NASA SBIR 2007 Phase I Solicitation

O2.03  Automated Collection and Transfer of Launch Range Surveillance/Intrusion Data

Lead Center: KSC

Participating Center(s): GSFC, MSFC

Range surveillance is a primary focus of launch range safety and often cost and schedule drivers as well. Launch delays due to difficulty in verifying a cleared range are common and will increase as development encroaches on existing spaceports and as spaceports are built in new areas. Proposals are sought for innovative sensors, instrumentation platforms, and communication technologies which expedite range clearance by providing real-time situational awareness for range operations such as launches, hazardous processing, and recovery.

Instrumentation platforms will provide mobile or transportable surveillance assets for broad area coverage to meet range needs. These platforms should be capable of a high degree of self-sufficiency and autonomy for unattended, long-term operations. During operations the platform must maintain stability so that instruments are not required to compensate for unique environmental characteristics surrounding the operations. Platforms may include, but are not limited to, Unpiloted Aerial Vehicles (UAV), High Altitude Airships (HAA), buoys, etc.

Instrumentation and sensors would include but not be limited to a wide spectrum of optical, infrared, Radio Frequency (RF), and millimeter wave. These would provide for the detection, recognition, and identification of persons and objects that have intruded areas of the range that must be cleared in order to conduct safe launch operations. In addition, multiple sensors and instruments may be used, or combined through the use of neural networks and data fusion, for accurate identification, and time and position of entities.

Centric and integrated communications schemes that adhere to widely accepted standards will enable a scalable architecture for range instrumentation that supports launch operations. Data rates and bandwidth requirements may vary greatly depending on instrumentation and sensors that are incorporated on a range. These constraints and the distributed nature of a range dictate the need to include multiple communication media such as free-space optics, Wi-Fi, and terrestrial and space-based communications links in order to transport the collected data. Novel and innovative approaches to this architecture are sought.