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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Program: MBA BA **Semester – III**
Subject (Course): Energy Analytics **Max. Marks : 100**
Course Code : DSBA 8007 **Duration : 3 Hrs**
No. of page/s: 2

- This paper of "Energy Analytics" consist of a single case study.
- You are allowed to browse online sources to substantiate your analysis and recommendation.
- You have to structure your response in functional as well as technical approach.

Case Study - Alarming number of accidents in ONGC and HPCL facilities: Parliamentary panel

A Report in EnergyWorld/ET, July 28,2018

The total number of accidents in the facilities operated by India's oil and gas Public Sector Undertakings (PSUs) have come down but the number of such cases in the installations of state-run explorer Oil and Natural Gas Corporation (ONGC) and refiner Hindustan Petroleum Corp (HPCL) continue to be high and alarming, a Parliamentary panel has said.

The panel noted in the three financial years 2014-15, 2015-16 and 2016-17, **309 accidents occurred in the oil and gas PSUs resulting in 81 fatalities and injury to 193 persons**. "The Committee although find that the number of accidents has come down in some of the PSUs but in HPCL and ONGC the numbers are still high which is alarming," the Standing Committee on Petroleum and Natural Gas noted in its report tabled in the Lower House on Wednesday last week

HPCL recorded the highest number of accidents at 149 during the period resulting in 20 fatalities and injury of 61 personnel. ONGC reported 85 accidents resulting in 15 fatalities and injury to 29 personnel. The country's largest fuel retailer Indian Oil Corporation (IOC) reported 40 accidents at its installations during the three-year period leading to 18 fatalities and 36 injured. Gas utility GAIL (India) recorded the least number of accidents among oil and gas PSUs but the highest number of fatalities at 25.

Major on-site accidents in India's Oil and Gas Sector from financial year 2014-15 to 2016-2017

Company	Accidents	Fatalities	Injured
HPCL	149	20	61
ONGC	85	15	39
GAIL	5	25	22
IOC	40	18	36
BPCL	11	2	17
Oil India	19	1	18
Total	**309**	**81**	**193**

Source: Standing Committee on Petroleum and Natural Gas

An explosion in GAIL's natural gas pipeline at Nagaram in East Godavari district of Andhra Pradesh claimed 24 lives in 2014. The report noted failure to adhere to Standard Operating Procedure (SOP) led to pipeline or equipment failure, leading to the explosion. "The cause of the accident was pipeline/equipment failure due to violations of SOPs. In this case, it has been reported that wet gas was being carried in the pipeline meant for dry gas without taking adequate precautions like pigging of pipeline at regular intervals," the report stated.

The committee also noted despite the provision of regular external and internal safety audits of installations and defined responsibilities of various enforcing organizations, accidents keep recurring in the oil and gas facilities.

The report stated poorly trained contracted personnel and lack of proper supervision were the main reasons for accidents at oil installations. "During the period 2014-17, 78 accidents were caused due to such workers of these contractors in which 43 contract workers lost their lives," it said.

The recommendations made by the committee to strengthen safety and security included proper training of contract workers, fool-proof mechanism for pipeline infrastructure, stringent actions for non-adherence to SOP, increased frequency of external safety audits, setting up of emergency response centers and formation of unified safety board, among others.

Question: –

- Design an analytical framework using Industry 4.0 Digital Technologies (IoT, Cognitive, AI/ML, Deep Learning, etc.) which can minimize incidents in the Energy sector. **(50 Marks) ($co_{2,3}$)**
- Substantiate your framework by referring to at least 1 oil and gas firm from any value chain – upstream/midstream/downstream (India/US/Europe/Middle East), how they are applying analytics to minimize incidents in their operations. **(50 Marks) ($co_{3\ \&\ Co4}$)**