Optim Eng (2017) 18:1–2
DOI 10.1007/s11081-017-9352-7

EDITORIAL

Optimization in the oil and gas industry

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Published online: 11 February 2017

The oil and gas industry is going through transformational times, as reflected in the shale revolution, the gradual increase of the use of non-renewables, the recent drop in oil prices, and the increasing efficiency of energy use. With these changes, the industry is faced with several challenges in achieving its goals of efficient and environmentally responsible operations, production optimization, and capital cost reduction.

The oil and gas industry is often divided into three sectors: upstream, midstream, and downstream. The upstream is mainly focused on activities related to the exploration and production of hydrocarbons. These activities include searching for subsurface accumulation of hydrocarbons, drilling wells, and the production of those resources. On the other hand, the downstream sector is mainly concerned with the conversion of produced raw hydrocarbons into useful and useable products. Downstream activities include the refining of petroleum crude oil, the processing of natural gas, and the distribution of refined products such as gasoline, jet fuel, diesel oil, heating oil, fuel oils, and lubricants. The midstream sector comprises the transportation, storage, and marketing of crude oil, refined petroleum products, natural gas and petrochemicals. Transportation and logistics for the various products are carried out through a variety of modes including pipelines, rail, barges, oil tankers, and trucks.

Optimization and analytics technologies are currently playing a vital role in enabling the oil and gas industry to achieve its goals. This issue of OPTE contains a collection of articles focusing on problem modeling and algorithmic development in

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all three sectors. We hope that this special issue will provide students and researchers with an overview of the important problems and the relevant technologies that are critical to this source of energy, which will continue to play a significant role in meeting the energy demands of the world for many years to come.