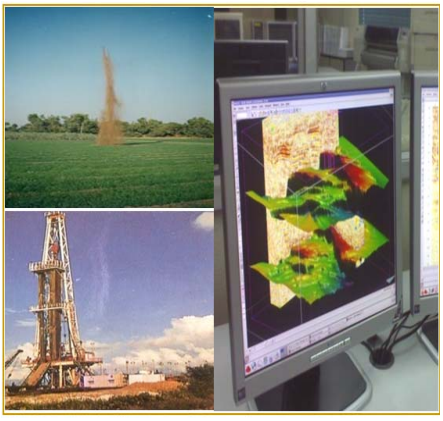
Report of the
Comptroller and Auditor General of India
on
Hydrocarbon Exploration Efforts
of
Oil India Limited

Union Government (Commercial)
Ministry of Petroleum and Natural Gas
No. of 2015
(Performance Audit)

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Comptroller and Auditor General of India

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for the year ended March 2014

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Preface

This Audit Report has been prepared in accordance with the Performance Audit Guidelines and Regulations on Audit and Accounts, 2007 of the Comptroller and Auditor General of India.

Oil India Limited (OIL), a National Oil Company (NOC) is engaged mainly in the business of exploration, development and production of crude oil and natural gas, transportation of crude oil and production of Liquid Petroleum Gas (LPG). The present Performance Audit was undertaken to examine OIL's preparedness towards meeting the Hydrocarbon Vision 2025 of the Government of India. Audit attempted to see whether OIL's exploration efforts had been taken up with proper planning and executed with efficiency and effectiveness to achieve its own and the nation's envisioned hydrocarbon goal.

Audit wishes to acknowledge the cooperation extended by the Management of OIL, the Directorate General of Hydrocarbons and the Ministry of Petroleum and Natural Gas at each stage of the audit process.

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Executive Summary

1. Introduction

Private sector participation in hydrocarbon exploration and production (E&P) in India dates back to the Government of India's decision of 1991 to invite foreign and domestic private sector companies to participate in the development of oil and gas fields already discovered or partly developed by National Oil Companies (NOCs[1]). New Exploration Licensing Policy (NELP) was formulated by the Government of India (GOI) during 1997-98 to provide a level playing field to both public and private sector companies in exploration and production of hydrocarbon. NELP became effective from February 1999. Since then, licenses for exploration are being awarded only through a competitive bidding system. Under NELP, NOCs are required to compete on an equal footing with Indian and foreign companies to secure Petroleum Exploration Licenses (PELs). Upto 31 March 2014, the GOI announced nine rounds between 1999 and 2010, inviting companies to bid for exploratory blocks under deep water, shallow water and onshore category in various basins.

Keeping in view the vital role of hydrocarbon sector in the economic growth of the country and to have a long-term policy i.e. 100 per cent exploration coverage of the Indian sedimentary basins by 2025, for the hydrocarbon sector, MOPNG formulated the Hydrocarbon Vision–2025 in March 2000.

A Performance Audit of Oil India Limited (OIL)'s hydrocarbon exploration efforts (2009-10 to 2013-14) was conducted against the above backdrop. Audit attempted to see whether OIL's exploration efforts had been taken up with proper planning and executed with efficiency and effectiveness to achieve its own and the nation's envisioned hydrocarbon goal. The main audit findings and recommendations are as follows.

[1] Oil & Natural Gas Corporation Limted and Oil India Limited

2. Main Audit Findings

Efforts of OIL towards Hydrocarbon Reserve Accretion

2.1 The net increase of hydrocarbon reserves was only under probable category. The work of reserves estimation was conducted through in-house team of OIL from 1967. While oil reserves under 2P (proved plus probable reserves) category increased, it decreased under 1P (i.e. proved) category. Oil reserves under 3P (i.e. possible) category decreased indicating non-addition of new fields through exploration activities. Gas reserves under all the categories declined from 2009-10 to 2013-14. Hence, OIL underperformed in proving of reserves which is necessary for future sustainable development of hydrocarbon sector. **(Para 3.1)**

2.2 Reserve accretion targets are fixed after taking into account the total number of exploratory wells planned for drilling during a year and also the exploratory drilling success of previous years. In India, the major exploration and production activities of OIL are carried out in Assam & Assam-Arakan and Rajasthan. In Assam & Assam-Arakan, during the years 2009-10 and 2010-11, there was an overall decreasing trend in respect of reserve accretion. OIL did not achieve its target for reserve accretion at Rajasthan during last five years. The total reserve accretion was only 59 per cent of the targeted quantity. **(Para 3.2)**

2.3 Reserve Replacement Ratio (RRR) measures the relationship between new reserves accreted and oil produced, reflecting how well an oil company is replacing its production. Though OIL achieved RRR of more than 1 in Assam & Assam-Arakan during the period from 2009-10 to 2013-14, the Ultimate Reserve Accretion registered a downward trend. Consequently, the RRR has a declining trend from 1.84 in 2009-10 to 1.31 in 2013-14. **(Para 3.3)**

2.4 OIL made 33 hydrocarbon discoveries in Assam & Assam-Arakan under Nomination regime[2] during the period from 2009-10 to 2013-14, including four discoveries which were yet to be monetized. Out of four discoveries pending for monetization, three discoveries were currently techno-economically unattractive for field development and one discovery is awaiting stimulation. **(Para 3.4)**

[2] Before introduction of New Exploration Licensing Policy in 1997, the National Oil Companies viz., ONGC and OIL were awarded blocks for exploration on nomination basis and are known as "Nomination Blocks".

2.5 In NELP, in spite of being one of the NOC with technical experience in the E&P sector, performance of OIL lagged behind peers in the industry. Out of the total discoveries during NELP period, OIL made only one discovery in Punam well in Rajasthan which is yet to be monetized (April 2015) though the discovery was made in July 2012. **(Para 3.4)**

Efficiency and Economy in Survey Process

2.6 OIL did not achieve its own targets of 2D survey with respect to revised plan target except in 2 years. Similarly, it did not achieve its own target in 3D for 3 years. OIL drastically reduced its targets in both 2D and 3D in first two years of twelfth five year plan from the Planning Commission targets. **(Para 4.1)**

2.7 No norm for timely Acquisition, Processing and Interpretation (API) completion was set/fixed by OIL to carry out in-house survey work. In absence of any norm, OIL did not have any control over the time schedule of survey work. In respect of 10 completed survey works, time taken to complete the API cycle ranged between 472 and 2005 days and in respect of 13 survey work-in-progress, the works remained incomplete from 330 days to 2069 days after completion of acquisition/ processing of data. In case of outsourced survey, excess time was taken in 9 contracts (75 *per cent*) out of 12 contracts examined, ranging between 1 month and 20 months**. (Para 4.2.1 & 4.2.2)**

2.8 Examination of survey contract also revealed deficiencies in the contract leading to undue benefit to the contractor, payment of penalty towards unfinished work programme and expenditure on survey works without value addition. **(Para 4.3)**

Efficiency and Economy in Drilling Operation

2.9 In exploratory drilling, there were significant shortfalls in the drilling of exploratory wells during the period 2009-10 to 2013-14. In development drilling, there was significant cumulative shortfall in the drilling of development wells during the period from 2009-10 to 2013-14. OIL depended more on development drilling (ranging from 48 to 66 per cent) and less on exploratory drilling (ranging from 34 to 52 per cent) resulting in shortfall in exploratory drilling as compared to development drilling. The

low prioritization of exploration efforts undermined the overall objective of adding new fields of hydrocarbon as envisioned in Hydrocarbon Vision 2025. **(Para 5.1.1.1)**

2.10 The efficiency of drilling rigs is judged on the basis of commercial speed and cycle speed. There were abnormal fluctuations in commercial speed and cycle speed of own rigs and hired rigs during the period from 2009-10 to 2013-14, while the number of rigs remained the same. OIL did not fix norms for commercial speed and cycle speed for its own rig and also did not fix and incorporate the same in the contracts for hired rigs. **(Para 5.1.1.3)**

2.11 The percentage of Non-Productive Time (NPT) in case of own rigs increased from 31 per cent in 2009-10 to 39 per cent in 2013-14. In case of chartered hire rigs, the percentage of NPT increased from 19 per cent in 2009-10 to 45 per cent in 2013-14. Although the ONGC norm for NPT is less than 10 per cent and international norm is less than 5 per cent, the average actual NPT of own rigs of OIL was 40 per cent and chartered hire rigs was 35 per cent. Norm for NPT has not yet been fixed by OIL. NPT of own workover rigs ranged between 7 and 13 per cent and chartered hire workover rigs ranged between 5 and 18 per cent during the period from 2009-10 to 2013-14. **(Para 5.1.1.4)**

2.12 Delay in production testing resulted in under utilization of rigs and loss of meterage which resulted in increase in NPT. In 59 wells (30 wells drilled by own rig and 29 wells drilled by chartered hire rig), OIL failed to complete the production testing as planned. The delay in completion of production testing ranged between 9 and 94 days. As per the status report of the wells as on 31 March 2014, in 8 wells the production testing remained incomplete even after a lapse of two to four years. Total delay for production testing in case of own rigs was 1005 days and in case of chartered hire rigs was 980 days during the period from 2009-10 to 2013-14. On account of delay in production testing, OIL paid ₹ 88.02 crore in 29 cases towards standby charges to the contractor against the chartered hire rigs. **(Para 5.1.1.5)**

2.13 The ideal life span of a drilling rig ranged between 20 and 25 years depending on various factors viz. use, maintenance etc. Vintage of in-house drilling rigs were in the range of 9 and 36 years as on 31 March 2014. Similarly, out of 13 existing in-house workover rigs, the vintage of 9 workover rigs was in the range of 25 and 35 years and vintage of 4 workover rigs was in the range of 5 and 25 years. Since OIL is operating

with a fleet of very aged equipment, it affected the exploratory drilling of OIL due to high NPT. **(Para 5.1.1.6)**

2.14 OIL did not initiate any action till December 2010 for procuring drilling rig to reduce its dependence on the hired rig. The last procurement of drilling rigs made by OIL was in 2006 only for replacement of old drilling rigs. Subsequent action of OIL in December 2010 for procurement/commissioning of drilling rigs did not materialize on account of legal dispute and an accident of the rig carrying vehicle. As such OIL still depended on hired rigs. **(Para 5.2.1)**

2.15 While reviewing the management of contracts for acquisition of own rigs and for chartered hiring of rigs, Audit found inordinate delay in procurement of rigs, higher dependence on chartered hire rigs, avoidable time allowed for mobilization of rigs, violation of contractual terms and conditions, idling of rigs etc. OIL gave preference to a supplier over manufacturer in procurement of rigs which lacked transparency. Further, it placed purchase order to a supplier for supply of drilling rigs without resorting to fresh tender, violating CVC guidelines. It also allowed the supplier to change specification of rig after finalization of contract. In another case OIL deprived itself of getting competitive rate by not going in for fresh tendering. **(Para 5.2.2)**

Effectiveness of Exploration Efforts

2.16 Under the Nomination regime, OIL was granted Petroleum Exploration License (PEL) in 16 blocks during the period from 1985 to 1999. During last five years ending 2013-14, OIL converted only two blocks, that too partially, from PEL into Petroleum Mining Lease (PML). Out of five operational PELs, OIL applied for extension in three blocks (Dibrugarh, Tinsukia and Deomali), in respect of which the approval of DGH was awaited (December 2014). In balance two PEL blocks (Jairampur Ext. and Namchik PEL) allotted in May 1990 and April 1999, OIL initiated action to drill in two locations. OIL had 22 PML blocks under operation during the period from 2009-10 to 2013-14, out of which five blocks remained idle from 4 to 14 years after conversion into PML, where the reasons were under OIL's control. **(Para 6.1.1 and 6.1.3)**

2.17 Upto round-IX, GOI offered 360 exploration blocks, out of which 254 blocks were awarded till 31 March 2014. OIL participated in all the nine NELP rounds and

submitted bids for 67 blocks and was awarded 40 blocks either alone or in the form of consortium. Out of 40 blocks awarded, in 11 blocks OIL performed as operator and paid LD of ₹ 68.63 crore towards unfinished minimum work programme during 2009-10 to 2013-14 in respect of 6 relinquished blocks. The percentage of participation in NELP rounds was quite low except in round-IX where OIL bid for 50 per cent of blocks offered**. (Para 6.2.1 and 6.2.3)**

2.18 The delay in granting of PEL by the concerned State Government also delayed the process of exploration. The PSC for block (KG-ONN-2004/1) was signed in March 2007, however, the PEL for 511 Sq. Km area in Andhra Pradesh was granted in February 2008, after a gap of 350 days from signing of PSC, and the PEL for 38 Sq. Km area in Puducherry was granted in June 2010, after a gap of more than three years from signing of PSC**. (Para 6.3.1)**

2.19 There were delays in exploration of blocks and non completion of committed Minimum Work Programme (MWP) within the exploration phase, due to non-obtaining of clearances by the MOPNG from different Ministries/ Departments before carving out of blocks for inclusion in the offer list of NELP round or even award of blocks under Nomination or pre-NELP period. This did not enable OIL to concentrate fully on their area of specialization (i.e. exploration and production). In seven blocks the exploration effort of OIL was held up due to delay in getting clearances or non-availability of clearances from the concerned Ministries/ Departments. **(Para 6.3.2)**

2.20 The weightage given in MOU for exploration activities of OIL towards timely completion of NELP blocks and payment of penalty in case of default was nil. Parameters with respect to seismic survey and drilling of wells in domestic field have not been given its due weightage in the MOU. Seismic surveys have been removed from the MOU target since 2011-12. Besides, parameter for drilling of wells under NELP was removed from MOU target since 2013-14. **(Para 6.3.3)**

2.21 OIL also bid for NELP blocks in the same area where it had relinquished an earlier PEL block for logistic constraints. It was also noticed that in two PEL blocks relinquished by OIL, hydrocarbon discovery was made by private operators under Pre-NELP/NELP regime. **(Para 6.4.1 and 6.4.2)**

Monitoring of Exploration Activities

2.22 OIL was not able to utilize the entire BE in all the years from 2009-10 to 2012-13. In 2013-14, expenditure under survey and exploratory drilling remained less than BE though overall expenditure exceeded BE due to increased investment in Joint Ventures. For all the five years, the actual expenditure against survey and exploratory drilling fell short of BE by 13 to 40 per cent. **(Para 7.1.1)**

2.23 The Hydrocarbon Vision 2025 inter-alia included, 100 per cent exploration coverage of the Indian sedimentary basins by 2025, to keep pace with technological advancement and application and be at the technological forefront in the global exploration and production industry. Actual expenditure on R & D activities was less than the BE in all the years during the period from 2009-10 to 2013-14; the reasons for such wide variations were not on record. **(Para 7.1.2)**

2.24 The exploration group consists of Geophysics, Geological & Reservoir and Drilling Department which plays a key role in exploration activities of OIL. There was shortage of manpower in these departments despite its importance in exploration activities. **(Para 7.2)**

2.25 OIL is having an Internal Audit Department headed by a General Manager who in turn reports to Director (Finance). During the period from 2009-10 to 2013-14, the post of GM (IA) remained vacant and the IA department directly reported to Director (Finance). Ideally the functioning of IA department should be independent and should report directly to CMD; contrary to this, the IA department of OIL was reporting to Director (Finance). **(Para 7.3)**

2.26 The contract manual did not specify the time line for different stages of contract processes in order to obtain the goods and services in time. It also did not include comprehensive guidelines regarding fixation of responsibility in case of damage or loss of drilling units/ sub-surface tools/ equipments of contract while carrying out the jobs. There was no schedule of programme for award of contract prepared by the concerned department. OIL has not fixed any norm for finalization of tender and award of the contract. As a result, no control mechanism was in place to ensure timely award of contract. Further, the contract manual was not updated since October 2009. **(Para 7.5)**

3. Recommendations

OIL as well as MOPNG may ensure that OIL's core business, i.e., hydrocarbon exploration as an upstream NOC is given priority as recommended below:

- OIL may build necessary capability to ensure proving of reserves by commensurate upgradation from 3P to 2P and 2P to 1P category of reserves.
- In the MOU the weightage given to "accretion to recoverable reserves" may be increased by MOPNG to emphasise higher importance of the core activity of exploration.
- Norms for the API cycle may be formulated and linked with performance parameters. OIL may closely monitor its survey contracts to ensure timely completion of exploration.
- MOPNG should take necessary steps to ensure that NOCs abide by the exploration targets assigned to them.
- OIL may finalize its procurement plan in time to replace the vintage rigs, both drilling and workover**.**
- OIL should be able to use its experience and resources to be able to operate in the competitive NELP regime and bid judiciously for prospective blocks.
- OIL should adhere to MWP schedules so as to fully explore the blocks and to avoid liquidated damages.
- MOPNG should ensure availability of clearances for carrying out exploratory activities before awarding the blocks.
- Proper monitoring on utilization of budget is called for to avoid shortfalls.
- OIL should pay attention to its R&D activities and keep abreast of latest technologies especially in view of the fact that it is a cash rich company**.**
- OIL should quicken its action on recruiting executives in technical departments as well as in internal audit department.
- The contract manual may be updated and the awarding of contracts need to be in line with CVC guidelines, principles of financial prudence and monitoring of contracts execution may be made more stringent.
- Reporting mechanism of OIL needs to be strengthened for creating MIS and monitoring of them by the different bodies culminating in the BOD.

CHAPTER 1

INTRODUCTION

1.1 Background

Energy drives our societies and industries. The growth of a nation, encompassing all sectors of the economy and all sections of society, is contingent on meeting its energy requirements adequately. Oil and gas are critical components of our energy basket and will continue to play a crucial role in meeting the energy requirement of our country in the foreseeable future until some renewable form of energy becomes viable.

Oil India Limited (OIL), a National Oil Company (NOC), is engaged in the business of exploration, development and production of crude oil and natural gas, transportation of crude oil and production of Liquid Petroleum Gas (LPG). OIL was incorporated on 18 February 1959 as a Partnership Venture (i.e. Oil India Private Limited) between Government of India (GOI) with one third share and Burmah Oil Company, United Kingdom (BOC) with two third share to manage oilfields of Naharkatiya in Assam. On 14 October 1981, OIL became a Government of India Enterprise, as a wholly owned public sector undertaking, under the administrative control of Ministry of Petroleum and Natural Gas (MOPNG) by taking over the equity of BOC. It was converted (August 1995) into a Public Limited Company to enable it to issue shares to its employees as well as to the public at large to augment resources for increasing exploration efforts. OIL became a listed company in September 2009 with 78.43 per cent share holding by Central Government and 21.57 per cent held by public and other financial institutions. OIL was conferred the 'Navratna Status' in April 2010.

One of main objectives[1] of OIL is to carry out exploration and to develop, optimize production of hydrocarbon by geological, geophysical or any other kind of surveys for exploration of petroleum resources, to carry out drilling, both onshore and offshore and other prospecting operations to probe and estimate the reserves or petroleum resources, to undertake, encourage and promote such other activities as may lead to the establishment of such reserves including but not limited to geological, geophysical, geochemical, scientific and other investigations.

The operations of OIL cover the entire gamut of upstream activities of hydrocarbon sector which includes geological survey, exploration and development of oilfields, production of crude oil and natural gas, conversion of natural gas into LPG, transportation of crude oil and natural gas. The operations of OIL are monitored from five places viz. Duliajan (Assam),

[1] Source: Memorandum and Articles of Associations of OIL

Jodhpur (Rajasthan), Kakinada (Andhra Pradesh), Guwahati (Assam) and Noida (Uttar Pradesh).

OIL's entire crude oil production comes from fields located in Assam and Arunachal Pradesh while production of gas comes from Assam, Arunachal Pradesh and Rajasthan fields. OIL also produces LPG in its LPG Bottling Plant at Duliajan, Assam.

1.2 Hydrocarbon Exploration and Production

Accretion of hydrocarbon is the goal of any upstream oil and gas company. The first phase in the process of extraction of hydrocarbon is exploration – the search for oil and gas deposits beneath the earth's surface. Such deposits could either be onshore or offshore. The major activities involved in the process of exploration are given in table 1.1:

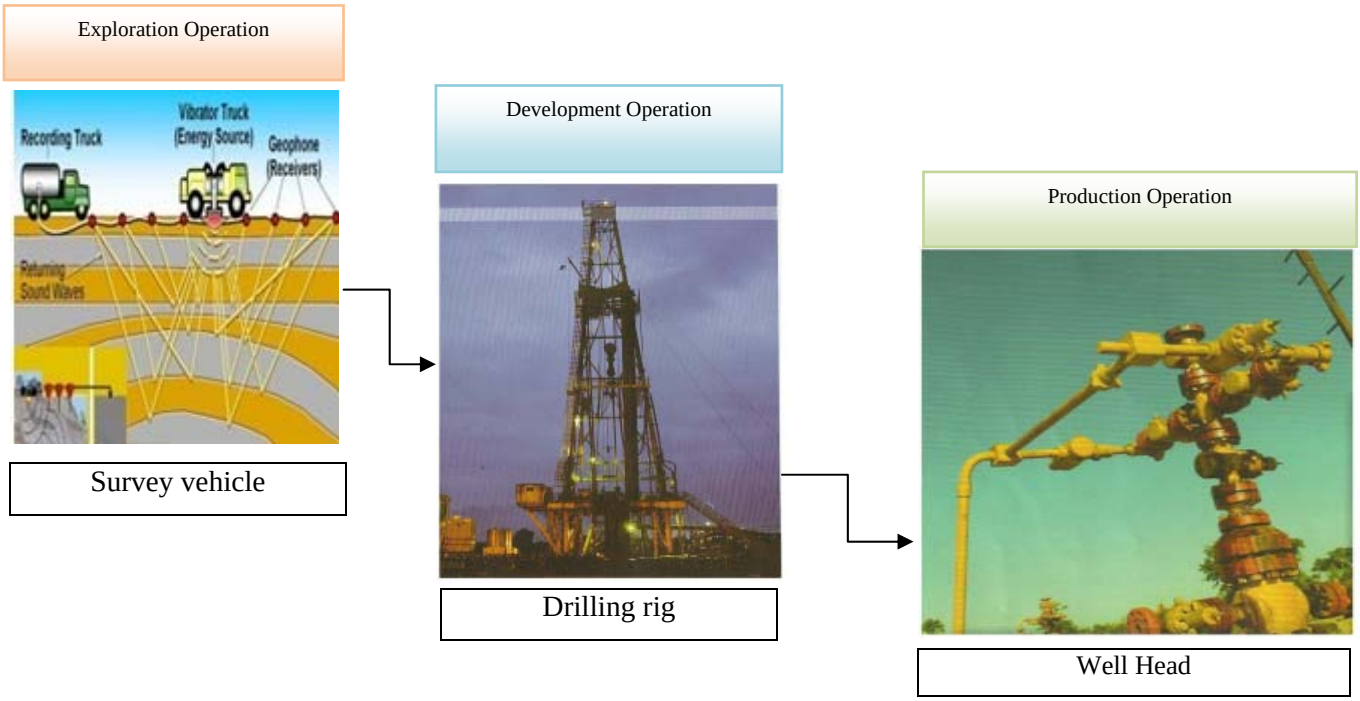
Table 1.1 – Phases of exploration

Types of Activities	Phases of exploration	Reference to the Chapter No. of the Report
Preliminary Survey - Surface Surveys and Sub Surface Survey	Surface surveys is the study and evaluation of surface structures and features including aerial photography, satellite imaging, imaging radar, and topographical and geological mapping from which inferences can generally be made regarding sub-surface formations. Sub-surface surveys is the study and evaluation of underground formations which involve accumulation of data to determine properties like gravitational pull, magnetic field and response to sound waves of the sub-surface rock structures using gravity meters, magnetometers and seismographs. Seismic studies (2D, 3D) are the most commonly used and important type of sub-surface testing.	Chapter-4
Seismic Survey	Seismic survey is conducted to identify the formation and possibility of locating hydrocarbon reservoirs. It involves acquisition of seismic data, processing and interpretation by geologists to identify formations with high probability, commonly known as Acquisition, Processing and Interpretation (API). Time taken in respect of API depends on the area of the Block, the volume of seismic data, the number of wells available in the Block, the number of prospects, the type of prospects, the vintage and quality of available data, the requirement for additional data and type of data and the size of the survey team.	Chapter-4

Exploratory Well and Exploratory Appraisal Well	Based on the results of survey, exploratory wells are drilled for the purpose of searching for undiscovered hydrocarbon accumulation on any geological entity. Wells drilled in an unproved area to determine the existence or otherwise of oil or gas after prospects are identified and evaluated. For adding newer areas of hydrocarbon reserves, exploratory drilling is important. Exploratory appraisal wells are drilled around exploratory wells to gauge the boundaries of the reservoir with the objective of accurately estimating the recoverable oil /gas reserves.	Chapter-5
Development wells	Development drilling starts once exploration has provided a reservoir model with enough information to choose drilling locations. Development wells are drilled for the purpose of increasing the production of hydrocarbon from an established field.	Chapter-5
Commercial Discovery/ Monetization	This is a declaration made by upstream oil companies duly approved by Management Committee comprising of representatives of MOPNG, Directorate General of Hydrocarbon (DGH) and local management and accepted by DGH regarding the commercial viability of discovered hydrocarbon reserve through monetization.	Chapter-3

Hydrocarbon exploration and production (E&P) operations, also referred to as upstream operations, can be described in the following phases as depicted in figure 1.1:

Figure: 1.1 Phases of Exploration



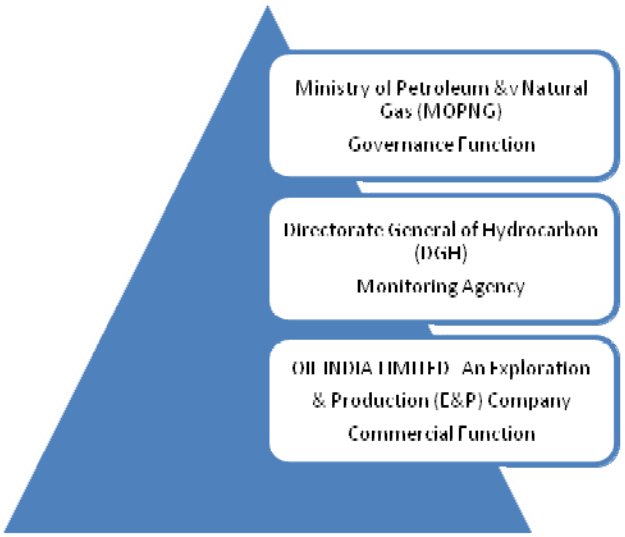
In the present Performance Audit Report, audit reviewed the first two stages of the above (i.e. exploration and development operation) of OIL for gauging hydrocarbon exploration efforts of OIL.

1.3 Institutional Framework for Hydrocarbon Exploration

MOPNG deals with exploration and production of oil and natural gas, refining, distribution and marketing, import, export and conservation of petroleum products. Besides, MOPNG formulates policies, rules and regulations that govern exploration and production operations in the oil and gas sector.

DGH - a nodal agency under administrative control of MOPNG was set up on 8 April 1993 for sound management of the Indian petroleum and natural gas resources and providing advice to MOPNG on issues relevant to the exploration and optimal exploitation of hydrocarbon in the country. The institutional framework showing the relationship of MOPNG, DGH and OIL is depicted in figure 1.2:

Figure: 1.2 Institutional Framework



Oil & Natural Gas Corporation Limited (ONGC) and OIL are two NOCs that are engaged in commercial activities related to exploration and production (E&P) of hydrocarbon. MOPNG with the assistance of DGH regulates the hydrocarbon exploration of OIL and other E&P companies under the provisions of Oilfields (Regulation and Development) Act, 1948 and Petroleum and Natural Gas Rules, 1959. MOPNG is also responsible for issue of licenses to the NOCs and the private operators for the offshore areas and concerned State Governments issue licenses for onshore E&P activities on the recommendation of MOPNG.

As per Petroleum and Natural Gas (Amendment) Rules 2003, “no person shall prospect for petroleum except in pursuance of a petroleum exploration license (hereinafter referred to as a license) granted under these rules, and no person shall mine petroleum except in pursuance of

a Petroleum Mining Lease (hereinafter referred to as a lease) granted under these rules. Every holder of a license and every holder of a lease shall in these rules be referred to as the licensee and the lessee, respectively.

For undertaking exploration activities, an entity is required to obtain Petroleum Exploration License (PEL[2]) under the provisions of the Petroleum and Natural Gas Rules, 1959 from the Central Government in respect of offshore blocks and from the concerned State Government in respect of onshore blocks with the previous approval of the Central Government. After discovery of hydrocarbon, PEL area is converted into Petroleum Mining Lease (PML[3]) area. For extraction of petroleum, the contractor is required to obtain a Mining Lease under the provisions of the Petroleum and Natural Gas Rules, 1959 from the Central/State Government.

The Central Government may, if it deems fit, notify in the official Gazette from time to time particulars regarding the basis on which the Central Government may be prepared to consider proposals for prospecting or mining operations in any specified area or areas. The area covered by a license shall be specified therein and the term of a license shall in the first instance be valid for a period of four years which may be extended for two further periods of one year each.

New Exploration Licensing Policy[4] (NELP) was formulated by the Government of India (GOI) in 1997 to provide a level playing field to both public and private sector companies in exploration and production of hydrocarbon. NELP became effective from February 1999. Since then, licenses for exploration are being awarded only through a competitive bidding system. Under NELP, NOCs are required to compete on an equal footing with Indian and foreign companies to secure PELs. Upto 31 March 2014, the GOI announced nine rounds between 1999 and 2010, inviting companies to bid for exploratory blocks under deep water, shallow water and onshore category in various basins[5].

Keeping in view the vital role of hydrocarbon sector in the economic growth of the country and to have a long-term policy i.e. 100 per cent exploration coverage of the Indian

[2] For undertaking exploration activities, the contractor is required to obtain Petroleum Exploration License under the provisions of the Petroleum and Natural Gas Rules, 1959 from the Central Government in respect of offshore blocks and from the concerned State Government in respect of onland blocks with the previous approval of the Central Government.

[3] For extraction of petroleum, the contractor is required to obtain a Mining Lease under the provisions of the Petroleum and Natural Gas Rules, 1959 from the Central/State Government.

[4] With the introduction of NELP in 1997, MOPNG awarded exploration blocks through a competitive bidding process to NOCs and private sector companies and are known as NELP blocks.

[5] A depression in the earth's crust where sedimentary materials are accumulated over the years.

sedimentary basins by 2025, for the hydrocarbons sector, MOPNG formulated the Hydrocarbons Vision–2025 in March 2000. The vision addresses the issues such as energy security, use of alternative fuels, inter-changeability of technology which are vital to ensure that the mix of energy sources used in the economy is optimal and sustainable and that adequate quantities of economically priced clean and green fuels are made available to the Indian consumers. The objectives of the vision, inter alia, are:

- To undertake a total appraisal of Indian sedimentary basins for tapping the hydrocarbon potential and to optimise production of crude oil and natural gas in the most efficient manner so as to have Reserve Replacement Ratio (RRR) of more than 1.
- To keep pace with technological advancement and application and be at the technological forefront in the global exploration and production industry,
- To achieve as near as zero impact, as possible, on environment.

OIL constituted (November 2009), an internal multi-disciplinary Task Force to formulate the Strategic and Corporate Plan for it. OIL, as such, prepared a draft Strategic and Corporate Plan 2011-2020 which was discussed in a Strategic Meet held in March 2012. However, the said plan was not placed before the Board for approval.

OIL's Draft Strategic and Corporate Plan 2011-20 has taken into consideration Hydrocarbon Vision 2025 as highlighted in table 1.2:

Table 1.2 – Hydrocarbon Vision 2025 vis-à-vis OIL's Draft Strategic and Corporate Plan 2011-20

Hydrocarbon Vision 2025	OIL Draft Strategic & Corporate Plan 2011-2020
To assure energy security by achieving self-reliance through increased indigenous production.	Maintain & Enhance reserves and production from NE assets by improving output and thus profitability of OIL would enhance by fully exploiting the potential of NE assets.
To undertake a total appraisal of Indian sedimentary basins for tapping the hydrocarbon potential and to optimize production of crude oil and natural gas in the most efficient manner so as to have RRR of more than 1.	Undertake regional basin modeling of Assam-Arakan Basin, geo-modelling and exploration in thrust belt area. Explore stratigraphic/ combination reservoirs. Explore Eocenes in and around matured fields.
To assure energy security by achieving self-reliance through investment in oil equity abroad.	Look for inorganic growth opportunities overseas.
Optimise recovery from discovered/matured	Build dynamic models for all fields and formulate

fields.	Field Redevelopment Plan/Development Plan. Establish reservoir-wise deliverability of existing oil & gas fields. Revisit Eastern and Western Satelite fields. Undertake reservoir optimization of Jorahan-Jaipur Field. Undertake measures to revitalize Digboi field.
Continue technology acquisition and absorption along with development of indigenous R&D	4-D Seismic for Reservoir Monitoring. Apply IOR/EOR methods and Water Flooding and bring Recovery Factor (RF) up to 45 per cent. Undertake enhanced systematic work-over operations. Reviews & Improve existing water injection system/monitoring of Water Front.
Aggressively pursue extensive exploration in non-producing and frontier basins for knowledge building and new discoveries including deep-sea offshore areas.	Exploration in frontier areas.
Acquire acreages abroad for exploration as well as production.	Acquire proven/producing assets or companies with proven/producing assets in India and overseas.

1.4 Performance Accountability Arrangements for Exploration

The Memorandum of Understanding (MOU) is a negotiated agreement between the management of the Central Public Sector Enterprises (CPSEs) and the GOI. The main purpose of the MOU system is to ensure a level playing field to the PSE vis-à-vis the private corporate sector. The management of the CPSE, is made accountable to the Government through the promise of a performance contract. The Government continues to exercise control in setting of MOU targets, and through performance evaluation during and at the end of the year. The Performance targets for MOUs are framed on a five point scale (i.e. Excellent, Very good, Good, Fair and Poor).

The performance evaluation of MOUs are divided into financial and non-financial parameters carrying weightage of 50 per cent each. The financial parameters relate to profit, size and productivity. The non-financial parameters are divided into dynamic, enterprise-specific (i.e. safety and pollution) and sector-specific (i.e. change in demand and supply, price fluctuation, variation in interest rates etc.) parameters. Subsequently, CSR, R & D and Sustainable Development were included in non-financial parameters with a weightage of five per cent each. The choice of individual non-financial parameters constitutes 50 per cent of weightage left to the combined wisdom of the CPSE, Administrative Ministry and Department of Public Enterprises (DPE).

Evaluation of MOU is done at the end of the year by MOPNG and DPE through a Task Force on the basis of actual achievement vis-à-vis the MOU targets. The overall MOU composite score is arrived at by adding weightage for all the parameters.

The year-wise weightage given to exploration activities (seismic surveys and drilling), accretion to recoverable reserve, production of crude, finding cost, cost of production of crude, are given in table 1.3:

Table 1.3 - Weightage given in MOU for exploration activities

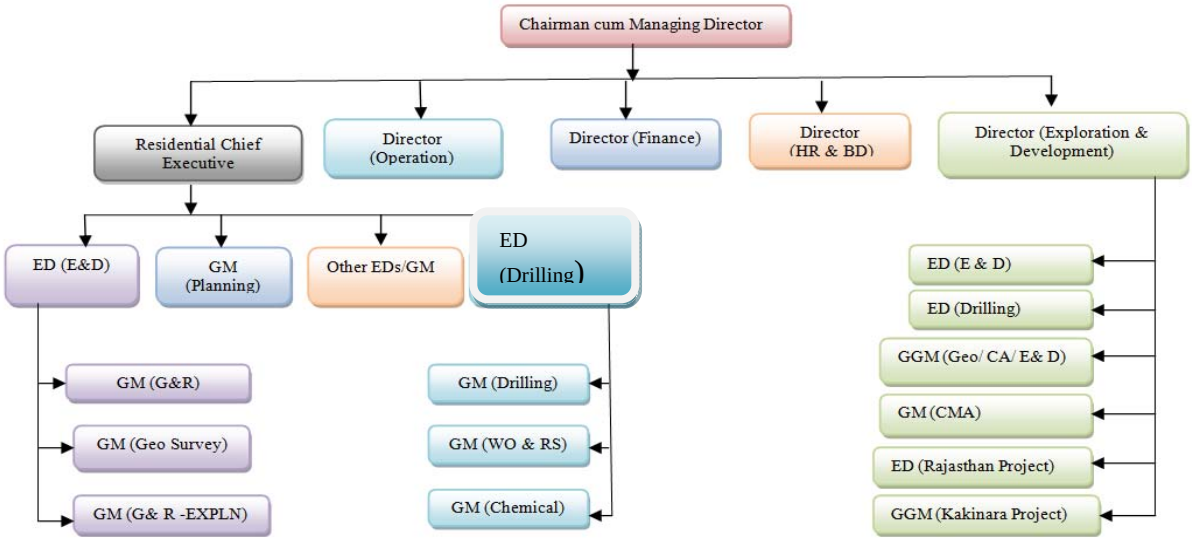
Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
Seismic survey (2D and 3D)	1	2	0	0	0
Drilling of wells in NELP	1	1	2	0	0
Accretion to recoverable reserve	8	8	7	4	5
Finding cost	5	4	1	1	2
Cost of production of crude	5	4	1	2	2

Based on the performance of OIL during the period from 2009-10 to 2013-14, DPE graded OIL as “Excellent” in four out of five years and was graded as “Very Good” for the year 2010-11.

1.5 Organisational Arrangements in OIL

The management of OIL is vested in a Board of Directors consisting of 12 Directors including two Government Nominee Directors and five independent Directors. The Chairman-cum-Managing Director (CMD) is the Chief Executive of the Company who looks after the day to day affairs of OIL with the assistance of a Director (Exploration and Development), Director (Human Resource and Business Development), Director (Operation), Director (Finance) and Company Secretary at the Corporate Office, Residential Chief Executive (RCE) at Registered Office at Duliajan, Assam and Group General Managers at the Project offices. The Director (Exploration and Development) is assisted by two General Managers at Corporate office level and General Managers at field level and are responsible for oil and gas exploration activities. The organizational chart of OIL related to exploration activities is given in figure 1.3:

Figure 1.3 - Organizational Chart of OIL's Exploration Activities

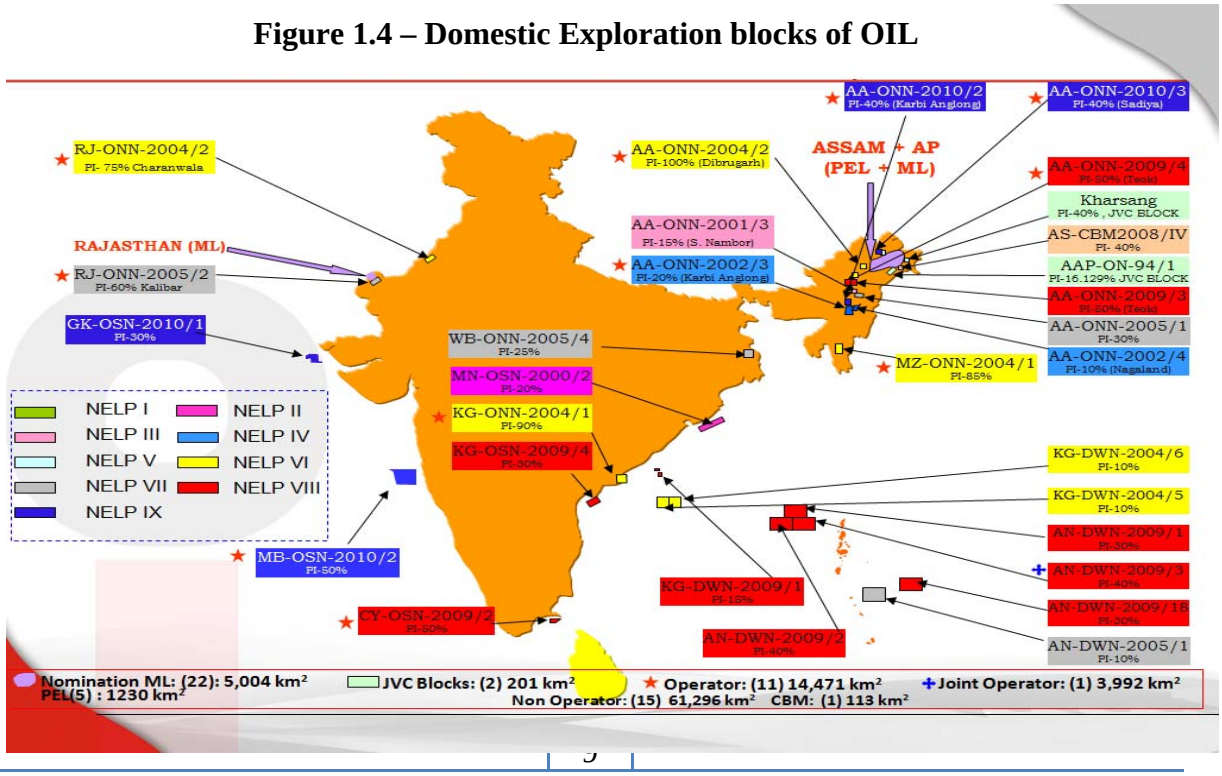


The Board set up (August 1993) a Corporate Business Committee (CBC), with all functional directors, for approval of all procurements and contracts (including service contracts, consultancy and turnkey contracts) upto ₹120 crore. The approval for procurement and contracts beyond the power of CBC vests with the Board of Directors (BOD).

1.6 Exploration Blocks of OIL in India and Overseas

The exploration blocks of OIL in India as on 31 March 2014 are shown in figure 1.4:

Figure 1.4 – Domestic Exploration blocks of OIL



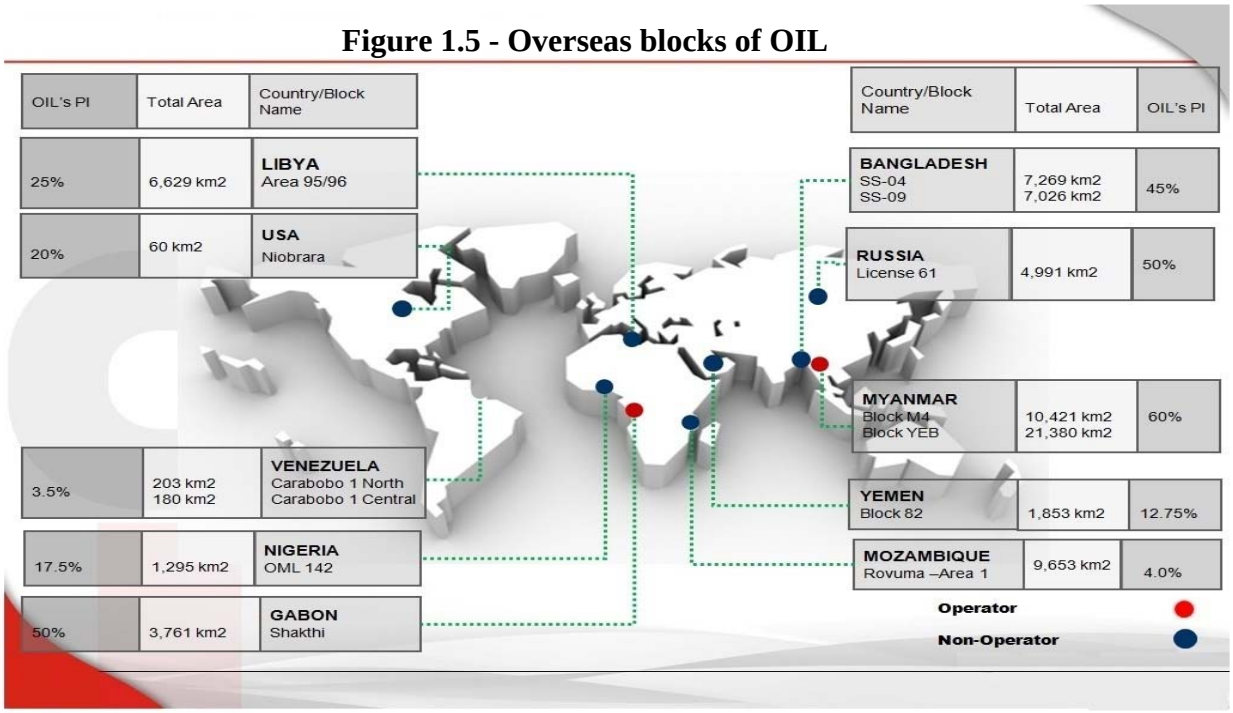
The activities of OIL in country are spread over the states/ union territories of Assam, Arunachal Pradesh, Mizoram, Rajasthan, Andhra Pradesh, Puducherry, Tamilnadu, Andaman, Maharashtra, Odisha, West Bengal and Gujarat. The total operational area of OIL under nomination is 6234 sq.km. and the same under NELP is 18463 sq.km.

OIL is currently operating in 22 nominated PML and 5 nominated PEL areas, allotted under the nomination regime[6]. OIL upto the end of NELP IX round is holding participating interest (PI) in total 30 NELP blocks both as operator and non-operator. These blocks are situated in ten[7] sedimentary basins. OIL holds PIs as non-operator in 15 blocks, 2 JVC and 1 CBM block.

OIL is operator in six basins consisting of 11 blocks and joint operator in one basin having 1 block. Among these, 9 blocks are in four basins, e.g Assam, Assam-Arakan, Krishna-Godavari and Rajasthan. Remaining 3 blocks are in Cauvery, Mumbai and Andaman basins which are in initial stages of operation, where blocks were awarded in NELP round-VIII to IX between June 2010 and August 2012.

The exploration blocks of OIL in overseas as on 31 March 2014 are shown in figure 1.5:

Figure 1.5 - Overseas blocks of OIL



[6] Before introduction of New Exploration Licensing Policy in 1997, the National Oil Companies (NOCs) viz., ONGC and OIL were awarded blocks for exploration on nomination basis and are known as "Nomination Blocks'

[7] Assam , Assam -Arakan, Rajasthan, Krishna-Godavari, Cauvery, Andaman, Mumbai, Mahanadi (non-operator), West Bengal(non-operator) and Gujarat-Kutch (non-operator)

OIL's overseas E&P activities comprises of 13 blocks and are spread over 10 countries covering Libya, Gabon, Nigeria, Yemen, Myanmar, Bangladesh, Venezuela, USA, Mozambique and Russia. Total area under OIL's overseas operations is 74721 sq.km.

1.6.1 Nomination blocks

The year-wise details of nomination blocks of OIL along with the areas held for the last five years ended March 2014 is given in table 1.4:

Table 1.4 - Year-wise position of Nomination blocks

Year	Year-wise position of PEL Blocks	Area (Sq. Km)	Year-wise position of ML Blocks	Area (Sq. Km)
2009-10	16	5367.750	19	4811.006
2010-11	7	1760.500	21	5028.500
2011-12	8	1783.750	20	4916.010
2012-13	8	1894.000	21	5095.000
2013-14	5	1230.000	22	5004.000

Source : Annual Plan of OIL

1.6.2 NELP blocks

The year-wise details of NELP blocks of OIL along with the areas held for the last five years ended March 2014 is given in table 1.5:

Table 1.5 - Year-wise position of NELP blocks

Particulars	2009-10		2010-11		2011-12		2012-13		2013-14	
	No.	Area (Sq. Km)	No.	Area (Sq. Km)	No.	Area (Sq. Km)	No.	Area (Sq. Km)	No.	Area (Sq. Km)
Onshore	10	11802	10	10987	10	10621	10	9513	9	9439
Offshore-Shallow water	0	0	1	1621	1	1621	2	5032	2	5032
Offshore-Deep Water[8]	0	0	1	3992	1	4040	1	3992	1	3992
Total	10	11802	12	16600	12	16282	13	18537	12	18463

Source : Annual Plan of OIL

1.7 Financial Parameters for Exploration Activities of OIL

The year-wise financial position of OIL during the last five years ended 31 March 2014 is given in table 1.6:

[8] Jointly operated block

Table 1.6 - Financial position of OIL

(₹ in crore)

Liabilities	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**Assets**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Paid up Capital	240.45	240.45	240.45	601.14	601.14	Net fixed assets	4018.90	4248.29	4493.53	4994.87	5478.73
Reserves & Surplus	13523.34	15361.42	17480.89	18610.34	20107.04	CWIP	927.11	1324.05	1131.50	1769.01	2077.16
Borrowings	37.50	1026.79	10.13	1057.81	9782.69	Investment	859.44	890.41	783.09	857.90	11256.61
Other long-term liabilities	1022.79	1313.53	1480.49	1666.76	2069.32	Other non-current assets	--	--	324.65	630.77	620.11
Trade dues & Other current liabilities	3269.29	3321.61	3469.31	3244.80	2314.26	Current Assets Loans and advances	12287.92	14801.05	15948.50	16928.30	15441.84
Total	**18093.37**	**21263.80**	**22681.27**	**25180.85**	**34874.45**	**Total**	**18093.37**	**21263.80**	**22681.27**	**25180.85**	**34874.45**

The year-wise total budgeted estimates, revised estimates and actual expenditure of OIL during the last five years ended 31 March 2014 is given in Annexure I.

CHAPTER 2

AUDIT FRAMEWORK

2.1 Why did Audit select this subject

The Indian economy is at a critical stage of development. While the energy requirement of the country continued to increase, with the limited domestic availability of oil and gas, the country is compelled to import over 75 per cent of its domestic requirement every year. Keeping in view the growing requirement of energy in the country, Ministry of Petroleum and Natural Gas, Government of India has adopted a multi-pronged strategy for giving momentum to exploration and production in the country by taking several measures during New Exploration Licensing Policy regime for enhancing the domestic production of crude oil and natural gas through involvement of public sector and private sector companies in a time bound manner.

In the above backdrop, the role of Oil India Limited (OIL) in hydrocarbon exploration is of great importance. Exploration of sedimentary basins, being one of the main objectives of OIL, helps to meet the hydrocarbon requirement of the nation. As such, the 'Performance Audit on Exploration Efforts of Oil India Limited' was undertaken considering the importance of exploration in the oil-gas sector and energy security of the nation.

2.2 Audit Objectives

The Performance Audit attempts to have a holistic view of OIL's exploration performance. The purpose of this audit was to ascertain whether OIL's exploration efforts had been taken up with proper planning and executed with efficiency and effectiveness to achieve its own and the nation's envisioned hydro-carbon goal.

The objectives of the Performance audit were to assess the extent to which:

- OIL had achieved hydrocarbon reserve accretion through exploration efforts;
- Efficiency and economy were achieved in conducting survey;
- Efficiency and economy were achieved in conducting drilling operations;
- Exploration efforts of OIL were effective under nomination and NELP regime; and

- OIL was effective towards utilization of financial, technological and human resources and oversight role of Board of Directors of OIL, MOPNG and DGH towards exploration efforts.

2.3 Audit Scope

The performance audit covered review of the major operational efforts of OIL covering the period from 2009-10 to 2013-14 in four operational basins i.e. Assam, Assam-Arakan[9], Krishna-Godavari and Rajasthan as operator towards hydrocarbon exploration which were carried out from Registered office at Duliajan, Assam, Project office at Kakinada, Andhra Pradesh, Project office at Jodhpur, Rajasthan and Corporate Office at Noida, Uttar Pradesh respectively. Activities in Mahanadi basin were also reviewed from Corporate Office at Noida and Audit also visited MOPNG and DGH for the purpose.

2.4 Audit Methodology

The common approach and methodology used for the Performance Audit were as follows:

- In order to brief the objectives, scope and methodology, an entry conference with OIL management was held on 16 September 2014.
- Entry conferences with Directorate General of Hydrocarbon and Ministry of Petroleum and Natural Gas were held on 20 November 2014 and 4 December 2014 respectively.
- During field audit (September 2014 to December 2014), the records maintained at Corporate Office at Noida (UP), Registered Office at Duliajan (Assam) and Project Office at Jodhpur (Rajasthan) of OIL were reviewed. The related records maintained at MOPNG and DGH were also reviewed. Based on the scrutiny of records, preliminary audit observations were issued during field audit.
- The draft audit report was issued (February 2015) to OIL. The relevant portion of draft audit report was also issued (February 2015) to MOPNG/DGH, however, no response was received. Reply of OIL to the draft report was received in April 2015 and the same has been suitably incorporated in the present report. The report was also discussed with OIL management in Pre-Exit Conference held on 15 May 2015. Responses received from OIL in the meeting have been suitably incorporated in the present report.

[9] Excluding 2 blocks under Joint Venture and one Coal Bed Methane block.

- The draft report was issued to MOPNG with a copy to DGH on 18 June 2015. The reply of MOPNG was received on 22 July 2015.
- As per the Comptroller and Auditor General of India standard practice, an Exit Conference was held on 22 July 2015 to provide an opportunity to the audited entities (MOPNG, DGH and OIL) to discuss the audit findings and present their views. The views expressed during the Exit Conference and reply received from MOPNG has been duly considered while finalizing the Report.
- Draft Final Performance Audit Report (DFPAR) after incorporating views expressed during Exit Conference was issued to audited entities on 8 September 2015 soliciting response thereto within one week. MOPNG stated (5 October 2015) that they do not have any further comments to offer in the matter.

2.5 Sources of Audit Criteria

The audit criteria have been derived from the following sources:

- India Hydrocarbon Vision 2025 issued by MOPNG;
- MOU signed by OIL with the Ministry
- CVC guidelines/ MOPNG Directions;

Other OIL documents:

- OIL Strategic & Corporate Plan 2011-20
- Minimum Work Programme committed for the Plan period;
- Annual Plan;
- Annual Performance Budgets;
- Annual Financial Budgets;
- Relevant rules/ guidelines issued by Statutory Authorities;
- Contract Manual and internal rules;
- Policies and guidelines prescribed for Management Information System/ Internal Control and Internal Audit.

2.6 Audit Sample

Audit selected twenty six Nominated and NELP blocks in total in Assam, Assam-Arakan, Krishna-Godavari, Rajasthan and Mahanadi basins wherein OIL is operator, including seven NELP blocks which were relinquished during the period of Performance Audit. The selection

and study of Nominated and NELP blocks and exploration contracts was done as shown in Table 2.1:

Table 2.1 - Basis of sample selection in audit

Selection of Blocks/Contracts	Total	Number Selected	Percentage covered	Basis
Nominated Blocks (PEL)	16	5	31	Volume of operations/Risk perception
Nominated Blocks (PML)	22	7	32	
NELP Blocks –Operational	11[10]	7	64	Significant activities
NELP Blocks -Relinquished	7	7	100	Risk perception
Exploration and Man-Management Contracts	73	33	45	Materiality and Risk perception

Audit had undertaken overall review of OIL's exploration activities. In reviewing OIL's activities in Nomination Regime, audit had selected 5 PEL blocks (including 3 relinquished blocks) and 7 PML blocks considering the volume of operations/risk perceptions. For review of activities under NELP, 7 operational blocks were selected where significant activities were carried out till date of audit. In addition all the 7 relinquished NELP blocks were selected. Further 33 exploration and man-management contracts were selected manually out of 73 contracts based on materiality and risk factors involved.

[10] Excluding one jointly operated block.

CHAPTER 3

EFFORTS OF OIL TOWARDS HYDROCARBON RESERVE ACCRETION

In order to determine how far OIL is effective in achieving its objective of hydrocarbon reserve accretion[11], audit reviewed reserve estimation process, efficiency in reserve accretion, success of OIL in hydrocarbon discoveries among the similar onshore upstream oil companies, monetization of discoveries and its efficiency in replacing production through RRR.

3.1 Reserve Estimation and Accretion

OIL initiated its first annual reserves estimation in the year 1956 through M/s Degolyer & MacNaughton, a consultant. The work of reserves estimation was conducted through in-house team of OIL from 1966. The estimation of reserve is carried out by incorporating the evidence gathered from various exploration and development activities, viz. drilling, work-over testing results, geological and engineering reviews, and pressure production behavior etc. of the reservoirs.

The historical perspective of oil and gas reserves under different estimation methods viz., 1P[12], 2P[13] and 3P[14] categories of OIL for the period from 2009-10 to 2013-14 are given in table 3.1 and figure 3.1 and 3.2:

Table 3.1 - Oil and Gas reserves of OIL

Category of estimation method	Type of Reserves	Year				
		2009-10	2010-11	2011-12	2012-13	2013-14
1P	Oil Reserves (MMSKL)	44.8	44.5	43.6	41.4	38.9
2P		92.1	92.8	95.4	95.1	97.3
3P		145.4	137.9	139.7	135.1	138
1P	Gas Reserves (BCM)	36	33.9	30	27.3	24.6
2P		56.2	53.7	50.7	47.3	45.18
3P		76.5	74	71.1	67.7	66.36

[11] Addition to recoverable hydrocarbon reserves
[12] equivalent to proved reserves
[13] equivalent to sum of proved plus probable reserves
[14] equivalent to the sum of proved plus probable plus possible reserves

Source: Reserve Appraisal Note

Figure 3.1 - Oil Reserve

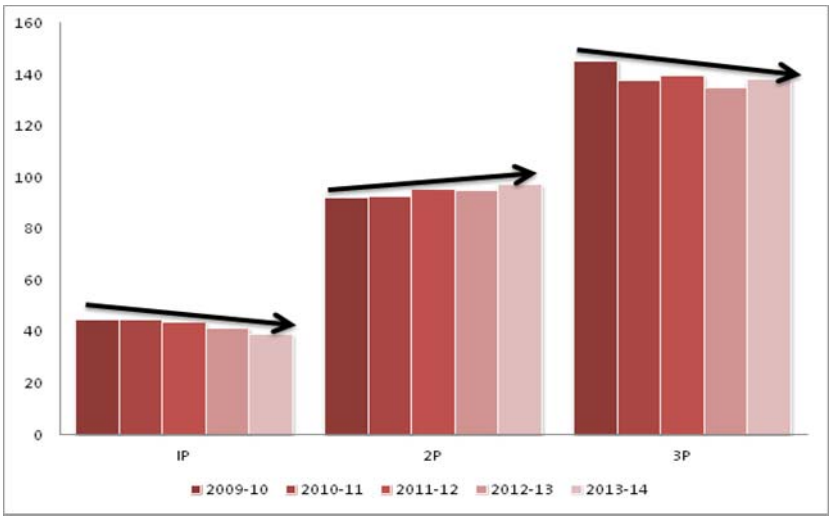
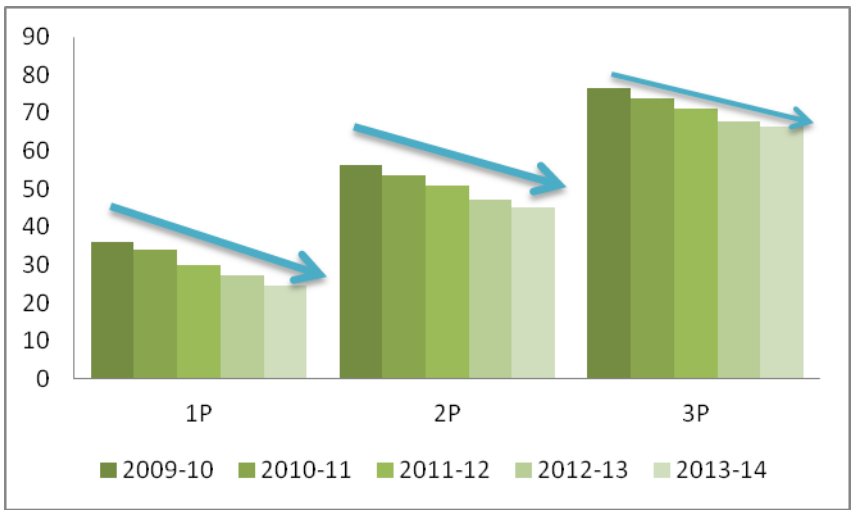


Figure 3.2 - Gas Reserve



Audit observed that:

- While oil reserves under 2P category increased, it decreased under 1P (i.e. proved) category. Hence net increase of reserves was only under probable category. The increase in 2P category can be attributed to geological and engineering reviews based on field development activities;
- Oil reserves under 3P (i.e. possible) category decreased indicating non-addition of new fields through exploration activities;

- Gas reserves under all the categories declined from 2009-10 to 2013-14. OIL stated in its Reserve Appraisal Note for the year 2013-14 that a decline in gas reserve trend was seen from 2008-09 onwards as no major MOU/Gas sale contract was signed in recent years.
- Although OIL had been producing gas from its Digboi and Kumchai fields, the same had to be flared and not considered in the reserve estimation in the absence of any contract for supply of such gas,

Hence, OIL underperformed in proving of reserves which is necessary for future sustainable development of hydrocarbon sector, as evident from declining trend in 1P category since 1P reflects proved reserves of hydrocarbon.

While accepting the audit contention, OIL stated (April 2015) that non-increase of 1P reserve was due to depletion of reserve on account of production and non-commensurate upgradation from existing lower category reserves. Similarly, lack of significant increase in 3P reserves indicated non-commensurate upgradation to probable category and new reserve accretion through exploration. Increase in 2P category was due to upgradaton of possible category to probable category reserve due to higher confidence through testing. Further, the gas sale agreement at Rajasthan was valid upto 31 March 2015 and action was in progress for renewal of the same. As regards flaring of gas, produced from EPA Digboi, the same was taking place mainly at Baghjan and Makum, out of which the major gas flaring was from Baghjan. OIL was laying a 16 inches gas pipeline from Baghjan to Duliajan for gas evacuation and installation of booster compressor at Hapjan, which was in progress. Gas produced from Kumchai field was largely flared for non-availability of customers. OIL was planning to set up Kumchai power plant project of 5 to 10 MW capacity to utilize the Kumchai Gas.

The fact remains that being a major NOC; OIL should have built necessary capability to ensure commensurate upgradation from 3P to 2P and 2P to 1P. Adding newer fields should be a key parameter for judging the performance of an E & P company. In view of the country's increasing need for new fields of hydrocarbon reserves, this has become more crucial.

In the Exit Conference (July 2015), MOPNG/OIL stated that due to exploration maturity in upper Assam basin which was the main operational area of OIL, size of discoveries and accretion to reserves were gradually decreasing. The decrease in 1P reserves over the years was because of depletion due to volume of oil and gas production and non-commensurate

upgradation of 2P reserves. The increase in 2P reserves was due to annual reserve accretion in 2P category. The decrease in 3P reserves was due to upgradation of a component of 3P to 2P category due to appraisal and developmental activities but limited accretion of new reserves in 3P category by exploration efforts.

Thus, OIL needs to focus its efforts towards accretion of new reserves in 3P category and commensurate upgradation of 3P to 2P and 2P to 1P category for sustainable oil and gas production.

3.2 Efficiency in Reserves Accretion

Reserves accretion targets are fixed after taking into account the total number of exploratory wells planned for drilling during a year and also the exploratory drilling success of previous years. In India, the major exploration and production activities of OIL are carried out in Assam & Assam-Arakan (A&AA) and Rajasthan (RJ). The year-wise targets and actuals of reserve accretion during the five years from 2009-10 to 2013-14 are shown in table 3.2 and figure 3.3:

Table: 3.2 – Targets and Actuals of Reserve Accretion

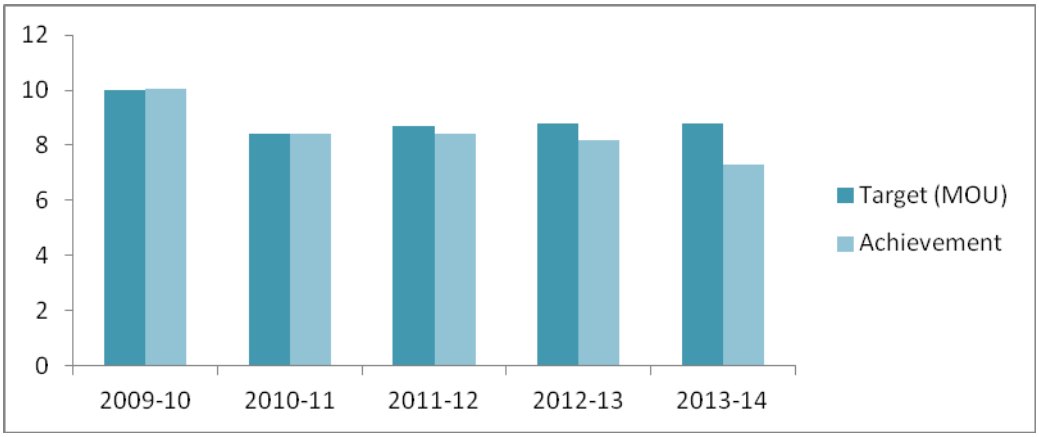
(In MMToe)

	Assam & Assam-Arakan						Rajasthan					
Year	2009-10	2010-11	2011-12	2012-13	2013-14	Total	2009-10	2010-11	2011-12	2012-13	2013-14	Total
Target (MOU)	10	8.4	8.7	8.8	8.8	44.7	NA	NA	NA	NA	NA	NA
Target (BE)	9.5	8	8.4	8	8	41.9	-	0.25	0.25	0.15	0.15	0.8
Target (RE)	-	-	-	8.5	6	14.5	-	0.05	0.05	0.15	0.07	0.32
Achievement[15]	10.06	8.43	8.41	8.2	7.31	42.41	0	0	0	0.464	0.007	0.471
Surplus/(Shortfall) from MoU target	0.06	0.03	-0.29	-0.6	-1.49	-2.29	-	(0.25)	(0.25)	0.314	(0.143)3	(0.329)

Note: In A&AA no RE Target fixed till 2011-12. No BE & RE Target fixed for 2009-10 in RJ. Since no MOU target was fixed for RJ, shortfall was calculated based on BE target.

[15] Excluding reserve accretion from Joint Venture blocks

Figure 3.3 - Target (MOU) vis-à-vis Achievement of A&AA



Audit observed that:

- In Assam & Assam-Arakan, during the years 2009-10 and 2010-11, the surplus came down and for the successive three years from 2011-12 to 2013-14 the shortfall increased. Thus, there was an overall decreasing trend in respect of reserve accretion.
- MOU targets were fixed by MOPNG in consultation with OIL each year for Assam and Assam-Arakan. No MOU target was fixed for Rajasthan.
- OIL did not achieve the target fixed in its MOU from 2011-12 onwards in Assam & Assam-Arakan and set the budgeted target and the revised target much below the MOU target during all the years.
- Though OIL achieved RE target in 2013-14, it is pertinent to note that in Assam & Assam-Arakan, OIL set RE target at 75 per cent of BE target and at 65 per cent of the MOU target. The reasons for such revision were not placed on record.
- In Rajasthan, during the period from 2010-11 to 2013-14, the aggregate BE Target of 0.80 MMToe was drastically reduced by 60 per cent in the RE target without any recorded reason;
- OIL did not achieve its target for reserve accretion in Rajasthan during last five years. The total reserve accretion was only 59 per cent of the targeted quantity.

OIL replied (April 2015) that R.E was based on half-yearly trend of physical activities to decide the revised plan. Only B.E. target is referred for performance evaluation and Government reporting. BE target of reserve accretion was based on the scientific evaluation

of possible contribution from planned drilling, work over and other evaluation efforts whereas MOU target of production was generally decided at higher level during negotiation by Task Force appointed by Government under a bilateral negotiation with growth perspective, limited to the core revenue earning from the producing areas. As a result, the accretion figures had to be upgraded to maintain RRR above 1(one). Thus, BE became lower than the MOU Target. OIL further stated that though exploratory drilling was carried out in all the years in Rajasthan, reserve accretion was established only in the year 2012-2013 and 2013-14. There was no reserve accretion in other years due to poor hydrocarbon prospects in other NELP blocks. It was also stated (May 2015) that they had not done any comparative study between MOU and Planning Commission's target relating to survey and drilling while fixing its own target.

The reply is not convincing as OIL has itself accepted that reserve accretion in Rajasthan was mainly due to geological and engineering reviews based on development drilling and not through exploratory drilling in new areas

The Standing Committee on Petroleum and Natural Gas (2010-11, 15th Lok Sabha) on demand for grants in its eighth report noted (August 2011) that the various targets set for oil PSUs are finalized by the Task Force consisting of experts, representatives from Ministries and oil companies taking all relevant factors into account. After finalization of targets, MOUs are signed between oil PSUs and the Ministry. However, these targets which are fixed with great deal of exercise are not adhered to by the companies and most of the targets set during the last three years remained unfulfilled on account of reasons which are often repetitive in nature. The Committee was of the view that with signing of MOUs, it becomes a commitment on the part of the companies to adhere to the targets. Any under-achievement was needed to be viewed seriously by the Ministry and suitable periodical corrective action taken to prevent shortfalls.

3.3 Decline in Reserve Replacement Ratio

Reserve Replacement Ratio (RRR)[16]measures the relationship between new reserves accreted and oil produced, reflecting how well an oil company is replacing its production. In order to ensure long term sustainability in E&P Sector, it is essential for OIL to replenish its reserves from which it produces oil and gas.

[16] RRR=Ultimate Reserve accreted during a year/Total production of hydrocarbons during the year

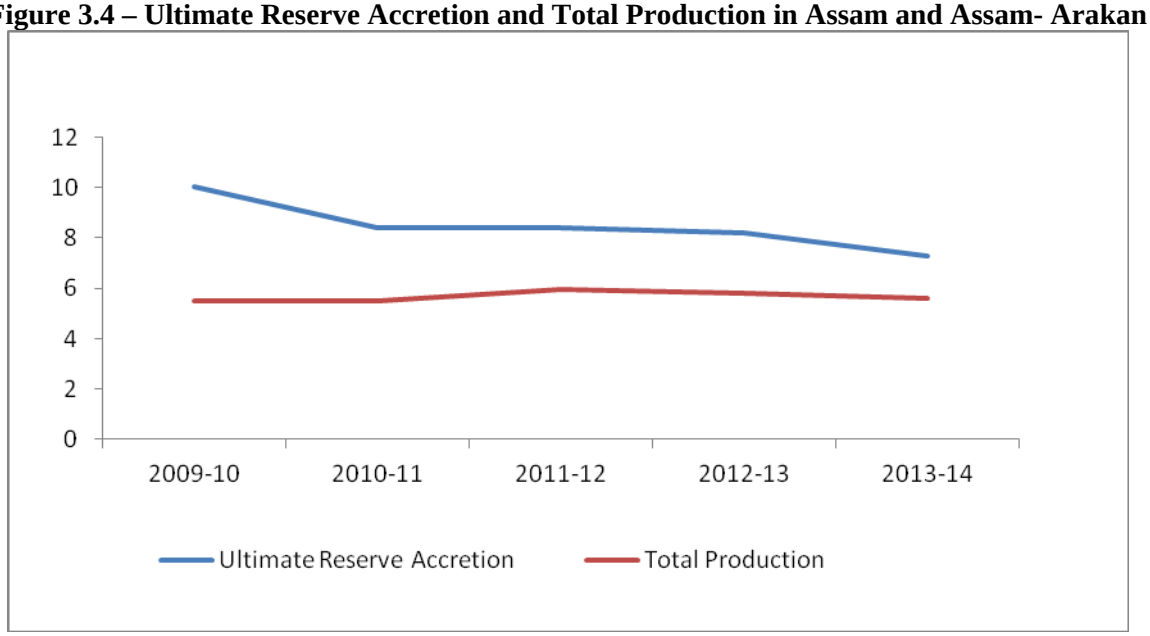
The production of crude oil and natural gas, Ultimate Reserve (UR) and RRR for the last five years ended 2013-14 of OIL's major producing areas of Assam & Assam-Arakan are given in Table 3.3 and figure 3.4 and 3.5 and in respect of Rajasthan the same are given in Table 3.4:

Table 3.3 - Computation of Reserve Replacement Ratio in Assam & Assam-Arakan

(Quantity in MMToe)

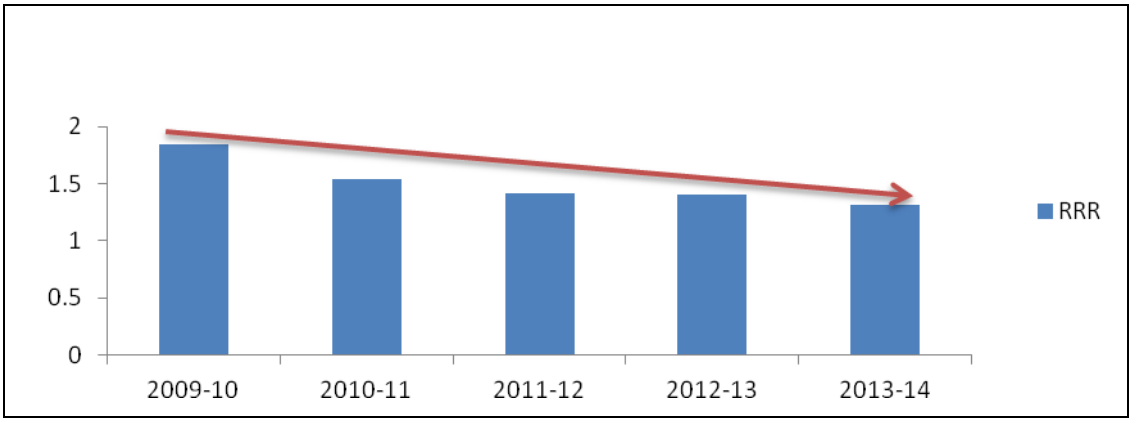
Sl. No.	Particulars	YEAR				
		2009-10	2010-11	2011-12	2012-13	2013-14
1	Initial In-place Hydrocarbon	1054.25	1055.43	1072.70	1088.09	1097.16
2	Ultimate Reserve Accretion	10.06	8.43	8.41	8.20	7.31[17]
3	Oil Production	3.54	3.56	3.82	3.64	3.44
4	Gas Production	1.94	1.93	2.12	2.16	2.15
5.	**Total Production (Sl. No.3 + 4)**	5.48	5.49	5.94	5.80	5.59
RRR (Sl.No.2/Sl.No.5)		1.84	1.54	1.42	1.41	1.31

Figure 3.4 – Ultimate Reserve Accretion and Total Production in Assam and Assam- Arakan



[17] Excluding reserve accretion from Joint Venture blocks

Figure 3.5 – Reserve Replacement Ratio in Assam and Assam-Arakan



Interpretation: While the total production has remained stagnant, "Ultimate Reserve Accretion" and "Reserve Replacement Ratio" has steadily declined over the period of five years.

Table 3.4 - Computation of Reserve Replacement Ratio in Rajasthan

(Quantity in MMToe)

Sl. No.	Particulars	2009-10	2010-11	2011-12	2012-13	2013-14
1	Gas Initially In Place	3.739	3.739	3.739	4.355	4.371
2	Economically Ultimate Recoverable Gas Reserve	2.771	2.771	2.771	3.235	3.243
3	**Accretion in EUR**	0.000	0.000	0.000	0.464	0.007
4	**Gas Production**	0.079	0.061	0.086	0.075	0.076
	RRR (Sl.No.3/Sl.No.4)	0.000	0.000	0.000	6.187	0.092

Audit observed that:

- Though OIL achieved RRR of more than 1 as prescribed in Assam & Assam-Arakan during the period from 2009-10 to 2013-14, the UR accretion registered a downward trend. Consequently, the RRR has a declining trend from 1.84 in 2009-10 to 1.31 in 2013-14.
- Rajasthan project registered RRR of more than 1 only in 2012-13. The reason for abnormally high RRR in Rajasthan in 2012-13 was noted to be the lack of reserve accretion upto 2011-12. However, reserve accretion in 2012-13 was mainly because of geological and engineering review.
- MOPNG exercises control in setting of MOU targets of OIL and does performance evaluation during and at the end of the year. Out of different parameters for which weightage is assigned, though exploration is a core business of OIL, the weightage given to “accretion to recoverable reserves” reduced from eight per cent in 2009-10 to

five per cent in 2013-14. This implies that OIL was being evaluated more on financial and non-financial parameters rather than on its core activity.

While accepting the audit contention regarding its Rajasthan operations, OIL stated (April 2015) that blocks in upper Assam were being extensively explored and significant discoveries were made over the years. However, discoveries made since last few years were comparatively smaller posing considerable challenges. Identifying and drilling these prospects were challenging both technically and economically. As such, reserves accreted from these discoveries showed a declining trend considering the degree of exploration already carried out in upper Assam petroliferous basin.

The reply is a reiteration of known facts and challenges. OIL needs to find out solutions to its problems by using its expertise gained over the years and to plan a proactive strategy for increasing the reserve accretion trends.

3.4 Success of OIL in hydrocarbon discoveries among peers

Nomination Blocks

OIL made 33 hydrocarbon discoveries in Assam & Assam-Arakan under Nomination regime during the period from 2009-10 to 2013-14, including four discoveries[18] which were yet to be monetized. Out of four discoveries pending for monetization, three discoveries were currently techno-economically unattractive for field development and one discovery is awaiting stimulation.

While accepting the audit contention, OIL stated (April 2015) that in respect of Madhakali-1 well, OIL did not have in-house expertise and technology and the same was outsourced. Similarly, it did not have adequate technology to produce heavy oil from Diroi-5. Further, Disaijan-1 had already been lined up for workover and results were expected in the early part of 2015-16. MOPNG stated (July 2015) that by induction of technology some production was established in April 2015 from Madhakali-1. Further, production from Mahakali was delayed due to lesser potential and isolated location which was lined up for workover to be completed in 2015-16.

[18] Madhakali-1, Diroi-5, Disaijan-1 and Mahakali-1

In this regard, the contention of OIL that it was lacking expertise on producing heavy oil is not convincing as being an upstream NOC, it is supposed to be abreast of latest technology to cope up with such challenges.

NELP Blocks

Standing Committee on Petroleum and Natural Gas (2014-15, 16th Lok Sabha) in its first report mentioned that under NELP, exploration blocks were awarded to Indian private and foreign companies through international competitive bidding process where NOCs viz., ONGC and OIL are also competing on equal footing.

Out of 254 blocks[19] awarded during NELP regime (Rounds-I to IX), 66 discoveries have been made by private/foreign companies as operators and 64 discoveries have been made by NOCs and State PSU (GSPCL). OIL, however, made only one discovery (block RJ-ONN-2004/2) from NELP blocks awarded in all the NELP rounds.

Audit compared OIL's success in hydrocarbon discoveries with its peers which are shown in table 3.5 and figure 3.6:

Table 3.5 - Hydrocarbon Discoveries under NELP

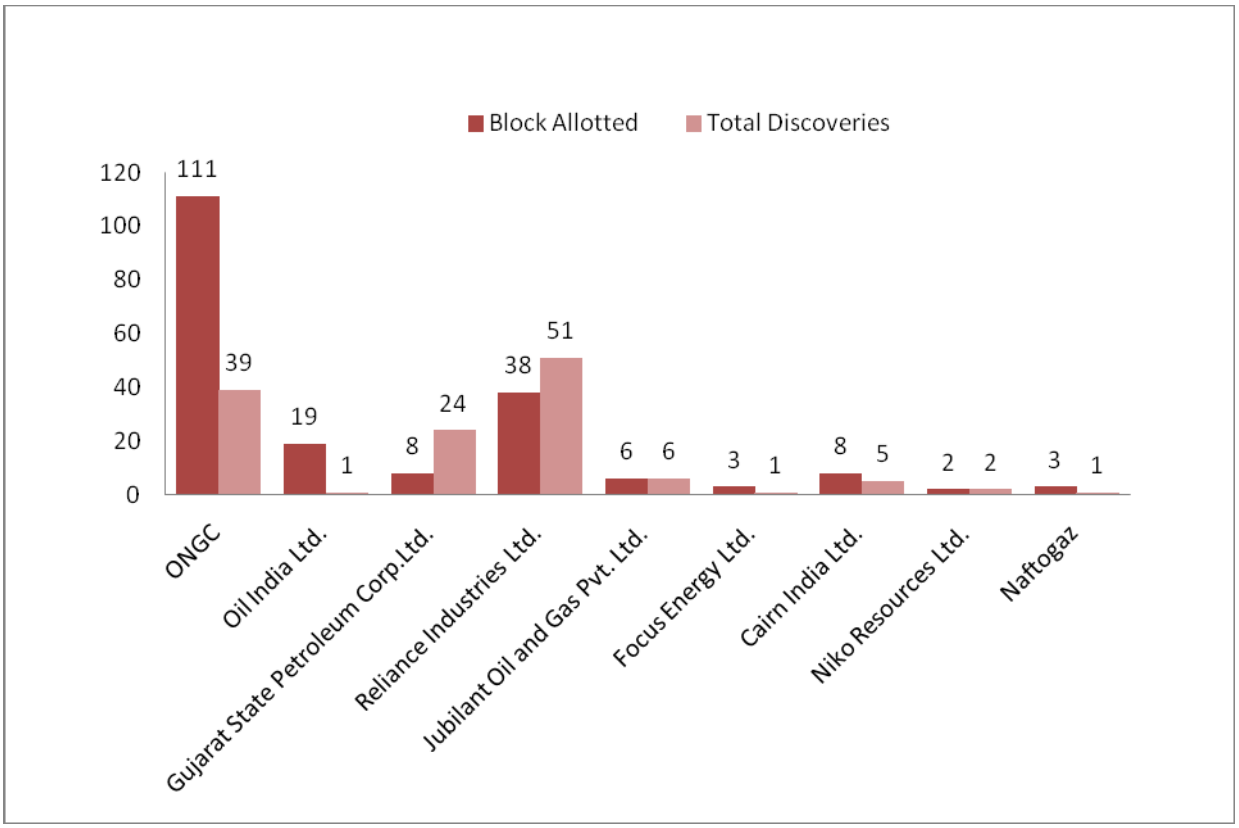
(As on 31.03.2014)

Sl. No.	Company (Operator)	Block Allotted	Oil Discovery	Gas Discovery	Total Discoveries
1	ONGC	111	10	29	39
2	Oil India Ltd.	19	1	-	1
3	Gujarat State Petroleum Corporation Ltd.	8	15	9	24
4	Reliance Industries Ltd.	38	14	37	51
5	Jubilant Oil and Gas Pvt. Ltd.	6	2	4	6
6	Focus Energy Ltd.	3	-	1	1
7	Cairn India Ltd.	8	4	1	5
8	Niko Resources Ltd.	2	-	2	2
9	Naftogaz	3	1	-	1
	Total	**198**	**47**	**83**	**130**

Source: DGH Report

[19] Out of 254 blocks awarded to different companies, 198 blocks pertain to those companies who have made discoveries.

Figure 3.6 – Hydrocarbon Discoveries under NELP



Audit observed that in spite of being one of the NOC having both financial resources and technical experience in the E&P sector, performance of OIL lagged behind peers in the industry. Out of the total discoveries during NELP period, OIL made only one discovery in Punam well in Rajasthan which is yet to be monetized (April 2015) though the discovery was made in July 2012.

OIL informed (December 2012) to DGH that it did not have adequate technology to produce heavy oil from Punam-1. The discovery was of potential commercial interest and merits appraisal. However, OIL submitted the Declaration of Commerciality (DOC) to DGH without drilling of any appraisal wells. The DOC was yet to be accepted by DGH (December 2014), resulting in delay in monetization of the discovery.

OIL stated (April 2015) that out of 40 blocks, OIL was operator in 19 blocks. Out of these 19 blocks, 3 blocks were relinquished without probing exploratory drilling due to logistics, MOD clearance etc. which were beyond OIL's control. Out of the remaining 16 blocks, 8

blocks were probed by exploratory drilling, and only 1 discovery was made upto 2013-14. In remaining blocks exploratory activities were going on and not yet probed.

The fact remains that OIL made only two discoveries till date. Standing Committee on Petroleum and Natural Gas (2012-13, 15th Lok Sabha) recommended that the country looks upon NOCs for achieving success in meeting the hydrocarbon requirement. As such, the NOCs should show greater commitment and achieve creditable results and fulfill the expectation placed on them. The committee recommended that MOPNG/DGH should monitor the progress in various exploration blocks to check timely achievement of various activities.

In the Exit Conference (July 2015) MOPNG stated that the audit observations contained in the Performance Audit Report would be useful in strengthening their mechanism for monitoring exploration efforts of OIL.

CHAPTER 4

EFFICIENCY AND ECONOMY IN SURVEY PROCESS

In order to examine the efficiency and economy of OIL's survey process consisting of Acquisition, Processing and Interpretation of data (API), audit reviewed the activities undertaken by OIL during survey, which is considered vital for the organization for achieving the exploration goal. Since seismic data is collected through 2D/3D surveys by OIL's own survey equipment (in-house) as well as by contractual hiring, audit reviewed the survey contracts to point out deficiencies in management of contracts leading to delay and shortfalls in Nomination Blocks and underachievement of MWP in NELP Blocks.

4.1 Shortfall in Acquisition, Processing and Interpretation of Seismic Data

OIL sets its BE and RE targets for API and submits it to the MOPNG. The BE and RE targets and actuals of API during 2009-10 to 2013-14 are given in Table 4.1 and subsequent figures 4.1 and 4.2:

Table 4.1 – 2D and 3D API Targets and Actuals

Year	2D				3D			
	BE Target (LKM)[20]	R E Target (LKM)	Actual (LKM)	Excess/ (Shortfall) against RE Target (LKM)	BE (Sq. Km)[21]	RE (Sq. Km)	Actual (Sq. Km)	Excess/ (Shortfall) (Sq. Km)
2009-10	2325	1715	1308	(407)	2065	1002	984	(18)
2010-11	1260	1182	1149	(33)	1698	661	619	(43)
2011-12	2090	1317	1397	80	1767	1767	1838	71
2012-13	470	500	224	(276)	1570	1925	1795	(130)
2013-14	200	490	499	9	500	718	928	210
Total	**6345**	**5204**	**4577**	**(627)**	**7600**	**6073**	**6164**	**91**

Source: Annual Plan of OIL for 2009-10 to 2013-14

[20] Line Kilometre
[21] Square kilometre

Figure 4.1 - Year-wise Target and Actual of 2D Seismic Survey

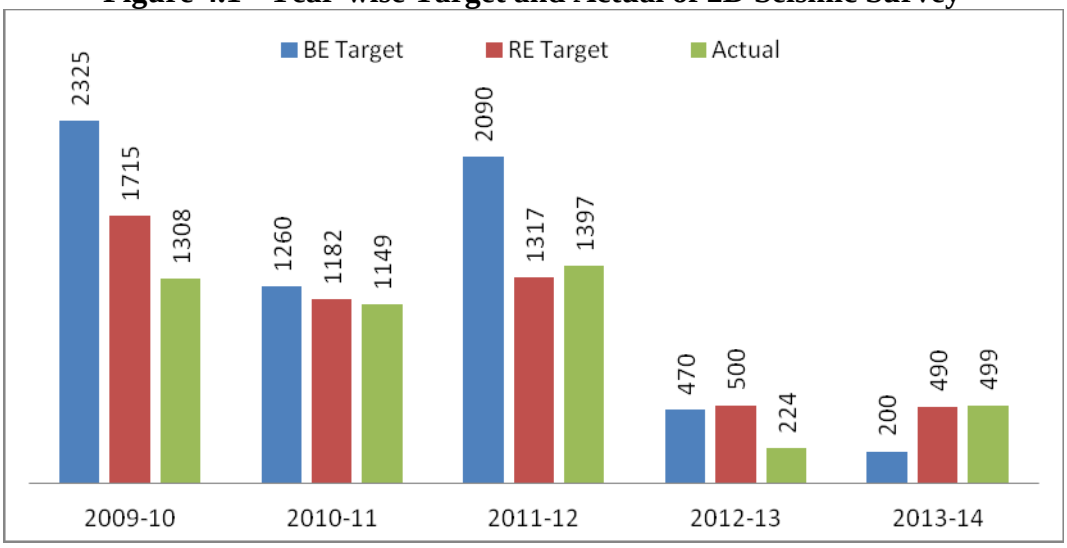
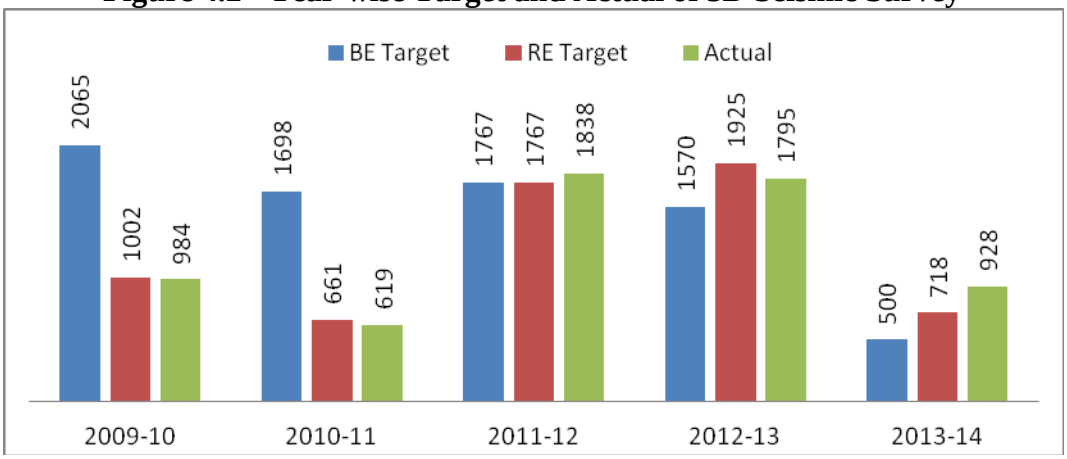


Figure 4.2 - Year-wise Target and Actual of 3D Seismic Survey



Audit observed that:

- OIL did not achieve its own targets of 2D survey with respect to revised plan target except for the years 2011-12 and 2013-14. Similarly, it did not achieve its own target in 3D for the years 2009-10, 2010-11 and 2012-13;
- The shortfall against 2D ranged from 3 to 55 per cent in 2009-10 to 2013-14 and the shortfall in case of 3D ranged from 2 to 7 per cent during the same period;
- OIL has reduced its 2D and 3D revised plan targets from its plan targets drastically in 2009-10. Further, OIL sharply reduced 2D targets in 2011-12 and 3D targets in 2010-11;

- While comparing the Planning Commission targets for 2D and 3D for 11th and 12th five year plan, audit noticed that OIL's 2D/3D targets were more or less in conformity with Planning Commission targets for the 11th five year plan. However, OIL drastically reduced its targets in both 2D and 3D in first two years of 12th five year plan, (lower by 2954 LKM and 1521 Sq. Km respectively from the Planning Commission targets, being 25 per cent and 63 per cent respectively); and
- The reasons for chronic shortfall in survey under 2D and 3D in different years were not placed before the Board for appraisal and for taking remedial measures.

Audit further observed that in Rajasthan, 2D survey was not taken up during 2009-10 to 2013-14 and there was a shortfall of 59 per cent against the plan target set for 3D survey. In Krishna Godavari, the achievements fell short of plan targets for 2D and 3D surveys by 49 and 64 per cent respectively during the last five years ending March 2014. In Cauvery, OIL failed to fix any targets for 2D survey against which 511 LKM of 2D survey was conducted during the period from 2009-10 to 2013-14. OIL stated (January 2015) that targets set for Cauvery were missed inadvertently in the annual plan.

While accepting the audit contention, OIL stated (April 2015) that the shortfall in 2D/3D data acquisition with reference to BE target was mainly in KG and Rajasthan Basins. The 2D/3D seismic targets set by Planning Commission in five year plan were broad targets as compared to BE/RE targets. The actual survey depends on various commitments and requirements in nomination blocks. Further the targets/achievements were appraised to the Board every year. OIL further stated that in Rajasthan basin, the shortfall was mainly due to delay in finalization of 2D contracts. The delay in KG basin was mainly for delayed receipt of Petroleum Exploration License from Puduchery Government and forest permission for reserve forest area. OIL further stated (May 2015) that they had not done any comparative study between MOU and Planning Commission target relating to survey and drilling target while fixing its own target.

The reply of OIL is not convincing as OIL needs to synchronize its own target with the Planning Commission target for achievement of national hydrocarbon goal. Further, the targets fixed by MOPNG to OIL are not in accordance with the Planning Commission target during 12th plan period. While Planning Commission targets are broader on a 5 year scale, they are fixed in consultation with MOPNG and OIL, keeping in view the overall

hydrocarbon scenario. Though statistical data of targets and achievements were placed before the Board but reasons for chronic shortfall in survey had not been placed for appraisal and taking remedial measures. Audit further observed that the shortfall in 2D and 3D seismic surveys were due to excess time taken in API cycle and other deficiencies in contractual management as detailed in the subsequent paragraphs.

4.2 Excess Time taken for API cycle

Timely acquisition, processing and interpretation of data through in-house survey equipment/contractual hiring are essential for completion of exploration activity as per the plan. Delay in API cycle has a cascading effect on total exploration period available to an E&P company.

4.2.1. In-house Survey

In-house survey work is carried out by Geophysics Department of OIL for acquisition and processing of data while interpretation of data is carried out by Geological and Reservoir (G&R) Department. The field days for acquisition work consist of mobilization, survey work, experimental work, production work, non-production work and demobilization days.

Audit examined 23 survey works, out of 26 in-house survey carried out during 2009-10 to 2013-14. Out of 23 survey works, 10 survey works were completed and 13 survey works were in progress as on November 2014 (Annexure II).The analysis of time taken in survey revealed the following:

- No norm was set/ fixed by OIL to carry out in-house survey work. In 10 completed survey works, time taken to complete the API cycle ranged between 472 and 2005 days.
- In respect of 13 survey works in progress, the works remained incomplete from 330 days to 2069 days after completion of acquisition/ processing of data. In respect of two survey works-in-progress viz., Jagun-Digboi-2D and Namsai-3D, no detailed information regarding present status of interpretation of data were made available to audit.
- In respect of six surveys carried out in-house, Geophysics Department took 25 to 464 days to start the work of processing after completion of data acquisition work.

- There was also a wide gap of 135 to 1362 days between completion of acquisition and processing work by Geophysics Department and commencement of interpretation of data by G & R Department.
- While OIL was setting time limits for the contractor, it was not setting any target dates for its in-house surveys. In absence of any norm, OIL did not have any control over the time schedule of survey work.

While accepting the audit contention, OIL stated (April 2015) that wide variations in API cycle of various surveys with respect to 10 completed works were primarily due to lack of in-house capability. This resulted in gap in API cycle activities in certain cases and was very difficult to standardize it, though there were broad norms in existence. However, the in-house capability in seismic data processing had been upgraded recently.

The contention with regard to existence of broad norms is not convincing as no supporting document was furnished by OIL in support of their views. Due to its inability to upgrade in-house capability of API processing, OIL relied more and more on outsourced survey which is being commented in subsequent paragraphs.

4.2.2. Outsourced Survey

Twelve contracts were outsourced for API cycle pertaining to various blocks in Assam & Assam-Arakan basin. Of these, eight contracts were for acquisition/acquisition and processing work and the remaining four contracts were for processing including interpretation of data. Details of time taken for API Cycle in respect of all 12 outsourced contracts are given in table 4.2:

Table 4.2 - Delay in completion of API

Name of the Block	Type of work	Contract No.	Time allotted to the Contractors (In months)	Actual time taken to complete API (In months)	Excess Time Taken (In months)
Mizoram	2D Acquisition	6102311	22.5	29.9	7.4
	2D Processing & Interpretation	6102869	18	37.9	19.9
	3D Acquisition	6204629	11	12.7	1.7
Karbi Anglong	2D Acquisition	6103105	15	24.3	9.3
Amguri & Dibrugarh	3D Acquisition & Processing	6102308	15	10.5	No delay
Amguri	3D Interpretation	6102789	1.5	5.1	3.6
Dibrugarh	3D Interpretation	6102789	2	4	2

Sadiya	3D Acquisition & Processing	6102875	11	12	1
	3D Interpretation	6102789	NA*	NA*	NA*
Namchik PEL & Ningru ML	2D Seismic data acquisition	6102866	24.5	27.6	3.1
Deomali & Namchik PEL	2D data acquisition	6102495	13.5	18.8	5.3
Kharsang/ Shongking	2D data acquisition	6102582	54	53	No delay

Note: *Not available

Audit observed that

- Out of 12 contracts, excess time was taken in nine contracts (75 per cent) ranging between one month and 20 months, though in case of only five contracts Liquidated Damages (LD) were imposed on the contractor;
- The field season for acquisition of seismic data normally commences from October and lasts till May of next year, which are termed as operating months. Monsoon break covers the months from June to September during which work remains suspended owing to extreme climatic conditions. However, OIL did not lay down any norm or guidelines to ensure that schedule of survey work is prepared and contracts are awarded in a timely manner, so that the execution of survey work does not get hampered due to monsoon break;
- In Assam & Assam-Arakan, during the period from 2009-10 to 2013-14, eight[22] survey contracts were executed for acquisition of 2D/3D seismic data, out of which, two survey contracts[23] were issued in February 2009 and November 2008 respectively as against the commencement of field season in October resulting in loss of five months and one month respectively.

OIL stated (April 2015) that in some blocks PEL deeds were signed in month of May-June which led to the award of contract in November and February and it was not in the hand of OIL to manage time in such cases.

[22] Kharsank/ Shonkgking (2D), Mizoram (2D), Mizoram (3D), Karbi-Anglong (2D), Amguri & Dibrugarh (3D), Sadiya (3D), Namchik (2D) PEL & Ningru ML, Deomali & Namchik PEL (2D)

[23] Sadiya (3D) and Karbi-Anglong (2D)

The reply of OIL needs to be viewed in the light of the fact that in case of survey contracts awarded for Sadiya and Karbi-Anglong, the date of signing of PEL was September 2005 and February 2004 respectively whereas date of award of contracts were in February 2009 and November 2008. Thus, there was ample scope to avoid monsoon break.

4.3 Illustrative Cases in Survey Process

(i) Deficiency in Contractual Clause giving undue benefit to the contractor

OIL awarded (October 2013) a labour supply contract[24] to M/s Naren Sonowal & Sons (NSS) at a total cost of ₹ 3.10 crore for 3D seismic survey at Sadiya block (AA-ONN-2010/3) under NELP-IX. Due to non-compliance of contractual obligation, the above contract was terminated. In turn, OIL finalized another contract[25] with M/s R.C. Das & Sons (RCDS) at a cost of ₹ 4.98 crore (inclusive of service tax) for carrying out the remaining work.

As per Clause 19.01 of Special Conditions of Contract (SCC), if a contractor fails to fulfill any of its contractual obligations within time, OIL may get the job done by itself or through third party of its own choice and the contractor will reimburse cost as per 'actual' plus 10 per cent towards handling charges.

Audit observed that subsequent to the termination (February 2014) of contract with NSS, OIL decided (August 2014) that the extra cost involved for non-execution of the contract was to be reimbursed by the contractor, only after completion of job by RCDS, which was pending (April 2015).

Audit scrutiny revealed that though the reimbursement was to be the differential amount plus 10 per cent towards handling charges instead of 'actual cost' plus 10 per cent, OIL could not implement the same due to non-inclusion of such clause in the contract executed with NSS. As a result, OIL could not initiate action against the defaulting contractor for recovering the amount of ₹ 1.88 crore (₹ 4.98 crore – ₹ 3.10 crore) being the differential amount (apart from 10 per cent handling charges), except issuing a show-cause notice. It was also seen that clause No. 25 of General Conditions of Contract (GCC) states that the recoverable amount can be adjusted against any amount due or payable to the contractor (including security deposit refundable to them) under this contract or any other contract. The provision of clause

[24] Contract No. CDI 6107584
[25] CDI 6205280

25 of GCC was, however, not invoked. As such OIL could neither adjust the recoverable amount towards any other contracts by the same party nor forfeit the Performance Bank Guarantee (PBG) till date (April 2015). However, OIL decided to amend the clause suitably for all future tenders.

Thus, due to inclusion of defective contract clause, OIL could not initiate action for recovery of ₹ 1.88 crore apart from handling charges against the contractor and it may also lead to litigation in future for enforcement of the clause.

While accepting the Audit contention, OIL stated (April 2015) that the retention money and security deposit of the contractor against its only other concluded contract[26] was available with OIL. Since the remaining seismic data acquisition job in Sadiya was still being carried out by RCDS[27], it had not been possible to estimate the exact amount to be deducted from NSS. Hence, it was thought prudent to wait for the completion of the replacement contract to find out the exact differential amount and accordingly necessary advice would be made to recover the cost from NSS.

However, the fact remains that apart from handling charges, out of ₹ 1.88 crore recoverable from the defaulted contractor, the retention money and security deposit of ₹ 36.72 lakh is only available with OIL from all concluded and existing contracts.

(ii) Deficiency in Contractual Clause resulting in payment of penalty

Sadiya (AA-ONN-2003/3 under NELP-V) Block was awarded to OIL with the validity for exploration from November 2006 to May 2010 including extension of six months. OIL awarded the contract for acquisition and processing of 275 Sq.kms. of 3D seismic data to M/s KCS, Kazakhstan in December 2006. The contract was terminated afterwards due to extremely poor performance and non-acquisition of any usable 3D data by M/s KCS.

In October 2008, a fresh contract was awarded to M/s GT Poland for acquisition and processing of 275 Sq. Km of 3D seismic data with the scheduled completion of work by March 2010. Since completion of work was crucial for fulfillment of the committed Minimum Work Programme (MWP) and the contractor could not complete the work, the contract period was extended by four months upto July 2010. In this context, it is pertinent to mention that the validity of the block expired in May 2010. However, the Contractor could

[26] Contract No. 6107586
[27] replacement contract CDI 6205280 in Sadiya

acquire only 217.536 Sq. Km as against 275 Sq. Km of 3D seismic data upto the extended period (July 2010).

OIL requested (May 2010) DGH/MOPNG for granting extension of 42 months under special dispensation for continuing the exploratory work which was refused by MOPNG in September 2010. Due to non-completion of MWP, OIL had to pay an amount of ₹ 19.79 crore (OIL's PI share of 85 per cent) towards cost of unfinished work programme to MOPNG.

Audit observed that while finalizing the contract with M/s GT Poland, OIL had not framed any valid contract clause to withhold any amount/effect any recovery for non-completion of the contract work within the stipulated time from the Contractor. Though the contract had provision for imposing LD for delay in mobilization, there was no provision for imposing LD for delay in completion of acquisition and processing work. Further, as per clause 12.1 of Section I of the Contract it was mentioned that "contract shall be deemed to have been automatically terminated on completion of acquisition and processing or expiry of the duration of the contract or extension, if any, whichever is earlier". Thus, as per the above clause, the contract stood terminated even before the completion of work by the contractor.

Though OIL paid ₹ 19.79 crore towards cost of unfinished work programme to MOPNG, there was no such provision of imposing LD for delay in completion of acquisition and processing work in the contract to safeguard the interest of OIL.

OIL accepted the audit contention.

(iii) Expenditure on seismic survey without value addition

The block AA-ONN-2009/4 (Teok) in Assam covering an area of 84 Sq. Km was awarded to a consortium of OIL (50 per cent) and ONGC (50 per cent) in NELP-VIII where OIL was an operator. As per the MWP, the operator had to carry out mandatory 45 LKM and 201 LKM of 2D API and 84 Sq. Km of 3D API along with drilling of seven wells during Phase-I. OIL requested (October 2012) DGH for exemption from carrying out the mandatory 2D API as per clause 5.2[28] of PSC[29] (NELP-IX) as the entire block area of 84 Sq. Km would be covered under 3D seismic survey.

[28] If the Work Programme of 3D seismic API is equal in size to the contract area then the contractor shall be exempted from carrying out the 2D seismic Mandatory Work Programme

[29] Production Sharing Contract

The request of OIL, however, was turned down (January 2013) by DGH as the block was awarded under NELP-VIII. As per the NELP-VIII PSC provision, if OIL was not able to cover any part of the contract area by 2D seismic survey of grid size specified in the article, OIL should submit a proposal for substitution of the shortfall in the Mandatory Work Programme (MWP) to the Management Committee. OIL, however, did not submit any proposal for substitution of shortfall in MWP and carried out 2D API as per the committed MWP.

Audit observed that due to non-submission of proposal for substitution of shortfall in MWP, OIL, as an operator, incurred an expenditure of ₹ 29 crore towards 2D API without any value addition.

OIL stated (April 2015) that as part of the MWP commitments, OIL had committed 201 LKM of 2D seismic survey and 45 LKM of mandatory 2D survey besides other work programmes. As such it decided to combine the mandatory 246 LKM 2D seismic survey to complete the work in one go utilizing the same contract which resulted in time and cost savings. OIL did not propose for substitution of work programme in place of mandatory 2D seismic survey in the block.

The contention of OIL needs to be viewed against the fact that OIL itself proposed to DGH that there would be no value addition by doing 2D seismic survey when the entire block area was covered by 3D API.

As per PSC provision of NELP-VIII, OIL needs to submit fresh proposal to DGH for substitution of shortfall in 2D seismic survey as per MWP.

MOPNG accepted (July 2015) the audit observation.

CHAPTER 5

EFFICIENCY AND ECONOMY IN DRILLING OPERATION

In order to determine OIL's efficiency of drilling operations and to review how far economy was achieved in its drilling contract management, audit reviewed the operational efficiency of its own and hired rigs, while looking at exploratory drilling vis-à-vis development drilling including drilling meterage, drilling speed, non productive time (NPT), vintage of rigs etc. as well as performance of workover rigs. Audit also looked at management of contracts for acquisition and refurbishment of own rigs as well as chartered hire rigs.

5.1 Operational Efficiency of Drilling

The success of drilling operation mainly depends on efficiency of rigs. OIL utilizes own as well as hired rigs for its drilling operations.

5.1.1 Operational Efficiency of Own and Hired Rigs

The performance of drilling operations through own and hired rigs are discussed in subsequent paragraphs.

5.1.1.1 Exploratory Drilling vis-à-vis Development Drilling

OIL carries out exploratory and development drilling for hydrocarbon exploration. OIL's target and actual of exploratory drilling and development drilling for the five years from 2009-10 to 2013-14 are detailed in table 5.1 and 5.2 respectively:

Table 5.1 - Target and Actual of Exploratory Drilling

Year	B.E Target		R.E Target		Actuals		Excess/(Shortfall) to BE target		Excess/(Shortfall) to RE target	
	Meterage	Wells	Meterage	Wells	Meterage	Wells	Meterage	Wells	Meterage	Wells
2009-10	71920	22	72957	20	58375	16	(13545)	(6)	(14582)	(4)
2010-11	103050	31	63650	20	45875	13	(57175)	(18)	(17775)	(7)
2011-12	101900	33	91642	24	56568	16	(45332)	(17)	(35074)	(8)
2012-13	114040	33	77044	25	66435	19	(47605)	(14)	(10609)	(6)
2013-14	100750	31	52404	17	35699	9	(65051)	(22)	(16705)	(8)
Total	**491660**	**150**	**357697**	**106**	**262952**	**73**	**(228708)**	**(77)**	**(94745)**	**(33)**

Source: **Tour Register of Rigs**

Table 5.2 - Target and Actual of Development Drilling

Year	B.E Target		R.E Target		Actuals		Excess/(Shortfall) to BE target		Excess/(Shortfall) to RE target	
	Meterage	Wells	Meterage	Wells	Meterage	Wells	Meterage	Wells	Meterage	Wells
2009-10	121680	44	109350	39	84076	30	(37604)	(14)	(25274)	(9)
2010-11	117000	46	70700	26	71253	24	(45747)	(22)	553	(2)
2011-12	92600	34	67529	28	71426	22	(21174)	(12)	3897	(6)
2012-13	91375	27	69051	29	62478	19	(28897)	(8)	(6573)	(10)
2013-14	105110	38	94042	33	69412	25	(35698)	(13)	(24630)	(8)
Total	**527765**	**189**	**410672**	**155**	**358645**	**120**	**(169120)**	**(69)**	**(52027)**	**(35)**

Source: Tour Register of Rigs

Audit observed that:

In **Exploratory Drilling**, there were significant shortfalls in the drilling of exploratory wells during the period from 2009-10 to 2013-14. In terms of meterage, RE targets for exploratory drilling were reduced from BE targets in the range between 10 and 48 per cent during 2010-11 to 2013-14. Even after reduction of BE targets for exploratory drilling, the meterage achievement fell short in the range between 14 and 38 per cent in all the years. In terms of wells, RE targets for exploratory drilling were reduced from BE targets in the range between 9 and 45 per cent during 2009-10 to 2013-14. Even after reduction of BE targets for exploratory drilling, the achievement in number of wells fell short in the range between 20 and 47 per cent in all the years.

In **Development Drilling,** there was significant cumulative shortfall in the drilling of development wells during the period from 2009-10 to 2013-14. Though OIL achieved its RE targets for development drilling in terms of meterage during 2010-11 and 2011-12, there were shortfall of 8 wells in the aforesaid period. In terms of meterage, OIL reduced its RE targets from its BE targets for development drilling ranging between 11 and 40 per cent during 2009-10 to 2013-14 without any recorded reasons. Even after reduction of BE targets, the shortfall in actual drilling ranged between 10 and 26 per cent in 2009-10, 2012-13 and 2013-14. In terms of wells, OIL reduced its BE targets for development drilling ranging between 11 per cent and 43 per cent during 2009-10 to 2013-14 except 2012-13. Even after reduction of RE targets, the shortfall ranged between 8 and 34 per cent in all the years.

Though OIL could not achieve the target for exploratory drilling over the years, it failed to execute the contract for one chartered hire rig which expired in December 2012.

Audit also compared the details of exploratory vis-à-vis development wells drilled in terms of meterage and wells during the period from 2009-10 to 2013-14. The results of Audit analysis are given in the table 5.3 and figure 5.1 and 5.2:

Table 5.3 - Percentage of Exploratory Drilling and Development Drilling

Year	Exploratory Drilling		Development Drilling		Total Meterage	Total Wells	Percentage of exploratory drilling to total drilling	Percentage of exploratory wells to total wells	Percentage of Development drilling to total drilling	Percentage of development wells to total wells
	Meterage	Wells	Meterage	Wells						
(I)	(II)	(III)	(IV)	(V)	(VI = II+IV)	(VII =III+V)	(VIII)	(IX)	(X)	(XI)
2009-10	58375	16	84076	30	142451	46	41	35	59	65
2010-11	45875	13	71253	24	117128	37	39	35	61	65
2011-12	56568	16	71426	22	127994	38	44	42	56	58
2012-13	66435	19	62478	19	128913	38	52	50	48	50
2013-14	35699	9	69412	25	105111	34	34	26	66	74
Total	**262952**	**73**	**358645**	**120**	**621597**	**193**	**42**	**38**	**58**	**62**

Figure 5.1 – Exploratory Drilling and Development Drilling (In Meterage)

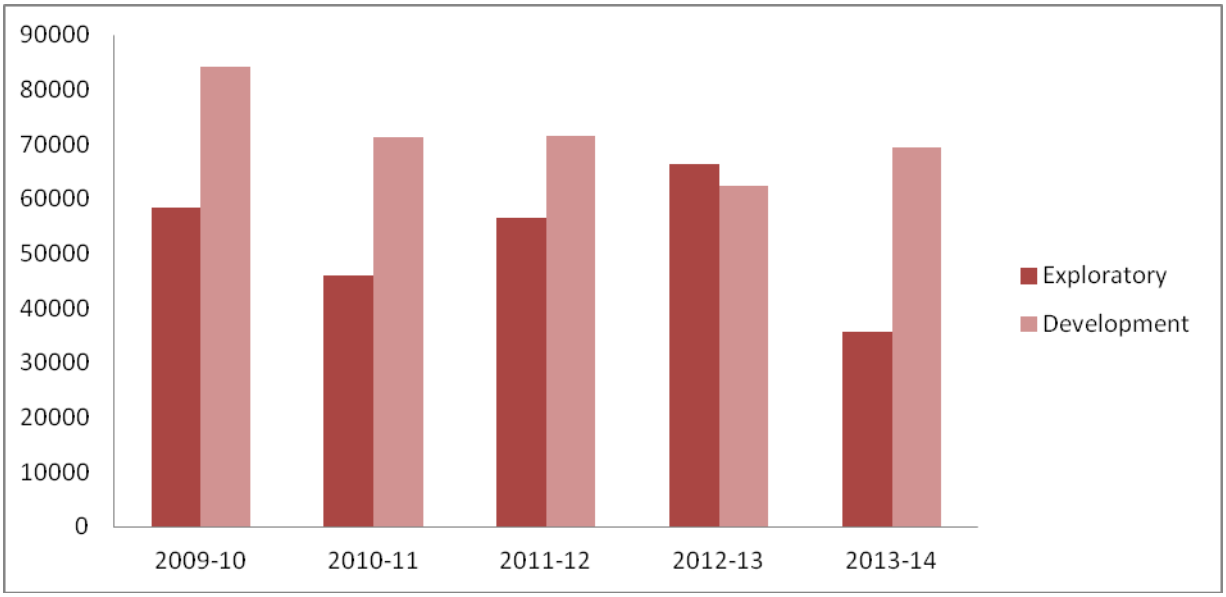
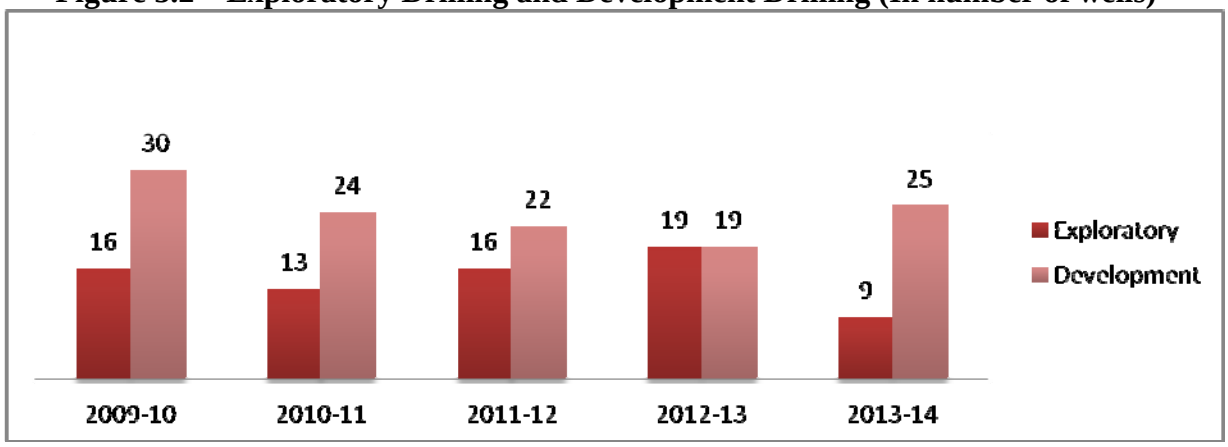


Figure 5.2 – Exploratory Drilling and Development Drilling (In number of wells)



It was observed that

- Except for 2012-13 when the ratio was almost 50:50, in other years, development drilling activities got preference over exploratory drilling during the period from 2009-10 to 2013-14.
- OIL depended more on development drilling (ranging from 48 to 66 per cent) and less on exploratory drilling (ranging from 34 to 52 per cent) resulting in shortfall in exploratory drilling as compared to development drilling**.**
- In order to add more proven field for development and to have better reserve replacement ratio, more and more new areas needed to be explored through exploratory drilling. The low prioritization of exploration efforts undermined the overall objective of adding new fields of hydrocarbon as envisioned in Hydrocarbon Vision 2025.

OIL stated (April 2015) that the variance of the drilling plans with the targets of the 12th five year plan was mainly due to long lead time for acquisition of land, forest clearance, defence clearance, litigation, prolonged production testing, difficult down hole problems leading to loss of rig years and local problems etc. OIL further stated that replacement contract for chartered hire of drilling rig was awarded but the contractor failed to mobilize the rig which was subsequently scrapped.

While accepting the Audit contention regarding more reliance on development drilling and less on exploratory drilling, OIL stated (April 2015) that exploratory drilling efforts from

2010 -11 to 2013-14 was a bit low, which was due to OIL's commitment to fulfill the production target and also due to many potential exploration areas coming under reserve forests / wild life sanctuaries.

The reply (April 2015) of OIL is not convincing as none of the factors mentioned were new to OIL and these should have been addressed to overcome the deficiencies, keeping in view that the targets were set by OIL considering all the above constraints. As regards deployment of chartered hire rig, the fact remains that no chartered hire rig as a replacement was available since January 2013 for exploration activities. OIL reduced its RE targets drastically compared to its BE targets and there were significant shortfalls in achievement even after such reduction. Though OIL had reported its performance of exploratory and development drilling regularly to BOD and MOPNG, no specific analysis of reasons for such shortfall and cause of downward revision of RE targets was available on record.

The contention of OIL about its commitment to fulfill production target and consequent less emphasis on exploratory drilling is not convincing. Considering the fact that OIL being an NOC in the E&P field, it fixes exploratory drilling target considering all aspects of its functioning.

The Standing Committee on Petroleum and Natural Gas (2013-14, 15th Lok Sabha) in its 21st report commented that under achievement of drilling targets of NOCs was mainly due to difficulties faced on account of geographic conditions/non availability of required permissions and clearances by MOD and MOEF, DRDO etc. The committee recommended that MOPNG/OIL should rigorously pursue the matter of obtaining permissions/clearances from the concerned authorities to seek early action for timely achievement of exploration targets. The Hydrocarbon Vision 2025 also emphasized on aggressive persuasion for extensive exploration and to focus on oil security through intensification of exploration efforts and achievement of 100 per cent coverage of unexplored basins in a time bound manner to enhance domestic availability of oil and gas. The committee also recommended that considering the shortfall in the drilling targets, MOPNG should take necessary steps to ensure that NOCs abide by the exploration targets assigned to them. The same committee in 2012-13 pointed out that in view of the need to explore more domestic hydrocarbon resources, the shortfall in the exploratory and development drilling targets would seriously impact the programme.

In the Exit Conference (July 2015) MOPNG/ OIL accepted the views of audit.

5.1.1.2 Performance in drilling depth and drilling time

OIL prepares yearly and three years Tentative Drilling Programme, in which it plans the numbers of wells to be drilled, its depth and planned days required for each well. Test check of records of 142 wells, out of total 193 wells drilled during the last five years ending 2013-14 revealed that:

- In 31 wells, due to difference in planned depth and actual depth, OIL drilled 1714 meters less than planned. However, it took 2084 excess days in aggregate for these wells. Delays for drilling the wells ranged between 6 and 277 days;
- In 6 wells, the actual drilling time taken was much more than the planned days although the actual and planned depth was equal. OIL took 637 excess days in aggregate for these wells. Delays for drilling of wells ranged between 19 and 276 days.

While accepting the Audit contention, OIL stated (April 2015) that the reasons for excess time taken were mainly due to downhole complications during drilling of deep development wells, drilling of J bend/ horizontal/S bend wells, local problems and difficulty in land acquisitions.

Audit has pointed out systemic deficiency of excess drilling time taken in majority of wells. Also the issues cited are well known to OIL and proper planning to curb the delays should have been resorted to.

5.1.1.3 Cycle speed and commercial speed of own and hired rigs

The efficiency of drilling rigs is judged on the basis of commercial speed [30]and cycle speed[31]. The commercial speed and cycle speed of own rigs and hired rigs for the period from 2009-10 to 2013-14 are tabulated in table 5.4:

[30] The commercial speed is the efficiency of operations during the drilling phase and is calculated in terms of meterage/ rig months. It includes the date from which the rig is on location and ready to resume operation to the final stage where production casing is tested. This covers only the actual drilling time.

[31] Cycle speed is the time taken during the entire cycle of rig deployment and is calculated in terms of rig months. It includes the date from which rig was released from its previous location to the rig release from its present location
after drilling of well. It includes rig movement time, drilling time, production testing time, and completion / well abandoning time.

Table 5.4 – Commercial speed and cycle speed of own and hired rigs

(Metres per month)

Drilling performance indicator		**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**
Commercial Speed	Own rigs	1259.42	1405.95	1241.64	1886.21	1532.49
	Hired rigs	1068.03	1293.48	1640.07	1885.74	976.70
Cycle Speed	Own rigs	834.61	487.44	573.40	1091.30	708.59
	Hired rigs	650.13	696.22	856.50	1579.15	578.19

Audit observed that:

- There were abnormal fluctuations in commercial speed and cycle speed of own rigs and hired rigs during the period from 2009-10 to 2013-14, while the number of rigs remained the same.
- The commercial speed and cycle speed of hired rigs reduced to 52 and 37 per cent respectively in the year 2013-14 as compared to 2012-13. OIL, however, did not incorporate any clause in the agreement for chartered hire of rigs to control the inefficiency in operation of hired rigs.
- OIL did not fix norms for commercial speed and cycle speed for its own rigs and also did not incorporate the same in the contracts for hired rigs.

While accepting the Audit contention, OIL stated (April 2015) that the commercial speed and the cycle speed for each rig and for each particular drilling location would not be the same and differ from location to location both for own rigs and chartered hire rigs due to sub-surface problem, different sub-surface geology, target depth, efficiency of equipment as well as operations, bit selection and local environmental problem. In view of the above it was inappropriate to compare the commercial and cycle speed in a generalized way. Further, the norm for planned commercial and cycle speed of OIL is guided by annual Tentative Drilling Programme (TDP). In the annual TDP against each rig, the time required for rig movement and spud[32] date to completion date was shown for each well earmarked which was used as basis of calculating planned commercial speed and cycle speed. This time line was applicable to both in-house and chartered hire rig. As for the efficiency of chartered hire rigs, penalty was being imposed i.e. zero rate wherever applicable as per the contract clauses.

[32] the process of beginning to drill a well.

The contention of OIL needs to be viewed in the light of the fact that even if situation varies from location to location, fluctuation may be in a reasonable range. Audit has pointed out abnormal fluctuation and uneven/skewed trend of the speed, for which no proper analysis was on record. Further, regarding imposition of penalty for lower commercial and cycle speed in respect of chartered hire rig, the reply is not convincing as OIL penalized the contractor only in case of rig remaining idle due to fault of the contractor and not due to lower commercial or cycle speed.

5.1.1.4 Non Productive Time of Rigs

As on 31 March 2014, OIL was in possession of 9 in-house drilling rigs and 13 work-over rigs of various capacities. In addition to own fleet, OIL also used 5 chartered hire drilling rigs and 4 chartered hire work-over rigs for drilling activities.

a) Own and Hired Drilling rigs

More efficiency can be achieved by reducing the non-productive time (NPT) with active co-ordination between logistic and other service providers of rigs. The year-wise details of NPT in respect of own drilling rigs and chartered hire drilling rigs for the period from 2009-10 to 2013-14 are given in table 5.5 :

Table 5.5 – NPT of own and hired drilling rigs

(Figures in hours)

Year	Own drilling rigs			Chartered hire drilling rigs		
	Total hours	Productive hours	NPT	Total hours	Productive hours	NPT
2009-10	63528	43550	19978	35064	28408	6656
2010-11	61320	34144	27176	36528	26842	9686
2011-12	68664	41980	26684	43800	22468	21332
2012-13	64272	41956	22316	43104	27488	15616
2013-14	40344	24676	15668	25680	14072	11608

Source: Tour register of Rigs

Audit observed that:

- The percentage of NPT in case of own drilling rigs increased from 31 per cent in 2009-10 to 39 per cent in 2013-14.
- In case of chartered hire drilling rigs, the percentage of NPT increased from 19 per cent in 2009-10 to 45 per cent in 2013-14.
- Although the ONGC norm for NPT is less than 10 per cent and international norm is less than 5 per cent, the average NPT of own drilling rigs of OIL was 38 per cent and

chartered hire drilling rigs was 35 per cent. Norm for NPT of drilling rigs has not yet been fixed by OIL.

- In the case of three chartered hire drilling rigs, OIL had to pay ₹ 5.34 crore towards standby charges to the contractors due to failure of OIL to provide equipment and materials in time.
- Out of 142 wells drilled in Assam & Assam-Arakan during the period from 2009-10 and 2013-14, there were delays in 33 wells in mobilization of drilling rigs calculated from the day of rig-down at present location to rig-up in next location. The delays ranged between 8 and 205 days.
- Apart from above, during the period from 2009-10 to 2013-14, six chartered hire drilling rigs were not available for a total span of 108 months.

While accepting the Audit contention, OIL stated (April 2015) that the exploratory drilling target could not be achieved for the period mentioned due to high rate of NPT which mainly constituted local problems, bundh, blockade and contractor's problem relating to chartered hire rig etc. OIL further stated (May 2015) that considering the DGH norm for calculation of NPT, besides taking surface and sub-surface problems and absenteeism the NPT ranged between 5 and 13 per cent during 2009-10 to 2013-14.

The contention of OIL is not convincing as the various reasons for NPT should have been addressed by it with the experience gained over a long period of time during its operations in E&P business. The bottlenecks and problems are also not new to OIL.

It is pertinent to note that the Standing Committee on Petroleum and Natural Gas (2014-15, Sixteenth Lok Sabha) in its fourth report noted that rigs were the key equipment for carrying out exploration and production activities. The committee also noted that the idle time for the chartered hire rigs was quite high for NOCs due to some avoidable and manageable constraints like rigs waiting for logistics and waiting on locations on ready sites which affected the productive period of rigs. The committee recommended that NOCs should concentrate in effective planning and management of exploration programmes so as to ensure optimum utilisation of rigs. The committee also desired that NOCs should strive to achieve the productivity level of rigs in line with international benchmark.

In the Exit Conference (July 2015), MOPNG/OIL stated that the audit observation was based on facts.

b) Workover rigs

Workover activities include one or more remedial operation on a producing well to increase production. It also refers to any kind of oil well intervention involving invasive techniques, such as wireline, coiled tubing or snubbing. In order to carry out workover activities, OIL engaged 13[33] in-house workover rigs and 4 chartered hire rigs during the period from 2009-10 to 2013-14 except in the year 2011-12 where only 2 chartered hire rigs were deployed. The year-wise details of NPT of own workover rigs and chartered hire workover rigs for the period from 2009-10 to 2013-14 are given in table 5.6:

Table 5.6 – NPT of own and chartered hire workover rigs

(Figures in hours)

Year	Own workover rigs				Chartered hire of workover rigs			
	Total hours	**Productive time**	**NPT**	**Percentage of NPT to total hours**	**Total hours**	**Productive time**	**NPT**	**Percentage of NPT to total hours**
2009-10	32776	29632	3144	10	25920	24524	1397	5
2010-11	50512	45906	4606	9	28632	25588	3044	11
2011-12	49600	46325	3275	7	17288	15264	2024	12
2012-13	51936	44935	7001	13	28968	25287	3681	13
2013-14	50528	44371	6158	12	35928	29436	6493	18

Audit observed that:

- NPT of own workover rigs ranged between 7 and 13 per cent and chartered hire workover rigs ranged between 5 and 18 per cent during the period from 2009-10 to 2013-14;
- NPT registered an increasing trend for both own and chartered hire workover rigs from 2009-10 to 2013-14;
- The percentage of NPT of chartered hire workover rigs was much higher than own workover rigs.

In this connection, it is pertinent to mention that the norm for NPT in respect of workover rigs has not yet been fixed by OIL.

While accepting the Audit contention, OIL stated (April 2015) that it had total 12 own work over rigs out of which seven rigs were almost 30 years old where NPT was more due to maintenance and thus increasing the NPT trend. In respect of chartered hire workover rigs,

[33] including one workover rig earmarked for training purpose in the year 2011-12

NPT increased mainly due to external problems in operational areas faced by the rig operators.

The fact remains that OIL did not finalize its procurement plan in time to replace the vintage workover rigs. In respect of chartered hire workover rigs, reasons for increasing NPT are known to OIL for taking timely remedial action.

In the Exit Conference (July 2015), MOPNG/OIL stated that the audit observation was based on facts.

5.1.1.5 Production testing of wells

Production testing in oil well is carried out to determine its flow capacity at specific conditions of reservoir and flowing pressures. OIL has fixed target days for completion of production testing, which is 15 days in case of an exploratory well and 10 days for development well.

Out of 193 wells drilled during last five years, the time taken for production testing in respect of 142 wells (92 wells with own rigs and 50 wells with chartered hire rigs) selected based on materiality were test checked.

Audit observed that:

- In 59 wells (30 wells by own rigs and 29 wells by chartered hire rigs), OIL failed to complete the production testing as planned. The delay in completion of production testing ranged between 6 and 94 days.
- As per the status report of the wells as on 31 March 2014, in 8 wells the production testing remained incomplete even after a lapse of one month to four years.
- Total delay for production testing in case of own rigs was 1005 days and in case of chartered hire rigs was 980 days during the period from 2009-10 to 2013-14.
- On account of delay in production testing, OIL paid ₹ 88.02 crore in 29 cases towards standby charges to the contractors against the chartered hire rigs.

The delay in production testing resulted in under utilization of rigs and loss of meterage which resulted in increase in NPT.

OIL replied (April 2015) that in general the time required for the production testing was dependent on various factors like number of zones identified for testing, downhole challenges

etc. OIL has furnished the well wise reasons for the delay in production testing which included non-availability of drilling crew, road breach, repair of isolation failure, local problem, poor cement squeezing job, internal issues, recovery of tubing fish, leakage in valves etc. apart from additional perforation carried out in single/multiple sands.

The reply of OIL is needs to be viewed in the light of the fact that most of the factors as considered by OIL for higher production testing time were controllable by proper planning. Besides, the norm for production testing for exploratory and development wells were adopted by OIL after duly considering all the down-hole challenges likely to be encountered during production testing.

5.1.1.6 Vintage of own rigs

OIL has a dedicated drilling department to accrete hydrocarbon reserves through drilling operation. Drilling Department uses both in-house rigs as well as chartered hire rigs. As on 31.03.2014, the Drilling Department had a fleet of nine in-house drilling rigs and five chartered hire drilling rigs.

The requirement of rigs for exploratory and development drilling in the nominated blocks is assessed on the basis of OIL's drilling commitments in the five year plan and deployment pattern as per three year Tentative Drilling Programme. In case of NELP blocks, the requirement of rigs is worked out by the concerned project based on the Minimum Work Programme (MWP) pertaining to the block. Commensurate with the type and nature of wells, rig types/capacities are determined and the need for additional rigs for exploratory effort is worked out considering the availability of in-house and currently engaged hired rigs.

It was noticed in Audit that the vintage of in-house drilling rigs were in the range of 9 and 36 years as on 31 March 2014. Similarly, out of 13 existing in-house workover rigs, the vintage of 8 workover rigs was in the range of 25 and 35 years and 5 workover rigs were commissioned in July/December 2008.

The ideal life span of a drilling rig ranged between 20 and 25 years depending on various factors viz. use, maintenance etc. Since OIL is operating with a fleet of very aged equipment, it affected the exploratory drilling of OIL due to high NPT.

OIL stated (April 2015) that its own rigs were refurbished since 2009 onwards except two rigs. In order to phase out the old workover/drilling rigs, procurement processes of nine new workover/drilling rigs were in progress.

OIL itself accepted that out of total 12 own work over rigs, seven rigs are almost 30 years old where NPT was more due to maintenance, leading to increase in NPT trend.

In the Exit Conference MOPNG/OIL stated (July 2015) that a number of new rigs were under procurement and old vintage rigs would be gradually replaced.

5.2. Management of Contracts

Procurement of rigs

Audit reviewed all the 4 procurement of rig contracts executed during 2009-10 to 2013-14. Certain deficiencies noticed in management of contracts are listed in Annexure III.

Chartered Hire rigs

Out of 20 executed contracts for chartered hire of rigs, audit reviewed 8 contracts selected based on materiality. Certain deficiencies noticed in management of contracts are listed in Annexure IV.

5.2.1 Dependence on hired rigs

OIL engaged chartered hire rigs in its operational area since 2004 and the practice continued thereafter in order to meet shortfall of its own drilling fleet. During the period from 2009-10 to 2013-14, OIL engaged five chartered hire drilling rigs. Similarly, it also engaged two to four chartered hire work-over rigs in all these years.

Audit observed that OIL did not initiate any action till April 2010 for procuring drilling rig to reduce its dependence on the hired rigs as the last procurement of drilling rigs made by OIL was in 2005 only for replacement of old drilling rigs. Subsequent action of OIL in April 2010 for procurement/commissioning of drilling rigs did not materialize on account of legal dispute and an accident of the rig carrying vehicle. As such, OIL depended on the engagement of hired rigs.

OIL in its reply (April 2015) stated that it engaged chartered hire rigs in its operational areas continuously since 2004 and the practice continued thereafter to meet the drilling requirement as envisaged in three yearly drilling plan. The procurement process of four 2000

HP drilling rigs were in progress to reduce the dependency on chartered hire rig. However, due to easy deployment, chartered hire rigs in certain areas were preferable than own rigs. Further, if more own rigs were used it might lead to redundancy of rig inventory due to non-sustaining of drilling activities.

The reply of OIL is not convincing since there was continuous requirement of drilling rigs as it failed to meet the exploration target over the years. The vintage of drilling rigs of OIL were in the range between 9 and 36 years and for workover rigs it ranged between 5 and 35 years. OIL itself admitted that vintage of workover rigs led to increase in non productive time due to maintenance. Further, the procurement action for four 2000 HP drilling rigs has not been completed (April 2015).

5.2.2 Illustrative Cases in Drilling Operation

(i) Procurement of rigs

OIL invited (January 2006) bids from rig manufacturers/ suppliers for supply of four 600 HP mobile workover/drilling rigs. In response to the tender, four bids from different manufacturers/suppliers[34] were received.

During technical scrutiny (April 2006), OIL, sought further information from two bidders, otherwise eligible {i.e. M/s China Petroleum Technology Development Corporation, China (CPTDC) and M/s SC TC UPET SRL, Romania(SCTC)}, by 25 May 2006.

Considering the CPTDC offer and subsequent clarifications, the technical committee concluded (July 2006) that the offer of CPTDC had serious limitations. However, GM (OD & RS) suggested that the bid of CPTDC was technically qualified by drilling department and recommended CPTDC as proven source as the 1000 HP mobile rig supplied by CPTDC earlier was working satisfactorily at Rajasthan. He also noted that performance of the rig quoted by M/s SC TC UPET SRL, Romania (SCTC), even though technically acceptable, was poor.

CPTDC in response to the clarification sought stated (September 2006) that the characteristics of 600 HP rigs were the same with that of 1000 HP rig supplied by them in

[34] 1. M/s National OilWell Varco, USA,
2. M/s China Petroleum Technology Development Corporation, China,
3. M/s SC TC UPET SRL, Romania and
4. M/s PMP, UK/ Ukraine

2005. CBC approved (September 2006) to send a team to manufacturer's site at China to obtain the requisite clarification and directed that they must visit the field where such rigs are being used in China. Accordingly, the team visited China and reported (October 2006) that the performance of the rigs was satisfactory and the offer of the party was technically acceptable.

OIL decided (October 2006) to open the price bid of only CPTDC. OIL rejected SCTC's presentation (November 2006), and concluded that the offered rig model by SCTC was not technically suitable.

The price bid of CPTDC was opened in January 2007 and the purchase order for supply of four 600 HP self propelled mobile workover/drilling rigs placed (February 2007) at total value of ₹ 28.15 crore to CPTDC which included ₹ 0.07 crore towards commission payable to their Indian agent (i.e. M/s Comet Energy Solution India Pvt. Ltd., New Delhi).

Subsequently, OIL modified (August 2007) the purchase order by issuing an amendment order which included change in various specifications[35] of the rigs. OIL issued another amendment (August 2007) for supply of one more rig with same specification at total value of ₹ 6.20 crore which include ₹ 0.02 crore towards agency commission payable to Indian agent without resorting to fresh tender. The contractor delivered the rigs in July-December 2008. OIL noticed that the rig did not adhere to the specification.

Audit observed that the procedure adopted by OIL lacked transparency on various counts:-

- OIL accepted the technical bid of CPTDC on the issue of weight and other issues rejecting the clarification of SCTC.
- OIL gave preference to CPTDC, a supplier of rig, over SCTC which was a manufacturer. The procurement of rigs from supplier had the risk of increased cost and non-availability of spares in future.
- OIL paid ₹ 0.09 crore towards agency commission to M/s Comet Energy Solutions India Pvt. Ltd. though the same was not included in the bid.
- CPTDC supplied a rig not confirming to specification. As per the Bid Rejection Criteria (BRC), bidders were not allowed to substitute the rig make/ model/

[35] rotary speed, weight of the compound gear box, weight of the elevated gear box, engine model and transmission model

specification once offered by them in their bid during the period of bid validity. OIL, however, violated the above provision.

OIL stated (April 2015) that it broadly followed the guideline of in-house contract and purchase manual and thus procedure followed was transparent. Further, clubbing of additional requirement against a purchase order was permitted as per the provisions of the Manual and it had been done as per operational urgency. OIL's contract manual had not fixed timeline for finalisation of rig contract. OIL also justified technical selection of CPTDC over SCTC.

OIL's reply was silent on subsequent change in specification by CPTDC after finalization of the contract. As explained above OIL's action lacked transparency and was against CVC guidelines.

(ii) Award of chartered hire rig contract without resorting to tender procedure

OIL required two chartered hire rigs and floated tender in April 2010 with a provision for an additional rig. It awarded (March 2012) the contract of one drilling rig to Simplex infrastructure, Mumbai (Simplex), as L1 bidder, at a total contract price of ₹ 51.67 crore, and Simplex offered only one rig in their bid. Subsequently, OIL awarded (May 2012) contract[36] for second rig to Jaybee Energy Pvt. Ltd. (JEPL) under the same tender at the price of L1. In July 2012, OIL decided to obtain the third rig on urgent basis by October 2012.

Instead of floating a fresh tender, OIL decided to exercise the third rig option to meet the requirement of additional rig as available in the tender[37] which was finalized in March 2012. OIL awarded (March 2013) the contract for third rig to JEPL for a period of two years at the rate of second rig (i.e. ₹ 51.67 crore).

Audit observed that:

- OIL had opened the technical and price bid in June 2010 and December 2011 respectively. However, OIL finalized the award of third rig in March 2013, after a lapse of almost three years, at the rate offered by JEPL in April 2010. Audit noticed from another contract[38] finalized in June 2012 that there was declining trend in the rate of hired rigs.

[36] No. CONT /GL /DRLG /288 /12
[37] No. CONT/GL/DRLG/259/10
[38] Contract No. OIL/CDG4167/DRLG/12

- In audit view, OIL deprived itself of getting the lower and competitive rate prevailing in 2013 by not going in for fresh tender for the third rig. OIL's action was lacking in transparency as OIL did not go for open tender.
- The proposal for obtaining third rig was processed on fast track basis in July 2012 without calling for fresh tender as the said rig was required by October 2012 and the contract was given to JEPL. Audit noticed that LOA was issued in March 2013. This ultimately defeated the purpose of bypassing of tendering system for expeditious availability of third rig as rig was not available till September 2013 even if the contractor mobilized the rig in time (i.e. 180 days of mobilization time from the date of awarding of contract).
- The contract value included mobilization charges of ₹ 0.54 crore. As the drilling rig offered by JEPL was working with OIL at Duliajan under another contract[39], the mobilization charges of ₹ 0.54 crore should have been excluded from the contractual value as it has been done in case of replacement of rig contracts[40].

OIL replied (April 2015) that the contract were awarded after deliberation of urgency of requirement and to avoid time required for floating fresh tender to hire third rig. The decision to award third rig was within the provisions of the tender which was floated on international competitive bidding basis and was also based on legal opinion.

The reply is not convincing as the procedure adopted by OIL not only lacked transparency but was also against the CVC guidelines issued in July 2007. Further, approval of Board of Directors was not obtained though the contract value exceeded the delegation of power of CBC for which Board approval was required.

[39] Contract No. OIL/CCO/DRLG/204/2008
[40] No.OIL/CCO/DRLG/GLOBAL/165/2007

CHAPTER 6

EFFECTIVENESS OF EXPLORATION EFFORTS

In order to determine how far OIL was effective in its exploration efforts in the nomination blocks, audit reviewed the status of conversion of PEL block into PML blocks, and relinquishment of PEL blocks under Nomination Regime during 2009-10 to 2013-14. Out of 16 PEL blocks and 22 PML blocks, audit reviewed 5 PEL and 7 PML blocks respectively.

Audit also reviewed success of bidding by OIL under various rounds of NELP, status of achievement of MWP and payment of liquidated damages (LD) by OIL in NELP blocks during 2009-10 to 2013-14. Blocks relinquished by OIL were also reviewed. Besides, role of MOPNG and DGH and certain illustrative cases related to exploration efforts of OIL have also been highlighted.

6.1 Performance in Nomination Blocks

6.1.1. Status of Conversion of PEL to PML blocks

Under the Nomination regime, OIL was granted Petroleum Exploration License (PEL) in 16 blocks during the period from 1985 to 1999.

Audit reviewed the status of seven of the above blocks and observed that:

- During last five years ended 2013-14, OIL converted only two blocks, that too partially, from PEL into PML. Only 90 Sq. Km (Borhat PEL: 81 Sq. Km and Tinsukia PEL: 9 Sq. Km) was converted out of 1887 Sq.Km. (222 sq.km for Borhat and 1665 sq.km for Tinsukia) allotted.
- Out of five operational PELs, OIL applied for extension in three blocks (Dibrugarh, Tinsukia and Deomali), in respect of which the approval of DGH was awaited (December 2014). In balance two PEL blocks (Jairampur Ext. and Namchik PEL) allotted (May 1990 and April 1999), OIL initiated action to drill only in two locations[41].

[41] JRB and NCK-1

6.1.1.1 Significant issues in management of PEL blocks

The Dibrugarh PEL was granted to OIL in November 1987. The civil work at location DIBH could not be started as the land was acquired only in February 2009. Even after acquisition of land, civil construction could not be started as PEL expired in March 2009. OIL applied for extension, only after expiry of the PEL in April 2009, which was granted in February 2011 and was valid upto February 2013. During the period April 2009 to February 2011, no activity was carried out pending extension of PEL. Further, civil construction could not be commenced due to litigation and demand of higher compensation by the local farmers. This remained unresolved since 2012.

In location DIBC, OIL carried out fresh civil work as the construction work done earlier at a cost of ₹ 1.17 crore was extensively damaged. OIL had to incur an amount of ₹ 0.90 crore for reconstruction of civil work.

MOPNG granted further extension upto February 2015. The PEL is still to be converted into PML (April 2015).

Audit observed that OIL did not take timely action for extension of PEL prior to March 2009. Further, MOPNG took inordinate time of 22 months in granting further extension thereby leading to idling of site and extra expenditure on fresh civil construction.

OIL replied (April 2015) that Dibrugarh PEL is currently under operation with discoveries. Based on the discoveries made in DIBC, presence of positive indication of hydrocarbon in DIBH and presence of identified prospects based on 3D seismic interpretation, 168.30 Sq.Km area was applied in February 2015 for conversion to Dibrugarh extension PML.

The fact remains that OIL held the block for 28 years and is yet to convert the block into PML (April 2015).

6.1.2. Status of relinquishment of PEL blocks

Out of 16 PEL blocks, OIL relinquished nine blocks in phases after holding them from 15 to 26 years without any discovery, even after incurring an expenditure of ₹ 219.11 crore (Annexure-V).

6.1.2.1 Significant issues in relinquished PEL blocks

- Lakhimpur PEL was awarded to OIL in December 1995. Though OIL completed extensive survey work and medium size prospects had also been identified, PEL block

was relinquished in March 2009 due to expiry of PEL as MOPNG did not grant further extension.

In Audit view the decision to relinquish the block on the ground of geological constraints (the area being in the Brahmaputra river system) could have been taken earlier without incurring expenditure of ₹ 169.15 crore on survey work and indicates poor planning on the part of OIL.

- Margherita PEL was awarded to OIL in November 1987. OIL incurred expenditure of ₹ 14.46 crore in the block. Tests confirmed presence of gas in the area under the block. Based on the lead obtained, reinterpretation of the area was done and OIL planned to test the untested prospective area by deploying a workover outfit. However, OIL surrendered (April 2009) the block due to expiry of PEL.

In Audit view this reflects poor planning and lack of efforts by OIL as it held the PEL block for 22 years and surrendered the PEL block even after initial signs of presence of hydrocarbons.

OIL replied (April 2015) that Lakhimpur and Margherita PEL were relinquished due to poor hydrocarbon prospects in exploratory well drilled in identified structures.

OIL's reply about Lakhimpur and Margherita blocks, however, is not borne out by facts contained in the records of OIL, which indicated positive prospects of hydrocarbon.

6.1.3. Status of PML blocks

OIL had 22 PML blocks under operation during the period from 2009-10 to 2013-14, out of which six blocks[42] remained idle from 4 to 14 years after conversion into PML. OIL stated the reasons for idling of six blocks which included inter alia the following:

- In Tinsukia, regular production could not be sustained in one of the discovery within the PML due to local issues and few of the discovered/extension wells have been kept shut-in due to inconclusive production behaviour.
- In Borhapjan, due to down-hole problem, inconclusive production behaviour and lack of evacuation facilities, detailed testing of the structure could not be carried out at that time.
- In Dholiya, currently single well Dholiya-1 had been lined up for workover after availability of evacuation facilities.

[42] Ningru Extn. (Kherem), Tinsukia, Borhapjan, Dholiya, Mechaki and Mechaki Extn.

- In Mechaki, commercial production could not be sustained due to reservoir complications.

Audit observed that out of six blocks, in five blocks the reasons cited were not convincing. Conversion of PEL to PML is a result of discovery of hydrocarbon. As such citing of problems like inconclusive production behavior of ground reality at such a later stage does not hold good. OIL could have taken timely action for lining up of facilities as cited above as OIL is a major player in E&P sector and is a cash rich entity.

6.2 Performance in NELP blocks

6.2.1. Success of bidding

Upto Round-IX, GOI offered 360 exploration blocks, out of which 254 blocks were awarded till 31 March 2014. OIL participated in all the nine NELP rounds and submitted bids for 67 blocks and was awarded 40 blocks either alone or in the form of consortium. Out of these 40 blocks awarded, OIL performed as operator in 11 blocks. The details of round-wise blocks offered, bids submitted and blocks awarded to OIL are given in Annexure VI.

Audit observed that:

- The percentage of participation in NELP rounds was quite low except in Round-IX where OIL bid for 50 per cent of blocks offered. The participation ranged between 4 and 50 per cent.
- OIL was successful in acquiring all the blocks for which it submitted bids in four NELP rounds (i.e. NELP-I, II, III and VI). OIL's performance, however, was not very encouraging in NELP round-V and IX, where the percentage of success was 14 and 24 respectively.
- In 27 blocks, OIL lost the opportunity for exploration of hydrocarbon under NELP due to lower work commitments/fiscal package /technical capabilities in the bid proposal as compared to the successful bidders.

OIL stated (April 2015) that the participation in NELP is a function of various factors decided by management i.e. balance of acquiring prospective areas for future reserve portfolio expansion, investment in core areas of operation for revenue generation for maintaining growth, the geological and commercial prospectivity interpretation by in-house/ outside expertise, resource availability (man, material and fund), risk sharing with consortium partners, location and infrastructure suitability etc.

The reply needs to be viewed in the light of the fact that OIL submitted its bid for 2 to 8 blocks in the NELP round I to VII, which is considered to be quite low. However, OIL submitted bid for 14 and 17 blocks in next two rounds of NELP. Further, the success rate of obtaining blocks was not encouraging in NELP round – V and IX. It also lost the opportunity for exploration of blocks due to lower work commitment/ fiscal package/ technical capabilities in the bid proposal. Though OIL itself mentioned that under NELP the operator is benefitted in four ways i.e. (i) it would fetch better price as crude oil price would be determined on international price mechanism, (ii) exemption of custom duties on import of exploration equipment, (iii) rate of royalty would be less, and (iv) exemption from payment of cess etc., it had not been able to participate in the bidding process with all out efforts as evident from above.

6.2.2 Status of adherence to MWP

OIL had participating interest either alone or as consortium in 27 blocks in operation as on 31st March 2014. OIL is operator in 11 blocks out of these 27 blocks.

6.2.2.1 Significant issues in non achievement of MWP

Audit reviewed 7 blocks out of 11 blocks where OIL was operator and significant observations in respect of these blocks are as follows:

i) The block **AA-ONN-2002/3** under NELP-IV in Karbi-Anglong and North Cachar hill districts in Assam was awarded (April 2004) to the consortium of OIL (PI:30 per cent) and ONGC (PI:70 per cent), where OIL was the operator. The PEL was obtained from Government of Assam in February 2005.

OIL awarded (October 2005) a contract for acquiring 300 Ground Line Kilometer (GLKM) 2D seismic survey along with 100 geo-chemical samples to M/s. Shiv-Vani Oil and Gas Exploration Services Ltd., New Delhi (Shiv-vani) at a contract value of ₹ 11.95 crore. Since Shiv-vani did not complete the seismic survey work as per contract, OIL cancelled (July 2007) the original contract. Subsequently, OIL awarded (November 2008) the contract for 2D seismic survey to M/s. Indian Oil Tanking Limited (IOTL) for 150 GLKM only. OIL again awarded 100 GLKM in October 2010 and 50 GLKM in September 2011 to IOTL. IOTL completed the works in January 2012.

Audit observed major lacunae in planning of contract process as detailed below:

- While the termination notice was served in January 2007 to the contractor, the contract was cancelled in July 2007. Thus, OIL wasted six precious months of MWP.

- Inspite of splitting of the initial work of 300 GLKM into three contracts, OIL awarded the work to one contractor i.e. IOTL and as such lost the opportunity to get competitive pricing.
- Consequently, OIL had to award the contract at ₹ 41.79 crore to IOTL for the same work which was originally awarded to Shiv-vani at a contract value of ₹ 11.95 crore only. This resulted in payment of an additional amount of ₹ 29. 84 crore by the consortium where OIL's share was ₹ 8.95 crore.
- Due to delay in completion of Phase-II, a penalty of ₹ 31.78 lakh (upto September 2014) had been imposed by DGH wherein OIL's share was ₹ 9.53 lakh.

OIL replied (April 2015) that after ascertaining the hydrocarbon prospectivity of the area through interpretation of initially acquired 150 GLKM 2D seismic data, both the JV partners (OIL and ONGC) jointly agreed to go ahead for further 100 GLKM acquisition of 2D seismic data (contract amendment done for 250 GLKM) and subsequently another additional 50 GLKM (contract amendment done for 300 GLKM) to narrow down the prospect in the study area. The further extensions were required, to detail certain geological prospects which were assessed to provide suitable drilling location for oil and gas, based on the broad grid seismic data acquisition of initial 150 GLKM.

The reply of OIL is not convincing as it retained the scope and quantum of work at 300 GLKM of 2D survey while splitting the contract in the later instance on hindsight only. Had OIL been justified in such splitting ab initio, it could have avoided delay and escalation. It shows error in long term planning in assessing the viability of block on the part of OIL.

ii) The onshore block **RJ-ONN-2004/2** at Rajasthan was awarded in NELP-VI round of bidding to the consortium of OIL (75 per cent PI) and M/s GeoGlobal Resources (Barbados) Inc. GGR (25 per cent PI).

Audit observed that:

- In October 2008, OIL planned to complete 3D seismic API and twelve exploratory wells by October 2011. However, due to delay in API and release of drilling locations, actual achievement recorded a shortfall of 10 exploratory wells in the original Phase I period. This led to an avoidable payment of LD of ₹ 34.35 crore.
- One more well was drilled during the extended period of Phase I (January 2012 to July 2013).

- GGR stated that under the directions of Management Committee, they signed Operating Committee (OC) Resolution for transfer of PI in the block to OIL and hence it was OIL who had to pay the LD amount even towards GGR's share in the block. Presently, arbitration case is in progress.
- Highly viscous Heavy oil were observed in the well Punam-1 in July 2012. However, even after expiry of more than two years the Declaration of Commerciality (DOC) had not yet (December 2014) been submitted.
- The Phase-II expired in January 2015 without drilling a single well in this phase.

Thus, delay on the part of OIL in API and release of drilling locations with consequential delay of exploratory drilling led to non-monetisation of the discovery in the block till date.

OIL replied (April 2015) that 3D seismic data was acquired in November 2008 and processing was completed in May 2009. Interpretation was completed in April 2010. Further, integrated in-house interpretation was also carried out at OIL's interpretation centre wherein six locations were identified. Thus, there was no delay in finalization of drilling locations. In the first phase, two best locations were drilled during April 2011 to September 2011. Both the wells are abandoned due to poor hydrocarbon prospect. Well Punam-1 was the discovery well of the block. Thus, there was no undue delay in finalization and release of drilling location. Therefore, payment of 10 per cent LD was unavoidable.

While accepting the issue of GGR's breach of contract, OIL added that Declaration of Commerciality (DOC) was supposed to be submitted by June 2014. However, a note comprising G&G review and status of DOC in view of non-availability of suitable technology and drilling rig to complete the appraisal work programme was submitted to DGH in June 2014. OIL's efforts were on and it was carrying out experimental production testing in well Punam-1 by using cold production technique condensate from OIL's gas fields. OIL applied to DGH/MOPNG for grant of 3 years additional period with effect from June 2014 for completion of appraisal work and DOC pertaining to the discovery of highly viscous heavy oil. OIL's efforts were on for production of this type of crude and presently the well was unloading at the rate of around 8 bbls of well fluid after xylene treatment. Although Phase-II of the block expired in January 2015, the well could not be drilled for want of drilling rig.

The fact remains that, firstly, OIL has not been able to justify delayed processing and interpretation work which has a direct impact on ultimate delay in identifying and releasing drilling locations. Secondly, given OIL's status as one of the two major NOCs, OIL should have kept abreast of latest technology. Planning for adopting the right technology should have been initiated much earlier to enable timely deployment of drilling rigs.

6.2.3 Status of relinquishment of NELP blocks

OIL, as operator, relinquished seven blocks, out of which one[43] block was relinquished prior to 2009-10 and six blocks were relinquished during the period from 2009-10 to 2013-14.

OIL paid LD for 6 blocks amounting to ₹ 68.63 crore towards unfinished minimum work programme (MWP) during 2009-10 to 2013-14. Review of all relinquished blocks is summarized in Annexure VII.

6.2.3.1 Significant issues in relinquished NELP blocks

i) The block **AA-ONN- 2004/1 (Amguri)** was awarded to OIL, as operator, with 85 per cent of PI. The MWP comprised reprocessing of 2D, 3D Seismic (API), Geo-chemical sampling and drilling of 3 exploratory wells with a project cycle of 4 years commencing from 2007.

Based on 144 Sq. Km of new 3D seismic data interpretation, 3 locations were identified out of which 1 location (AMG-1) was released for exploratory drilling which was spudded in October 2009. The well was, however, abandoned in April 2010 in view of hydrocarbon discovery.

The land for drilling of second location of exploratory well (AMG-2) was acquired in April 2010 and civil work started in May 2010. OIL took 6 months extension under Phase-I (upto December 2011) in order to complete drilling of AMG-2, which was spudded in July 2011. AMG-2 was abandoned in December 2011 as there was no discovery of hydrocarbon. OIL did not agree to the proposal of availing additional 6 months extension (upto June 2012) to complete drilling and testing of third committed well (AMG-3) by paying 10 per cent LD on the ground that the matter had already been delayed and there was huge liability towards LD.

In the meantime, MOPNG had directed DGH that Phase-I of the Block was expired/terminated in December 2011.

Audit observed that:

[43] MN-ONN-2000/1

- In case of AMG-I the planned date for spud-in was August 2009. OIL spudded the well in October 2009 after a delay of two months.
- Land acquisition for construction of civil work for AMG-2 was not completed timely. OIL did not plan well in advance to allow civil work for AMG-2 to be completed before abandonment of AMG-1.
- OIL incurred a total expenditure of ₹ 83.59 crore[44] without completing its committed MWP and finally relinquished the block.
- OIL did not drill the committed third well (AMG-3) and paid an amount of ₹ 12.32 crore[45] towards LD as cost of unfinished committed minimum work programme to MOPNG due to delay in completion of the works arising out of improper planning.

OIL replied (January 2015) that as a part of expeditious exploration activities in the block, the first well AMG-1 was drilled. AMG-2 was drilled to the northern part of the block, on a separate fault block. Additional geo-scientific studies were carried out prior to drilling of AMG-2. Hence, land acquisition process was not initiated simultaneously to AMG-1. The lapse of one month for starting of civil work was due to finalizing the related contracts. OIL added that more than one year was taken to complete the civil work for AMG-2 because of the involvement of strengthening and repairing of 8.40 Km approach road to facilitate movement of heavy vehicles / rig transportation and carrying rig machineries. Moreover, civil work for AMG-2 had to be carried out during severe monsoon time which also delayed the spud-in of well AMG-2.

Contention of OIL is not convincing as OIL is an entity operating mostly in upper Assam and is technically capable in handling such reasons cited for delay. Since land acquisition of AMG-2 and ancillary civil work was not initiated simultaneously, while AMG-1 was in process, the delay was multiplied. OIL could have simultaneously carried out additional geo-scientific study without losing precious MWP time. The above reflected poor planning on the part of OIL.

Also three locations were identified (AMG-1, AMG-2, AMG-3) at the initial stage based on the 3D seismic data interpretation and 3 wells were to be drilled as per MWP. OIL, however, did not take up AMG-3 and incurred the burden of LD.

[44] 85 per cent of ₹98.35 crore
[45] 85 per cent of ₹14.49 crore

ii) The **Block RJ-ONN-2000/1** in Rajasthan was awarded to OIL under NELP-II. OIL as operator held 100 per cent PI initially. The PSC for the block was signed in July 2001. The PEL was granted in January 2002 and Phase-I was effective from the date of grant of PEL for a period of 3 years. However, the block was relinquished in February 2010 during Phase-III on the ground of poor hydrocarbon prospect.

Audit observed that:

During Phase-II of this block, M/s Suntera Resources Limited (SRL) expressed interest to participate for 40 per cent share. OIL decided to allow SRL to participate through an agreement in August 2006. Proposal for assignment of PI from OIL to SRL was approved by MOPNG in June 2007 at a stage when MWP (i.e. drilling of one well) of Phase-II had already commenced (June 2007).

It was seen that SRL as JV partner had not paid the past cost amounting to ₹ 4.25 crore (bill raised in July 2007 for the period from 17.8.2001 to 31.3.2007), which was payable within 15 days of raising of invoice as per agreement.

Due to non-compliance of contractual obligations, SRL's participation in the block was terminated in August 2009 under provision of Article 29.5 of PSC. Audit noted that there was delay of more than two years by OIL and MOPNG to terminate the contract giving an undue opportunity to SRL to assess the viability of the block without monetary contribution. SRL also took a significant part in the subsequent decision of entering into Phase-III as evident from the fact that the JV partner considering the short time available, not only suggested (September 2007) hiring the services of M/s RPS Energy Ltd., UK (RPS) for a quick look post drilling evaluation of a well of the block but also awarded (September 2007) the job directly to RPS. It has been noted that post facto approval for releasing payment to RPS for carrying out the quick look evaluation was granted by OIL only in November 2007.

OIL replied (April 2015) that the decision to enter into phase –III was a joint decision by all JV partners.

OIL's contention is not convincing as availability of funds during the next phase (which incidentally was not forthcoming from SRL) was none the less a crucial factor for taking the decision whether to enter into next phase or not. It also gave undue advantage to SRL by allowing it to select the consultant (M/s RPS) and taking part in the decision-making without any monetary contribution.

6.3 Status of monitoring by MOPNG/DGH in Nomination and NELP Blocks

6.3.1 Delay in Grant of Petroleum Exploration License

Under NELP-VI, MOPNG awarded the block KG-ONN-2004/1 to the consortium of OIL (90 per cent PI) and Geo Global Resources Inc., Barbados (10 per cent PI). The block covered an area of 549 Sq. Km, out of which 511 Sq. Km in Andhra Pradesh and 38 Sq. Km in Puducherry.

The PSC for the block was signed in March 2007, however, the PEL for 511 Sq. Km area in Andhra Pradesh was granted in February 2008, after a gap of 350 days from signing of PSC, and the PEL for 38 Sq. Km area in Puducherry was granted in June 2010, after a gap of more than three years from signing of PSC.

Thus, the delay in granting of PEL by the concerned State Government also delayed the process of exploration and the goal set in the Hydrocarbon Vision 2025.

6.3.2 Delay in clearances from Ministries/Departments

In order to carry out exploration activities in the awarded blocks under nomination or pre-NELP or NELP period, the contractor is required to obtain various clearances from different Ministries/Departments (i.e. Ministry of Environment and Forests, Ministry of Defence, Ministry of Home Affairs, Ministry of External Affairs and Department of Space).

As on November 2014, the blocks where exploration activities were affected due to delay in getting clearances or non-availability of clearances from the concerned Ministries/ Departments are given in table 6.1:

Table 6.1 - Delay in clearances from Ministries/Departments

Sl. No.	Blocks	Time taken (In days)	Remarks
1	AA-ONN-2002/3	199	Delay in grant of environmental clearance by MoEF
2	AA-ONN-2004/2	713	Delay in grant of forest clearance by MoEF
3	KG-ONN-2004/1	2093	Delay in grant of forest clearance by MoEF
4	Ningru PEL	More than nine years	Delay in grant of forest clearance by MoEF
5	Ningru Extension PEL	More than nine years	Delay in grant of forest clearance by MoEF
6	MZ-ONN-2004/1	More than four years	Delay in grant of forest clearance by MoEF
7	RJ-ONN-2000/1	One year	Delay in grant of clearance by MoD

Audit observed that:

- Delay in getting PEL from State Governments and clearances from concerned Ministries/ Departments adversely affected the functioning of upstream oil companies and their efforts towards achieving goals set under Hydrocarbon Vision 2025 as well.
- There were reported delays in exploration of blocks and non completion of committed MWP within the exploration phase, due to non-obtaining of clearances by the MOPNG from different Ministries/ Departments before carving out of blocks for inclusion in the offer list of NELP round or even award of blocks under Nomination or pre-NELP period. This deprived the upstream oil companies to concentrate fully on their area of specialization (i.e. exploration and production);

Thus, in seven blocks, the exploration efforts of OIL was held up due to delay in getting clearances or non-availability of clearances from the concerned Ministries/ Departments. Besides, in absence of clearance from Ministry of Defence, the block CY-OSN-97/2 was relinquished without exploration, defeating the objective of awarding of block.

The Standing Committee on Petroleum and Natural Gas (2014-15, Sixteenth Lok Sabha) in its 1st Report also recommended (December 2014) that 46 per cent of sedimentary basin had to be assessed for hydrocarbon prospects under the Hydrocarbon Vision 2025. However, due to non-availability of requisite clearances from different Ministries there was delay in exploration activities. The Committee, therefore, recommended that the MOPNG/ DGH should ensure that all the necessary clearances are obtained from concerned authorities for the blocks offered for auction so that the companies which emerge successful can commence their exploration work at the earliest.

However, MOPNG decided (December 2014) that as a matter of policy, it shall ensure in-principle approval from all the concerned Ministries/Department for identified blocks before auction in future.

OIL confirmed (April 2015) the audit remarks in respect of 7 blocks allotted to OIL under NELP. In the Exit Conference (July 2015), MOPNG reiterated the stand taken in December 2014.

6.3.3 Less weightage in MOU for timely completion of MWP

Timely completion of MWP under NELP is of prime importance as delay in completion of MWP attracts penalty in the form of LD. Audit reviewed the weightage given in MOU for exploration activities of OIL and observed the following deficiencies:

During the period from 2009-10 to 2013-14, no parameter was incorporated in the MOU towards timely completion of NELP blocks and payment of penalty in case of default.

Parameters of MOU with respect to seismic survey and drilling of wells in domestic field particularly blocks under NELP are of high importance being the core activity of an upstream oil company. Further, as per the PSC, OIL was required to pay LD in case it fails to abide by the stipulated time period. These parameters have not been given its due weightage in the MOU[46]. Seismic surveys have been removed from the MOU target since 2011-12. Besides, parameter for drilling of wells under NELP was removed from MOU target since 2012-13.

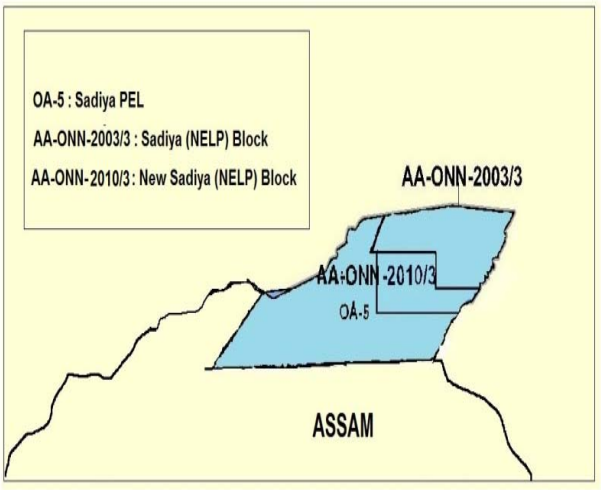
While accepting the audit contention OIL stated (April 2015) that it is committed to honour the MWP of PSCs. Considering the national and organizational priority, urgency and need, Department of Public Enterprise (DPE) may consider inclusion of such parameter for timely completion of MWP.

In the Exit Conference MOPNG stated (July 2015) that they had tried to give more weightage to exploration activities and the matter was taken up with the Task Force under DPE on previous occasion, however, the same was not accepted by the Task Force.

6.4 Illustrative Cases in Exploration Efforts

6.4.1 Unjustifiable bidding for NELP blocks in known problematic areas

Sadiya PEL was awarded to OIL in November 1995 under nomination regime for exploration in 1130 Sq. Km. Out of this area, 282.5 Sq. Km was relinquished by OIL during 1st re-grant (Nov 2001). The remaining area of the block was finally relinquished by OIL in April 2009 without exploratory drilling due to logistic constraints such as non availability of approach road and bridge over the river Brahmaputra for rig mobilization.



Audit observed that:

- In NELP round-V (2005), OIL bid for the NELP block AA-ONN-2003/3 in Sadiya measuring 275 Sq. Km, which was located in the same area where OIL earlier had relinquished PEL, despite knowing the logistic constraints.

[46] As referred in Table 1.4 of Chapter 1.

- OIL surrendered the above block (AA-ONN-2003/3) in May 2010 due to logistic problems similar to those for which Sadiya PEL was surrendered in April 2009. OIL paid LD to MOPNG for an amount of ₹ 19.79 crore for non achievement of MWP.
- Though the logistic constraints were still persisting as the bridge over river Brahmaputra was yet to be constructed (April 2015), OIL again bid for New Sadiya (AA-ONN-2010/3) block measuring 171 Sq. Km in NELP round-IX (2012) and MOPNG awarded the block to OIL.

Thus OIL's exploration efforts failed repeatedly due to known logistic problems.

OIL confirmed the facts and figures as above and further stated (April 2015) that Sadiya PEL was relinquished without essential exploratory drilling due to logistic constraints. As the bridge over Brahmaputra was currently under construction, the area had been retaken through NELP. OIL also stated that erstwhile PEL block Sadiya was similar to subsequent allotment under NELP in the name of Sadiya and new Sadiya.

The reply of OIL itself is contradictory as logistic constraints as well as non availability of bridge over river Brahmaputra were already known from its experience in nomination regime. Thus, OIL's subsequent bidding for two blocks, Sadiya and new Sadiya under NELP regime lacks justification. The fact remains that the NELP block carved out from earlier nomination block was again surrendered by OIL in May 2010 after payment of LD of ₹ 19.79 crore and further bidding was done for another area which still have the shortcomings of the earlier block.

MOPNG/OIL stated (July 2015) that Sadiya block was re-bid in NELP-X round, as the construction of bridge over river Brahmaputra was started in 2010 and it was supposed to be completed in April 2015.

6.4.2 Unjustifiable relinquishment of blocks having hydrocarbon prospects

Two blocks **(AAP-ON-94/1** and **NEC-OSN-97/2**) were awarded to OIL where OIL was operator under Nomination PEL. These blocks were subsequently relinquished by OIL without any discovery of hydrocarbon. Later, these blocks were awarded to private operators viz. Hindustan Oil Exploration Company Limited (HOEC) and Reliance Industries Limited (RIL)/ Niko Resources Limited (NIKO) under Pre-NELP (AAP-ON-94/1) and NELP-I (NEC-OSN-97/2) where the private operators discovered gas. OIL, however, did not carry out any review to assess the reasons for failure of OIL's exploratory efforts for discovery of hydrocarbon when private operators were successful in discovery of hydrocarbon.

OIL stated (April 2015) that in respect of block AAP-ON-94/1, OIL could not give focused attention to the area due to difficult surface logistics and geological complexities being close to thrust belt area and also priority areas elsewhere. The block was later carved out of Margherita PEL and awarded in the VIII round of Pre-NELP bidding during 1996 to private JV operator HOEC as part of GOI policy. OIL was very much aware of the prospectivity in the area and chose to become active partner with the consortium to fast track the exploration activities with risk sharing. OIL had technically contributed immensely in gas discoveries in the block. The first commercial gas production in the block is slated to begin from August 2016.

In respect of block NEC-OSN-97/2 OIL stated that it held the block area during nomination regime and carried out exploration activities including drilling of one well (NEC-2) which had positive indication of presence of gas. As PEL validity expired, OIL relinquished the block and part of this block was later offered in NELP round–I to the private JV operators who own the block and discovered gas in the block.

OIL accepted the audit contention in respect of NEC-OSN-97/2 block. However, in respect of block AAP-ON-94/1 the reply of OIL is not convincing as it had the opportunity to discover from the block which remained with it for more than 11 years.

In the Exit Conference MOPNG/OIL stated (July 2015) that it was a common global phenomenon to see an oil E&P company failing to hit oil in one exploration cycle and succeed in subsequent efforts.

However, the fact remains that performance of OIL lagged behind peers in the E & P sector as highlighted in para 3.4.

6.4.3 Failure to share the risk and cost of exploration in two blocks

Two blocks viz., **AA-ONN-2004/1** and **AA-ONN-2004/2** in Assam under NELP–VI (2007) were awarded to OIL. The block AA-ONN-2004/1 was awarded to a consortium of OIL (PI 85 per cent) and Shiv-Vani Oil and Gas Exploration Services Limited (Shiv vani) (PI 15 per cent). Similarly, the block AA-ONN-2004/2 was awarded to a consortium of OIL (PI 90 per cent) and Suntera Resources Limited (SRL) (PI 10 per cent).

Subsequently, OIL signed a MOU with Assam Hydrocarbon & Energy Company Limited (AHECL) in September 2006 to transfer 10 per cent PI in both the blocks to AHECL. In return AHECL would reimburse OIL the proportionate share of past cost incurred by OIL on the above blocks as per agreement. The Board of Directors (BOD) of OIL approved (July

2007) the assignment of 10 per cent of its share of PI in the aforesaid two blocks in favour of AHECL.

Audit observed that:

- In case of block AA-ONN-2004/1, AHECL requested (September 2011) OIL to intimate the exact amount required to be paid by AHECL and the detail payment schedule. In reply (October 2011) OIL informed AHECL to share expenditure of ₹ 6.46 crore upto March 2011 being 10 per cent of the total expenditure (₹ 64.61 crore) incurred in the above block. However, no further persuasion was made with AHECL on the above issue. Meanwhile the block was relinquished in December 2011.
- In block AA-ONN-2004/2, DGH terminated (May 2009) SRL's participation as it defaulted in submission of BG. While OIL submitted (May 2009) application for transfer of its 10 per cent PI to AHECL, after lapse of 22 months from the decision of the BOD to DGH, the proposal (May 2009) for transfer of 10 per cent PI to AHECL in the block AA-ONN-2004/2 was returned (February 2010) by DGH as OIL had mentioned 10 per cent PI of SRL erroneously and DGH had directed OIL to resubmit the proposal after necessary correction. OIL is yet to send a fresh proposal in this regard to MOPNG. The total expenditure of the block upto June 2014 was ₹ 61.31 crore. Since OIL did not take any action on correcting the faulty recommendation till date (April 2015), it could not get AHECL's participation of ₹ 6.13 crore (being 10 per cent PI) in AA-ONN-2004/2 block.

Though OIL was interested for transfer of 10 per cent of its PI to AHECL, it failed to avail the opportunity to share the risk and cost with AHECL in both the blocks. Thus due to non transfer of PI to AHECL, OIL lost the opportunity to pass the financial burden of ₹ 12.59 crore to AHECL.

OIL stated (April 2015) that transfer of 10 per cent PI to AHECL in blocks AA-ONN-2004/1 and AA-ONN-2004/2 could not materialize due to lack of response and interest from AHECL.

The reply needs to be viewed in the light of the fact that OIL did not make adequate efforts to recover the past cost from AHECL after October 2011 in respect of block AA-ONN-2004/1. As regards AA-ONN-2004/2 block, OIL's inaction on resubmission of proposal to MOPNG resulted in the impasse. Since the exploration of hydrocarbon is a risky and highly capital intensive business, sharing of risk was considered advisable during exploration phase.

Further, OIL itself opined in a board note (July 2007) that it would also be helpful by way of better relation with the Government of Assam and encourage state level new hydrocarbon exploration company to come up which may be useful in OIL's over all business plan.

CHAPTER 7

MONITORING OF EXPLORATION ACTIVITIES

In the previous chapters various performance indicators of OIL in respect of its efficiency in reserve accretion, survey process, drilling operation and management of exploration blocks have been discussed. It is seen that under-achievement in various parameters can be linked to OIL's own estimation of budget, management of human resources, robustness of internal control and oversight by higher management. It also involves updation of manuals.

Audit reviewed the effectiveness of OIL towards utilisation of financial, technological and human resources to achieve its hydrocarbon goal, utilization of budgetary outlay and resource allocation for research and development. Audit also reviewed OIL's contract manual. Results of audit examination are detailed below:

7.1 Utilization of Budgetary Outlay

7.1.1. Under Utilization of Plan Outlay

The Annual Budget is drawn up with a view to plan future operations and to make ex-post-facto checks on the results obtained. Timely preparation of budget and analysis of the variations noticed in the actual execution serve the purpose of Internal Control.

OIL prepared its annual budget for each financial year for its operational activities based on which it carried out its planned activities. Audit noticed variations between the Budget Estimates (BE), Revised Estimates (RE) and actuals in respect of major operational activities during the period from 2009-10 to 2013-14.

The annual plan outlay vis-à-vis actual and physical performance of OIL for the period from 2009-10 to 2013-14 are given in Annexure I and VIII.

Audit observed that:

- OIL was not able to utilize the entire BE in all the years from 2009-10 to 2012-13. In 2013-14 expenditure under survey and exploratory drilling remained less than BE though overall expenditure exceeded BE due to increased investment in joint venture.

For all the five years, the actual expenditure against survey and exploratory drilling fell short of BE by 13 to 40 per cent.

- Similarly, the actual expenditure relating to survey and exploratory drilling against RE fell short in all the years from 2009-10 to 2013-14 which ranged between 2 and 33 per cent.
- The shortfall in achievement of physical target was not commensurate with the shortfall in achievement of financial target. In case of survey, the shortfall in physical target was upto 55 per cent and the same for exploratory drilling was upto 47 per cent.
- In OIL's MOU, MOPNG had not put any weightage for expenditure under plan outlay for the period from 2009-10 to 2011-12. However, the expenditure under Plan Outlay was considered as a parameter for fixation of MOU target with 1 per cent weightage in 2012-13 which was increased to 2 per cent weightage in 2013-14.

OIL's persistent shortfall in financial achievement/utilization of budgetary outlay indicates that it lacked in monitoring of its expenditure and grossly over-estimated its expenditure.

OIL replied (April 2015) that Plan outlay and actual expenditure in Assam and Arunachal Pradesh during the referred period was primarily affected by less achievement in physical activities than planned due to availability of less number of chartered hire rigs, litigation in procurement of rigs, land acquisition problems, frequent bandh and blockades in Assam disrupted field operations including drilling and field preparatory work.

Survey and drilling suffered due to continued rain for prolonged period and heavy floods in Assam resulting in limited working window in the North East, delay in getting statutory clearances / permissions, insurgency prone forest and river confluence areas (Sadiya, Karbi Anglong) and public obstruction in developmental works.

OIL added that it had a definite control mechanism of physical performance through its monthly action plan which ultimately reflects the year end actual financial expenditure. OIL has implemented Business Planning and Consolidation (BPC) for preparation of Budget and for real time controlling, Fund Management (FM) module has been activated in SAP. The system provides warning popup messages when the expenditure exceeds the budgeted amount and thus control exercised. Plan outlay is introduced as a dynamic efficiency parameter in MOU system in the recent years and is monitored internally and in QPR meetings with MOPNG.

OIL further stated that selection of new parameters (viz., plan outlay since 2012-13, flare reduction for 2015-16 etc.) or deletion of any parameter (viz., acquisition of producing asset overseas, RP ratio, etc,) in MOU is absolute prerogative of the Task Force based on priority and to avoid duplication etc.

All the above replies put forward by OIL need to be viewed in the light of the fact that budgeting is an exercise aimed at anticipating future course of income and expenditure. Persistent variations in budget and actual indicated a lack of internal control.

The Standing Committee on Petroleum and Natural Gas (2011-12, Fifteenth Lok Sabha) in its Tenth report felt that most of reasons given for shortfall viz. land acquisition problem, delay in obtaining various clearances from concerned departments, non-availability of drilling rigs etc. were avoidable and could have been timely addressed with proper planning by the company. The committee therefore desired OIL to make all out efforts for 100 per cent utilization of funds in the current financial year and also would like DGH to effectively monitor to ensure that there is no underutilization of funds by oil companies.

Further, the Standing Committee on Petroleum and Natural Gas (2014-15, Sixteenth Lok Sabha) in its First report noted that there was skewed utilization of budget outlays by various oil PSUs compared to the previous financial years. In some of the PSUs, there was huge variation between budget estimates and revised estimates and further, there is under-utilization of even the revised budget estimates. The committee further expected the oil PSUs, some of them Navratnas, to be more serious in their budgetary exercises and revamp their budgetary planning mechanism so that such flawed estimates are avoided. The committee also recommended that a stringent monitoring system should be put in place to ensure that budget projections are achieved in the stipulated timeframe for effective planned activity.

7.1.2 Budgetary Allocation for Research and Development

OIL is an upstream exploration and production Public Sector Organization engaged in various activities in petroleum sector in India and overseas. OIL's vision includes "a learning organization, nurturing initiative, innovations and aspirations with best practices". Technology induction is, thus, a strategic goal and an essential requirement in the field of exploration.

The actual expenditure vis-à-vis Budget Estimates (BE) and Revised Estimates (RE) on Research and Development (R&D) activities for the last five years ended 2013-14 are given in table 7.1:

Table 7.1 – Budget Estimates, Revised Estimates vis-à-vis Actual Expenditure on R&D activities

(₹ in crore)

YEAR	B.E	R.E	Actual Expenditure	Excess/(Shortfall) (BE - Actual)
2009-10	29.23	30.00	22.49	(6.74)
2010-11	33.28	25.55	19.79	(13.49)
2011-12	30.74	26.44	26.99	(3.75)
2012-13	63.52	30.11	37.39	(26.13)
2013-14	43.53	38.97	38.74	(4.79)
Total	**200.30**	**151.07**	**145.40**	**(54.90)**

Audit observed that:

- Actual expenditure on R & D activities was less than the BE in all the years during the period from 2009-10 to 2013-14, the reasons for such wide variations were not on record.
- Actual expenditure in 2011-12 and 2012-13 was more than the RE by 2 and 24 per cent respectively. However, the excess of actual expenditure of 2012-13 over RE of the same year was attributable to manifold reduction (53 per cent) in the BE.

OIL replied (April 2015) that it had been making all efforts to develop and acquire new technology through R&D. R&D activities planned in different years under review have been completed with less expenditure / cost against budgeted amount. High BE for the year 2012-13 was mainly due to planned construction activity of proposed building for Centre of Excellence for Energy Studies (COEES) at Guwahati in line with 12th five year plan projection for 2012-13 (₹ 39.85 crore). However, no expenditure was incurred on construction of COEES during the year as it was operating from a rented building. Therefore, RE was reduced significantly after reviewing the planned activity.

OIL's reply focuses on non-utilization of fund for setting up of COEES. The fact remains that OIL could not incur the planned expenditure on R&D and acquire new technology for exploration of hydrocarbon, as brought out in Para 3.4 that even though OIL discovered (July

2012) highly viscous Heavy Oil in the well Punam-1 in Rajasthan, it failed to produce from the well due to absence of required technology with them.

The Hydrocarbon Vision 2025 *inter alia* included 100 per cent exploration coverage of the Indian sedimentary basins by 2025, to keep pace with technological advancement and application and be at the technological forefront in the global exploration and production industry.

7.2 Utilization of Human Resources (HR) in Exploration

Exploration efforts in OIL are carried out by a dedicated exploration group consisting of executive and non-executive staff of Geo-physics, Geological & Reservoir and the Drilling Services. As on 31 March 2014, out of total manpower of 7746, the manpower for exploration group was 1368, representing 17.66 per cent of total manpower.

The exploration group consists of Geophysics, Geological & Reservoir and Drilling Department which plays a key role in exploration activities of OIL. There was shortage of manpower in these departments despite its importance in exploration activities.

Audit observed that:

- During 2009-10 to 2013-14, in Geophysics department, the actual workmen were higher than the sanctioned posts ranging from 97 to 124 per cent due to regularization of contract labour over the period from 1992 to 1996;
- The shortfall of executive in Geological & Reservoir (G&R) department ranged between 28 and 37 per cent during the same period;
- Executive shortfall went up from year to year in Drilling department. The same was 16 to 25 per cent during the period from 2009-10 to 2013-14.
- As on 31 March 2014, there were only 100 and 70 employees in the cadre of Rigman and Topman against the sanctioned strength of 233 and 108 respectively;
- During the period from 2009-10 to 2013-14, OIL planned to recruit 391 persons in executive cadre and 1081 persons in non-executive cadre against which only 340 persons were recruited under executive cadre and 597 persons in non-executive cadre. The shortfall of manpower was still persisting (December 2014). It is pertinent to mention that to address the shortage of technical manpower, OIL was regularly entering into Man Management Contract in order to operate its own rigs.
- During the period from 2009-10 to 2013-14, major attrition took place in G&R and Geophysics department as out of total attrition of 36 cases, 10 executives (28 per cent)

were from G&R department and 7 executives (19 per cent) from Geophysics department. The maximum number of attrition was found in B and C cadre.

While accepting the audit observations, OIL replied (April 2015) that sanctioned strength was dated and was already under review as work persons requirement in different departments was changing over the years. Once this sanction was reviewed, then the manpower allocation issue could be addressed by re-allocation of reviewed sanctioned post. Although OIL had been carrying out external recruitment and was taking all efforts to expedite the recruitment process so as to meet manpower shortage, it was also experienced that recruitment process took considerable time due to problems and demands raised by various local organizations for recruitment of locals. Efforts were on to reduce the time required to complete recruitment processes.

OIL further stated that it carried out its exploration activities including production and other associated services through various technical groups where manpower was deployed as per its operational requirement. Depending on exploration requirement, non-executive manpower was determined and the requirement was met through its existing employees and also through external recruitment.

OIL's reply shows acceptance of audit comments. Audit has not come across any human resource policy consciously adopted by OIL.

In the Exit Conference MOPNG/OIL stated (July 2015) that they have commenced reviewing and redeploying the manpower to strengthen certain functional groups and also initiated efforts in supplementing the manpower through recruitment.

7.3 Oversight of Internal Control

OIL is having an Internal Audit Department headed by a General Manager who in turn reports to Director (Finance). During the period from 2009-10 to 2013-14, the post of GM (IA) remained vacant and the IA department directly reported to Director (Finance). The IA department operates from Corporate Office, Noida and Registered Office, Duliajan. The IA carried out audit of all the Departments at Corporate Office (Noida), Registered Office (Duliajan), Project Offices (North East Frontier, Rajasthan and Kakinada) and Joint Venture blocks (Domestic and Abroad) either on its own or outsourced to different Chartered Accountant (CA) firms.

Audit observed that:

- Ideally the functioning of IA department should be independent and should report directly to CMD; however, contrary to this, the IA Department of OIL was reporting to Director (Finance). As per IA Manual, IA Department should be headed by an Executive Director (ED) who is to be assisted by two GMs. However, during the entire period from 2009-10 to 2013-14, the posts of ED and GMs remained vacant. The GM (IA) took over charge only from July 2014. During the period from 2009-10 to 2013-14, only three to five executives were posted in the IA Department. As a result the IA function was outsourced to different CA firms. IA Department included only people from Finance without any representative from technical wings.
- In case of outsourcing of IA functions, OIL has not incorporated any condition in the Letter of Award to include technical people having knowledge in upstream oil companies in their audit team to review the technical issues in its operational areas. Further, there was no system in place to verify the composition of Audit team engaged by the CA firms for conducting the IA functions.
- Internal Audit reports were not placed before the Board of Directors during the period from 2009-10 to 2013-14 for appraisal. OIL did not have an Internal Audit Manual till April 2012. As per the IA Manual, the IA department should meet the CAG Auditors and Statutory Auditors at least once in six months to discuss their plans for the next six months to ensure that there is no duplication of efforts. The same was, however, yet to be arranged. Compliance to Internal Audit reports were not furnished by concerned departments in a time bound manner.

Thus, Internal Audit which is an important part of Internal Control System remained inadequate and needs to be strengthened. The Statutory Auditors also in their report (May 2014) to the Members stated that the coverage of the area and monitoring of internal audit system needs to be strengthened.

OIL replied (April 2015) that Internal Audit and Technical Audit Department were existing in the company since long back and the audits were being carried out as per the annual audit program approved by the audit committee. The functioning of the department was guided by Audit Committee periodically. It was felt prudent to have Internal Audit Manual to guide the audit department and its functions. Accordingly the Audit Manual was prepared which came into force in the month of April 2012. The Audit Committee in its meeting held in August 2014 resolved that Internal Audit Department was to report to CMD as a part of good

Corporate Governance. Accordingly, the Internal Audit Department henceforth was reporting to CMD.

OIL has accepted the audit contention.

In the Exit Conference MOPNG/OIL stated (July 2015) that corrective action had already been taken based on the deficiencies pointed out in Audit and the IA was now directly reporting to CMD.

7.4 Involvement of Board in decision making

The Board of Directors (BOD) is responsible for overall supervision of the performance of the Company and plays a key role in advising the company about its activities. The following deficiencies in involvement of BOD in decision making were observed in audit:

- OIL submitted (September 2011) a Capital Outlay Plan for the period 2012-17 to MOPNG amounting to ₹ 19,003.02 crore. The Plan was not placed before BOD for their consideration and approval.
- As per the requirement of MOPNG, OIL prepared its Quarterly Performance Report (QPR) for onward transmission to MOPNG. The same was, however, not placed before BOD for their approval on regular basis as out of 20 QPRs prepared during the last five years ended 2013-14, only 10 QPRs were placed before BOD. During the last two years (i.e. 2012-13 and 2013-14) only 1 QPR in each year was placed before BOD.
- As per the Central Vigilance Commission (CVC) guidelines (Circular No.15/5/06 dated 9 May 2006), the contract awarded on nomination basis needs to be brought to the notice of BOD for their scrutiny and vetting post-facto. The Audit Committee is also required to check at least 10 per cent of such nomination contract.

Scrutiny of Board minutes revealed that during the period from 2009-10 to 2013-14, as a matter of routine only a list of contracts awarded under nomination basis was placed before BOD for their appraisal on quarterly basis which was noted by BOD. However, no post-facto scrutiny and vetting was done by BOD on the contracts awarded on nomination basis. Further, nothing was placed on record in favour of the fact that Audit committee checked at least 10 per cent of contract awarded on nomination basis as per the guidelines of CVC.

In addition, scrutiny of minutes of Local Management Committee (LMC) meeting revealed that in one occasion while finalizing the contract[47] for hiring of rigs, although the minutes of LMC had not been drawn, its decision was implemented.

[47] No. Cont./GL/DRLG/259/10

OIL replied (April 2015) that Strategic Meet was held on 10 March, 2012 at Ahmedabad which was attended by Directors of OIL under the Chairmanship of CMD, wherein the Strategic Plan was discussed in detail. It was a fact that this was not placed in BOD. However, implementation was done on the basis of recorded minutes of the said meeting and the same were circulated to all concerned.

Capital Outlay plan of OIL is discussed in detail with Functional Directors before submission to the MOPNG and it is kept in mind while preparing Annual Plan and Non-Plan Budget. Annual Plan and Non Plan Budget are placed before the Board for its approval.

Quarterly Performance Report is discussed at Functional Directors level before submission to MOPNG. However, Board is informed about the production of crude oil, gas, LPG and other products in every Board meeting. Further, CMD in his communication to the Board informs about the key performance, highlights covering areas like drilling, production, capital expenditure (India and Overseas) and CSR initiatives. BOD also reviewed on quarterly basis, the performance of the company while approving the quarterly results. Hence, BOD of OIL was well informed about the performance of the company.

As per CVC guidelines and Board decisions, information about the contracts awarded on nomination basis are regularly being placed in the Board Meetings. Queries/ clarifications in this regard by the Board, if any, are being suitably addressed/replied accordingly by the concerned departments as and when required. Further, Internal Audit department checks all kinds of contracts including the contracts awarded on nomination basis. Based on the samples decided on regular basis, significant audit observations arising out of the same are placed to the Audit Committee.

The reply is not convincing as OIL reports only the statistical information to the BOD and no discussion or analysis were traceable from the Board Minutes during the period from 2009-10 to 2013-14.

7.5 Deficiencies in Contract Manual

Contract life cycle management is the process of systematically and efficiently managing the contract creation, execution and analysis for maximizing operational and financial performance and minimizing risk of the organization. The contract manual of OIL incorporated the importance of timely award of contract, saying that indenting department shall indicate, the time by which the award shall be placed, the contract and the indenting

departments shall discuss and agree upon a schedule of programme for awarding contract, starting from the purchase requisition date to date of award of contract.

Audit reviewed the contract manual of OIL and management of contracts of acquisition and chartered hire of rigs and observed that:

- The contract manual did not specify the time line for different stages of contract processes in order to obtain the goods and services in time;
- It also did not include comprehensive guidelines regarding fixation of responsibility in case of damage or loss of drilling units/ sub-surface tools/ equipments of contract while carrying out the jobs. As a result in two contracts[48] OIL paid ₹ 3.18 crore as compensation to the contractor, though the committee formed for fixing of responsibility failed to fix the responsibility either on the part of the contractor or on OIL.
- There was no schedule of programme for awarding of contract prepared by the concerned department;
- OIL has not fixed any norm for finalization of tender and award of the contract. As a result, no control mechanism was in place to ensure timely award of contract.
- The contract manual was not updated since October 2009.

In view of the above, the Internal Control System prevalent in OIL remained deficient.

OIL replied (April 2015) that as per the advice of MOPNG, it consulted ONGC's manual and updated its manual with the help of international consultant. Necessary amendments suggested for incorporation in OIL's manual were approved. The contract manual is currently under advanced stage of finalisation after incorporation of amendments as necessary. OIL has already put in place a new, "Banning Policy" , which inter alia contains the provision of putting a supplier/contractor on holiday for failure of timeline deviation, non-performance and failure to supply goods/services as per contractual terms and conditions.

While accepting the audit observation, OIL stated (April 2015) that no schedule of program for awarding of contract was in place earlier which was now being incorporated. Further, OIL has prepared a time frame for tender finalization.

In the Exit Conference MOPNG/OIL stated (July 2015) that the contract manual was under revision and expected to be finalized by September 2015, which would eventually bring down the tender processing period.

[48] No.OIL/CCO/DRLG/GLOBAL/187/2007 and No.Cont./GL /DRLG/ 287/ 12

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

MOPNG formulated the Hydrocarbon Vision–2025 in March 2000 emphasizing the vital role of hydrocarbon sector in the economic growth of the country having a long-term policy of 100 per cent exploration coverage of the Indian sedimentary basins by 2025.

Keeping the above in view, a performance audit on Oil India Limited (OIL)'s hydrocarbon exploration efforts (2009-10 to 2013-14) was conducted. Audit attempted to see whether OIL's exploration efforts had been taken up with proper planning and executed with efficiency and effectiveness to achieve its own and the nation's envisioned hydrocarbon goal.

8.1 Conclusion

Audit noted that OIL's contribution to the net increase of hydrocarbon reserves was only under probable category, as reserves under 2P category (i.e. probable) increased, and decreased under 1P (i.e. proved) category. Further, oil reserves under 3P (i.e. possible) category decreased indicated no new fields were being added through exploration activities. Gas reserves under all the categories also declined. OIL did not achieve the target for reserve accretion fixed in its MOU. Though OIL achieved RRR of more than 1 as prescribed, Ultimate Reserve Accretion registered a downward trend.

OIL failed to monetize three discoveries in nomination regime due to non-availability of latest technology. In spite of being one of the major NOCs and having both financial resources and experience in E&P sector, performance of OIL lagged behind peers in the industry as it had made only one discovery in July 2012 under NELP which was not monetized till April 2015.

OIL achieved neither its own targets of 2D survey in any of the five years, nor its own target in 3D survey in three out of five years. There was delay in completion of API cycle, absence of time schedule for in-house survey and outsourced survey. Contracts were not awarded in a

timely manner. Survey contracts also revealed deficiency in contractual clauses leading to undue benefit to contractor and payment of penalty towards unfinished work programme.

There were significant shortfalls in exploratory drilling as well as development drilling. OIL did not place the desired emphasis on its core exploration activities. Further, there were anomalies in MOU target setting and reporting as well as performance measurement (through RRR). OIL's performance in drilling depth was also not satisfactory. There was abnormal fluctuation in commercial and cycle speed of both own and hired rigs.

The vintage of own drilling rigs were ranging between 9 and 36 years. While reviewing contracts for acquisition of own rigs and for chartered hiring of rigs, Audit found several deficiencies, including inordinate delay, avoidable time allowed for mobilization of rigs, violation of contractual terms and conditions, preference to a supplier over manufacturer of rigs and procurement of rigs without resorting to tender procedure etc. leading to lack of transparency.

Audit observed that OIL's performance in nomination blocks have been unsatisfactory and has given very few discoveries to add to the hydrocarbon reserve of the country. It converted very few blocks from PEL to PML, held PEL blocks for as long as 28 years without converting them into PML, relinquished PEL blocks after holding them from 15 to 26 years without any discovery and kept many PML blocks idle.

Under NELP regime, the participation and success of OIL in the bidding process remained low. In awarded NELP blocks where OIL was operator, it under-achieved MWP and paid LD to MOPNG in many cases. It also relinquished NELP blocks without completing committed work. Interestingly OIL also bid for NELP blocks in the same area where it had relinquished an earlier PEL block for logistic constraints. Audit also noticed that in two PEL blocks relinquished by OIL, hydrocarbon discovery was made by private operators under Pre-NELP/NELP regime.

OIL had persistent shortfall in financial achievement/utilization of budgetary outlay. OIL did not have adequate technology to monetize its discoveries of highly viscous heavy oil till date.

8.2 Recommendations

OIL as well as MOPNG may ensure that OIL's core business, i.e., hydrocarbon exploration as an upstream NOC is given priority as recommended below:

- OIL may build necessary capability to ensure proving of reserves by commensurate upgradation from 3P to 2P and 2P to 1P category of reserves;
- In the MOU the weightage given to "accretion to recoverable reserves" may be increased by MOPNG to emphasise higher importance of the core activity of exploration;
- Norms for the API cycle may be formulated and linked with performance parameters. OIL may closely monitor its survey contracts to ensure timely completion of exploration;
- MOPNG should take necessary steps to ensure that NOCs abide by the exploration targets assigned to them;
- OIL may finalize its procurement plan in time to replace the vintage rigs, both drilling and workover;
- OIL should be able to use its experience and resources to be able to operate in the competitive NELP regime and bid judiciously for prospective blocks;
- OIL should adhere to MWP schedules so as to fully explore the blocks and avoid liquidated damages;
- MOPNG should ensure availability of clearances for carrying out the exploratory activities before awarding the blocks;
- Proper monitoring on utilization of budget is called for to avoid shortfalls;
- OIL should pay attention to its R&D activities and keep abreast of latest technologies especially in view of the fact that it is a cash rich company;
- OIL should quicken its action on recruiting executives in technical departments as well as in internal audit department;
- The contract manual may be updated and the awarding of contracts needs to be in line with CVC guidelines; principles of financial prudence and monitoring of contracts execution may be made more stringent;

- Reporting mechanism of OIL needs to be strengthened for creating MIS and monitoring of them by the different bodies culminating in the BOD.

MOPNG accepted (July 2015) the recommendations and assured to take appropriate action.

(PRASENJIT MUKHERJEE)
Deputy Comptroller and Auditor General
and Chairman, Audit Board

New Delhi
Dated: 13 November 2015

Countersigned

(SHASHI KANT SHARMA)
Comptroller and Auditor General of India

New Delhi
Dated: 13 November 2015

Annexure – I

(Para 1.7)

Budgeted Estimates, Revised Estimates and Actual Expenditure for the last five years ended 2013-14

(₹ in crore)

Head of expenditure	2009-10			2010-11			2011-12			2012-13			2013-14		
	BE	RE	Actual	BE	RE	Actual	BE	RE	Actual	BE	RE	Actual	BE	RE	Actual
Survey	489.28	462.36	359.00	303.72	284.10	286.00	314.33	308.55	341.00	335.11	548.97	477.00	483.89	487.59	511.00
Exploratory Drilling	444.98	745.55	456.00	945.62	602.14	521.00	1068.98	706.68	652.00	1337.45	785.38	737.00	1097.67	642.26	440.00
Development Drilling	497.07	490.36	381.00	509.03	352.59	397.00	502.82	391.66	506.00	568.66	412.38	381.00	591.91	652.87	846.00
Capital Equipment & Facilities	414.00	400.00	264.00	425.00	374.50	266.00	484.06	460.00	383.00	538.50	774.96	806.00	619.67	526.00	620.00
Overseas Projects	430.97	277.07	89.00	251.61	311.08	154.00	144.46	108.50	15.00	588.57	499.66	136.00	291.82	192.90	196.00
Joint Venture/ Equity Investment	0.00	0.00	8.00	2030.00	2288.58	119.00	665.68	287.29	153.00	10.00	48.17	353.00	496.02	7937.31	6738.00
Total	2276.30	2375.34	1557.00	4464.98	4212.99	1743.00	3180.33	2262.68	2050.00	3378.29	3069.52	2890.00	3580.98	10438.93	9351.00

Annexure - II

Statement indicating time taken for Acquisition and processing by Geophysics Department and Interpretation by Geological & Reservoir Department

(Para 4.2.1)

Sl. No.	b	Geophysics Department							Time gap between Geophys and G&R Deptt	Geological & Reservoir Department			Total days taken for API as on November,2014
		Time taken for acquisition			Time gap between acquisition and	Time taken for processing				Time taken for Interpretation			
		From	To	Days		From	To	Days		From	To	Total (In days)	
1	Rajgarh Regional Lines (2D)	01/04/2009	30/05/2009	60		Under processing				Data Processing in progress			2069
2	Deohal-Makum (2D-3C)	21/11/2009	03/02/2010	76	-	Processing & Interpretation was completed by ION-GXT (Jan,		…..	939	01.09.2012	31.01.2013	153	1168
3	Jagun-Digboi (2D)	17/12/2009	10/06/2010	176	105 90	08/04/2011 10/09/2010	19/05/2011 23/12/2010	147		Under jurisdiction of NEF Project			1804
4	Digboi-Pengree (2D)	08/12/2010	16/03/2011	99	261	02/12/2011	26/04/2011	146		Data interpretation has not yet started			1815
5	Sonari (2D Experimental)	14/03/2011	28/03/2011	15	-	Analysis completed in April, 2011		32		Data acquired/ processed as experimental data only. Not available for interpretation			1309
6	Santi-Jaipur (2D)	03/05/2011	20/05/2011	237	-	01/07/2012	31/03/2014	639		-	-	Data to be interpreted when study of area is taken up.	1116
7	Santi-Jaipur-Namrup (2D)	19/12/2011	27/05/2012		-					-	-		
8	Namrup-Borhat-Sapekhati (2D)	10/12/2012	10/01/2013		-					-	-		
9	Namrup-Borhat-Sapekhati (2D)	26/04/2013	21/05/2013		-					-	-		
10	Teok (2D)	26/04/2013	17/05/2014	387		Processing of four no. of lines are completed. Rest of the lines are under progress		Under process		Data processing not yet completed. Ionterpretation to commence after receipt of complete processed data.			581
11	Haldibari-Dikharipathar (3D)	01/04/2008	15/03/2009	349	25	10/04/2009	25/03/2010	351		01.02.2007	17.08.2007	198	923
12	Moran (Pilot 2D-3C)	16/03/2009	29/03/2009	14	-	Processing & Interpretation was completed by ION-GXT (Jan,		-	1250	01.09.2012	31.01.2013	153	1417
13	Haldibari-Dikharipathar (3D)	01/04/2009	24/05/2009	54	0	10/04/2009	25/03/2010	350	730	01.04.2012	30.11.2012	244	1378
14	Namsai (3D)	14/12/2009	30/03/2010	107	464	08/07/2011	24/11/2011	140		Under jurisdiction of of NEF Project			1700
15	Deohal (Pilot 3D-3C)	05/03/2010	30/05/2010	87		Processing & Interpretation was completed by ION-GXT (Jan,			822	01.09.2012	31.01.2013	153	1062
16	Santi-Tarajan (3D)	07/05/2010	07/06/2010	32		Processed with Naharkatiya 3D Block i.e. 28.03.2013 (compl. dt)		1023	135	10.08.2013	26.11.2013	109	1299
17	Sonari (3D)	15/12/2010	13/03/2011	89	229	28/10/2011	08/03/2012	132	974	07.11.2014	-	Study in progress	1447
18	Diroi-Dipling (3D)	25/04/2011	25/05/2011	31	310	30/03/2012	24/05/2012	55	897	07.11.2014	-	Study in progress	1316
19	Naharkatiya (3D)	26/12/2011	27/05/2012	154	0	31/05/2012	28/03/2013	302	135	10.08.2013	26.11.2013	109	699
20	Teok (3D)	27/12/2012	08/04/2013	103	0	01/04/2013	31/09/2013	183	0	01.10.2013	04.04.2014	186	472
21	Sadiya (3D)	03/01/2014	----------			Acquisition is under Progress				Data Processing not completed. Interpretation			330
22	Sologuri-Borbam (Contract 3D)	---------	03/04/2009	….	-	Acquisition & Processing Contract was completed on 08/04/2010		370	1362	01.01.2014	30.09.2014	273	2005
23	Digboi-Margherita (Contract 3D)	14/12/2009	----------	…	-	Acquisition & Processing Contract was completed on 11/02/2011		425	292	01.12.2012	28.08.2013	271	988

Annexure III

(Para 5.2)

Contracts for Procurement of own rigs

Sl. No.	**Tender/Contract No.**	**Brief Audit findings**	**Audit observation**	**OIL's response** (April 2015)	**Remarks, if any**
1	SDG9009P11/07, 7950293 dated 23.02.2007, 7950293 (Amendment no 2 dated 23.08.2007)	• Delay in processing in tender • All the three POs for procurement of rigs awarded to a suppler (i.e CPTDC) during the period from 2006-07 to 2013-14 depriving OIL from obtaining competitive rates as well as assured supply of spares. • Deviation from BRC criteria	Inordinate delay in procurement of drilling /workover rigs led to higher dependence on chartered hire rig. Management also changed the specification of rig after placing of purchase order, which in view of audit led to lack of transparency in the bidding procedure and undue advantage was extended to the supplier.	• No schedule of program for awarding of contract was in place previously which is now being incorporated. Further OIL has prepared a time frame for tender finalization for approval of the Competent Authority. • No response from OIL • To Audit observation for supply of one 750 HP rig in 2008, OIL amended make/specification of rig, deviating from BRC criteria. OIL's comment is that the technical specifications were modified to some extent without compromising with BRC. • Rigs are purchased as a replacement of retired rigs. However deployment of both in house and hired rigs are optimised to balance the drilling performance	• OIL accepted the contention of Audit. • No response from OIL • The reply of OIL is not tenable. Providing equal opportunity to other bidder has not been adhered to. This is also in contravention of CVC guidelines (July 2007).

Annexure IV

(Para 5.2)

Contracts for chartered hire of rigs

Sl. No.	Tender/Contract No.	Brief Audit findings	Audit Observation	OIL's response (April 2015)	Remarks, if any
1	OIL/CCO/DRLG/GLOBAL/141/2006, CONT/GL/DRLG/259/10, OIL/CCO/DRLG/GLOBAL/165/2007, OIL/CCO/DRLG/GLOBAL/204/2007, CONT/GL/DRLG/307/13, OIL/CCO/DRLG/GLOBAL/166/2007, OIL/CDG4167/DRLG/12 and CONT/GL/DRLG/288/12	• no norm has been fixed and incorporated in the contract manual towards permissible rig mobilization time; • Excess time taken for rig mobilization. • OIL incorporated different LD rate in the chartered hire rig contracts as it applied 15 per cent in three cases and 7.5 per cent in four cases	In absence of norms OIL failed to monitor the time schedule for finalization of contract.	The fixed mobilization period mentioned in the tender is applicable to all the bidders irrespective of location of their offered Rigs. However, the possibility of putting mobilization period with respect to location of bidder's offered available rig shall be explored for future tenders. OIL further stated that in three contracts, the contracts were entered prior to 2009 (i.e. prior to introduction of contract manual) and higher rate of LD (Maximum 15 per cent instead of 7.5 per cent) was incorporated in the contract as per the advice of the Board. However, in four contracts, as the contracts were finalised after introduction of contract manual maximum ceiling of 7.5 per cent LD was followed.	Audit has looked into contract management of OIL in respect of chartered hire rigs and found certain systemic deficiencies per se. In respect of reduction in the rate of Liquidated Damage from 15 per cent to 7.5 per cent OIL's reply is not tenable since the reduction has not been approved by the BOD and is also against the interest of the Company.
2	OIL/CDG4167/DRLG/12 and CONT/GL/DRLG/307/13	Avoidable time allowed for rig mobilization in two replacement contracts.	Excess time given for rig mobilization.	In respect of two replacement contracts awarded to same party OIL stated that though mobilization period was allowed 180 days and 210 days, the contractor completed mobilization in 41 days after the rig release from the previous location.	Two replacement contract awarded to same party, the replies of the management itself proved that excess mobilization time was allowed in the contracts as actual time taken was much less than the time allowed. Thus, there was a scope to reduce the schedule

				Similarly in other contract, the actual mobilization time taken was in 39 and 63 days respectively.	mobilization period to avoid allowance of unnecessary mobilization time to the contractor to ensure timely completion of exploration activities within the timeframe stipulated in the PSC. Therefore a suitable clause should be included in the contract to fix reasonable mobilization period mutually agreed upon based on the distance and related factors in case the contract is awarded to the existing contractor.
3	OIL/CCO/DRLG/GLOBAL/141/2006, OIL/CCO/DRLG/GLOBAL/165/2007, OIL/CCO/DRLG/GLOBAL/ 204/2007 and OIL/CCO/DRLG/GLOBAL/166/2007	OIL failed to finalize the replacement contracts for chartered hire of drilling rigs prior to expiry of the existing contracts as a result OIL had extended the contract period for two years though the relevant clause of the contract allowed extension upto one year only	Since rigs were working in OIL's operational areas in the close vicinity and the contracts were awarded to the same party as a replacement contract, the time allowed for mobilization was avoidable.	Accepted the observation	
4	CONT/GL/DRLG/259/10, OIL/CDG4167/DRLG/12 and CONT/GL/DRLG/288/12	OIL took excess time (more than two years) to issue LOA from the date of issue of purchase requisition to finalize the replacement of chartered hire rig contract.	OIL forced to extend earlier contracts in contravention to the provisions of the contractual terms and conditions;	Subsequent to issue of LOAs, the party was seeking extension after extension.	Reply of OIL is not pertinent to the audit observation

5	OIL/CCO/DRLG/ GLOBAL/ 204/2008	Loss of opportunity to utilize the rig which was kept in abeyance for a period of 130 days due to inept decision making.	Idling of rigs	No response	
6	OIL/CCO/DRLG/ GLOBAL/166/2007 and OIL/CCO/DRLG/ GLOBAL/165/2007	OIL lost 113 days in aggregate due to delay in renewal of contract resulting in idling of rigs for periods ranging from 24 to 61 days.	Delay in renewal of contracts.	Accepted	
7	OIL/CCO/DRLG/ GLOBAL/ 204/2008	OIL's delay on account of change of location etc led to refund of 2.62 crore to the contractor recovered earlier for delay of 43 days in mobilization of rig.	Delay in making location available.	Accepted	
8	OIL/CCO/DRLG/ GLOBAL/166/2007 and OIL/CCO/DRLG/ GLOBAL/141/2006	Since OIL could recover LD only upto 210 days in two contracts where delay ranged between 309 to 368 days, the interest of OIL could not be safeguarded.	Faulty clause in the contract	Accepted	
9	OIL/CCO/DRLG/GLOBAL/ 141/2006 and OIL/CCO/DRLG/GLOBAL/ 144/2006	• For chartered hire of one 1400 HP (Min) drilling rig awarded to Jaybee Energy Private Limited, the make of the rig was changed by the contractor from what was originally offered., • For two chartered hire of workover rigs awarded to Shiv-vani Oil & Gas Exploration Services	OIL allowed the contractor to change the specification of the rigs after finalization of contract.	The decision to accept change in Rig model/ specification was taken by OIL as the same was technically acceptable. Further, in one case the rig supplier was changed due to urgency of rig to meet the enhanced drilling programme and other case the rig model with higher capacity was changed due to operational exigency.	OIL's reply is not tenable as this is against the CVC guidelines on transparency in tendering process.

		Limted, the specification of one rig was allowed to be changed from 600 HP to 750 HP alongwith change in Model Number.			
10	OIL/CCO/DRLG/GLOBAL/166/2007	OIL paid M/s Shiv-Vani Oil and Gas Exploration Services Limited, New Delhi dues at previous contract rate, which was higher than the new contract rate, though contractor agreed and confirmed (January 2012) to accept lower rates out of the existing contract rates.	Violation of contractual clause led to payment of excess amount of Rs.5.18 crore to the contractor	Accepted and recovery action initiated.	
11	OIL/CDG2531/DRLG/12 and CDG9056P13	OIL opened price bid for chartered hire of one 1400 HP drilling rig in September 2013. OIL decided (September 2014) to cancel the tender, after a lapse of one year from opening of price bid without issuing LOA to the L1 bidder (PLU) due to non performance of the bidder in another contract. Due to delay of one year in decision making (to cancel the tender) OIL could not fulfill the requirement of rigs which was extremely urgent to meet the target. OIL also lost the opportunity to impose penal provision on the contractor for non mobilization of rig due to non issuance of LOA.	Delay in decision making	Entering into another contract for the same service with defaulted party who could not mobilise the rig against the last contract would have landed OIL into similar situation. Accordingly, it was decided to cancel the second tender.	Fact remains that OIL lost precious time and unable to penalise as no LOA was issued.

Annexure – V
(Para 6.1.2)
Relinquishment of PEL Blocks under Nomination Regime from 2009-10 to 2013-14

SL No.	Name of PEL	Date of Original Grant	Original Area (Sq. Km)	Area relinquished/Conversion into ML (Sq. Km)		Date of Area Relinquished/Conversion into ML	Work done up to Relinquishment	Current Status	Expenses Incurred (₹ in crore)
1.	Margherita	10.11.1987	750	Transferred to JV	382	1993-94	Wells Jagun-1 and Toklong-1 drilled & completed in the year 1998.	**Relinquished**	14.46
				Area relinquished during first re-grant	92	01.04.02			
				Area relinquished during Extension	92	01.04.06			
				Final relinquishment	184	31.03.09			
2.	DumdumaExtn. (NF-F), Blocks B+C	01.08.1985	395	Area converted to ML	218	2001-02	Well Umatara-1 was drilled and completed in 2009.	**Relinquished**	36.57
				Area relinquished during first re-grant	44	01.08.03			
				Area converted to Sapkaint ML	105	2010-11			
				Final relinquishment	28	31.07.2009			
3.	DumdumaExtn (F), Block C	10.11.1987	38	Area relinquished during first re-grant	9.5	November 1987	Well North Duarmara-1 was drilled in 2009	**Relinquished**	
						01.04.02			
				Area relinquished during second re-grant	9.5	01.04.06			
				Final relinquishment	19	05.11.2010			
4.	Dirak	18.11.1995	170	Area relinquished during first re-grant	42.5	18.11.01	Well: Phillobari-1 was drilled and completed in 2011.	**Relinquished**	27.97
				Area relinquished during second re-grant	42.5	18.11.05			
				Final relinquishment	85	05.04.2011			
5.	Murkongselek (NF)	25.12.1986	1307	Area relinquished first re-grant	327	01.04.02	Well: Murkongselek-1 was drilled and completed in 2012.	**Relinquished**	16.29
				Area relinquished during second re-grant	327	01.04.06			
				Area relinquished during third	204	01.04.07			

				re-grant					
				Final relinquishment	449	05.04.2012			
6.	Murkongselek(F)	15.11.1987	191	Area relinquished first re-grant	48	01.04.02	Well: Murkongselek-2 was drilled and completed in 2013.	**Relinquished**	112.16
				Area relinquished during second re-grant	48	01.04.06			
				Final relinquishment	95	17.07.2013			
7.	Borhat	01.04.1988	222	Area relinquished first re-grant	55.5	01.04.02	• Well Balimara-2 was completed in 2012 & well Baruanagar-3 was completed in 2013. • 81 Sq. Km area was converted to PML.	**Relinquished**	86.62
				Area relinquished during second re-grant	55.5	01.04.09			
				Area converted to ML	81	13.08.2013			
				Final relinquishment	30	14.08.2013			
8.	Dibrugarh	Nov 1987	1230	Conversion to ML	186	21.01.1998	Part of the relinquished area was interpreted as part of an integrated study.		163.87
				Conversion to Chabua ML	189	12.06.2002			
				1st relinquishment	214	2002-03			
				2nd relinquishment	214	2005-06			
				Extension	427	Upto 14.02.2015			
9.	Tinsukia	15.11.1987	1665	Conversion to Tinsukia ML	250	07.12.2001	Part of the relinquished area was re-interpreted alongwith adjoining areas.	Extension applied for.	136.49
				1st relinquishment	257	2002-03			
				Conversion to Baghjan ML	75	14.05.2003			
				Conversion to TinsukiaExtn. PML	185	17.05.2003			
				Conversion to Mechaki ML	195	19.05.2003			
				2nd relinquishment	223	2005-06			
				Conversion to MechakiExtn. ML	9	06.07.2013			
				Extension	471	Upto 01.12.2014			
10.	Jairampur PEL	28.10.1987	170	Area relinquished first re-grant	146	July, 1999.	• Acquisition of 9 GLKM of 2D seismic data. • Drilled one (1) well	**Surrendered**	4.40
				Area relinquished during second re-grant	6	01.04.2002			

11.	Jairampur Ext. PEL	01.05.1990	185	Area relinquished first re-grant	154	July, 1999.	• Block valid till 03.03.2019. • API of 75 GLKM of 2D seismic data. • Released one Exploratory drilling location (Loc. JRB)	Action initiated to drill Loc. JRB	Merged with Jairampur PEL
				Area relinquished during second re-grant	7.75	01.04.2002			
12.	Namchik PEL (Kharsang-Shonking& adjoining areas)	30.04.1999	260	Area relinquished first re-grant	65	13.03.2002	• Block valid till 24.09.2020 • Acquisition of 69 GLKM 2D data. PI of 30 GLKM of 2D seismic data during 2003-2007. • Acquisition and processing of 170 GLKM of 2D seismic data. Interpretation is in progress.	Action initiated to drill Loc. NCK-1	24.33
13.	Namsai PEL	25.11.1992	494	Area relinquished first re-grant	124	17.08.2004	• API of 354 GLKM of 2D seismic data. • API of 210 Sq. Km of 3D seismic data covering Kumchai, Kherem&Namsai area. • Drilled one (1) exploratory well.(Loc NSA)	**Surrendered**	43.82
14.	Deomali PEL	18.02.1999	365.16	(i) JVC block (AAP-ON-90/1)	213.83	24.05.2005	• Geological Mapping • API of 70 GLKM of 2D seismic data. • Release of one (1) exploratory drilling location. • Geochemical analysis of 96 nos. of samples.	Applied for 5th & 6th year extension as well as 211 days extension under statutory delay	5.20
				(ii) Deomali PEL	151.33				
				Relinquished 25% area of 151.33 Sq. Km	37.83				
15.	Sadiya	18.11.1995	1130	1st Four Year Regrant (18.11.01): 282.5 Sq. Km One Year Extn. (18.11.05) **Final relinquished**	282.5	17.11.2006 **31.03.09**	(i) 2D Seismic API (ii) Ground GM & MT Survey	Relinquished	Nil
16.	Lakhimpur	20.12.1995	4200	1st Four Year Regrant (20.12.01): 1050 Sq. Km One Year Extn. (19.12.05) **Final relinquished**	1050	19.12.2006 **31.03.09**	(i) Four wells drilled. No commercial discovery. (ii) 2D Seismic API	Relinquished	Nil

Annexure – VI
(Para 6.2.1)
OIL Performance under NELP Regime

NELP Round	Block Offered	Bid Submitted				Block Awarded				Relinquished	Operational
		Deep Water	Shallow Water	Onland	Total	Deep Water	Shallow Water	Onland	Total		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
I	48	1	1	0	2	1	1	0	2	2	0
II	25	2	0	2	4	2	0	2	4	3	1
III	27	1	0	2	3	1	0	2	3	2	1
IV	24	2	0	4	6	2	0	3	5	3	2
V	20	1	1	5	7	0	0	1	1	1	0
VI	55	2	0	6	8	2	0	6	8	2	6
VII	57	1	0	5	6	1	0	3	4	0	4
VIII	70	5	4	5	14	5	2	2	9	0	9
IX	34	6	5	6	17	0	2	2	4	0	4
Total	**360**	**21**	**11**	**35**	**67**	**14**	**5**	**21**	**40**	**13**	**27**

Annexure – VII
(Para 6.2.3)
Statement showing the avoidable payment of liquidated damages in NELP Blocks

SI No	Name of the block	Extension period	Date of relinquishment	Liquidated damages (₹ in crore)	Audit remarks
1	MN-ONN-2000/1	24.04.2005 to 23.10.2005 (Phase – I) 24.04.07 to 23.10.08 (Phase – II)	**06.01.2009**	**6.15**	As per the work programme, approval of existing 2D data, re-processing of 500 GLK of seismic data and API of 200 GLK and prospect generation, techno-economic analysis and decision for phase-II has to be completed by July 2004, however, due to delay in completion of committed MWP, the Operator forced to enter Phase-II though all three prospects of the block were not economically viable as per the interpretation report of Fagru Robertson. However, OIL did not drill the two committed wells in its exploration period and availed of extension by paying LD. Subsequently, the block was relinquished in January 2009.
2	RJ-ONN-2000/1	18.01.2005 to 17.07.2005 (Phase – I) 18.07. 2007 to 21.11. 2007 (Phase – II)	**09.02.2010**	**--**	**Details in para no. 6.2.3.1 (ii)**
3	RJ-ONN-2001/1	23.07.2006 to 22.07.2007 (Phase – I)	**10.10.2009**	**2.32**	API was completed in January 2005 and in the OC meeting held on 22/23-12-2005 two locations, viz, Location B (Sekhra) & Location C (Lunkha) were released, after a delay of one year. Further, due to delay in finalization of rig day rates well at Location B (Sekhra) was drilled on 31-05-2006, after delay

					of more than five months. Similarly, due to delay in finalization of 3rd location, well at Location C (Lunkha) was drilled on 10-01-2007, after a delay of more than two years from completion of 2D and 3D API and more than 12 months delay from release of location for drilling by OC. Thus, due to delay in decision making by OC and delay in finalization of rig day rates and delay in finalization of third location, the Operator was forced to seek extension with consequential payment of LD. Though the OIL was aware of the MWP in Phase-II (3D API of 100 sq km along with one exploratory well), the contract for 3D API could not be finalized within the stipulated time and as a result to complete the committed MWP in Phase- II period two extensions had to be taken with consequential payment of provisional LD amounting to Rs.1.69/- crore which could have been avoided had the contract for 3D API was finalized in time. OIL had not sustained their own committed time frame due to improper planning, lack of coordination, delay in finalization of rig day rate and delay in finalization of drilling locations resulting in payment of LD.

4	RJ-ONN-2002/1	23.06.2009 to 21.12.2009 Phase – II)	**28.12.2009**	**5.12**	In the Phase-I, it was decided to carry out interpretation of 1200 GLKM of 2D data in –house and accordingly data was loaded into the workstation at New Delhi during October 2005. It is pertinent to mention that although Geosciences Department had intimated in April 2005 that many of the projects which were of a priority nature were in line for interpretation job and it would not be possible to interpret the data of Block RJ-ONN-2002/1 still the data was loaded into the workstation. In the finalisation of contract for interpretation job a valuable period of 16 months (September 2005 January 2007) was lost in this process. Thus due to lack of coordination a considerable delay of 16 months had to be suffered by the Consortium for interpretation of the data. As a result of delay in interpretation of 2 D seismic data, the MWP committed in Phase-I was not completed and the Phase-I period had to be extended by 6 months in the process curtailing Phase-II period by 6 months. The scope of work was also increased in Phase-II as the OC committed AP of 600 LKM of 2D Seismic Data in 3.0 X 3.0 Km grid over the Rajsar Lead-1 and east of Lead-1 in addition to the MWP committed in the PSC. Moreover, the fact that the entire period (2 years) of the Phase-II (including extended period) was spent in 2D A+P tender finalisation; indicating inadequate planning.

5	AA-ONN-2003/3	30.11.2009 to 29.05.2010 (Phase – I)	**29.05.2010**	**19.79**	Details in para 4.3. (ii)
6	RJ-ONN-2004/3	**--**	**20.01.2012**	**22.93**	As against the MWP requirement of drilling eight wells during 1st exploration phase, parties to JOA had drilled only two exploratory wells i.e. Rachan-1 & Madasar-1. It has been noted that M/s GGR in its capacity as partner and technical arm to the Consortium had time and again insisted on improving the operational efficiency of the project and had also expressed its concern on the slow progress of the project work in the block which would eventually result in unnecessary payment of LD for non-fulfilment of MWP commitment.
7	AA-ONN-2004/1	28.06.11 to 27.12.2011 (Phase – I)	**27.12.2011**	**12.32**	**Details in para no. 6.2.3.1 (i)**
	Total			**68.63**	

Annexure – VIII

(Para 7.1.1)

Physical performance for the last five years endedv 2013-14

Physical Performance																
		2009-10			2010-11			2011-12			2012-13			2013-14		
		Plan	Actual	(Shortfall)/ Excess	Plan	Actual	(Shortfall)/ Excess	Plan	Actual	(Shortfall)/ Excess	Plan	Actual	(Shortfall)/ Excess	Plan	Actual	(Shortfall)/ Excess
Survey	2D (LKM)	1715	1307.87	(407.13)	1182	1149.45	(32.55)	1316.8	1396.91	80.11	500	223.77	(276.23)	490	499.24	9.24
	3D (Sq. Km)	1002	984.29	(17.71)	661.36	618.62	(42.74)	1767	1837.69	70.69	1925	1795.22	(129.78)	718	928.48	210.48
No. of Exploratory Wells		20	16	(4)	20	13	(7)	24	16	(8)	25	19	(6)	17	9	(8)

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Glossary of Technical Terms

Technical Terms	Description
Appraisal well	A well drilled to determine the extent or the volume of Hydrocarbon reserves and the likely production rate of the new oil or gas field.
Basin	A Depression in the earth's crust where sedimentary materials are accumulated over the years.
Barrels of oil equivalent	The amount of natural gas that has the same heat content as an average barrel of oil. It is about 6000 cf of gas.
Block	Area identified in a field which is offered by the Government under nomination (PEL) or to prospective bidders under New Exploration Licensing Policy, for the purpose of exploration of oil and gas.
Commercial discovery	A discovery of hydrocarbon reserves which is of potential commercial interest and has been declared as a Commercial Discovery in accordance with the provision of PSC.
Commercial speed	Commercial speed is meterage drilled upto the bottom of drilling well/rig months from spud date to well completion.
Condensate	A hydrocarbon mixture composed primarily of molecules with 5, 6 and 7 carbon atoms. It is liquid under surface conditions but is a gas mixed with natural gas under subsurface reservoir conditions. Condensate is very light in density and is transparent to yellowish in color. It is almost pure gasoline in composition.
Crude Oil	A liquid composed of over one hundred different types of hydrocarbon molecules. The molecules range from 5 to more than 60 carbon atoms in length. Crude oil colors range from black to greenish to yellowish to transparent.
Cycle speed	Cycle speed meterage drilled per drilling rig month during the complete period from release from earlier well and mobilization to release for next well.
Deepwater area	Area falling beyond four hundred (400) metre isosobaths.
Development	Following discovery, drilling and related activities necessary to begin production of oil or natural gas.

Development well	A well drilled for the purpose of increasing the production of oil/ natural gas from an established field.
Discovery	The finding of a deposit of hydrocarbon not previously known to have existed, which can be recovered at the surface in a flow measurable by conventional petroleum industry testing methods.
Exploration	Searching for oil and/or natural gas, including topographical surveys, geological surveys, seismic surveys and drilling wells.
Exploration operations	Operations conducted in the contract area pursuant to the contract in searching for Petroleum and in the course of an Appraisal Programme and shall include but not be limited to aerial, geological, geophysical, geochemical, paleontological, palynological, topographical and seismic surveys, analysis, studies and their interpretation, investigations relating to the subsurface geology including structural test drilling, stratigraphic test drilling, drilling of Exploration Wells and Appraisal Wells and other related activities such as surveying, drill site preparation and all work necessarily connected therewith that is conducted in connection with Petroleum exploration.
Exploration period	Any and all periods of exploration set out in the PSC.
Exploratory well	A well drilled for the purpose of searching for undiscovered hydrocarbon accumulations on any geological entity (be it of structural, stratigraphic, facies or pressure nature) to at least a depth or stratigraphic level specified in the Work Programme.
Field	Oil Field or Gas Field or a combination of both as the case may be. In respect NELP blocks, the Contract Area in respect of which a Development Plan has been duly approved in accordance with provisions of the Production Sharing Contract.
G & G	Geological and geophysical
Gas in place	The amount of gas in the pores of a reservoir.
Geologist	A scientist who identifies and studies rocks.
Geology	The science that deals with the history of the earth and its life as recorded in the rocks.
Geophysics	The application of certain familiar physical principles: magnetic attraction,

	gravitational pull, speed of sound waves, the behavior of electric currents – to the science of geology.
Hydrocarbon	In organic chemistry, a hydrocarbon is an organic compound consisting entirely of hydrogen and carbon.
Initial in-place Hydrocarbon (IIP/H)	IIP/H are the volumes of crude oil, condensate, natural gas, natural gas liquids and associated substances anticipated to be present in known accumulations at a given time.
Joint venture	A business or enterprise entered into by two or more partners. Joint venture leasing is a common practice. Usually the partner with the largest interest in the venture will be the operator.
Liquidated damages	Liquidated Damages/Penalty accrued and provided for payment would include all expenditure incurred for taking time extension or failure to complete the Minimum Work Programme committed for obtaining/continuing with the exploration activities in search of Hydrocarbons beyond the period allowed at the time of taking/continuing such exploratory rights.
Management committee	The Committee constituted in terms of Production Sharing Contracts.
Minimum work programme	With respect to each Exploration Phase, the work programme specified for the purpose of carrying out Petroleum Operations as provided in the PSCs
Monetization	The process involved in bringing the hydrocarbon discoveries of a field/block to commercial stage.
Natural gas	Gaseous forms of petroleum consisting of mixtures of hydrocarbon gases and vapours, the more important of which are methane, ethane, propane, butane, pentane and hexane; gas produced from a gas well.
New discovery	A Discovery made after the Effective Date of the PSCs.
New Exploration Licensing Policy (NELP)	NELP was formulated by the Government of India in 1997-98 to provide a level playing field in which all the parties may compete on equal terms for the award of exploration acreage. This was for accelerating the pace of hydrocarbon exploration in the country through which various blocks including deep-water acreages were offered for competitive bidding.

Operator	The Company who (a) is responsible for maintaining a producing lease & (b) is in charge of operations in working interest area.
Participating Interest	In respect of each Party constituting the Contractor, the undivided share expressed as a percentage of such Party's participation in the rights and obligations under the PSC.
Petroleum	Crude Oil and/or Natural Gas existing in their natural condition but excluding helium occurring in association with Petroleum or shale.
Production sharing contract	The contract between Government and International/National E&P Company. The E&P Company bears the entire cost of exploration, drilling and production. The E&P Company is reimbursed for expenditures from the oil/gas that is produced. After reimbursement, the oil/gas proceed is split according to an agreed formula.
Prospects	Prospects indicate the areas of hydrocarbon accumulation.
Proved reserve	Those measured mineral resources of which detailed technical and economic studies have demonstrated that extraction can be justified at the time of determination and under specific conditions.
Reserve Replacement Ratio	An oil company's reserve replacement ratio is the quantity of hydrocarbon added to its ultimate reserves divided by the quantity of hydrocarbon extracted during a year.
Reserves	The calculated amount of gas and/or oil that is expected to be produced from a well/wells or a field. Proven reserves are calculated with reasonable certainty. Developed reserves can be produced from existing wells whereas underdeveloped reserves cannot. Unproven reserves are not as certain due to technical and economic reasons as proven reserves. Probable and possible reserves are even less certain.
Reservoir	A naturally occurring discrete accumulation of hydrocarbon.
Rig	An equipment that is used for drilling a well bore. There are various types of rigs like jack-up rigs, floaters, Modular rigs, etc. The jack up rigs can be further classified into Cantilever type jack up rigs, Slot type jack up rigs and Mat type jack up rigs.
Rig days	No. of days for which rigs were in operation/available during a particular period.

Rig month	Total No. of days for which rigs were in operation/available during a particular period.
Sedimentary basins	Sedimentary Basins are depressions in the earth's crust where organic matters are deposited.
Shallow water	Upto 400 metre bathymetry.
Site restoration	All activities required to return a site to its state as of the Effective date pursuant to the Contractors environmental impact study and approved by the Government or to render a site compatible with its intended after use (to the extent reasonable) after cessation of Petroleum Operations in relation thereto and shall include, where appropriate, proper abandonment of Wells or other facilities, removal of equipment, structures and debris, establishment of compatible contours and drainage, replacement of top soil, re-vegetation, slope stabilization, in-filling of excavations or any other appropriate actions in the circumstances.
Snubbing	The pressure in the well bore acting on the cross sectional area of the tubler can exert sufficient force to overcome the weight of the drill string, so the string must be pushed ("snubbed") backed into the well bore.
Spud	The process of beginning to drill a well.
Ultimate Reserve	A production approximation method commonly used in the oil and gas industry. Estimated ultimate reserve (EUR) is an approximation of the quantity of oil or gas that is potentially recoverable from a reserve or well.
Viscosity	Viscosity is the measure of fluid resistance to flow.
Well	A borehole, made by drilling in the course of Petroleum Operations, but does not include a seismic shot hole.
Well head	A wellhead is that part of an oil well which terminates at the surface, whether on land or offshore, and is the point from where petroleum or gas hydrocarbons can be withdrawn
Work over	To have a service Company do work (a workover) such as pullrods or sand cleanout on a producing well. A production rig, either a workover rig or a smaller service or pulling unit is used.

3D Seismic	A petroleum exploration method that shows the seismic reflectors in three dimensions. It is usually displayed on a computer monitor. The record can be rotated and slices (time or horizontal slices) taken out at various levels.
4C	4-Component; Bore hole or marine seismic data are typically acquired using three orthogonally oriented geo-phones and a hydro-phone within an ocean bottom sensor (deployed in node type systems as wells as cables) provided the system is in contact with the sea bed or bore hole wall, the addition of geo phone allows measurement of shear waves, whereas the hydro phone measures compressional waves.
4D	Time-lapse 3D or 4D seismic technology is the use of 3D seismic surveys acquired at different times in the productive life of a reservoir. It encompasses a broad workflow from feasibility and design, to acquisition and processing, to inversion and interpretation, and finally to integration with reservoir management.

List of Abbreviations

Abbreviated Form	Full Form
2D	Two dimensional
3D	Three dimensional
A&AA	Assam & Assam Arakan
API	Acquisition, Processing and Interpretation
BE	Budget Estimates
BEC	Bid Evaluation Criteria
CMD	Chairman and Managing Director
CPSE	Central Public Sector Enterprise
DGH	Directorate General of Hydrocarbon
DOC	Declaration of Commerciality
DPE	Department of Public Enterprises
E&D	Exploration & Development
E&P	Exploration & Production
G&G	Geological & Geophysical
GIIP	Gas initial in place
GOI	Government of India
HR	Human Resources
IIH	Initial In-place Hydrocarbon
JV	Joint Venture
KG	Krishna Godavari
LD	Liquidated Damages
LKM	Line Kilometre
LOA	Letter of Acceptance
MC	Management Committee
ML	Mining Lease
MMSCMD	Million Metric Standard Cubic Meter Per Day
MMTOE	Million Metric Tonne Oil Equivalent
MOD	Ministry of Defence
MOPNG	Ministry of Petroleum and Natural Gas
MOU	Memorandum of Understanding
MWP	Minimum Work Programme
NELP	New Exploration Licensing Policy
NIKO	Niko Resources Limited
NOC	National Oil Company
OC	Operating Committee
ONGC	Oil and Natural Gas Corporation Limited
PEL	Petroleum Exploration License
PI	Participating Interest
PML	Petroleum Mining Lease
PSC	Production Sharing Contract
PSE	Public Sector Enterprises
PBG	Performance Bank Guarantee
R&D	Research & Development
RE	Revised Estimates
RIL	Reliance Industries Limited
Sq. Km	Square Kilometre
GM (OD&RS)	General Manager (Oil Drilling & Related Services)
IOR	Improved Oil Recovery
EOR	Enhanced Oil Recovery