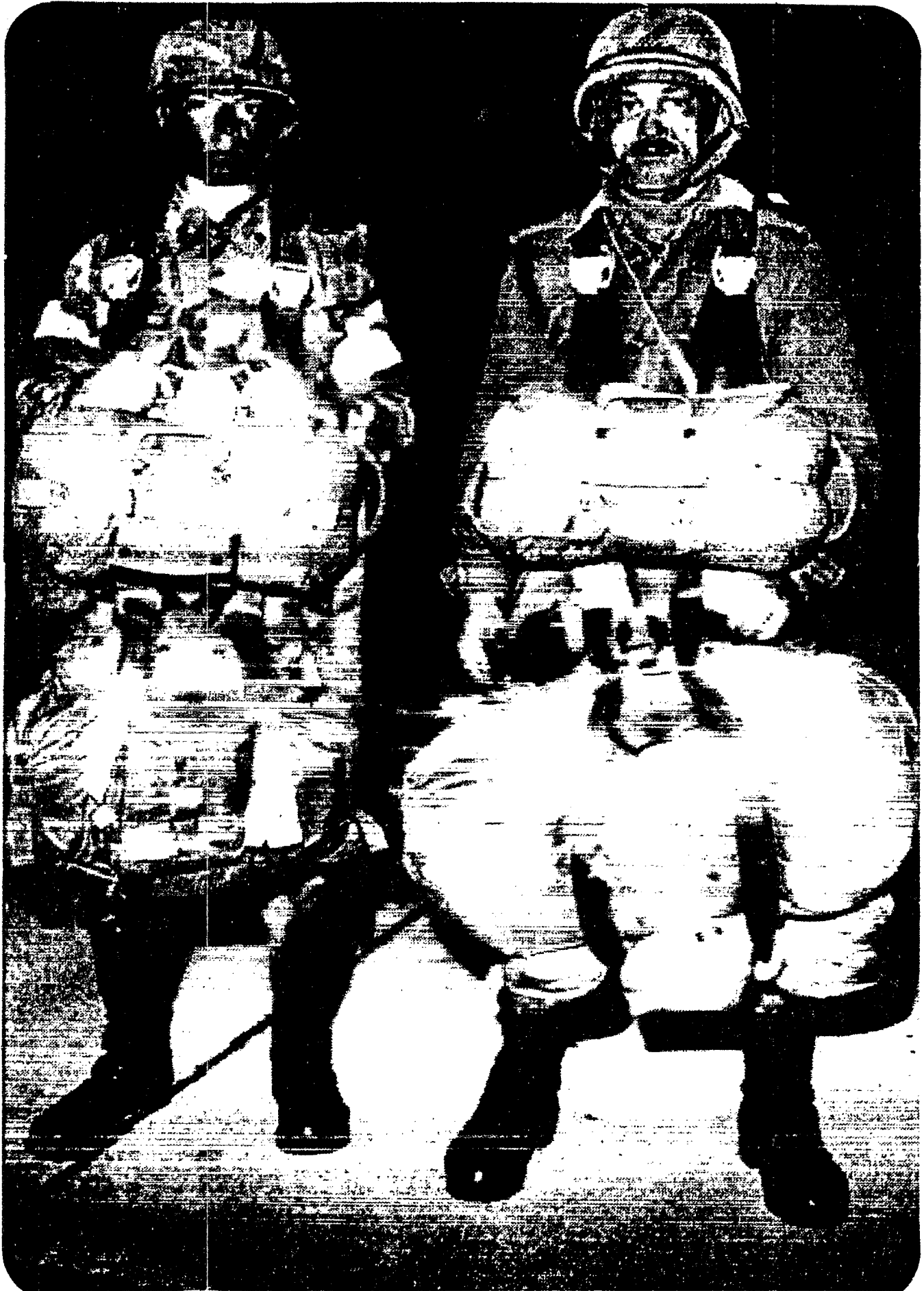
- Tech base work
- Minor development projects
- Staffing and implementing the major project

D6378 - IPCE TECH DEMO

THE REQUIREMENT

- FOCUS ON LAND SOLDIER
- PROTECT SOLDIER AGAINST ALL THREATS
- REDUCE SOLDIER'S BURDEN
- INTEGRATE HIS CLOTHING AND EQUIPMENT
- ENHANCE HIS CAPABILITIES





D6378 - IPCE TECH DEMO

RELATED INTERNATIONAL ACTIVITIES

NATO

- AC 301 - SG 'B' - WG5 (In-service clothing)
- AC 225 - Panel II - WGE 3 (Army individual clothing + equipment)
- AC 225 - Panel VII - WGE 5 (Tri-Service NBC clothing)
- NIAG-SG 48 (Soldier Modernization Program)

UK

- MOU signed April 1994

US/AS

- MOU under discussion

ABCA

- TTCP Ad hoc Study Group - Being set up

D6378 - IPCE TECH DEMO

MINOR PROJECTS

1. HAZARD ASSESSMENT MODEL
2. THE SOLDIER'S DAY MODEL
3. CB PROTECTIVE LAYER
4. CB PROTECTIVE GLOVES
5. NBC HARDENED TEMPERATE CLOTHING
6. POWER SOURCE
7. SYSTEM STUDY
8. OTHER



MAJOR PROJECT

TITLE:

IPCE Tech Demo for mid-term ensemble

AIM:

To provide the technical basis for the design and manufacture of the mid-term ensemble

WORK PLAN:

- 1. Take concept studies and component development started under the tech base and minor programs and conduct further studies as required**
- 2. Conduct system integration studies and associated trials**
- 3. Provide tech data base for systems engineers to develop an integrated protective ensemble which achieves balanced protection with minimized performance degradation**

Resources: \$14M

Schedule: 1995-1999

D6378 - IPCE TECH DEMO

MILESTONES

- | | |
|---|--------|
| • Designate lead DRE | Feb 90 |
| • Approval-in-principle on strategy | Feb 90 |
| • Raise DPASS and TDSS for minor projects | Nov 91 |
| • PCP to CRAD | Nov 94 |
| • PCBSC approval | Apr 93 |
| • CDs raised | Apr 94 |
| • Contract let | May 95 |
| • Contract completion | Nov 95 |
| | Dec 99 |

