Stretch in Technology and Keeping the Focus on Process Safety for Exploration and Production in the 21st Century

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ABSTRACT

Oil and gas are contributing enormously to the quality of our life into the 21st century, just as they were throughout the 20th century. With the economy developing forward, more and more energies are required by our society, and in the last several decades people have switched to offshore deepwater hydrocarbon reservoirs. Besides politics, current exploration and production are limited by the technology, which may lie in deeper well, higher pressure, or crudes which are difficult to recover because of higher viscosity.

Innovative offshore technology needs to be developed to carry out deepwater production and operations. At the same time, these hazardous operations (i.e., deeper wells and higher pressure) are creating new and unique hazards. Along with the current attention from Transocean Deepwater Horizon Incident and Oil Spill, the development of advanced technologies to ensure the process safety and operational reliability of offshore facilities is becoming extremely important.

Currently, we face the challenge of how to prevent or control hazards of deepwater exploration and production. Process safety is always an essential part of the oil and gas industry and a core value that needs continual improvement. In this work, a variety of ideas, including inherent safety design and human factor, are proposed to improve offshore process safety, protect workers and the environment. Regulations should be dynamic and ready to be modified based on occurring industrial issues. Accordingly, the government and offshore operators should develop comprehensive management programs or regulations that assess process safety and environmental hazards.