

Example of a Successful Collaboration with Industry & Government: Advanced Spectroscopic Portal (ASP) Program

Presented at CenSSIS RICC

October 2, 2006

*Mark Russell – Vice President, Engineering
Raytheon Integrated Defense Systems*

*Lianne Ing – Vice President, Business Development
Bubble Technology Industries*

Complementary Strengths

- **CenSSIS:**
 - One of only 19 NSF Engineering Research Centers
 - Multidisciplinary expertise in sensor fusion techniques for detecting objects concealed beneath a surface
 - A “hub” for many diverse industrial partners
- **Raytheon IDS:**
 - World-class prime contracting expertise
 - Broad base of engineering and high volume production capabilities
 - Systems integration experience for total customer solutions
- **Bubble Technology Industries (BTI):**
 - Leader in radiation detection and explosives detection technologies
 - Breakthrough innovations through an agile, multi-disciplinary research team
 - Rapid prototyping capabilities and cost-effective solutions for complex problems

Key CenSSIS Functions for Industry

- Serves as a source of innovative technologies through applied research programs
- Provides a venue to connect diverse industrial partners with common research interests
 - Industrial members include a broad range of large and small companies from different fields of expertise
- Produces graduates with relevant training and stronger industrial focus
 - New Gordon Program provides an unprecedented opportunity to intensely prepare engineering graduates with the leadership skills desired by industry

The ASP Program

- Advanced Spectroscopic Portal program for the Department of Homeland Security is an example of collaboration among diverse partners
- R&D phase of the program was successfully executed through a CenSSIS-BTI partnership
 - Accelerated development program yielded a prototype system in only 10 months
- Program was transitioned to a Raytheon-BTI partnership for the engineering and production phase
 - 5-year contract awarded July 2006 from DHS' Domestic Nuclear Detection Office (DNDO)
 - Program includes engineering, production and spiral development of advanced radiation portal monitors that will protect the nation from nuclear threats
 - Total domestic market across 3 selected contractors estimated at \$1.3 billion, according to DHS

The ASP Program



- First-generation radiation portal monitors are currently deployed at points of entry across the nation
- Intended to detect nuclear threats, such as dirty bombs, nuclear weapons and other illicit radioactive materials
- Current portal monitors susceptible to false alarms caused by legitimate radioactive materials
 - E.g. Bananas, kitty litter, medical isotopes, ceramic tiles, fertilizer
- False alarms create undesirable operational burdens on Customs & Border personnel and costly delays in commercial flow of goods

The ASP Program

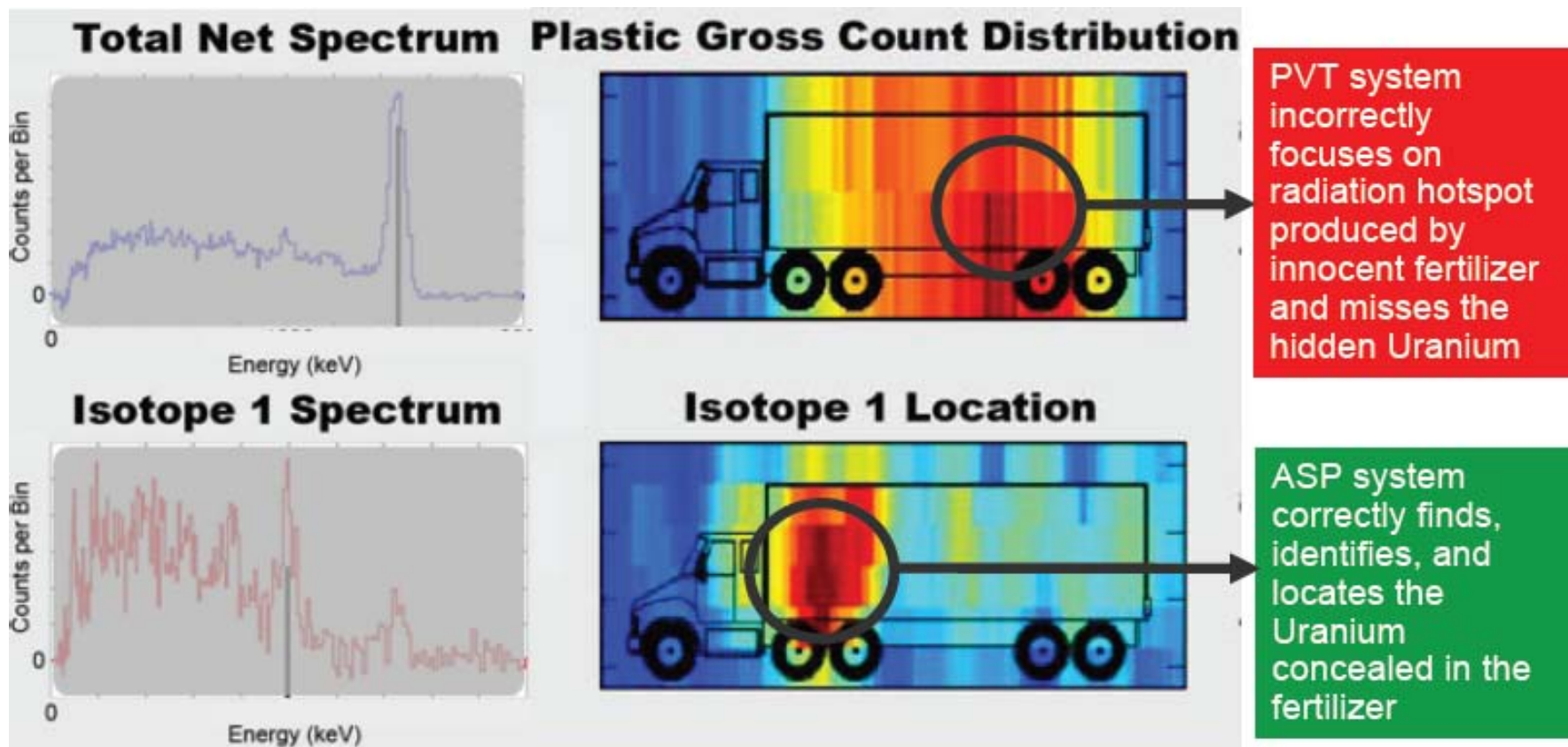
- Next-generation Advanced Spectroscopic Portals include a suite of radiation sensors, combined with advanced threat identification algorithms
- ASPs dramatically reduce false alarms while providing excellent detection capability
- Systems use spectroscopy to detect **and** identify the radioactive source
 - ASPs can distinguish between a real nuclear threat and an innocent radioactive source



ASP for cargo vehicle screening

The ASP Program

- ASPs provide significant performance improvements over first-generation radiation portal monitors, as shown in the example below



Summary

- ASP program represents a new model for collaboration
 - R&D performed through academic-industrial partnership
 - Transition to production achieved through small business-large business partnership
 - All partners presented with opportunities they could not have achieved alone
- Current defense/security needs drive multi-partner teams
 - Types of threats are changing from traditional to non-traditional
 - Pace of technology innovation is accelerating
 - Multi-partner teams with synergistic technology expertise, management skills, and production capabilities provide the fastest, most effective solutions

Summary

- CenSSIS' new Gordon Engineering Leadership program can provide an important contribution to engineering industry
- Industry needs engineers with strong technical skills and solid leadership skills
 - Communication in all forms is a critical skill
 - Ability to coordinate and lead multi-disciplinary teams through challenging programs is essential
 - Deadlines and budgets are part of everyday engineering life; graduates will benefit from a better understanding of how to manage these realities