

**GOVERNMENT OF INDIA  
PETROLEUM AND NATURAL GAS  
LOK SABHA**

UNSTARRED QUESTION NO:2333  
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ADVANCED TECHNOLOGY FOR OIL AND GAS EXPLORATION  
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**Will the Minister of PETROLEUM AND NATURAL GAS be pleased to state:**

- (a) whether modern and advanced technology are being used for the exploration work for oil and natural gas in the country;
- (b) if so, the details thereof;
- (c) the details of the advanced technology used in exploration of oil and natural gas during the last two years; and
- (d) the manner in which this technology is superior to the oil technology alongwith the extra achievements therefrom?

**Answer**

MINISTER OF STATE FOR PETROLEUM AND NATURAL GAS(SHRI DINSHA PATEL)

(a) & (b) Yes, Sir. Modern and advanced technology is being used for exploration of oil and gas in seismic survey, horizontal drilling, multilateral drilling, logging while drilling (LWD) and processing and interpretation of seismic data.

(c) & (d) In the last two years, seismic data is being acquired and then processed and interpreted on especially designed advanced software at a virtual reality center.

During the last two years (2004-06), ONGC has used the following advanced technology:-

(i) For onland data acquisition:

# Induction of seismic data acquisition system with higher channel capacity, digital sensors and field processing unit (FPU).

# Multilevel Vertical Seismic Profiling (VSP) Data acquisition system.

(ii) For offshore data acquisition:

# Up gradation of departmental offshore survey vessel Sagar Sandhani with dual streamer cable, dual source and onboard processing capability.

(iii) Data Processing: Induction of PC Cluster technology, periodic upgrades of the processing softwares (Western Geco, CGG, Paradigm), induction of new software for onboard Geophysical data processing system of Sagar Sandhani.

(iv) Data Interpretation: Induction of more powerful graphic workstations, Virtual Reality Centres in Panvel, Geophysical Data Processing and Interpretation Centre (GEOPIC), Dehradun and Vadodara.

(v) Induction of new methodology like Q-Technology, GX Technology, Sea Bed Logging etc.

(vi) `State of art technologies` in wire line logging namely, CHFR (Cased Hole Formation Resistivity), Platform Express, MDT-LFA (Modular Dynamic Formation Tester- Live Fluid Analyser), ECS (Elemental Capture Spectroscopy).

As far as Oil India Limited (OIL) is concerned, OIL has recently set up a highly sophisticated and modern Petroleum Exploration Assets Center at Nodia, UP with workstations having state-of-the-art hardware and software. OIL installed prospect evaluation software/hardware for techno-economic evaluation for exploration blocks. This is in addition to a similar set up at OIL's Headquarters at Duliajan, Assam.

OIL has also adopted drilling of horizontal well in its fields in Assam through contract services, utilizing OIL's own drilling rig.

In exploration in Thrust belt areas, OIL has adopted techniques of structural balancing for its areas through outsourcing.

In respect of ONGC, the new technology/methodology is superior in terms of :

# Enhanced subsurface imaging capacity

# Computing power which is reflected in terms of turn around time

# Improved workflow methodology and concept, like VR Centre, which gives an improved visualization power of the subsurface.

# Improved tools and technologies for reservoir characterization and direct detection of hydrocarbons like AVO (M/s. Hampson-Russel) and Inversion (M/s. Fugro-Jason).

New technology, like Sea Bed Logging for direct detection of hydrocarbons and risk mitigation based on resistivity measurements, Q-Technology for higher resolution seismic survey, GX Technology for higher resolution and much deeper crustal information, up to a depth of 10Km and beyond, has also been inducted and data acquisition & interpretation is in progress.

In terms of extra achievements, enhanced subsurface imaging capacity and volume visualisation have resulted in firming up prospects for subtle plays, both onland and offshore, for testing them by drilling.