Track 6
Alternate Fuels / Climate Change

Bob Wilson
Jake Haase
Mike Gallinaro

***Government/Industry Pipeline R&D Forum – Crystal City, Virginia*, June 24-25, 2009**

Attendance Breakdown

Approximate total attendance	25 persons
Federal Regulators	4 persons
State Regulators	0 persons
International Regulators	0 persons
Pipeline Industry	4 persons
Standard Organizations	4 persons
Researchers	6 persons
Academics	0 persons
Other (Biofuel Producer)	1 persons

Top 3 Identified R&D Gaps

Gap #1 – Material Compatibility with Biodiesel and Cleaning effects of Biodiesel on Pipelines. (General Knowledge)

Gap #2 – Pipeline Safety and Integrity Issues Associated with Renewable Gas. (General Knowledge)

Gap #3 – Pipeline Integrity Impacts From Flowing Hydrogen Through Pipes. (General Knowledge)

Associated Details
(Gap #1)

Material Compatibility with Biodiesel and the Cleaning Effects of Biodiesel on Pipelines

This knowledge would target pipelines currently transporting refined liquid petroleum products, specifically diesel fuel. Pipelines would primarily be onshore and could be of any composition (steel, polymeric, etc).

The following technical focus areas are either necessary or recommended:
a. Identify what materials have not already been researched (in vehicle compatibility studies)
b. Determine the impact of biodiesel on elastomers and other polymeric materials (ID'd in step a)
c. Establish threshold levels of concern as related to pipeline integrity for various biodiesel constituents.
d. Investigate standardized monitoring methods and instrumentation for both biodiesel content and potential deleterious constituent levels
e. Investigate the potential cleaning effect of biodiesel

A proposed mandate calls for significant biodiesel use by 2012. Most of this work will need to be completed to meet this mandate.

Associated Details
(Gap #2)
Pipeline Safety and Integrity Issues Associated with Renewable Gas

This knowledge would target pipelines currently transporting natural gas. Pipelines affected include gas transmission and local distribution lines. Pipelines of steel and polymeric construction would be included.

The following technical focus areas are either necessary or recommended:
a. Identify trace constituents in gas that have an impact to pipeline integrity. Both existing natural gas sources as well as renewable gas sources (such as biogas) need to be investigated.
b. Conduct a materials science evaluation of existing pipeline components and their interaction with gas constituents.
c. Investigate the chemistry of odor fade concerns related to existence of trace constituents and its impact to public safety.
d. Investigate standardized monitoring methods and instrumentation for detecting the deleterious constituent identified above

This gap needs a short term solution because of both the changing nature of the country's gas supply and the influx of more renewable gas sources

Associated Details
(Gap #3)

Pipeline Integrity Impacts From Flowing Hydrogen Through Pipes

This knowledge would target pipelines currently transporting natural gas or newly constructed pipelines dedicated to hydrogen gas transportation. Pipelines affected include gas transmission and local distribution lines. Pipelines of steel and polymeric construction would be included.

This gap concerns both co-mingling hydrogen gas with natural gas and transportation of pure hydrogen gas.

The following technical focus areas are either necessary or recommended:
a. Perform literature search or public “roadmapping session” to identify and prioritize issues.
b. Investigate impact of hydrogen on materials of construction.
c. Establish threshold limits for hydrogen gas in pipeline transportation scenarios.
d. Develop evaluation criteria for repurposing existing pipelines for hydrogen gas transportation.
e. Investigate trace constituents in hydrogen gas that results from hydrogen manufacture. Investigate the impact of any identified constituents on gas quality and pipeline integrity

Due to the large potential scope of these focus areas, this is a long term, multiyear project.

Additional Identified Gaps

- Enhanced in-situ leak detection and leak quantification for methane emissions
- Investigate regulatory barriers that impede methane recovery.
- Prioritize emission detection locations by specific asset (equipment) class. For example, should emission detection focus on valves instead of flange connections.
- Perform study on pipeline lifecycle emissions. Compare GHG emissions caused by pipelines from construction through de-commissioning to the GHG emissions caused by alternate transportation methods.