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14. ABSTRACT Met all established contract requirements and added-in (2) additional technical requirements while achieving cost and schedule obligations Required specification change proposal acceptance from ARDEC unsuccessful for Laser Filter units and Unity Power Periscopes Specification change proposal accepted for M22 and M24 Binoculars Contract close out activities well underway.					
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Report Title

Program Review (Summary Report)

ABSTRACT

Met all established contract requirements and added-in (2) additional technical requirements while achieving cost and schedule obligations

Required specification change proposal acceptance from ARDEC unsuccessful for Laser Filter units and Unity Power Periscopes

Specification change proposal accepted for M22 and M24 Binoculars

Contract close-out activities well underway

ARO Final Report
Contract W911NF-10-C-0036
February 19, 2014

Program Overview:

Met all established contract requirements and added-in (2) additional technical requirements while achieving cost and schedule obligations

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Technical Objectives:

Demonstrate the suitability of a transparent olefin substrate with a laser dye filter for use in Army fire control optic systems

Integrate the transparent olefin filter into a hybrid laser protection system that meets all stated performance requirements

Obtain a specification change for Laser Filter Units, Binoculars and Unity Power Periscopes to accommodate the use of a transparent olefin substrate with a laser dye filter

Technical Accomplishments:

Polymer Optic Substrate Material:

Fully qualified polymer optic performance to ARDEC Requirements

- Laser damage
- Solarization
- Environmental
- Optical transmission\Resolution and optical performance

Laser Absorbing Dyes:

Fully qualified laser dye performance to ARDEC Requirements

- Laser protection/optical density at 110% of specified power levels
- Solarization Saturation
- Optical transmission
- Resolution
- Developed a comprehensive library and simulation tool for PLT, SLT and OD performance
- Tested all high demand laser dyes up to 2X specified requirements to validate performance

Facilities, Staffing, Training, Testing and Validation:

- Instituted a facility security clearance for handling documents and information up to the Secret Level
- Established an optical metrology lab to address all established requirements for fire control optics
- Trained Engineering staff on all Army fire control optics requirements

Product Development Highlights:

Laser Filter Units for Fire control optics:

Developed an Optical hybrid prototype and submitted samples to ARDEC for evaluation.

Validation to all established optical and laser damage requirements by ARDEC was successful

Requires a specification change to all for the use of laser dyes

Form, fit and function replacement to existing technology

Unity Power Periscopes:

Developed a prototype Periscope for Armored Carrier Vehicles

Submitted a Value Engineering Change Proposal to ARDEC for the use of the polymer optical laser filter design

Proposal was well received

Form, fit and function replacement to existing technology

M22 & M24 Binoculars:

Developed prototypes of M22 and M24 binoculars

Prototypes were well received by ARDEC

New M Series specifications allow for the use of a polymer based laser filter with dyes

Obtaining cooperation and interest from existing and historical suppliers was unsuccessful

Obtaining interest from current supplier was unsuccessful

Commercialization Activities:

Laser Filter Units – Requires a specification change to proceed with commercialization. While there is a clear desire within the Army to support this change and while the change has been made for the

Binoculars, efforts to secure a specification change from Picatinny Arsenal for the LFU have been unsuccessful.

Unity Power Periscopes - Requires the proposed specification change to proceed with commercialization. Efforts to secure support within the current Periscope supplier base have been unsuccessful. Efforts to receive funding from Picatinny Arsenal to fully qualify the proposed VECP have been well received but also unsuccessful.

M22 & M24 Binoculars – Existing supplier (Fujinon/L3) is not interested in the use of laser dye technology as L3 is the prime contractor and they supply the thin film laser protection technology. Capable suppliers such as Meopta and Steiner are not interested in the M22 and M24 programs due to the low prices and low volumes associated with these programs. Additionally, these binoculars will likely be replaced with the new digitally stabilized binoculars the Army is developing with Fraser-Volpe and Fujinon/L3.

Path Forward/Recommended Additional Research Activities:

For the LFU, Fosta-Tek recommends the Army proceeds as follows:

- Fund a formal development contract to fab, test and fully qualify LFU's to the full requirements of the Quality Assurance Procedure.
- Institute the required specification change, exactly the same as the binoculars.
- This was the original intent of the research and it would position Fosta-Tek to be a competitive small-business source of supply for all of the Army's LFU's.

For Periscopes Fosta-Tek recommends the Army proceeds as follows:

- Efforts to secure support for the VECP within the existing supply base have proven unsuccessful for a variety of technical, commercial and funding issues; therefore Fosta-Tek recommends the Army fund the development of a transparent defroster.
- Fosta-Tek and our suppliers have considerable experience with transparent conductors
- The fogging of armored vehicle periscopes is a well known problem
- With the support from the user community the institution of the defroster window/windows into the periscope would entail a limited development and qualification effort.