NASA SBIR 2008 Phase I Solicitation

O2.01 Automated Collection and Transfer of Launch Range Surveillance/Intrusion Data

Lead Center: KSC

Participating Center(s): GSFC, MSFC

NASA is seeking innovative technologies for sensors and instrumentation technologies which expedite range
clearance by providing real-time situational awareness for safe Range operations from processing to launch and
recovery. These sensors and instruments are expected to operate, as a payload, on mobile or deployable
Unmanned Aerial Systems (UAS), High Altitude Airships (HAA), buoys, etc.

Purpose: NASA is embarking on a new era of space exploration with new launch vehicles and demands for
availability to support launch times within hours of one another to ensure mission success. This availability
requirement is allocated across the entire launch operations which includes the Range that provides clear corridor
of land, air and sea for the vehicles to transit through, as they ascent or return. The current Range infrastructure is
aging, labor intensive and independent, and would benefit from new sensors and instrumentation that improve the
situational awareness to those that are responsible for ensuring public safety, mission assurance and efficient
operations.

To aid in this situational awareness the new sensors and instrumentation must be able to operate in the
environment that takes advantage of mobile or deployable Unmanned Aerial Systems (UAS), High Altitude Airships
(HAA), buoys, etc. Use of these vehicles as a platform is intended to increase the Ranges availability while
reducing the cost of operations. Size, power, weight and stability of these systems, that operate on these platforms,
will be a major constraint their use.

These sensors and instrumentation provide for the remote detection, recognition, and identification of persons and
objects that have intruded into areas of the range that must be cleared in order to conduct safe launch operations.
This would include a wide spectrum of optical, infrared, Radio Frequency (RF), and millimeter wave sensors for this
purpose. In order to achieve accurate identification, time and position of intruding entities multiple sensors and
instruments may be used, or combined through the use of neural networks and data fusion techniques. This will
require the use of standards for communications, so that, data from individual sensors or instruments can be
combined on a platform and processed on-board, or communicated to central location where a fused solution is
processed.

Research should be conducted to demonstrate technical feasibility during Phase 1 and show a path toward a
Phase 2 hardware and software demonstration and delivering a demonstration unit or software package for NASA
testing at the completion of the Phase 2 contract.