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
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
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