Performance Based Specification

Persistent Threat Detection System (PTDS)
Full & Open Procurement, Operations and Sustainment Support

Product Manager, Robotics and Unmanned Sensors (PM RUS)

For

PM Night Vision/ RSTA

Program Executive Officer, Intelligence, Electronic Warfare, and Sensors (PEO IEW&S)

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1 Scope

This document specifies the performance of the Baseline and Tactical Persistent Threat Detection System (PTDS). Section 3 specifies the requirements for the Baseline PTDS and Section 4 specifies the requirements for the Tactical PTDS (T-PTDS). Throughout this specification, the acronym PTDS (without B- or T-) applies to both the Baseline PTDS and Tactical PTDS.

2 Applicable Documents

In the event of a conflict between the below documents and the content of this PBS, the content of the PBS supersedes. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

The following specifications, standards, and handbooks are provided for informational purposes for assistance and guidance, as appropriate, in the completion of tasks identified in this PWS. Unless otherwise specified, the issues of these documents are those listed in the ASSIST database (http://assist.daps.dla.mil/quicksearch/) and supplemental thereto.

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-882D	Standard Practice for System Safety
MIL-STD-1275D	Military Platform Power Standard
MIL-STD-810G	Department of Defense Test Method Standards for Environmental Engineering Considerations and Laboratory Testing
MIL-STD-961E	Defense and Program-Unique Specifications Format and Content
MIL-STD-1916	DoD Preferred Methods for Acceptance of Product

DEPARTMENT OF DEFENSE HANDBOOKS

MIL-HDBK-310	DoD Handbook - Global Climatic Data for Developing Military Products
MIL-HDBK-344	Electronic Stress Screening of Electronic Equipment
MIL-HDBK-781A	Reliability Test Methods, Plans, and Environments for Engineering, Development, Qualification, and Production

2.1 Industry – Non-Government Publications

The following documents form a part of this specification to the extent specified herein and are provided for informational purpose to assist and guide you as you deem appropriate, for completing tasks identified in this PWS. Unless otherwise specified, the issues of the documents that are DoD adopted are those listed in the latest update of the ASSIST database. Unless otherwise specified, the issues of documents not listed in ASSIST are the issues of the documents cited in the solicitation.

ISO 10007:2003	Quality Configuration Management Systems
IEEE-STD-1042	Planning Software Configuration Management (SWM)
IEEE-STD-828	Standard for SWM Plans
IEEE 1220-2005	Standard for Application and Management of the Systems Engineering Process

(Unless otherwise indicated, copies of the above specifications, standards, handbooks or publications are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Any documents required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting officer.)

3 Baseline PTDS Requirements

The Baseline PTDS (B-PTDS) consists of a tethered aerostat with a modular mobile mooring system, an aerostat-mounted imaging sensor package (single/dual), aerostat-mounted communications relay package, a transportable environmentally controlled ground control station (GCS), external power generators, shore power interface, air/ground based sensors, and an Unattended Transient Acoustic MASINT System (UTAMS), an aerostat mounted UTAMS and a Joint Synchronization Information Transceiver (JSIT) capable of dissemination of Full Motion Video (FMV) to the units One System Remote Video Terminals (OSRVTs) communication net components.

The B-PTDS Aerostat Assembly consists of:

- Aerostat envelope with rigging
- Helium valve
- Pressurization system
- Power distribution system
- Flight control and monitoring system
- Collision avoidance system (i.e. strobe lights and/or FAA transponder)
- Emergency Locator Beacon (ELB)

The rugged aerostat envelope material is built with coatings on the inner and outer layers that limit helium permeability and permit field operators to quickly perform permanent repairs in less than an hour. The aerostat has a total payload capacity of several hundred pounds at sea level with an altitude up to 5000 feet above ground level (AGL). Operational altitude can be adjusted to accommodate wind, temperature, helium purity, and negative superheat conditions. B-PTDS provides a fully integrated persistent surveillance and dissemination capability to provide response forces the ability to find, fix, track, target, and engage (F2T2E) threats against counter-insurgency personnel, civilians, facilities, and infrastructure within the PTDS area of responsibility (AOR).

The B-PTDS is capable of providing day/night, 360 degree detection, surveillance, monitoring, and target-location capability. It has the ability to maintain persistent surveillance and monitor activity in its area of operations 24/7 for periods of twenty-five (25) days continuously at altitudes of at least 2,500 and up to 5,000 ft AGL with a mobile mooring platform emplaced at elevations of at least 6000 ft above sea level (ASL) and climatic conditions characteristic of the CENTCOM AOR.

3.1 Aerostat

The B-PTDS aerostat consists of all flight components necessary to safely perform its intended mission as helium filled lighter than air unmanned category platform. It consists of an envelope, rigging, helium valve, pressurization system, power distribution system, flight control and monitoring system, essential navigation lighting, an envelope mounted collision avoidance system (CAS) component strobe lights, and a US-only Emergency Locator Beacon (ELB). The aerostat is to be capable of lifting the required payloads plus 200 pounds reserved for future growth to 5,000 feet AGL (with the platform located at 0 ft ASL) defined by the Aerostat Lift Performance defined below.

3.1.1 System Environment. The B-PTDS shall be fully functional in the environmental conditions anticipated in the CENTCOM AOR (OEF and OIF), as described in MIL-HDBK-310, consistent with flight, equipment, and navigation hazard limitations.

3.1.1.1 Static Air Environment. The B-PTDS' airborne components shall be designed to operate in a static air environment (i.e. no wind or platform motion).

3.1.2 Collision Avoidance System. The B-PTDS shall include a collision avoidance system (CAS), and prevent aircraft from colliding with the Aerostat and Tether.

3.1.2.1 Aircraft Situational Awareness Capability. The **B**-PTDS shall incorporate an aircraft situational awareness capability, such as an FAA transponder on the aerostat, to notify aircraft of the location of the B-PTDS.

3.1.2.2 Aerostat and Tether Markings. The B-PTDS shall incorporate mechanisms (flags, strobes, etc.) to make the Aerostat structure and tether visible to pilots up to 5 miles both day and night according to Federal Aviation Regulation 101.

3.1.2.3 Strobe Night Vision Visibility. The aerostat and tether collision avoidance markings shall be visible to pilots using night-vision goggles.

3.1.3 Flight Termination System. The B-PTDS shall incorporate a redundant flight termination system providing an emergency descent mechanism that is manually activated upon aerostat breakaway.

3.1.4 Emergency Locator Beacon. The B-PTDS shall incorporate a U.S.-only emergency locator beacon.

3.1.5 Aerostat Lift Performance.

3.1.5.1 Lift Capacity at Sea Level. The aerostat shall be capable of lifting the mission payload to an altitude of 5,000 feet above ground level under the following conditions:

1. Aerostat site elevation = mean sea level
2. Ambient air temperature = 59 degrees F
3. Lapse rate = 0.00357 deg F/ft
4. Standard sea level pressure of 14.7 lb/square inch
5. Helium purity = 97%
6. Wind speed = 0.0 knots
7. Free lift = 15% (Free lift is defined as the percentage of static lift in excess of that required to maintain the aerostat system at 5,000 feet above ground level under zero wind conditions)
8. Payload weight = all required mission payloads plus 200 pounds (Payload weight includes all payload and payload support equipment weights including payload mounting equipment, payload electronics for control and communications, payload cables, etc.)

3.1.5.2 Lift Capacity at 6,000 feet. The aerostat shall be capable of lifting the mission payload to an altitude of 2,500 feet above ground level under the following conditions:

1. Aerostat site elevation = 6,000 feet.
2. Ambient air temperature = 59 degrees F
3. Lapse rate = 0.00357 deg F/ft
4. Standard sea level pressure of 14.7 lb/square inch
5. Helium purity = 97%
6. Wind speed = 0.0 knots
7. Free lift = 15% (Free lift is defined as the percentage of static lift in excess of that required to maintain the aerostat system at 5,000 feet above ground level under zero wind conditions)
8. Payload weight = all required mission payloads plus 200 pounds (Payload weight includes all payload and payload support equipment weights including payload mounting equipment, payload electronics for control and communications, payload cables, etc.)

3.1.6 Persistent Operations Duty Cycle. The PTDS shall have the capability to operate 24 hrs/day for at least twenty-five (25) consecutive days.

3.2 Tether

The B-PTDS includes a tether to connect the Aerostat to the Mobile Mooring System. The tether allows for aerostat station-keeping and may also support power to the aerostat and data transfer between the aerostat and ground equipment.

3.2.1 Tether Break Strength. The tether cable shall provide a break strength safety factor of four times (4X) the maximum anticipated load with an aerostat flight at 5000 ft above ground level (AGL) at sea level with a 70 knot wind, and a three times (3X) safety factor under all flight conditions.

3.2.2 Tether Length. The tether cable shall be sufficient in length to allow aerostat operations of at least 5,000 feet AGL with operational margin for extended use.

3.3 Mobile Mooring System (MMS)

3.3.1 MMS Mooring and Station-Keeping Capability. The MMS shall support the aerostat both while it is moored/docked on the ground and while it is flying.

3.3.2 MMS Trailer. The B-PTDS Mobile Mooring System (MMS) shall be a self contained rolling stock platform with a tether winch capable of holding at least 5,000 feet of tether plus whatever margin is required for operations on an extended deployment.

3.3.3 MMS Components. The MMS shall include redundant in-haul/out-haul winch, three-point mooring of the aerostat, a platform pivot capable of 360 degree weather vane, day/night working platform, interconnecting cables to the Ground Control Station, and a panel to control aerostat launch & recovery and monitor aerostat vitals.

3.3.4 MMS Transportability. The MMS design shall allows all MMS components to be transported via trailers that are 30’ or less in length. This allows for ground transport to FOBs which are located in remote locations via semi-improved roads.

3.3.5 Strength Safety Factor. The MMS shall be designed to a safety factor of 3 times maximum anticipated loads on any system component.

3.3.6 Aerostat In-Haul and Out-Haul. The MMS shall support aerostat in-haul and out-haul during day and night in all weather conditions anticipated in the CENTCOM AOR at elevations from sea level to 7200 ft above sea level, under the control of an operator either on the MMS platform or inside the GCS. This implies a need for a redundant command/control capability for aerostat flight operations.

3.3.7 In-Haul Rate. The MMS shall be capable of in-hauling 5000 ft of tether within 30 minutes in case of emergency.

3.3.8 Backup Winch. The MMS shall include a backup (redundant) system to allow in-haul in case the primary drive system fails.

3.3.9 MMS Trailer. The MMS components shall be transportable by military aircraft (including C-17, C-5), and driven over standard and semi-improved roads.

3.3.10 MMS Trailer Standards. The trailer shall meet the CONUS road regulations for standard semi-trailers without requiring any special permits.

3.3.11 MMS Assembly. MMS components besides those mounted to the trailer shall allow rapid MMS assembly on site, and are transported on standard ISO pallets or inside standard ISO containers.

3.3.12 MMS Work Area. The MMS shall provide a work area for servicing the aerostat and payloads while moored.

3.3.13 Sustained Wind Tolerance. The B-PTDS shall operate in up to a 70 knot sustained wind and withstand a 90 knot sustained wind while moored.

3.3.14 MMS Weathervaning. The MMS shall be capable of minimizing inertial loads by allowing weathervaning in high shifting winds.

3.3.15 MMS Paint. The MMS components shall be painted sand color.

3.4 Mission Payloads

The B-PTDS mission payload equipment consists of:

- EO/IR

- Unattended Transient Acoustic MASINT System (UTAMS) Receiver
- Enhanced Position Location Reporting System (EPLRS) and/or the Single Channel Ground and Airborne Radio System (SINCGARS)
- Payload Support (power, data interface, etc.)
- Special User Systems

UTAMS, EPLRS and SINCGARS are Government Furnished Material (GFM) and may be installed in the field.

3.4.1 Sensor Payloads

The aerostat-mounted sensor payload requirements are as follows.

3.4.1.1 EO/IR Sensor. The **B-**PTDS shall include an EO/IR sensor that includes a gyro stabilized imaging sensor capable of low magnification continuous zoom and color TV, high magnification step zoom and monochrome IR, high magnification step zoom and monochrome TV.

3.4.1.2 Internal GPS. The **B-**EO/IR sensor shall include an internal GPS receiver to provide the reference location of the turret and timing to the sensor control unit.

3.4.1.3 Identification and Detection Range. The EO/IR sensor shall have the capability to identify personnel at 10Km to 20Km range, and detect personnel at 20Km to 30Km range through multiple spectral and day/night sensors.

3.4.1.4 Sensor Capabilities. The EO/IR sensor shall include at a minimum EO (e.g., color, daylight, image intensified TV, low-light TV and spotter), IR, laser illumination and laser range-finding capabilities. As an objective, the imaging payload should also include features such as shortwave IR, midwave IR, multiple-frame integration, image fusion and stabilization.

3.4.1.5 Dual Sensor Capability. The aerostat-mounted payload support system shall be modularly constructed to accommodate up to two EO/IR sensor payloads should this capability be required.

3.4.1.6 Supported Sensors. The payload support system shall support a range of different EO/IR payloads, without reconfiguration except for mounting hardware. A range should include at least three sensors with distinct weights and capabilities.

3.4.1.7 Stand-alone Operation. The EO/IR sensor shall provide a stand-alone surveillance capability to observe and monitor specific areas of interest (AOI) as commanded by the operator in the GCS, and archive the recorded video.

3.4.1.8 External Cueing. The EO/IR sensor shall respond to cues by external organic sensors (i.e. UTAMS) to targets in order for PTDS to provide a near-real-time "eyes on target" full motion video capability.

3.4.1.9 AFATDS and ABCS Message Support. The **B-**PTDS shall receive and respond to target coordinates from appropriate Command & Control (C2)/Fire Control Centers via standard AFATDS and ABCS message formats so its sensors can be queued to a target location, maintain surveillance of the target, provide laser pointing/illuminating a target, and provide laser ranging.

3.4.1.10 Aerostat Mounted UTAMS (AMUS). The **B-**PTDS shall support an aerostat mounted Unattended Transient Acoustic MASINT System (UTAMS).

3.4.1.11 Ground Based UTAMS. The **B-**PTDS shall support ground-based UTAMS; the aerostat shall support a UTAMS receiver to receive RF messages from the UTAMS sensor on the ground and send the messages to the GCS. Either or both UTAMS version can be installed and supported at a given time.

3.4.1.12 Quick Release Capability. Long-lead or high-cost aerostat mounted equipment shall have mechanisms to aid in quickly detaching the equipment in the event of a recovery following tether breakaway.

3.4.2 Communications Payloads

The **B-**PTDS aerostat supports the following communications payloads.

3.4.2.1 EPLRS. The **B-**PTDS shall support a communications relay package for the Enhance Position Location Reporting System (EPLRS) communication net.

3.4.2.2 SINCGARS. The **B-**PTDS shall support a communications relay package for the SINCGARS communication net.

3.4.2.3 JSIT. The **B-**PTDS shall support a Joint Synchronization Information Transceiver (JSIT).

3.4.3 Platform Position and Altitude Reporting System

3.4.3.1 Inertial Navigation System. The **B-**PTDS aerostat shall have an inertial navigation capability to precisely determine sensor position in three dimensional space and sensor pointing relative to true north.

3.4.3.2 Target Coordinate Locating. The **B-**PTDS shall have the capability to provide highly accurate target coordinates in Military Grid Reference System (MGRS) coordinates.

3.4.4 Future Mission Capabilities

3.4.4.1 Modular and Expandable Design. The **B-**PTDS shall be designed to accommodate future mission capabilities with a minimum of modification to the baseline system.

3.4.4.2 Reserved Power Capability. The **B-**PTDS shall provide a reserve power capability to the aerostat to support future mission capabilities.

3.4.4.3 Reserved Data Bandwidth. The **B-**PTDS shall provide a reserve network bandwidth capability to the aerostat to support future mission capabilities.

3.4.4.4 Modular Power Distribution/Control. The **B-**PTDS shall provide modular power distribution and control, allowing for independently switchable (power on/off) payloads.

3.5 Ground Control Equipment

3.5.1 Functionality

The Ground Control Equipment (GCE) includes an environmentally controlled space for operator personnel and equipment racks. The GCE permits ready rear accessibility to components by operator and maintenance personnel.

3.5.1.1 GCE Capabilities. The GCE shall include aerostat control and monitoring components, Global Positioning System (GPS), analog and SD/HD SDI video distribution, monitoring and archiving equipment, EO/IR command & control equipment, AFATDS and Blue Force Tracker interfaces, input/output connections, RF communications (including Flight Termination System), Air Traffic Control (ATC) radios, weather monitoring/lightning detection equipment, and SIPR/NIPR/DSN connectivity.

3.5.1.2 GCE-TOC Communications. The GCE shall provide MIRC chat messaging and bi-directional Voice-Over-Internet-Protocol (VOIP) communications with the supported Tactical Operations Center (TOC).

3.5.1.3 Antenna and Weather Station Tower. The GCE shall have the ability to hold antennas and weather sensors.

3.5.2 Maintenance and and Personnel Space. The B-PTDS shall include environmentally controlled space for equipment maintenance and personnel office activity.

3.5.3 Ground Equipment Transportability. The B-PTDS ground equipment shall be capable of being transported on a standard military or commercial flatbed truck, with trailers not exceeding 30' in length, for relocation to a new site over standard and semi-improved roads.

3.5.4 Paint. The shelters shall be painted sand color.

3.5.5 Shock and Vibration. The B-PTDS equipment shall be able to withstand shock and vibration induced by transport.

3.5.6 Environmental Control Units. The ground equipment shall include sufficiently sized Environmental Control Units (ECU) to support mission requirements and operations in the CENTCOM AOR, as defined in MIL-HDBK-310.

3.5.7 Shelter Design. The ground personnel shelter(s) shall comply with MIL-STD-1472.

3.5.8 Flight Control and Monitoring Station. The Flight Control and Monitoring Station shall contain controls and instrumentation necessary to control the aerostat in flight, including in-haul and out-haul and monitor system health.

3.5.8.1 Independent Flight Command and Control. The Flight Control and Monitoring capability shall be independent of mission payloads, allowing reconfiguration of mission payloads without impact to flight control and monitoring.

3.5.9 Camera Control. The camera command and control workstation is used for control of the aerostat imaging sensor, situational awareness of the sensor map FOV location and operator control of laser components in the imaging sensor**.**

3.5.9.1 Sensors Supported by C2 System. The B-PTDS shall provide command and control capabilities for the airborne sensor payloads supported.

3.5.9.2 Dual Camera C2 and Video Dissemination. The GCS shall provide equipment necessary to support all command, control, and video dissemination functions for a second EO/IR sensor if a second sensor is installed.

3.5.10 Interface Work Station (IWS). The GCS shall include a workstation to support sending and receiving AFATDS messages and integrating with Blue Force Tracker.

3.5.10.1 AFATDS Support. The B-PTDS IWS shall be interoperable with AFATDS Battle Command System to process messages from cueing sensors, put eyes on target and distribute data.

3.5.10.2 Blue Force Tracker Support. The IWS shall integrate with the Blue Force Tracker system.

3.5.11 Video Display, Distribution, and Archiving

3.5.11.1 Multi-Channel Video. The B-PTDS shall distribute video, including both analog SD and HD/SDI video.

3.5.11.2 OSRVT Video Output. The B-PTDS shall broadcast video that is compatible with One System Remove Video Terminal (OSRVT).

3.5.11.3 PSDS2 Video Dissemination. The B-PTDS shall provide an interface to a PSDS2 NGREPs.

3.5.11.4 Dual PSDS2 Interfaces. If two EO/IR payloads are installed, the B-PTDS shall provide a separate interface to two PSDS2 NGREPs. Accommodations in the ground equipment must allow for this second PSDS2 interface as a configuration option.

3.5.11.5 UTAMS and Site Security Camera. The B-PTDS shall display data from UTAMS, AMUS, and a site security camera.

3.5.11.6 Video Archive and Display. The B-PTDS shall have the ability to distribute and archive video as well as display images on a ground equipment display.

3.5.11.7 State of Health and Status Display. The B-PTDS shall display state of health and system status information.

3.5.11.8 Receive JSIT Transmissions. The B-PTDS shall provide a One-System Remote Video Terminal (OSRVT) interface to receive and display video from JSIT transmission sources.

3.6 Power Distribution

3.6.1 Shore or Site Power. The B-PTDS shall be capable of being powered from shore power or from on-site generators.

3.6.2 Site Power Equipment. B-PTDS on-site power equipment shall consist of:

- Military generators
- Automatic transfer switches
- Distribution panels
- Interconnecting cabling and connectors .

3.6.3 Standing Load. The B-PTDS system standing load shall be powered off one generator with redundancy provided by a second generator. The system standing load does not include the large motor loads of the Mobile Mooring System (MMS).

3.6.4 MMS Additional Power. An additional generator may be used for standby power to the large motor loads of the Mobile Mooring System (MMS).

3.6.5 Aerostat Power Isolation. The power distribution system shall provide isolation between payload and flight avionics power distribution.

3.6.6 Uninterruptible Power Supply (UPS). The B-PTDS shall provide UPS protection and power conditioning for ground station computers to facilitate graceful shutdown and transfer between generators or to shore power

3.6.7 Automatic Power Transfer. Automatic transfer switches shall be provided to allow for the backup operation between the generators and shore power.

3.7 Remote Video Display

The PTDS shall provide a video feed to allow display of B-PTDS video data (e.g. large screen TV, computer projection) in the supported unit's tactical operation center, via fiber optic cable or secure wireless link.

3.8 Interoperability

3.8.1 Remote Cueing. The B-PTDS shall be capable of performing its mission as a stand-alone system or while integrated with remote systems from which it can receive standard AFATDS messages from a variety of cueing sensors.

Example cueing sources include:

a. FireFinder Radars AN/TPQ-36 and AN/TPQ-37
b. Lightweight Counter Mortar Radar (LCMR)
c. Unattended Transient Acoustic MASINT System (UTAMS)
d. Counter-Rocket, Artillery, and Mortar (C-RAM) FAAD C2 System

3.8.2 Full Motion Video Dissemination. The B-PTDS shall be capable of disseminating video via PSDS2 and via JSIT to OSRVTs.

3.9 Set Up, Support, and Tear Down

3.9.1 Set Up. The B-PTDS shall be capable of being set-up and operational within 48 hours from arrival time at a site prepared to no more than 5% grade with soil density equal to or greater than 20 pounds per square inch.

3.9.2 Tear Down. The B-PTDS shall be capable of being disassembled and prepared for road march to a new location within 48 hours upon notification by the Government.

3.9.3 Support Equipment. The B-PTDS shall include all non-consumable equipment needed to support the site for an extended deployment. This may include forklift, aerial lift, utility truck, or tools.

3.10 Transportability/Mobility

3.10.1 Air Transport. The B-PTDS shall be air transportable by C-17 and C-5.

3.10.2 Ground Transport. The B-PTDS shall be ground-transportable over semi-improved roads.

3.10.3 Flat Bed Trailer Compatibility. All components of the B-PTDS shall either be standard rolling stock or transportable on flat-bed trailers pulled by either commercial or military trucks.

3.10.4 Component Lifting. The B-PTDS shall be capable of being lifted by forklift and crane.

3.10.5 Government Supplied Theater Assets. The Government will provide prime movers from in-theatre assets to accomplish road transportation.

3.11 Operational Availability

3.11.1 Availability Performance. Each deployed B-PTDS shall have an Operational Availability (mission-capable time/total time) of not less than 95% based on 24/7 operations over a one (1) year period. Total time does not include beyond-specification weather or battle damage related downtime.

3.12 System Integration Lab

The System Integration Lab (SIL) will include a subset of B-PTDS equipment located at the contractor's facility to evaluate upgrades, maintain Information Assurance Vulnerability Alerts (IAVAs), and maintain system compliancy. Additionally, the SIL will serve the purpose of troubleshooting and reach back support 7 days a week.

4 Tactical PTDS

Tactical PTDS (T-PTDS) is a modular package of capabilities derived from the baseline PTDS that will provide at least a subset of the Baseline PTDSs' capability; it will be a miniaturization and modularization of the Baseline PTDS. The T-PTDS will be smaller, more mobile, less expensive, faster to deploy, and manned by smaller crews than PTDS but with adequate sensor performance to fill its role as a persistent surveillance capability.

4.1 Mission Capabilities

4.1.1 EO/IR Sensor. The T-PTDS shall provide an EO/IR sensor, with a 360 degree field of view, target geo-location, range finding, and laser illumination. The sensor shall be capable of personnel detection at 9 km and personnel identification at 3 km. The sensor shall be capable of vehicle detection at 20 km and vehicle identification at 7 km.

4.1.2 Moving Target Detection. The T-PTDS shall provide a 360-degree wide-area search capability that can detect moving small vehicle targets at a range of 5 km and personnel at a range of 2km.

4.1.3 Mortar/Artillery Detection. The T-PTDS shall be provide a 360-degree wide-area search capability that can detect mortar fire at a range of 3 km (threshold) / 6 km (objective).

4.1.4 Reserve Payload Capacity. The T-PTDS shall provide reserve payload capacity to support up to 100 pounds of additional payload.

4.1.5 Aerostat Height. The T-PTDS shall fly above small arms fire (up to 0.50 calibre) with a ground elevation of 6000 ft above mean sea level (MSL) at 59 degrees F.

4.1.6 AFATDS Cueing. The T-PTDS shall accept standard AFATDS messages as slew-to-cue inputs to which the EO/IR sensor can (at the operator's option) be automatically cued.

4.1.7 Video Dissemination. The T-PTDS shall disseminate full motion video and metadata in near-real time to a supported tactical operations center.

4.1.8 PSDS2 Interface. The T-PTDS shall provide an interface to PSDS2 NGREPs.

4.1.9 Video Display. The T-PTDS shall include a display to show the active EO/IR sensor video.

4.1.10 Moving Target Data Display. The T-PTDS shall display the active moving target detection sensor data.

4.1.11 AFATDS Output. The T-PTDS shall output AFATDS messages indicating detected mortar, small arms, or artillery fire as an output.

4.1.12 Weather Data. The T-PTDS shall have the ability to receive weather data.

4.1.13 Continuous Operation. The T-PTDS shall have the capability to operate for a minimum of 10 days continuously.

4.1.14 System Environment. The T-PTDS shall be fully functional in the environmental conditions anticipated in the CENTCOM AOR (OEF and OIF), as described in MIL-HDBK-310, consistent with flight, equipment, and navigation hazard limitations.

4.1.14.1 Static Air Environment. The T-PTDS' airborne components shall be designed to operate in a static air environment (i.e. no wind or platform motion).

4.1.15 Collision Avoidance System. The T-PTDS shall include mechanisms that prevent aircraft from colliding with the Aerostat and Tether.

4.2 Transportability and Fielding

4.2.1 Air Transportable. The T-PTDS shall be air-transportable using a maximum of two C-130 aircraft, with no more than 35,000 pounds of total load between the two aircraft.

4.2.2 Ground Transportable. The T-PTDS shall be capable of road march in a country with an austere transportation infrastructure.

4.2.3 Trailer Length. All T-PTDS components shall be transportable via trailers that are no more than 30' in length.

4.2.4 Semi Improved Roads. T-PTDS shall be transportable over semi-improved and unpaved roads.

4.2.5 Battalion Level Assets. T-PTDS shall be transportable using no more than battalion level assets, including HEMMT or 5-ton trucks.

4.2.6 Minimal Site Preparation. The T-PTDS must require minimal site preparation for fielding.

4.2.7 No External Assets. The T-PTDS shall require no external assets in order to field the system beyond those required for the security of system crew and equipment.

4.2.8 Lighter-than-air Gas Supply. The T-PTDS shall be capable of carrying a 10-day supply of a lighter-than-air gas as an organic system asset.

4.2.9 Rapid Set-up/Tear-down. The T-PTDS shall support set-up and tear-down within 4 hours or less.

4.3 Survivability

4.3.1 Lightning. The T-PTDS shall provide the ability to direct lightning strikes away from major electronic components,

4.3.2 Wind. The T-PTDS shall be capable of operating in a 40-knot sustained wind and surviving while moored in a 50-knot sustained wind.

4.3.3 Small Arms Fire. The T-PTDS shall be capable of operating for a brief period after sustaining small arms fire before mooring.

4.3.4 Flyaway. The T-PTDS shall be recoverable within 1 hour of a flyaway.

4.3.5 Rapid Reconstitution. The T-PTDS shall support reconstitution within 48 hours after a system failure.

4.4 Operational Availability

4.4.1 Availability Performance. Each deployed T-PTDS shall have an Operational Availability (mission-capable time/total time) of not less than 95% based on 24/7 operations over a one (1) year period. Total time does not include beyond-specification weather or battle damage related downtime.

4.5 System Integration Lab

The System Integration Lab (SIL) will include a subset of T-PTDS equipment located at the contractor's facility to evaluate upgrades, maintain Information Assurance Vulnerability Alerts (IAVAs), and maintain system compliancy. Additionally, the SIL will serve the purpose of troubleshooting and reach back support 7 days a week.

5 Quality Assurance and Test

5.1.1 QA and Test Program. PTDS shall have a quality-assurance and test program, as specified in the PTDS PWS.

5.1.2 PWS Compliance. The test and quality programs shall be designed in accordance with the PWS and this specification, to ensure that high-quality systems meeting all performance-requirements are delivered to the Government.

5.2 Requirements Verification.

5.2.1 Verification Methods. Verification shall be accomplished by inspection, analysis, demonstration, and test, either individually and in selected combinations, as required. Verification is accomplished during First Article Test (FAT), as described in the PTDS PWS.

5.2.2 Test Plan & Procedure Approval. All test plans and procedures shall be approved by the Government. Test plans and procedures are to be delivered in accordance with the PTDS PWS.

5.2.3 Facilities. Except as otherwise specified, the contractor shall use either their own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government.

5.2.4 Verification Methods. Definitions used herein are derived from MIL-STD-961E. Verification methods are defined as follows:

- ***Analysis (A):*** *An element of verification that uses established technical or mathematical models or simulations, algorithms, charts, graphs, circuit diagrams, or other scientific principles and procedures to provide evidence that stated requirements were met.*
- ***Demonstration (D):*** *An element of verification that involves the actual operation of an item to provide evidence that the required functions were accomplished under specific scenarios. The items may be instrumented and performance monitored.*
- ***Examination (E):*** *An element of verification that is generally nondestructive and typically uses sight, hearing, smell, touch, and taste; simple physical manipulation; and mechanical and electrical gauging and measurement.*
- ***Test (T):*** *An element of verification in which scientific principles and procedures are applied to determine the properties or functional capabilities of items. Testing typically occurs multiple times to generate a statistically relevant data set.*

5.2.5 Test Plan Identifies Verification Methods. The test plan shall identify the verification method(s) to be used to verify each requirement.