



Application of Seismic Exploration Techniques in Exploration of Unconventional Hydrocarbons and CCS projects

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Abstract

The present world is facing two big challenges, first, satisfying the increasing energy demand and second, mitigating climate change. In the past decade, there are only a few new oil reserves were discovered and out of them none is a giant oil reserve. The existing oil reserves are being depleted at a fast rate and thus there is an imminent need for new unconventional energy resources. The other problem of climate change is associated with large CO₂ emission from industries and thermal power plants. While we look for viable alternate energy sources, lowering CO₂ emission from such plants is another challenge. The carbon capture and sequestration (CCS) technique offers one such solution by permanently storing the CO₂ in the existing geological reservoirs.

To address the above two problems, the first requirement is a high-resolution subsurface image that can be obtained using seismic methods. The seismic method has been extensively used in hydrocarbon exploration and it is equally useful for the exploration of unconventional resources. In context of India, CSIR-NGRI has taken various initiative to address these two problems. For former problem, one of such initiative is the exploration of Coal Bed Methane (CBM) and Shale gas, unconventional hydrocarbon resources, which can cater to energy requirements of India. In this work, we present a systematic study for delineation of coal seams in Patratu valley, Jharkhand, and shale formations in Raniganj, WB. Further, we will also discuss some of the recent works related to CCS studies.

Keywords: Seismic, Unconventional resource, Coal Bed Methane, Carbon Capture and Sequestration.

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