DOCKETED

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Energy Commission Natural Gas Research Program

Energy Research and Development Division
California Energy Commission
April 28, 2016

Natural Gas Research Areas

- **Energy Efficiency**
  - Buildings Energy End-Use Efficiency
- **Renewable Energy and Advanced Generation**
  - Combined Cooling, Heat and Power (CCHP)
- **Natural Gas-Related Transportation**
- **Energy Infrastructure**
  - Natural Gas Pipeline Integrity
  - Energy-Related Environmental Research

Quick Response for Aliso Canyon

Major Accomplishment

Using a Research Aircraft to Identify and Quantify Emissions from Transmission Pipelines

- **Contractor:** University of California, Davis
- **PIER Funds**: $300,000
- **Description:** Using an aircraft equipped with methane and ethane sensors to detect and quantify methane emissions from natural gas pipelines
- **Results**: The ethane analyzer allows the identification of pipeline leaks from other sources of methane. Quantification of leaks was a success during a controlled released executed by PG&E.
- **Ratepayer Benefits:** This project is developing a more efficient method for detection of natural gas pipeline leaks, thereby improving the reliability of pipelines and reducing inspection costs. The same airplane is being used for another project quantifying leaks from the natural gas system (e.g., underground storage).

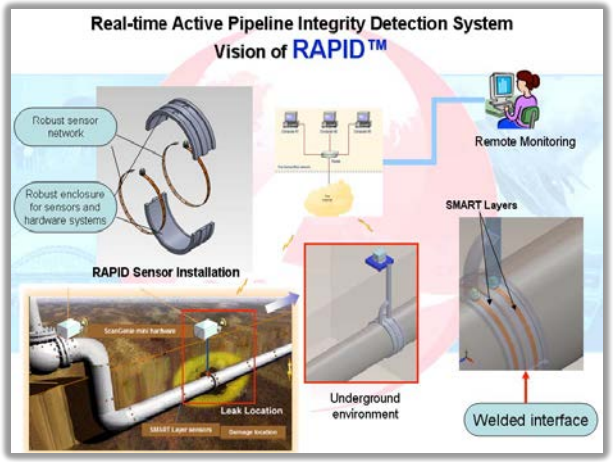
Natural Gas Storage Research Approved at June 12, 2017 Energy Commission Business Meeting

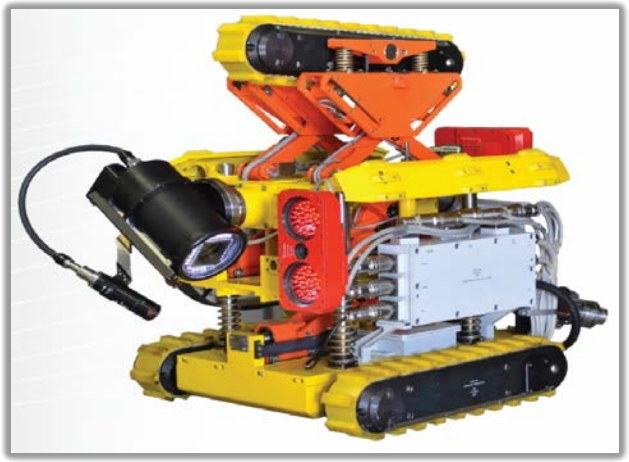
GFO-16-508
NATURAL GAS STORAGE INFRASTRUCTURE SAFETY AND INTEGRITY RISK MODELING RESEARCH SOLICITATION

DOE-LAWRENCE BERKELEY NATIONAL LABORATORY. Proposed resolution approving Agreement PIR-16-027 with the Department of Energy's Lawrence Berkeley National Laboratory for a $2,975,761 grant to develop an Integrated Risk Management and Decision-Support System.

DNV GL FORMERLY KNOWN AS DET NORSKE VERITAS (U.S.A). Proposed resolution approving Agreement PIR-16-028 with DNV GL formerly known as DET NORSKE VERITAS (U.S.A.), Inc. for a $2,398,939 grant to develop and demonstrate an advanced risk assessment methodology for managing the safety and integrity of Underground Gas Storage (UGS) assets in California

Natural Gas Infrastructure Safety and Integrity

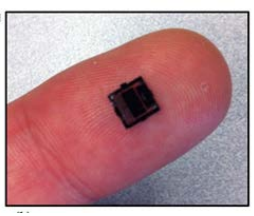




Current Portfolio Highlights and Major Initiatives

Name of Initiative	Description	Status
Innovative Monitoring Technologies	**Contractor:** The Regents of the University of California – UC Berkeley – CITRIS/CIEE **R&D Funds:** $855,835 **Term:** 6/30/2011 – 1/1/2015 **Purpose:** To explore innovative sensor and communication technologies and approaches for inspecting and monitoring natural gas pipelines, and develop a testbed for testing sensors under simulated field conditions in the lab	**Accomplishments** • Designed and developed an innovative low-cost, miniature Micro Electro-Mechanical Sensor (MEMS) system prototype to inspect, monitor and report on the operating condition of natural gas pipelines • Designed and fabricated a safe and convenient pipeline sensor test bed • Tested sensors for reliability and refined sensor designs • Prototyped wireless communication package for inexpensive real-time data transfer • Results presented to NG Pipeline Integrity and Safety stakeholders at several workshops **Current Status** • Final Report published http://www.energy.ca.gov/2014publications/CEC-500-2014-104/index.html

Natural gas pipeline sensors testbed at UC Berkeley



Miniaturized sensor

Current Portfolio Highlights and Major Initiatives

Name of Initiative	Description	Status
Innovative Monitoring Technologies	**Contractor:** Diakont Advanced Technologies, Inc. PON-12-505 **R&D Funds:** $1,000,000 **Match Funds**:$1,600,000 **Term:** 6/30/2013 – 4/1/2015 **Purpose:** To demonstrate and commercialize a multi-channel electromagnetic acoustic transducer sensor module for pipeline (in-line) inspection crawler for accurately detecting, locating, and measuring natural gas pipeline girth weld defects	**Accomplishments** • Completed design and manufacturing of hardware components and developed control and signal conversion software • Completed hardware and software integration. • Demonstrated sensor on PG&E pipeline in south Bay Area near San Francisco • Reduced cost of inspections • Non-destructive and requiring minimum digging (1/75th of the excavation sites typically required for the inspection with current methods) • Faster inspection times **Current Status** • Test data analysis and further evaluation in progress • Final Report is published. http://www.energy.ca.gov/publications/displayOneReport.php?pubNum=CEC-500-2015-028

Diakont's Robotic Operational Defect Inspection System (RODIS) at the pipeline entry

AGENDA

10:10-12:00 Energy Commission Natural Gas Research Project Updates

- **Natural Gas Pipeline Technology Assessment Update (Emerging Technologies in California and Nationwide)**
  Khalid Farrag, GTI

- **Pipeline Integrity Detection System**
  Howard Chung, Acellent

- **High Accuracy Mapping for Excavation Damage Prevention and Emergency Response**
  Hamid Abbasi, GTI

- **Demonstration of a Multi-Analytic Risk Management Tool for the California Pipeline Industry**
  François Ayello, DNV GL

- **Pipeline Right of Way Monitoring and Notification System**
  Chris Ziokowski, GTI

- **GPS Excavation Encroachment Notification System Implementation**
  Khalid Farrag, GTI