

## Low Light Level Sensors

### PROBLEM / OBJECTIVE

Night vision devices are crucial to Soldiers in combat across a vast array of missions, mounted and dismounted, providing the necessary situational awareness for increased survivability, maneuverability, and lethality. Emerging vision systems that will retain the US Army's "ownership of the night" require digital, low light level devices that provide the same or better performance as the current, traditional image intensifier tubes. Digital sensors also allow for remote use and image capture, image processing, and better performance at the lowest light levels. However, digital sensors were too expensive, not available in the large quantities needed, and failed to meet all performance requirements.

The Army ManTech funded a project with the objective to reduce unit costs by greater than 75% as well as decrease life cycle costs, allowing for more widespread implementation of new Low Light Level Sensor (LLS) technology.

### ACCOMPLISHMENTS / PAYOFF

**Process Improvement:** This ManTech project modified the sensor envelope to increase production yield, optimized individual component manufacturing processes for better performance, and automated production steps and data tracking to reduce costs. ManTech efforts achieved the following:

- Improved manufacturing readiness from MRL 5 to MRL 7
- Increased photo response by over 25% and pixel operability to over 99.8%
- Increased production yield by more than 200%, and reliability by over 300%

### Implementation and Technology Transfer:

Low Light Level Sensor (LLS) transitioned to PM Apache, which accepted the first production camera in December 2013. The LLS has been implemented into Full Rate Production.



AH-64 Apache Helicopter

Low Light Level Sensor

### Expected Benefits and Warfighter Impact:

The increased performance and reliability of the sensor system achieved through this ManTech has already resulted in user acceptance and a multitude of cross-Service transition paths, including the Apache, the F-35 Joint Strike Fighter, and as a leading candidate for the future Enhanced Visual Acuity system for the Naval Air Systems Command. Benefits include:

- Reduced sensor cost by over 60%, and increased production capacity by over 20X
- Reduced unit costs from \$24,600 to \$5,600 at estimated production volumes of 5,000 or greater.

### TIME LINE / MILESTONE

Start Date	October 2010
End Date	January 2015

### FUNDING

U.S. Army ManTech	\$7.0M
PM Soldier Sensors and Lasers (PM SSL)	\$2.5M
NAVAIR	\$0.5M

### PARTICIPANTS

U.S. Army RDECOM Communications-Electronics Research, Development and Engineering Center (CERDEC), Night Vision and Electronic Sensors Directorate (NVESD)  
 PM Soldier Sensors and Lasers (PM SSL)  
 NAVAIR