



**Pipeline and Hazardous Materials Safety Administration
Office of Pipeline Safety**

Pipeline Safety Research & Development Program

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U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

PHMSA: Your Safety is Our Mission



Competitive Academic Agreement Program

- The Competitive Academic Agreement Program (CAAP)
 - Academic pipeline safety research and development
 - Spur innovation by focusing on high technical risk and high payoff solutions.
 - Expose undergraduate and graduate students to research in the pipeline safety field; and cultivate new talent.
- PHMSA began soliciting for R&D projects under CAAP in 2013



CAAP Process

- PHMSA solicits and awards R&D projects under CAAP on an annual cycle
- CAAP Notice of Funding Opportunities (NOFOs) are typically announced in the winter months
- CAAP projects are typically awarded in the 4th quarter of the fiscal year



CAAP Process (Continued)

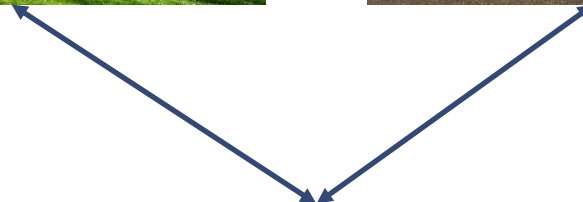
- Total CAAP yearly awards are approximately \$2 Million
- Individual CAAP awards are limited to \$1 Million of government funding
- Statutory requirement* for a 20% cost share for CAAP awards

*Section 22 of the Protecting Our Infrastructure of Pipelines Enhancing Safety (PIPES) Act of 2016



Partnerships

- University partnerships with other universities is highly recommended to expand capabilities
- Partnerships with industry are critical to ensure that the research is relevant and commercially viable



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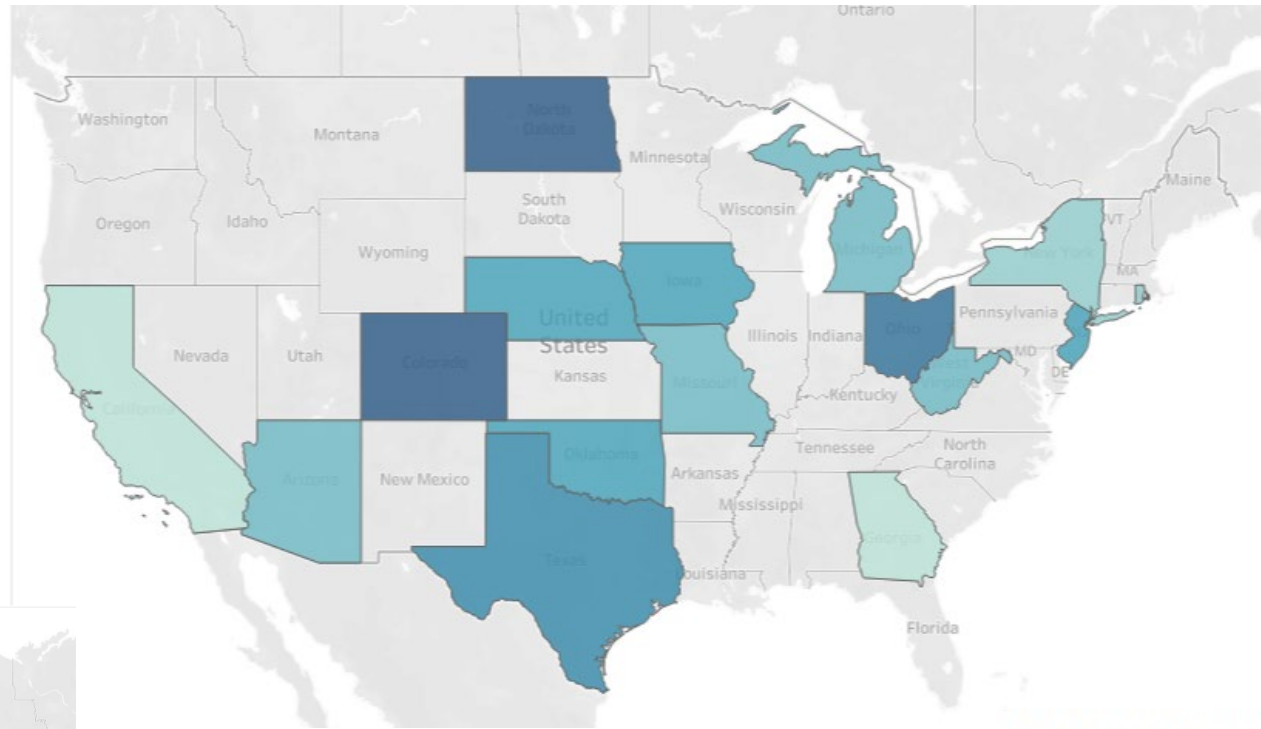


CAAP History

- PHMSA has awarded \$15.1 Million of federal funding under the CAAP program since its inception
- Over 345 students have been exposed to the pipeline safety field through the program
- 18 students have received internships in the pipeline safety industry
- 18 students are employed or been offered full time employment in the pipeline safety industry

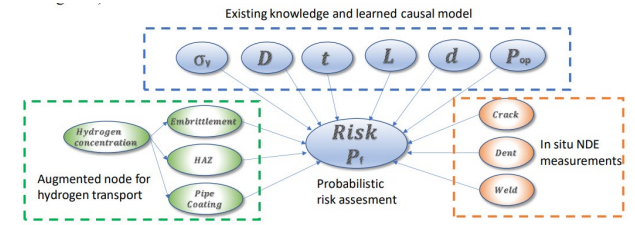


CAAP History (Continued)



2021 CAAP Awardees

CAAP Project Title	Details
Knowledge-guided Automation for Integrity Management of Aging Pipelines (KAI-MAP) for Hydrogen Transport	Arizona State University \$844,726
Pipeline Risk Management Using Artificial Intelligence-Enabled Modeling and Decision Making	Rutgers, The State University \$349,328
Easy Deployed Distributed Acoustic Sensing System for Remotely Assessing Potential and Existing Risks to Pipeline Integrity	Colorado School of Mines \$665,370



Picture courtesy: Arizona State University

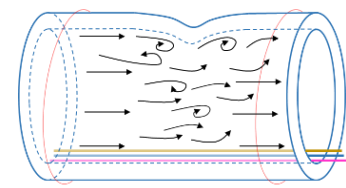


Fig. 12. Eddies induced by Dent/Deformation

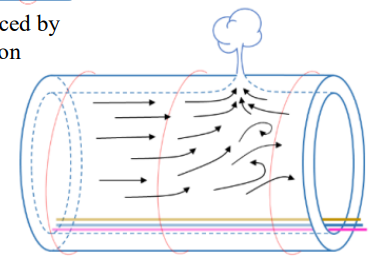


Fig. 14. Vortex Induced by Leakage

Picture courtesy: Colorado School of Mines



CAAP Presentations



U.S. Department of Transportation
Pipeline and Hazardous Materials
Safety Administration

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PHMSA: Your Safety is Our Mission



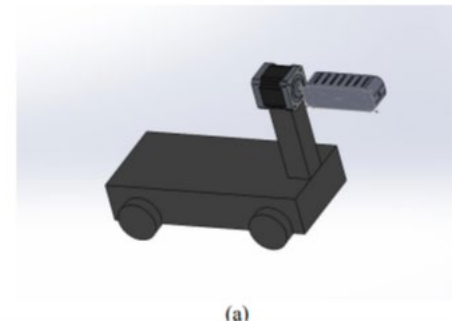
December 1st Presentations

- CAAP virtual presentation will occur from 12:45 – 2:45 PM ET tomorrow
- The meeting page includes a PDF with links to the various presentations
- The presentations will occur simultaneously, but some will offer 2 presentations in that time frame.



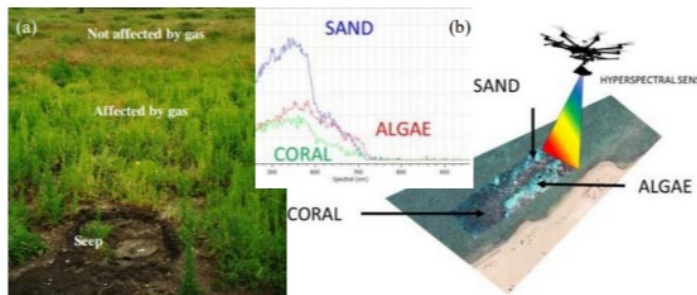
December 1st Presentations

- Arizona State University
 - AI-enabled Interactive Threats Detection using a Multi-camera Stereo Vision System
 - PI: Dr. Yongming Liu
 - Knowledge-guided Automation for Integrity Management of Aging Pipelines (KAI-MAP) for Hydrogen Transport
 - PI: Dr. Yongming Liu
- Georgia Institute of Technology
 - Predicting Remaining Fatigue Life of a Dent with Corrosion Using Advanced Measurements and Modeling
 - PI: Dr. Laurence Jacobs



December 1st Presentations

- University of Texas at Austin
 - Internal Corrosion Monitoring in Pipelines by using Helical Ultrasonic Waves
 - PI: Dr. Salvatore Salamone
- Missouri University of Science and Technology
 - An Unmanned Aerial System of Visible Light, Infrared and Hyperspectral Cameras with Novel Signal Processing and Data Analytics
 - PI: Dr. Genda Chen



December 1st Presentations

- North Dakota State University
 - Brain-Inspired Learning Framework to Bridging Information, Uncertainty and Human-Machine Decision-Making for Decoding Variance in Pipeline Computational Models
 - PI: Zhibin Lin
 - New Bio-Inspired 3D Printing Functionalized Lattice Composites for Actively Preventing and Mitigating Internal Corrosion
 - PI: Zhibin Lin

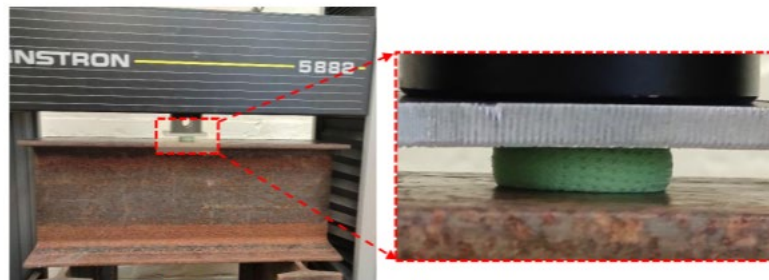
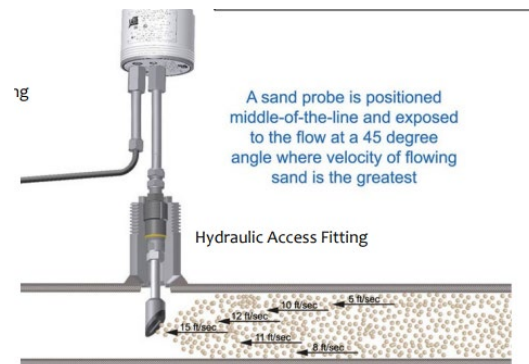


Fig. 6. Compressive testing of the sample



December 1st Presentations

- Marquette University
 - Multi-modal NDE Assisted Probabilistic Pipeline Performance Evaluation under Interactive Anomalies
 - PI: Dr. Qindan Huang
- University of Alaska
 - Development of Low-Power Wireless Sensor Network of Conductivity Probes for Detection of Corrosive Fluids Inside Pressure Vessels and Piping
 - PI: Dr. Matthew Cullin



Equity



Administration's Agenda

- Executive Order 14041, White House Initiative on Advancing Educational Equity, Excellence, and Economic Opportunity Through Historically Black Colleges and Universities
- Expand PHMSA's outreach to Minority Serving Institutions
- Increase participation in the CAAP Program
- Gap analysis to identify Minority Serving Institutions and their research capabilities



Minority Serving Institutions

HBCU (86)

Historically Black Colleges and Universities

AANAPISI (45)

Asian American and Native American Pacific Islander Serving Institutions

MSI

4 Year Schools

TCU (14)

Tribal Colleges and Universities

HSI (202)

Hispanic-Serving Institutions



More Efforts on Equity

- Equity through Technology and Innovation Task Force - Executive Order 13985, “Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.”



Thank You

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