

Pasadena Citizens' Advisory Council

Technological Innovations in the Safety of Transporting Hazardous Materials by Pipeline

December 3, 2020

Jeff Whitworth, Shell Pipeline Reliability and Integrity Manager, presented information regarding safety challenges facing the liquids pipeline industry and how the industry is addressing them with improved technology and other programs.

Statistics show that pipelines deliver products safely 99.999% of the time. Liquids pipeline incidents that impact people or the environment have decreased 20% over the last 5 years. From 2014-2018, the most common reasons for failure were corrosion (25%), followed by excavation incidents, natural force incidents (e.g., landslides or storms), material pipe/weld failures, and incorrect operations.

Testing is one way to detect problems before an incident occurs. Among improvements in recent years is the use of increasingly sophisticated inspection tools called “smart pigs” for inline testing. Whitworth compared the use of “smart pigs” to detect internal damage on a pipeline to a medical CT or MRI scan for humans. The federal Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA) and the Pipeline Research Council International (PRCI) work together to test new technology for the detection of leaks.

To continue to improve pipeline safety, the industry is 1) focusing on a mindset of Goal Zero process safety incidents; 2) supporting collaboration between industry, regulatory agencies, and vendors to advance new technologies; and 3) supporting use of data platforms that will allow for the sharing of incidents and best practices. A recent example of collaboration is construction of a full-scale pipeline testing facility in Colorado where innovations can be tested. An example of data sharing is a project to systematize 20 years of mechanical damage research. The goal of these improvement efforts is that liquids pipelines deliver their products safely 100% of the time.