



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

**Pipeline Safety Research & Development Program**

**Workgroup#2: Integrity of Underground Natural Gas/Hydrogen Storage**

*James Pfeifle*

December 1, 2021



# Good Morning & Welcome!

**PHMSA Leader:** James Pfeifle, General Engineer/Program Manager

**Industry Co-Leader:** Anders Johnson, VP Gas Storage, Kinder Morgan

**Industry Co-Leader:** Gordon Loyd, Project Engineer, Combustion Turbine Group, Northern California Power Agency

**Industry Co-Leader:** Hilary Petrizzo, Project Manager, Hydrogen Engineering Strategy, Southern California Gas

- Thank you for choosing this Workgroup
- We have an important charge for you:
  - Listening/Learning
  - Assist in developing PHMSA's future research agenda

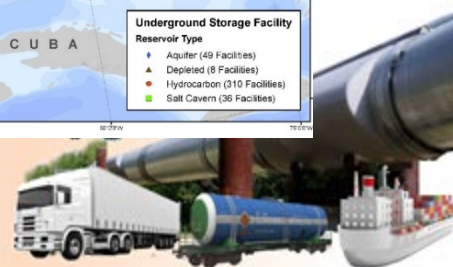


# Workgroup Objectives

1. Updating the audience on the challenges and funded research to date associated with this workgroup subject
2. Identifying technical gaps that address key challenges
3. Developing a list of important topics for future PHMSA funded research from identified gaps



# Workgroup Objectives



# PHMSA UNGS Program

1. 403 Facilities, 17,056 wells, 124 Operators
2. For 2021, we have 287 UNGS facilities under PHMSA Inspection
3. 116 UNGS facilities under State Inspection, however 54 require PHMSA Enforcement
4. Completing 4th year of a 5-year initial inspection plan.



# Agenda at a Glance



# Today's Agenda – December 1

<b>Time</b>	<b>Presentation</b>	<b>Speaker</b>
<b>10:00 AM</b>	Introduction to Workgroup	Workgroup Leader PHMSA Workgroup Leader Industry
<b>10:30 AM</b>	Research Funding Organization Presentations	Presenters 1-4
<b>11:30 AM</b>	Q&A	
<b>12:00 PM</b>	Contractor Support Introduction & Description	S&K Facilitate
<b>12:10 PM</b>	Research Gap Brainstorming Session	Workgroup Participants
<b>12:45 PM</b>	Lunch Break & CAAP Poster Presentations During Lunch similar gaps will be combined.	
<b>2:45 PM</b>	Review gaps identified following the combination.	Workgroup Leaders
<b>3:15 PM</b>	Sticky Note Exercise – Round 1 & 2 Workgroup prioritizes R&D Gaps	S&K Facilitate
<b>4:15 PM</b>	Break	
<b>4:30 PM</b>	Workgroup Research Topic Roadmapping	Workgroup Leaders & Participants
<b>6:00 PM</b>	Workgroup Closeout Day 2 closeout	Workgroup Leader



# Tomorrow's Agenda – December 2

10:00 a.m. **PHMSA's Year-Round R&D Solicitation**

10:10 a.m. **Workgroup Readouts**

**The results of this Workgroup will be presented at 10:10 a.m. tomorrow ETZ.**

**Return to the event meeting page to find the entry link to Day 3.**





# PHMSA Funded Research



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

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**PHMSA: Your Safety is Our Mission**



# PHMSA Related Research

## PHMSA Funding: 5 projects with \$2.9 M

1. Risk Assessment and Treatment of Wells
2. Reliability of Subsurface Safety Valves
3. Tubing and Packers Life-Cycle Analysis for Underground Gas Storage Applications
4. Evaluation of Well Casing Integrity Management for Underground Storage Wells
5. Advancement of Through-Tubing Casing Inspection For Underground Storage Wells (**active project**)

**No research addressing the impact of hydrogen blends or pure hydrogen storage yet funded by PHMSA**



Centralizer

Caliper Fingers

Centralizer

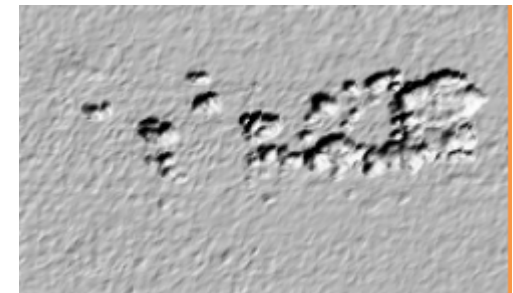
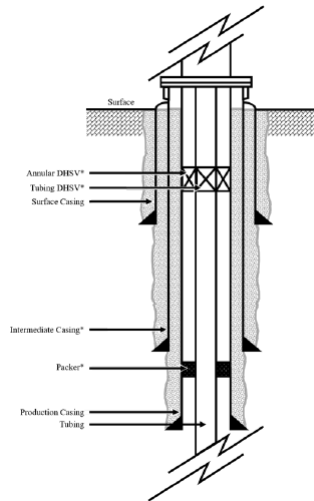


# Notable Research Impacts

- Project final reporting provide very useful information about the issues covered
  - Several papers have been published
- No Technology Transfer yet registered to a vendor
- No Knowledge Transfer yet registered to standards bodies



Aliso Canyon courtesy L.A. Times



Pitting Corrosion



# Related Policy Issues



# Thank You!

## Research Program Contacts

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