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CO2 transportation the new challenge: APIA

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PIPELINE transportation of carbon dioxide is one of the great challenges facing the pipeline industry, according to Australian Pipeline Industry Association president Ashley Kellett.

"It is not a simple task to transport CO2 emissions. It is a great challenge, but this industry has been transporting oil, gas and other products under high pressure and over long distances for many years," he told the 40th APIA annual convention in Perth.

"We can do the same for carbon waste and APIA looks forward to working with government and other industries to ensure safe and efficient transportation of CO2."

He added the industry welcomed Prime Minister Kevin Rudd's acknowledgement that the transportation of CO2 was an integral part of the carbon capture and storage process.

Kellett did note that transportation of CO2 under high pressure at large, commercial levels required further work.

"Most of the CO2 transportation research already undertaken has not yet looked at the tremendous volumes and, for Australia, the distances of transporting CO2."

WorleyParsons principal materials engineer Michael Dinon also told delegates the pipeline remained the safest and most economical long-term solution for transporting CO2 over long distances, but requires urgent research into the methods and materials.

"Given that sources of CO2 and the geological formations suitable for its geo-sequestration are not often co-located, it is almost inevitable that pipelines will be used for its transport," he said.

According to Dinon, there are risks that must be managed in transporting CO2 by pipeline, and special consideration must be given to the differences in properties between CO2 and the Hydrocarbon gases and liquids that designers are more familiar with in Australia.

"Although CO2 pipelines have been in operation for many years as part of enhanced oil recovery and have much in common with natural gas pipelines and high vapour pressure liquid pipelines, there are some important differences which must be considered during the design and operation," he said.

"While natural gas either catches fire or quickly dissipates into the atmosphere, CO2 can follow the contours of the land and accumulate in valleys and depressions, and thus represents a potential danger of asphyxiation, which must be managed within the design process.

"Depressurisation of CO2 can produce very low temperatures, and the impacts of these temperatures on pipe materials and their stresses and strain rates must be considered in designing for the prevention and control of pipeline fractures."

Despite the challenges, Dinon said the pipeline was already a proven method suitable for low-risk transportation of dense phase CO2 over the required distances.

"All of the design issues associated with the different properties in comparison with natural gas can be overcome with present-day knowledge," he said.

"The design and application of low-cost external crack arrestors is one area in which additional knowledge would be useful.

"The remaining impediments to the use of CO2 pipelines are the requirement for suitable economic incentives and a legal framework for carbon capture, transport and storage."