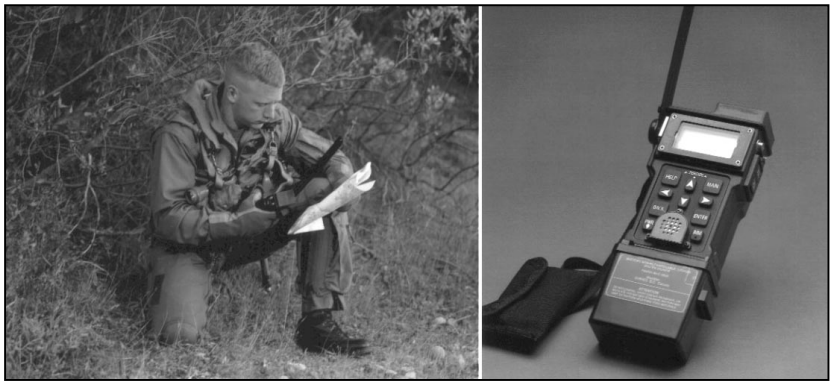
COMBAT SURVIVOR EVADER LOCATOR (CSEL) SYSTEM



The Combat Survivor Evader Locator (CSEL) is the next generation, survival radio/personnel locator system designed to provide accurate survivor/evader (S/E) location and reliable two-way communication between S/Es and rescue elements. CSEL allows the command elements and search and rescue forces to locate and maintain communication with CSEL-equipped isolated personnel.

CSEL is more than a hand-held radio. It is a complex aerospace command and control system including radios, support equipment, unmanned base stations, and rescue center workstations. The system relies on support from many systems including UHF Satellite Communications (UHF SATCOM), Secret Internet Protocol Network (SIPRNET), National Systems, Search and Rescue Satellite Aided Tracking System (SARSAT), and Global Positioning System (GPS).

The Hand Held Radio (HHR) uses UHF/VHF line-of-sight voice, beacon, precise GPS, and three Over the Horizon (OTH) data communications modes to provide worldwide coverage. GPS position is included in all OTH transmissions. The radio support equipment consists of the unit-level CSEL planning computer and radio set adapter. The OTH segment includes four unattended UHF Base Stations (UBSs) that control SATCOM communications with the HHRs and interface with National Assets, SARSAT, and Joint Search and Rescue Centers (JSRC) via the SIPRNET. The ground segment displays and prepares messages for transmission to/from the HHR through the UBS.

BACKGROUND INFORMATION

The Air Force initiated CSEL as an Acquisition Reform, 18-month program to rapidly field the system. CSEL is intended to replace the current PRC-90 and PRC-112 survival radios. The program was placed under DOT&E oversight in spring 1998 because of its importance to joint warfighting, congressional interest, and potential impact of CSEL integration into DoD C4I systems.

AFOTEC conducted an operational assessment (OA1) from April-July 1998. It included data and observations from combined ground based and shipboard testing, participation in joint rescue exercises, and water and cold weather testing in Alaska. The CSEL EMD configuration tested in OA1 was neither effective nor suitable. As a result of OA1 deficiencies, the Air Force delayed purchasing 891 production radios, restructured the program, and adopted a spiral development approach. The OA1 system was designated Spiral 1. Spiral 2 included corrections to most of the OA1 problems and was tested in September 1999. Spiral 3 HHRs were used for OA2 in March 2001 and included the following

functionality: secure two-way UHF SATCOM; SARSAT capability; UHF and VHF Voice; and GPS Selective Availability Anti-Spoofing Module (SAASM). Multi-Service OT&E (MOT&E) is scheduled for October 2002, using production representative radios similar to the OA2 radios but with a SAASM hardware configuration improved to reduce cost and enhance producibility while retaining all the functionality of the OA2 configuration. The new SAASM will undergo developmental and combined testing prior to MOT&E. Spiral 4 will be for FOT&E and will include software upgrades to enable Demand Availability Multiple Access (DAMA)-compatible UHF SATCOM and Defense Information Infrastructure Common Operating Environment Level 7 Interoperable Joint Service Rescue Centers (JSRCs).

A full-rate production decision is planned for 3QFY03. The F-117 and F-16 losses during Operation Allied Force increased DoD focus on the CSEL program. The Commanders in Chief, U.S. Central Command and U.S. Special Operations Command, requested program acceleration. In addition, current counter-terrorist activities have elevated the need for CSEL, resulting in the Services also requesting acceleration.

TEST & EVALUATION ACTIVITY

Operational Assessment #2 was conducted in FY01. It included observations from combined DT/OT, as well as water and jungle testing. OA2, using 22 radios and support equipment, a UBS, and four JSRC workstations, supported a proposed decision to buy 376 production radios. As a result of OA2, 35 production radios with the OA2 SAASM, and 341 radios with the improved SAASM were purchased. These will be used for DT and combined DT/OT in the summer of 2002 to mitigate risk to MOT&E. The OTAs, led by AFOTEC, requested 110 production representative HHRs to conduct MOT&E.

An update to the TEMP is in coordination and is expected to be approved in February 2002.

TEST & EVALUATION ASSESSMENT

The OA2 configuration was determined to be potentially effective and suitable, but CSEL was not ready for operational employment. Seven areas required corrective action prior to MOT&E: Concept of operations, battery, training, manning requirements, ORD requirements, fielding plan, and communications infrastructure. Only three of the seven are directly attributable to the CSEL system: battery, training, and manning requirements. The remaining four must be addressed by the Services and Combatant Commands, not solely by the contractor or the Program Office. Since OA2, the contractor has announced that all deficiencies generated from both OA1 and OA2 have been corrected. These fixes will be validated during DT3 in March 2002. There are no mission critical deficiencies requiring resolution prior to MOT&E.

LESSONS LEARNED

An overarching lesson for CSEL has been the importance of early coordination with external agencies. This has proven true in CSEL development, not only with systems it depends on and supports, but also with a user community that has never had such a capability. The program has experienced a number of problems attributable to poor/late coordination, although some of these may have been exacerbated by the program accelerations. There have also been problems with access to the systems on

which CSEL depends. Next, the planners, operators, and maintainers have not understood how the capabilities and limitations of these systems affect CSEL. Also, users must be an early and integral part of the program, particularly when a new concept is accelerated. In some areas, development has outpaced the user community's preparations to receive it. This has not only created problems with fielding and support, but with the ability of the users and testers to discover and articulate functional, operational and support problems with the system. In addition, users, trainers, testers, and acquisition personnel must consider the entire system, but some have not been involved in the program enough to appreciate this. Concept of operations, fielding, manning, training, and support have been slighted in the rush to produce a 'radio.'

Another lesson learned in CSEL has been the utility of early and often OT involvement. The program has been consistently pushed into an aggressive schedule of near concurrent development and field-testing. In addition, demanding performance and reliability requirements have kept the program on the leading edge of technology. As a result, the technology at times has been too immature for the users to field. Early OT involvement in the rapid development cycle and combined DT/OT have allowed the Services to evaluate the system, thereby identifying significant issues early in CSEL's development.

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