



U.S. ARMY COMBAT CAPABILITIES DEVELOPMENT COMMAND

MANUFACTURING TECHNOLOGY SUCCESS STORY

12 μ m Pixel High Definition Uncooled Longwave Infrared Sensors

PROBLEM / OBJECTIVE

Uncooled longwave Infrared (LWIR) sensors are a key technology that provide the Soldier with improved situational awareness and lethality. Applying traditional packaging methods to newly developed large-format, high-definition, uncooled imaging sensor arrays resulted in a sensor assembly that was too bulky and costly for fielding. High-volume 12 μ m uncooled sensor production and fabrication lacked maturity with low yields contributing to high camera costs. To maintain U.S. Warfighter overmatch, an increase in range, resolution and field of view (FOV) while reducing size, weight and power, plus cost (SWaP+C) is critical.

The objective of this ManTech project was to optimize the microbolometer and readout integrated circuit manufacturing process for 12 μ m uncooled sensors by reducing cost and increasing performance capabilities, including a ~2x increase in range and FOV while meeting the SWAP+C requirements.

ACCOMPLISHMENTS / PAYOFF

This project resulted in a substantial improvement to manufacture 12 μ m HD-class uncooled sensors. Accomplishments include:

- Increased sensor yields reducing camera costs
- Improved sensitivity, uniformity and operability
- Camera performance was demonstrated in operationally relevant environments
- Matured MRL from 4 to 7.

The successful transition was highlighted by the delivery of sensor die to PEO-Soldier / Program Manager Soldier Sensors and Lasers (PM-SSL) Family of Weapon Sights – Crew Server / Sniper (FWS-CS/S) program), for the Engineering & Manufacturing Development phase of the program. To ensure a seamless transition, this project was fully aligned with

the FWS-CS program goals and timeline and PM-SSL was instrumental supporting the project.



(Photo credit: U.S. Army)

This ManTech project supports the Army Futures Command Soldier Lethality modernization priority by significantly improving the Soldier's situational awareness in day, night, and obscured conditions.

PARTICIPANTS

This project was executed by the Combat Capabilities Development Command (CCDC) - Command, Control, Communication, Computers, Cyber, Intelligence, Surveillance and Reconnaissance (C5ISR) center in collaboration with industry partners.

CCDC C5ISR, Night Vision and Electronic Sensors Directorate, Fort Belvoir, VA

- BAE Systems, Nashua, NH
- Leonardo DRS, Dallas, TX
- Raytheon Vision Systems, Goleta, CA