

## **Project 1, Micro-Sensors for Environmental Monitoring**

### General Purpose:

A team of collaborators from Ohio State University, Case Western Reserve University, Cleveland State University, Rockwell Automation, Hull & Associates, and ER Microsensor, are working together to bring to market a micro-sensor suite capable of measuring ground water quality at the bottom of wells surrounding municipal and hazardous landfills.

### Timeline:

Q4: First five prototypes shipped

Q5: transition to manufacturing

Q8: second five prototypes

Q9 transition to manufacturing

Q12: final five prototypes; transition to manufacturing

### Outcome:

The team will completely eliminate the problems with current measurements by placing the micro-sensor suite in the well and by using wireless communication.

## **Project 2, Intelligent Fluid Monitoring**

### General Purpose:

Applied Standard/Makel Engineering, Rockwell Automation, Case Western Reserve University, and The Ohio State University have developed a teaming arrangement to advance the commercialization and manufacturing capabilities of a novel fluid monitoring sensor array. The array detects parameters that are indicative of fluid condition, remaining useful life, and potentially can detect the onset of catastrophic equipment failure.

### Timeline:

Q6: Diesel engine oil monitor for military and trucking fleets, market channel finalization;

Industrial machinery monitor, market channel finalization

Q9: Petrochemical processing online monitor, market finalization

Q12: Food oil online monitor; Biodigestor monitor, market finalization

### Outcome:

The technology will provide significantly lower costs and improved capabilities for maintenance of large fleets of vehicles (military and commercial) and industrial machinery in the short term, and provide capabilities that do not currently exist for on-line monitoring of chemical processing, food processing, biodigesters for waste to energy conversion, and other markets.

## **Project 3, Sensor Interface Family**

### General Purpose:

Linear Dimensions, ER Semiconductor, Case Western Reserve University, and the University of Akron are collaborating to develop a family (4 to 8 different part numbers) of semiconductor device that would serve as an integrated interface from a sensor or network of sensors, to a communication platform customarily used in the target applications.

### Timeline:

Q1: Product family chart  
Q5: Packaged prototype front-ends  
Q6: Packaged back-end digital communications prototypes  
Q9: Packaged engineering samples  
Q12: Beta customer feedback report

Outcome:  
Ease integration of new sensors and lower their cost.

#### **Project 4, High Temperature Generic Sensor Interface (HTGSI)**

General Purpose:  
A business group of six will work together with the Wright Center for Sensor Systems Engineering to bring the defense markets (via the Joint Strike Fighter) a High Temperature Generic Sensor Interface (HTGSI) module.

Timeline:  
Q6: Fabricate ASICs  
Q7: Fabricate ASICs; Fabricate upgraded HTGSI devices  
Q8: Fabricate upgraded HTGSI devices  
Q12: Delivery to DOD for Joint Strike Fighter

Outcome:  
It is envisioned that once the HTGSI is commercialized for military and commercial aircraft applications, various derivative models will be produced for other harsh environment markets such as locomotive, truck, and automotive, marine, and industrial.

#### **Project 5, Open Architecture Middleware for Sense-and-Respond Systems**

General Purpose:  
Working with a team that includes Case Western Reserve University, Kent State University, Cleveland State University, ABB, Rockwell, and the Air Force, this pre-competitive incubation project will develop open-architecture middleware and representative applications for distributed real-time embedded sensor and actuator systems. The project focuses on distributed sensor system software, which is a major roadblock that hinders the commercialization of sensor systems.

Timeline:  
Q1: Performance specifications outlined  
Q7, Q8, Q9: Begin integration of all research tasks with middleware  
Q12: Transition to demonstration

Outcome:  
At the conclusion of this pre-competitive incubation project, we expect that the technology that was developed will continue in a follow-on demonstration project sponsored by ABB or Rockwell to more directly address the monitoring and operation of power plants.

#### **Project 6, Secure Data Aggregation and Decision Making**

**General Purpose:**

To support effective data gathering and decision-making, a business group Rockwell Automation, Timken, Mobile Awareness, and the University of Akron proposes to develop a novel data aggregation scheme that can be adapted to suit a variety of applications, resulting in a widely applicable software tool.

**Timeline:**

Q5: Verify base software tools

Q7: Prototype demonstration for homogenous sensors

Q10: Prototype demonstration for heterogeneous sensors

Q12: Transition to demonstration

**Outcome:**

Networks moved into company locations.