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**Report of the
Comptroller and Auditor General of India
on
Hydrocarbon Exploration Efforts of
Oil and Natural Gas Corporation Limited**



**Union Government
Ministry of Petroleum and Natural Gas
No. 11 of 2012-13
(Performance Audit)**

Report of the Comptroller and Auditor General of India

on
Hydrocarbon Exploration Efforts of
Oil and Natural Gas Corporation Limited

For the year ended March 2011

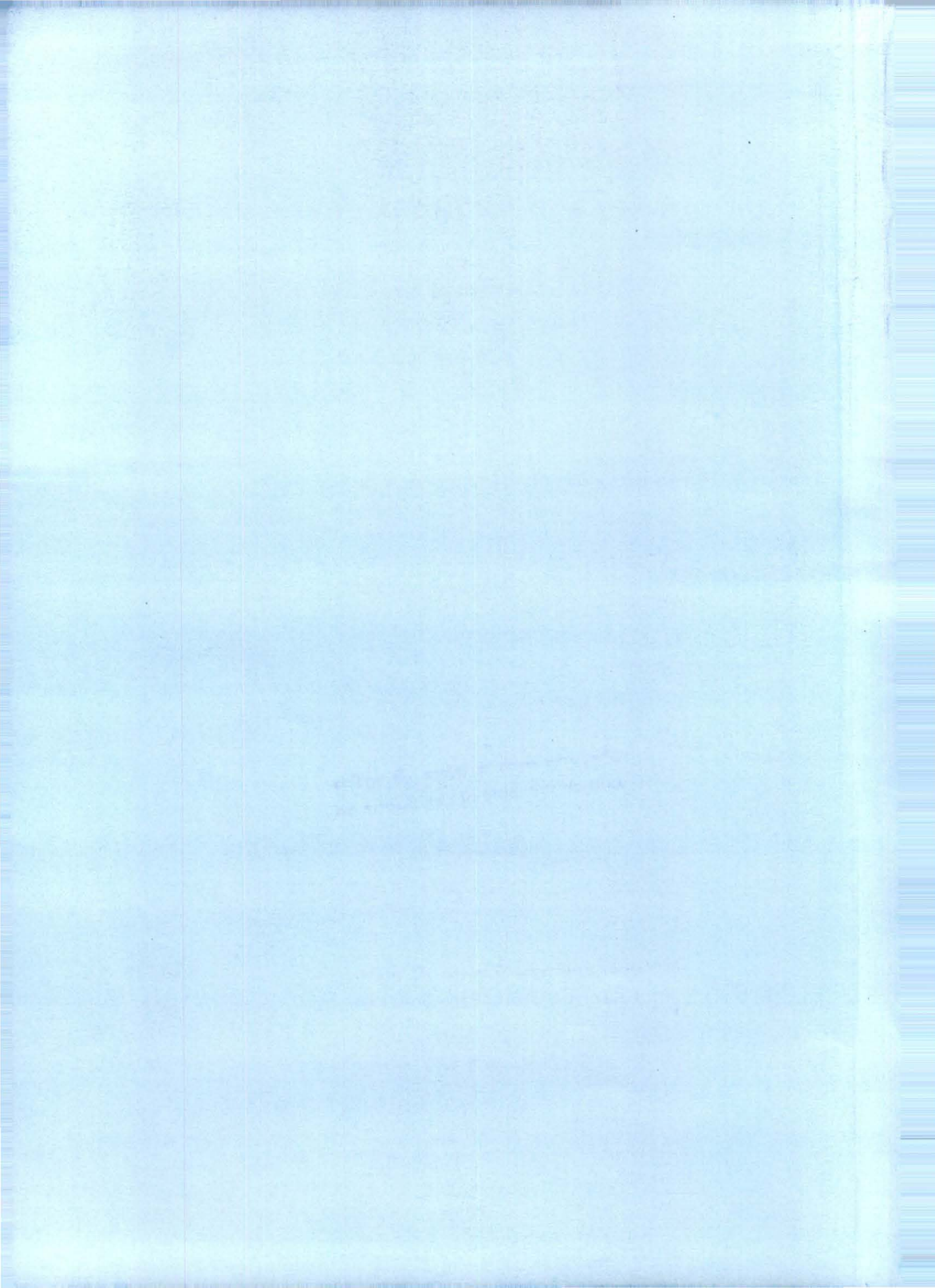
लोक सभा पटल में प्रस्तुत की तारीख
Laid on the table of Lok Sabha on

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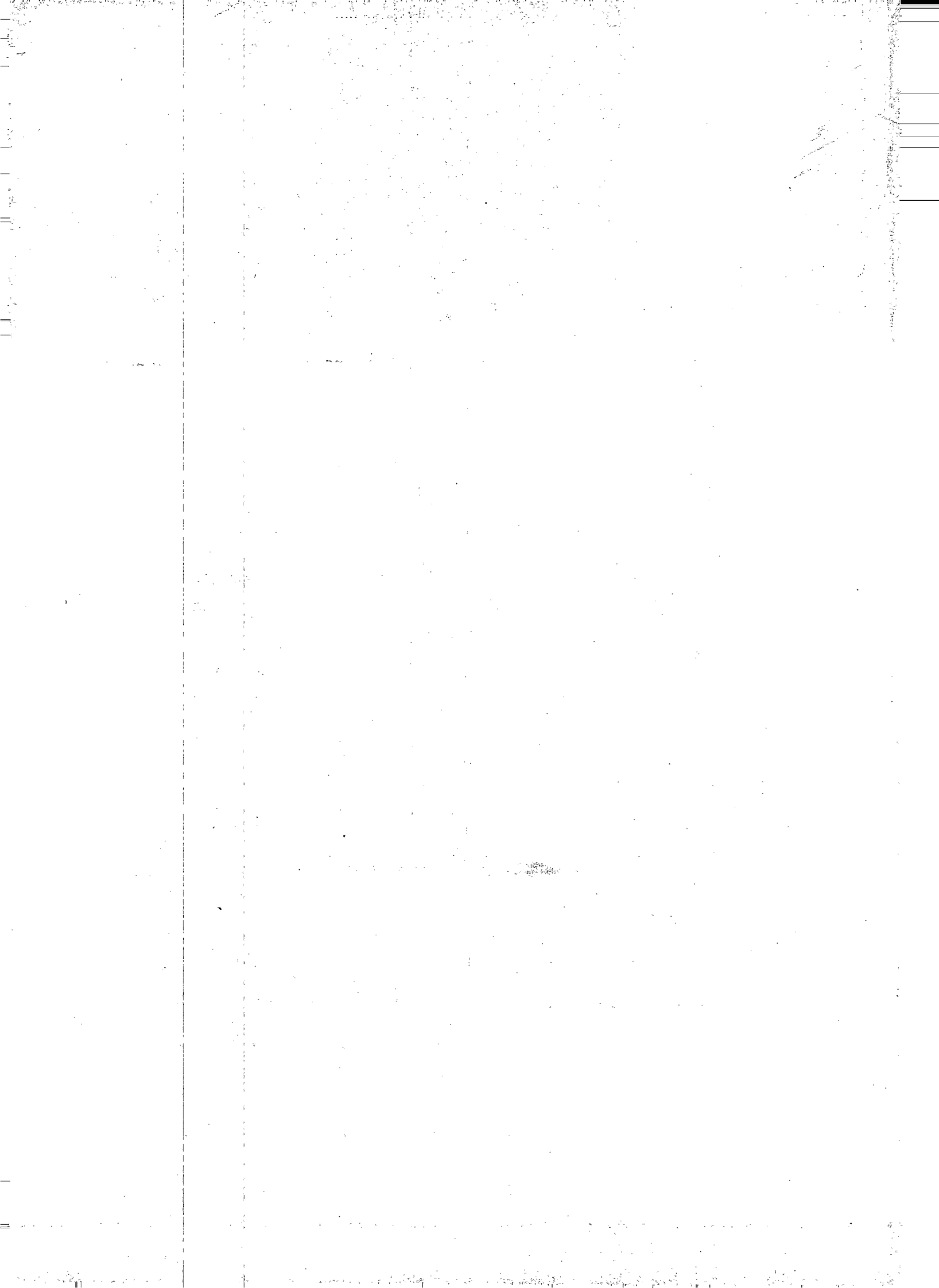
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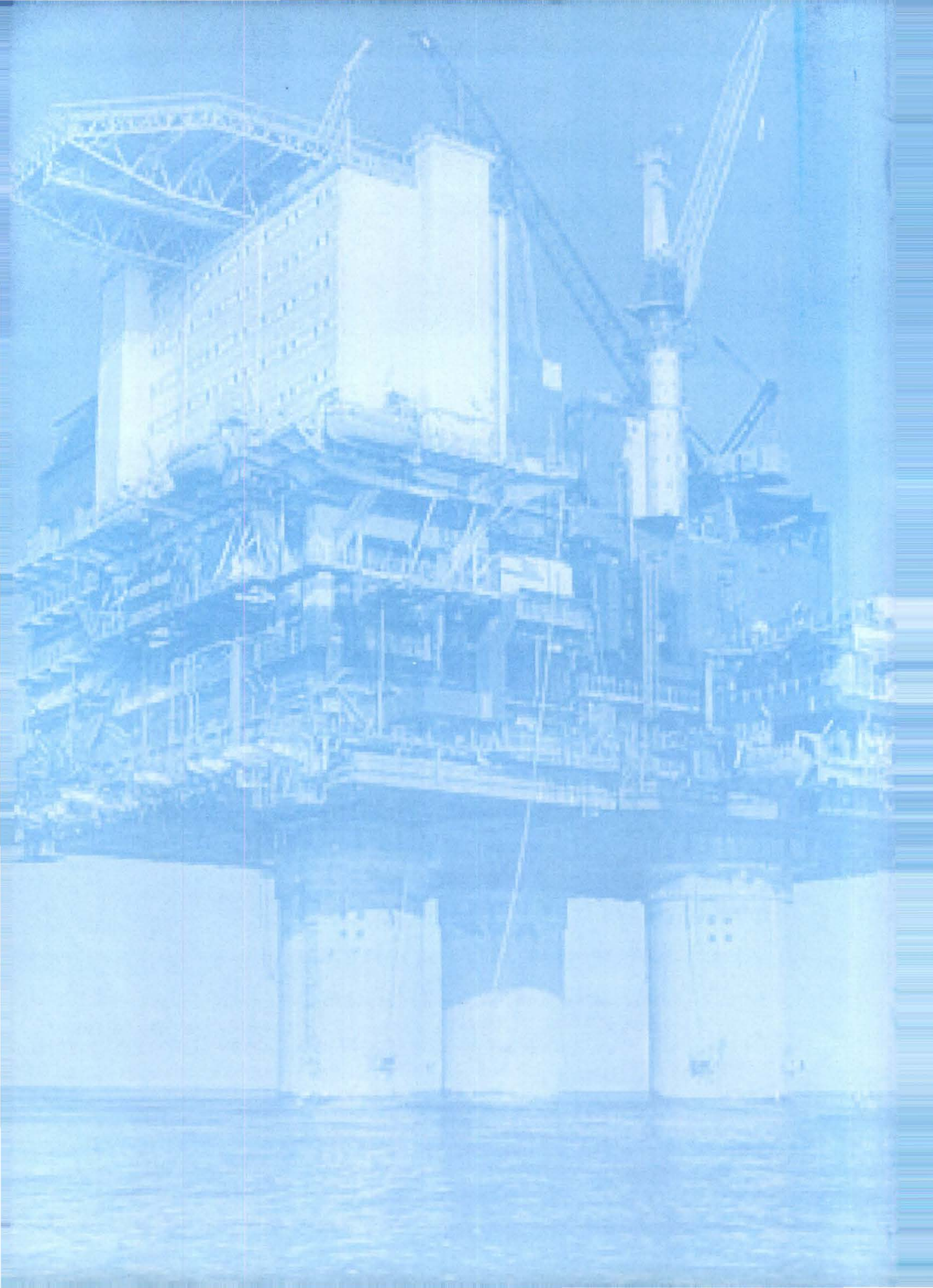


Preface

The Audit Report has been prepared in accordance with the Performance Audit Guidelines and Regulations on Audit and Accounts of the Comptroller and Auditor General of India (C&AG).

Performance of Oil and Natural Gas Corporation Limited (ONGC) in three facets of its hydrocarbon exploration activities viz. Deep Water, Shallow Water and Onshore exploration activities, were reviewed by C&AG in Report No.PA9 of 2008 on 'Deep Water Exploration', Report No.PA27 of 2009-10 on 'Onshore Exploration Activities', and Report No. 10 of 2010-11 on 'Shallow Water Exploration' and a number of recommendations were made. Given the fact that production of oil and gas by ONGC had been almost static with a downward trend over the last decade (2001-02 to 2010-11), the present Performance Audit was undertaken to examine ONGC's preparedness towards meeting the Hydrocarbon Vision 2025 of the Government of India; including prescribing targets in the Memorandum of Understanding with the Government of India to achieve the same besides oversight role played by the ONGC Management and the Ministry of Petroleum and Natural Gas to address the gaps/deficiencies in this regard. The Report also examines the response of the Company to the audit observations and recommendations contained in the earlier three Reports of C&AG.

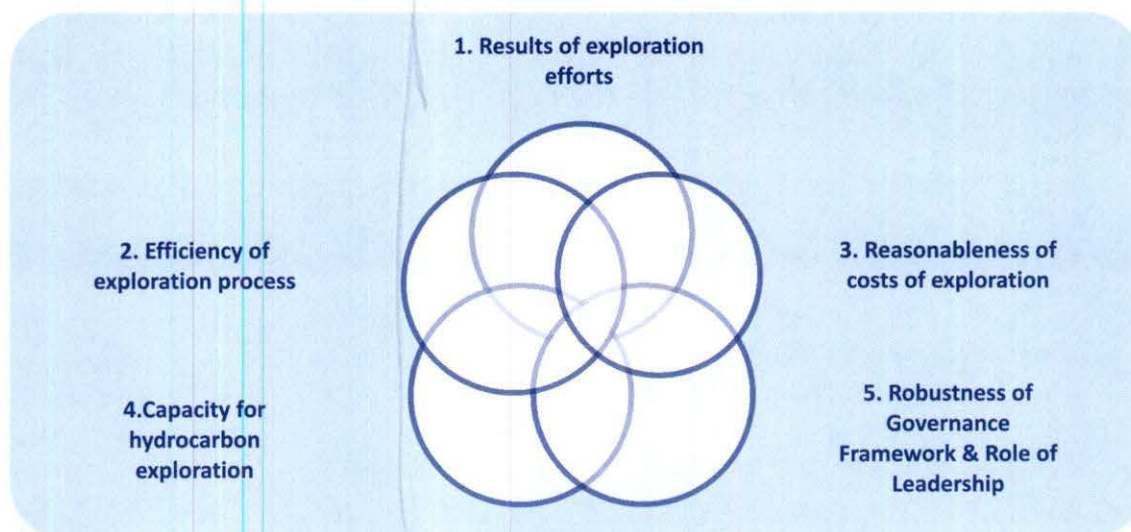
Audit wishes to acknowledge the cooperation extended by the Management of ONGC, the Directorate General of Hydrocarbons and the Ministry of Petroleum and Natural Gas at each stage of the audit process.



Executive Summary

Performance Audit of hydrocarbon exploration efforts (2007-08 to 2010-11) of Oil and Natural Gas Corporation Limited (ONGC) was conducted *to ascertain whether ONGC'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 audit conclusions based on detailed examination of records of Basins and Services, at the corporate level of ONGC, at the Ministry of Petroleum and Natural Gas (MOPNG) and the Directorate General of Hydrocarbons (DGH), through other national and international sources are detailed below:

Results of Exploration efforts – *ONGC mainly operates in its producing fields to meet both, reserve accretion and production targets. Lack of adequate efforts and results in new fields, coupled with the ageing of producing fields, is a matter of concern for future.*



- The actual reserve accretion through exploratory wells, wildcat wells and appraisal wells accounted for only 13 per cent to 38 per cent of the MOU targets set for the Company by MOPNG. The 'finding cost'¹ was also understated by US \$ 4.84 to US \$ 21.71/boe².

(Para 3.1)

¹ Finding Cost is the cost of finding reserves calculated by dividing the exploration cost by ultimate reserve accreted.

² boe: barrel of oil equivalent. A term used to summarize the amount of energy that is equivalent to the amount of energy found in a barrel of crude oil.

- Despite acquiring 89 prospective blocks out of 120 blocks upto VIII round of New Exploration Licensing Policy (NELP), ONGC made only 11 discoveries in 8 blocks. The Company did not complete its committed work in 25 prospective blocks and drilled only 30 out of 90 committed wells within the specified period. In 74 per cent of highly prospective blocks acquired by the Company under NELP I to V rounds, ONGC could not complete its work commitments.

(Para 4.3 and 4.3.1)

- Though ONGC made 99 discoveries in NELP and Nomination blocks over 2007-2011, it accreted a reserve of only 80.93 MMToe³. A comparison of discoveries in the NELP regime shows that despite its large acreage and rich experience in Exploration and Production (E&P) sector, ONGC made lesser discoveries than new entrants like Gujarat State Petroleum Corporation (GSPC) and Reliance Industries Limited (RIL).

(Para 3.1 and 3.2)

- ONGC had monetized⁴ only 73 out of its 158 discoveries made during 2002 to 2011. The Company succeeded in monetizing only 2 out of the 56 offshore discoveries. In fact, non monetized offshore discoveries contained major reserve accreted.

(Para 3.4)

- ONGC has been maintaining a reserve replacement ratio (RRR⁵) of more than 1. However, the RRR shows an increasing trend mainly on account of upward trend in reserve accretion (due to reinterpretation and development drilling) and downward trend in production due to ageing fields and delay in monetization. Consequently, ONGC's healthy RRR of >1 is in fact due to a static/declining trend of production and reserves being accreted mainly through reinterpretation.

(Para 3.3)

Efficiency of Exploration Efforts – ONGC's exploration processes were far from being efficient. Cost overruns and shortfalls in survey and drilling targets were noted.

- Less than 50 per cent of the Basins were only able to meet 2D/3D survey targets. Despite assurances by ONGC in response to previous Performance Audits conducted by the Comptroller and Auditor General of India (C&AG), ONGC did not fix norms for completion of the Acquisition, Processing and Interpretation (API) cycle. In nearly 40 per cent of the projects, ONGC took more than 2 years to complete the API cycle, leaving a little time for drilling of committed exploratory wells within the phase. This led to extensions and payment of liquidated damages of ₹133.03 crore to MOPNG for not drilling 24 wells in 13 blocks within the committed period.

(Para 4.1.1 and 4.1.2)

³ Million Metric tonnes of oil equivalent.

⁴ Monetization is the process involved in bringing the hydrocarbon discoveries of a field/block to commercial stage.

⁵ RRR measures the relationship between new reserves accreted and oil produced, reflecting how well an oil company is replacing its production.

- ONGC was tardy in purchase of a seismic survey vessel. Though procurement process was initiated in 2004, a vessel was yet (March 2012) to be purchased. Survey vessel continued to be hired leading to an extra cost of ₹ 128.98 crore per annum.

(Para 4.1.4)

- ONGC lost field season⁶ due to delay in award of survey contracts. While the normative period required for tendering process is 125 to 140 days, ONGC took upto 178 days for finalization of contracts. Delays in tendering defeated ONGC's exploration objectives of timely acquisition of seismic data.

(Para 4.1.5)

- There was a shortfall of 3,32,855 metres and 109 wells in ONGC's exploration performance. Except Western Offshore Basin, none of the other Basins could drill the targeted exploratory wells.

(Para 4.2)

- Even as ONGC failed to acquire planned rigs for its operations, there were delays in hiring and mobilization of rigs leading to a shortfall of 47,450 metres of drilling meterage and delay of 2,592 rig days in rig mobilization due to monsoon intervention.

(Para 4.2.5)

- ONGC's owned rigs were less efficient than the hired rigs. Despite refurbishment, cycle speed⁷ of ONGC's owned rigs was lower than that of chartered hired rigs by 11 per cent.

(Para 4.2.1 and 4.2.6)

- ONGC took 7 per cent to 16 per cent extra days for drilling as compared to its own norms. As against the international norm of less than 5^a per cent and ONGC's own norm of 10 per cent, the actual non productive time of rigs (average) was 19 per cent. A comparative analysis carried out by DGH showed that ONGC's drilling performance in terms of average metres drilled per day (well depth/ total drilling days) was below the drilling performance of another National Oil Company viz. Oil India Limited (OIL) and other private operators.

(Para 4.2.1 and 4.2.2)

- There was a substantial shortfall in achievement of exploratory drilling targets as compared to development drilling. ONGC's preference for development drilling was also a contributory factor to non achievement of its exploratory drilling targets.

(Para 4.2.8)

⁶ *Field season: The window of fair weather period in a year during which the seismic survey is normally conducted.*

⁷ *Cycle speed: Meterage drilled per drilling rig month during the complete period from release from earlier well and mobilization to release for next well.*

^a *Based on an internal audit report (2006-07) by M/s. Ernst & Young on Western Offshore Drilling Services of ONGC.*

- DGH did not clarify its stand on acceptance of the type of survey conducted in comparison to the work commitments in NELP blocks leading to delays in exploration.

(Para 4.3.2)

Capacity for Exploration and Costs of Exploration – There was a lack of independent assurance on its technology and its HR policies and practices that revealed critical gaps.

- A comparison of physical achievements vis-à-vis financial provisioning indicated that the allocated budget remained under-utilised (as high as 12.2 per cent in 2009-10), the shortfalls in achieving physical targets for surveys and drilling of exploratory wells was significantly higher (upto 60 per cent in surveys and 29 per cent in exploratory wells) than the shortfall in utilisation of budget provision indicating poor budgetary control.

(Para 5.2)

- Despite advice and concerns raised by the Planning Commission, ONGC was yet to undertake any independent assessment of its technology. While the Management is confident that ONGC's technology is up to date – only an independent assurance can provide the necessary credence.

(Para 5.3)

- Acute shortage of operating crew for rigs seriously impacted the efficiency of ONGC's owned rigs. Fifty two per cent of the total attrition took place from exploration and drilling groups. The highest level of attrition (63 per cent and 68 per cent in drilling and exploration respectively) took place from ONGC's most experienced, trained and qualified personnel. Besides, there was lack of succession planning at the top level and important Board level positions continued to remain unoccupied for long periods.

(Para 5.1.1, 5.1.2, 5.1.3 and 5.1.4)

- The current system of empanelling experts and consultants does not provide for a competitive bidding process to acquire quality services at competitive costs. As the Basins that hire consultants do not send appraisal reports to the Corporate Exploration Center, effectiveness of their services could not be gauged. Further, 50 per cent of the consultants hired were ex ONGC employees.

(Para 5.1.5)

Robustness of Governance Framework and Role of Leadership – Performance accountability arrangements for ONGC did not place the desired emphasis on exploration efforts.

- Despite the fact that exploration is a core activity for ONGC, its Memorandum of Understanding (MOU) with MOPNG has only two performance parameters for exploration – 'reserve accretion' and 'finding cost' with a combined weightage of only 4.5 per cent. In fact, over the period 2007-11, the weightage assigned in the MOU to reserve accretion declined from 8 to 4 per cent while the weightage for finding cost went down from 2 to 0.5 per cent.

(Para 6.2)

- ONGC used different criteria for target setting and reporting on exploration parameters of the MOU. While the Company sets reserve accretion targets based on reserves accreted through exploratory wells, wildcat wells and appraisals, the reporting against this target included reserve accreted through reinterpretation and development drilling also, reflecting a higher performance than actuals on reserve accretion which misleads the stakeholders. In fact, actual reserve accretion through exploratory wells, wildcat wells and appraisals accounted for only 13 per cent to 38 per cent of the total reserve accretion reported while through reinterpretation was 59 per cent to 63 per cent and through development drilling was 3 per cent to 27 per cent during 2007-11. Thus, if performance on reserve accretion was appropriately reported, it would reveal a performance way below the MOU targets. While ONGC reported on reserve accretion targets by including reinterpretation and development drilling, their cost was not included while working out the finding cost. Consequently, the finding cost of ONGC exploration activities exceeded the targets by 129 per cent to 648 per cent.

(Para 6.3)

- While ONGC's strategic plan is aligned to the Government of India (GOI)'s Hydrocarbon Vision 2025, its own five year and annual plan targets do not stretch to meet these envisioned objectives. The ONGC Board, which is responsible for oversight and accountability, has not ensured alignment between strategy and plans. It has also failed to take care of the governance issues like target setting and reporting on exploration performance.

(Para 6.1)

- ONGC did not benchmark its exploration performance. The Company informed that they undertake internal peer benchmarking only and that they are unable to find suitable performance parameters and information for international benchmarking. In the absence of such benchmarks, assurance on performance could not be satisfactorily derived.

(Para 6.4.3)

Recommendations:

ONGC should

1. **Strengthen the performance accountability framework for exploration** – As the flagship E&P National Oil Company, it is incumbent on ONGC/ MOPNG that more weightage be assigned to exploration efforts in the MOUs that are signed every year. Weightage given to reserve accretion and finding cost should also be appropriately increased. ONGC Board should ensure that the criteria used for reporting on reserve accretion matches the targets set in the MOU. MOPNG may also review the MOU parameters to ensure that the performance measures set for exploration are adequate and appropriate to objectively measure exploration performance. There should be greater transparency in reporting on the MOU targets.

2. **Introduce a MOU parameter for monetization of discoveries** - Discovery to stream in case of major offshore discoveries may be rigorously pursued to enable higher level of production from new fields. In order to ensure that reserve accretion translates into increase in production, MOPNG may consider introduction of a new performance parameter in the MOU that assesses ONGC's performance with respect to monetization of discoveries.
3. **Benchmark Exploration Performance** – ONGC needs to take suitable initiatives to strengthen internal peer benchmarking across the organization and draw suitable linkages to target setting and performance evaluation based on these benchmarks. In this regard, DGH may be ideally positioned to standardize performance parameters and benchmarks for the E&P industry in India. Target setting within ONGC and for the MOU should be done on the basis of internationally benchmarked exploration performance on important exploration parameters viz. reserve replacement ratio, finding cost, success rate of exploratory wells and proved oil and reserve growth.
4. **Improve efficiency of Exploration Process** – Systemic lacunae in tendering and award of contracts pointed out in this report should be addressed to improve efficiency of exploration process. Norms have also to be fixed for the acquisition, processing and interpretation (API) of seismic data cycle to ensure efficiency.
5. **Ensure independent assurance on Technology** – As suggested by the Planning Commission and as decided by its Board, ONGC must carry out an independent assessment of technology in vogue in the Company to provide an assurance that it is indeed up-to-date.

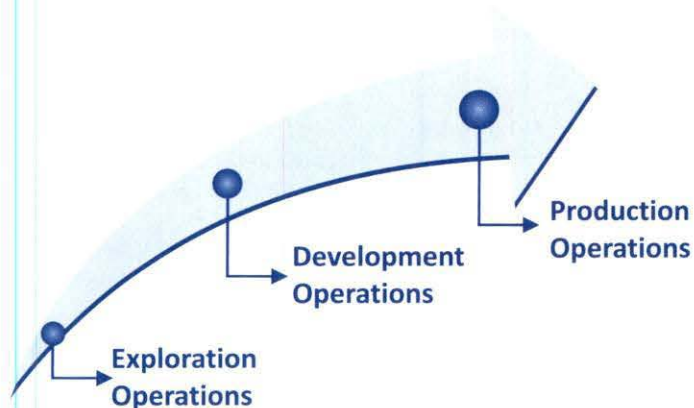
HYDROCARBON EXPLORATION by ONGC - AN INTRODUCTION

1.1 Background

The 'Oil and Natural Gas Corporation Limited' (ONGC) started as a Directorate of Geological Survey of India on 14 August 1956. With the enactment of the Oil and Natural Gas Commission Act, 1959, it became a statutory body called Oil and Natural Gas Commission with effect from 15 October 1959. The Central Government decided to restructure the Commission into a company under the Companies Act, 1956. Accordingly, the Oil and Natural Gas Corporation Limited was incorporated as a Company on 23 June 1993 to carry out exploration and to develop and optimize production of hydrocarbons.

1.2 Exploration Process

Hydrocarbon Exploration and Production (E&P) operations, also referred to as upstream operations, can be broadly grouped into three categories.



Exploration process

The process of hydrocarbon exploration starts with prognostication and geo-scientific surveys on the identified sedimentary basins. The information collected from these surveys is processed and interpreted to construct a logical model of the basin. The model so constructed, is tested by drilling exploratory wells. If the area proves to be hydrocarbon bearing, delineation wells are drilled to determine the boundaries or the extent of reservoir of the new oil or gas field. This is followed by drilling of development wells, laying oil pipelines and installation of facilities to put the field on regular commercial production.

The first phase in the process for 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.

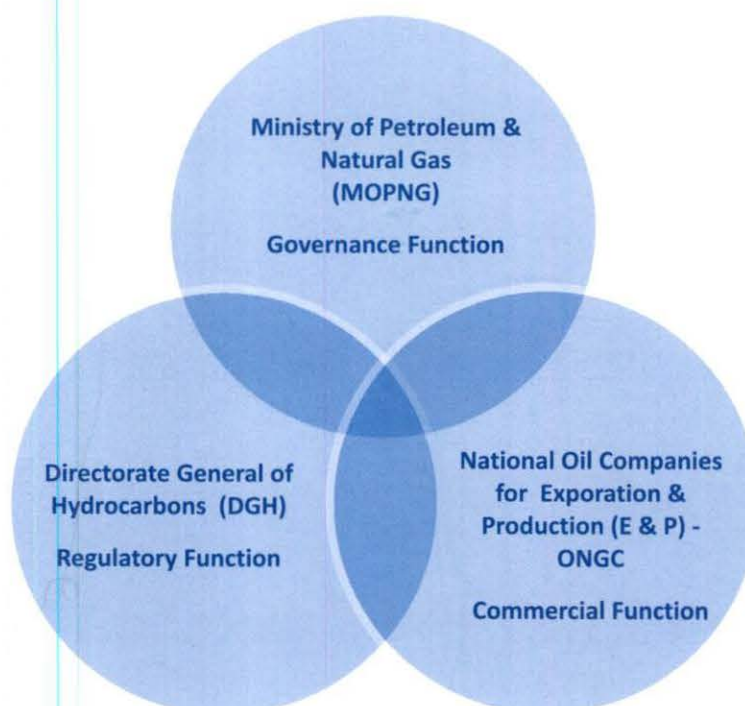
Exploration consists of several sub-phases:



1.3 Institutional Framework for Hydrocarbon Exploration

In India, the Ministry of Petroleum and Natural Gas (MOPNG) is responsible for formulating policies and rules and regulations that govern exploration and production operations in the oil and gas sector.

Institutional Framework



The Directorate General of Hydrocarbons (DGH) operates under the supervision of MOPNG and is responsible for regulation and oversight of upstream activities in the petroleum and natural gas sector in India. DGH is also the technical arm of the MOPNG in matters related to exploration and production of hydrocarbons. ONGC is one of the two national oil companies (NOCs) that are engaged in commercial activities related to exploration and production of hydrocarbons. MOPNG with the assistance of DGH regulates the hydrocarbon exploration of ONGC 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.

In the year 2000, MOPNG formulated a 'Hydrocarbon Vision 2025' to lay down the framework which would guide the policies relating to the hydrocarbon sector for the next few years. One of the main areas of the Hydrocarbon Vision is 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. ONGC has formulated its strategy based on the Hydrocarbon Vision 2025.

1.4 Performance Accountability Arrangements for Exploration: MOU between MOPNG and ONGC

The performance accountability arrangements for hydrocarbon exploration are enforced through the annual Memorandum of Understanding (MOU) signed between MOPNG and ONGC. The guidelines for MOU between ONGC as a Central Public Sector Enterprise (CPSE) and MOPNG as the administrative Ministry are prescribed by the Department of Public Enterprises (DPE). On the basis of the performance against the targets set in the MOU, the CPSE is ranked on a five point scale: 'Excellent', 'Very Good', 'Good', 'Fair', 'Poor'. ONGC achieved an overall grading of 'Very Good' for all the four years ended March 2010-11.

Organisational arrangements for Hydrocarbon Exploration in ONGC



Hydrocarbon exploration of ONGC is spread over seven sedimentary basins⁸ located in onshore as well as offshore areas. The Basins are involved in the actual exploration of the blocks. The Director (Exploration) heads the exploration activities and the organizational chart is as shown above. The institutes of ONGC viz. GEOPIC, KDMIPE, IRS, IDT and the SPIC/RGLs⁹ carry out research and development work for exploration. The exploration group is also supported by

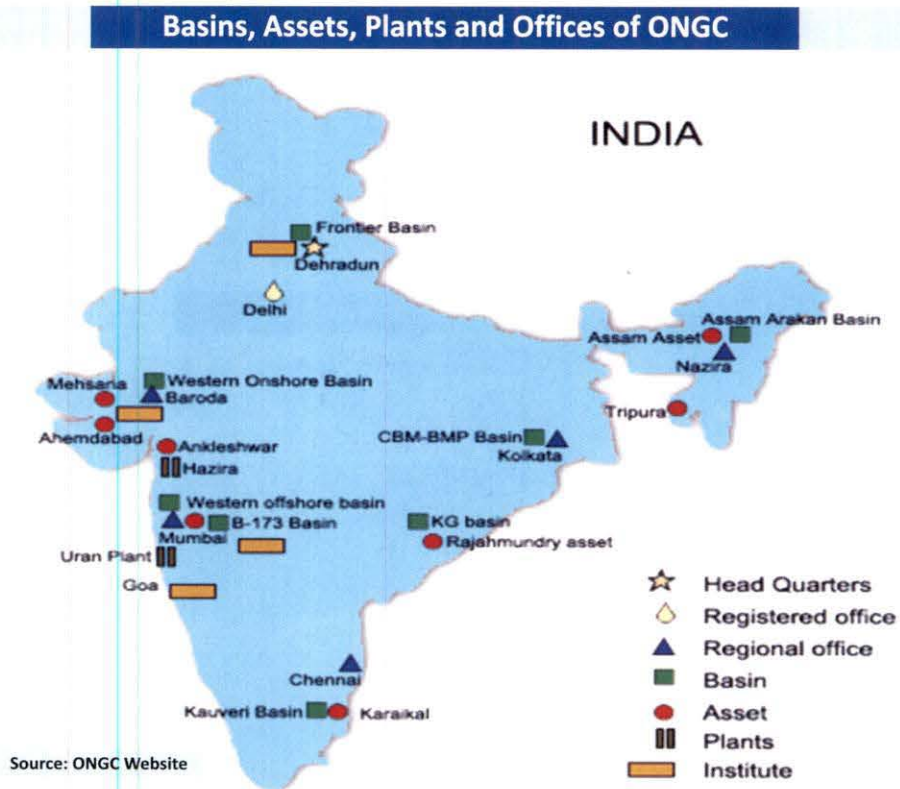
- Geophysical Services for acquisitions and processing of seismic surveys;
- Drilling Services for drilling of Exploratory and Appraisal Wells; and
- Logging¹⁰ Services for logging of the wells.

⁸ Western Offshore Basin (WOB), Western Onshore Basin (WON), Krishna Godavari – Pranahita Godavari (KG-PG) Basin, Mahanadi-Bengal – Andaman (MBA) Basin, Assam & Assam Arakan (A&AA) Basin, Cauvery Basin, Frontier Basin (FB).

⁹ Refer list of abbreviations.

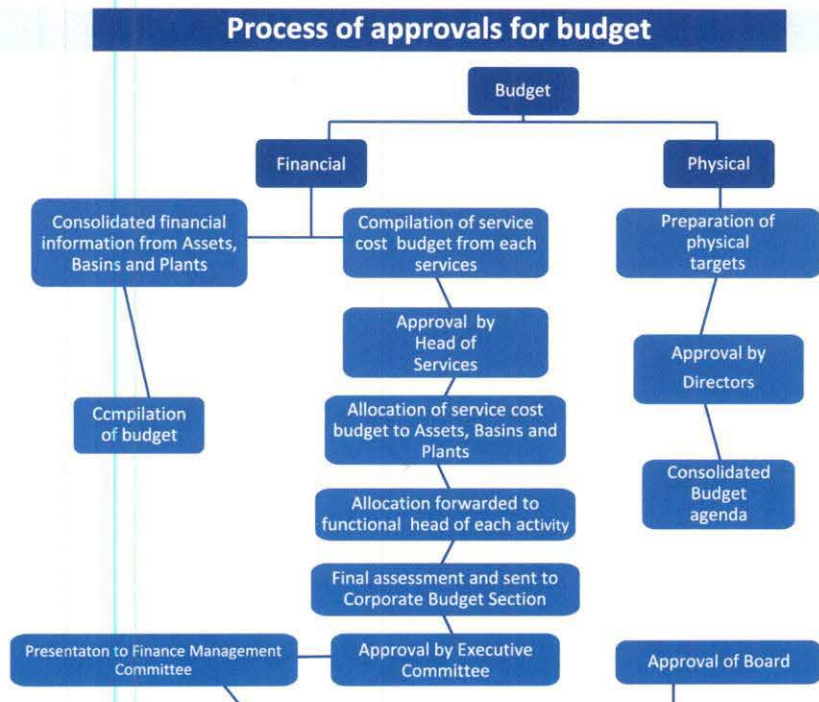
¹⁰ Logging – recording of rock and fluid properties to find hydrocarbon zones in the geological formations intersected by a borehole.

The exploration Basins, Assets, Plants and offices of ONGC in India are shown in the map given below:



1.5 Financial Arrangements for Exploration

Process of approvals for decisions related to each phase of exploration is depicted in the flowchart below:



1.6 ONGC's Exploration Blocks

As on 1 April 2011, ONGC held a portfolio of 40 Nomination¹¹ blocks (73,839 Sq. Km) and 82 New Exploration Licence Policy (NELP) blocks (428,591 Sq. Km) in onshore, offshore shallow water and deepwater areas.

1.6.1 Nomination Blocks

The year-wise details of onshore, offshore-shallow water (SW) and deepwater (DW) nomination blocks with ONGC along with the acreages held for the four years from 2007-08 to 2010-11 is as follows:

Nomination blocks with ONGC										
Areas	Nomination blocks as on									
	1-4-2007		1-4-2008		1-4-2009		1-4-2010		1-4-2011	
	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)
Onshore	80	43106	67	39358	58	32418	45	22876	26	21655
Offshore-SW	20	37205	18	32422	15	23449	12	22663	10	17946
Offshore-DW	8	48131	7	43643	6	43524	5	35024	4	34238
Total	108	128442	92	115423	79	99391	62	80563	40	73839

Source: ONGC's Annual Corporate Plan Performance Reports for 2007-10 and data furnished by ONGC for 2010-11

1.6.2 NELP blocks

The year-wise details of onshore, offshore, shallow water and deepwater NELP¹² blocks along with the acreages held by ONGC for the four years from 2007-08 to 2010-11 is as follows:

NELP Blocks of ONGC										
Areas	NELP blocks as on									
	1-4-2007		1-4-2008		1-4-2009		1-4-2010		1-4-2011	
	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)	No.	Area (sq.km)
Onshore	13	34022	21	55761	29	39227	30	53759	33	54734
Offshore-SW	10	66619	9	63735	14	75440	9	37828	13	29122
Offshore-DW	16	202003	28	308795	30	337428	31	330983	36	344735
Total	39	302644	58	428291	73	452095	70	422570	82	428591

Source: ONGC's Annual Corporate Plan Performance Reports for 2007-10 and data furnished by ONGC for 2010-11.

¹¹ Nomination blocks- Before introduction of NELP, the National Oil Companies (NOCs) viz. ONGC and OIL were awarded blocks for exploration on nomination basis and are known as 'Nomination Blocks'.

¹² NELP blocks: 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.

APPROACH TO THIS PERFORMANCE AUDIT

Hydrocarbon exploration, being one of the core activities of ONGC, has been studied over the years by Audit. As mentioned in Preface to this Report, Performance Audit of exploration activities of ONGC was conducted and printed in C&AG Audit Reports of 2008, 2009-10 and 2010-11.

2.1 Audit Objective

The Performance Audit attempts a holistic view of ONGC's exploration performance. The audit objective has been ***to ascertain whether ONGC'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 of the country and ONGC.*** The following issues have been examined:

- Are the results of ONGC's exploration efforts satisfactory?
- Did ONGC drive its exploration process efficiently and economically?
- Does ONGC possess required capacity for hydrocarbon exploration?
- Was the governance framework robust and was the leadership role as expected of ONGC in hydrocarbon exploration effective?

The audit effort has been to answer these questions not only from ONGC's perspective, but from the overall institutional framework within which ONGC operates. As such, the role of MOPNG as the key stakeholder and that of DGH as the regulator of the upstream sector has also been studied.

Another significant objective of this audit has been a follow up on the recommendations and observations of the three recent performance audits on exploration activities of ONGC in onshore, deepwater and shallow water areas wherein Audit made 24 recommendations. The results of the follow up have been suitably incorporated in this report under the issues that they pertain to.

2.2 Audit Scope

The Performance Audit covers ONGC's exploration efforts for the period from 2007-08 to 2010-11.

2.3 Audit Criteria

The audit criteria have been derived from the following sources:

- Strategic Documents regarding hydrocarbon exploration - The documented policy on India Hydrocarbon Vision 2025, targets set in the MOU signed by ONGC with the Ministry, targets fixed in the Strategic plan and annual plan of the Company;

- ONGC's policies, rules & regulations – bidding strategy for acquisition of NELP blocks, rules for application of re-grant of Nomination blocks, Material Management Manual and policies formulated for contracting, Minutes of the meetings of the 'Board of Directors' (Board), Strategy Meets, Key Executives Meet, Conclaves, Exploratory Board Meetings, Reports of Committees of both Houses of the Parliament;
- Comparisons based on performance of other national and international players, internal and international benchmarks, rates indicated in the Rig locator publications and internal documents relating to Five Year Plan (FYP), Annual Plans, Rig Deployment Plan, prescribed norms for drilling, Performance contracts entered into with Basins, Service Level agreements entered into by Basins with Services *etc.*;
- Human resources policies, policies for engagement of consultants/experts, policy of adoption of new technologies;
- International/national data of various E&P operators for the last four/five years.

2.4 Audit Methodology

- An Entry Conference with ONGC Management was held on 12 September 2011 for discussion on the audit objectives, scope and methodology.
- Audit reviewed the records of various units of ONGC like Basins, Corporate office, Exploration & Development Directorate, office of the Director (Exploration), Corporate Planning Cell, Exploration Contract Monitoring Cell, Costing Cell, Performance Management and Benchmarking Cell, ONGC's Institutes, *etc.* and also reviewed the related records at MOPNG and DGH.
- The draft audit report was issued (February/March 2012) to ONGC. Reply of ONGC received in March 2012 has been suitably incorporated in the report. The report was also discussed with ONGC Management at an Exit Conference held on 30 March 2012. ONGC's responses have been suitably included in the report.
- The draft audit report was also issued to MOPNG in March 2012. No response has been received from the Ministry till date despite issue of reminders in March, June and July 2012.

2.5 Audit Sample

All the seven Basins in ONGC have been covered through sampling techniques to select blocks for conducting Performance Audit. Sampling has also been applied in selection of contracts of goods and services for scrutiny.

- **Selection of Blocks** - Both Nomination and NELP blocks (onshore and offshore), were selected using the following criteria:
 - Nomination blocks – Twenty five *per cent* for onshore and fifty *per cent* for offshore, on random selection basis.

- NELP blocks – Twenty five *per cent* for onshore and fifty *per cent* for offshore, selected on random sampling basis. In both Nomination and NELP blocks, stratified sampling was done by going for 50 *per cent* live and 50 *per cent* surrendered blocks. Blocks awarded in NELP VIII (14 blocks awarded in 2010) were not selected since these blocks were under first year of exploration.
- **Selection of wells** - During 2007-11, ONGC drilled 457 exploratory wells. A 20 *per cent* sample was selected for detailed audit.
- **Purchase Order/Service Contracts** – Twenty five *per cent* of high value contracts/purchase orders based on materiality in descending order was selected for audit.

Sl. No.	Area	Sample size percentage	Population	Sample size
1.	Block audit at 'Basin ¹³ '.	25 <i>per cent</i> for onshore and 50 <i>per cent</i> for offshore blocks	200	94
2.	Contracts for hiring for goods and services.	25 <i>per cent</i>	191	88

¹³ 'Basin(s)' refers to ONGC's Unit(s) engaged in exploration activities.



RESULTS OF ONGC'S EXPLORATION EFFORTS

The main objective of exploration is to accrete reserves such that production of hydrocarbons is sustained. The results of exploration efforts can be measured through four main parameters - Reserve accretion through exploration, Finding cost of accretion, Reserve Replacement Ratio (RRR) and Discoveries leading to production. To assess the results of ONGC's exploration, the following issues have been addressed:

- Whether the reserve accretion as a result of exploration efforts was satisfactory;
- Whether the finding cost of reserves accreted was reasonable;
- Whether ONGC's discoveries compared favourably with its peers; and
- Whether ONGC had taken timely action in monetizing its discoveries.

The results of our audit examination are detailed below:

3.1 Reserve Accretion¹⁴

The Basin-wise targets for reserve accretion through exploration as per performance contracts entered into by Director (Exploration) and achievement thereagainst during the four year from 2007-08 to 2010-11 (as reported by ONGC) are given below:

Achievement of reserve accretion targets (in MMToe)

Basin	2007-08		2008-09		2009-10		2010-11	
	Target	Actual	Target	Actual	Target	Actual	Target	Actual
W. Offshore	20.0	11.43	20.00	3.12	22.35	6.11	12.00	16.70
W. Onshore	5.20	2.94	4.41	0.78	4.95	2.48	4.92	5.38
A&AA	4.90	3.14	8.50	3.87	8.60	3.49	6.30	1.47
Cauvery	1.70	-0.04	8.05	0.29	3.25	0.27	6.25	0.44
KG-PG	16.50	2.73	29.25	0.56	25.25	3.87	39.25	7.00
MBA	6.30	2.01	2.50	0	8.60	2.12	7.45	0.77
Frontier	0	0	0	0	0	0	0	0
Total	54.60	22.21	72.71	8.62	73.00	18.34	76.17	31.76

Source: Performance Contract Targets set for Basins for 2007-11 and actual furnished by ONGC.

As against the aggregate target of 276.48 MMToe, the actual reserve accretion was only 80.93 MMToe (29% of the target) even though the total number of discoveries was 99 (88 Nomination and 11 NELP). As the above table indicates, except for two Basins (Western Offshore and Western Onshore) in the year 2010-11 and Frontier Basin which did not have any reserve accretion targets, none of the Basins achieved the reserve targets during the four years under consideration. The shortfall in the key performance

¹⁴ Reserve accretion is the accretion/addition to recoverable hydrocarbon reserves.

parameter in the MOU of 'reserve accretion' has been discussed in Chapter 6. The reserve accreted through exploration alone was only 13 *per cent* to 38 *per cent* of the MOU targets set for the Company. The finding cost in the four years under audit has exceeded the MOU targets by US \$ 4.84 to US \$ 21.71 per boe that worked out to 129 to 648 *per cent* (reference para 6.3.2).

ONGC in reply stated (March 2012) that reserves accretion as a whole needs to be considered while judging the performance. The Company also stated that it has been able to over-achieve its accretion targets all these years.

ONGC's response is not acceptable as the Basin wise targets are set for accretion through exploratory wells, wildcat wells and appraisal wells. By their own admission, ONGC does not set targets for reinterpretation and development drilling. As such, while assessing performance against targets, it is fair that only a like to like comparison is done.

3.2 Hydrocarbon discoveries by ONGC

Under the NELP regime (upto February 2011), ONGC, Oil India Limited and other private companies had made 83 NELP discoveries - 38 oil and 45 gas in NELP block acquired by them. A comparison (table below) indicates that performance of ONGC was less even though it had the largest acreage under NELP and a rich experience in the E&P sector.

Discoveries of ONGC and private parties (from inception to February 2011)			
Company		Oil	Gas
ONGC		5	13
Essar Oil Ltd		4	0
Focus		0	2
GSPC		11	8
Hardy		0	1
HOEC		1	1
Jubilant		2	3
RIL		11	15
Cairn		3	2
Total		38	45

Source: Data furnished by ONGC in December 2011.

The Secretary (MOPNG) during the Sixth Strategy Meet (August 2007) opined that ONGC would become a marginal player in case the organization is not able to set right its priorities and align its actions along the mandate. He further observed that smaller and nimble companies were proving formidable and ONGC would have to register exploration successes and strengthen its systems to retain its position in the industry.

The Management stated (December 2011) that it made 22 discoveries (18 upto February 2011 and 4 from February 2011 to March 2012) from NELP blocks between 2005-06 to 2011-12; all the initial discoveries were gas discoveries and that too in deepwater and that appraisal/development programme had been submitted in majority of the cases. The Management also stated that while other companies listed by Audit were operating under NELP regime alone, ONGC in this period operated in NELP as well as Nomination blocks and a better comparison would be the total number of discoveries by ONGC during this period in both NELP and Nomination regime. ONGC reiterated that during the period under audit, ONGC made 88 discoveries in Nomination blocks and 11 discoveries in NELP blocks and these 99 discoveries are the highest by any company operating in India; though many of the companies listed by Audit can hardly be called ONGC's peer.

The response of ONGC is not acceptable. A comparison of NELP and Nomination discoveries with only NELP discoveries by private operators would not be fair as

- (i) The private operators do not have access to Nomination blocks.
- (ii) Nomination blocks were in the possession of ONGC for more than 12 years without the stipulation of the conditions, regarding time schedule *etc.*, contained in the Production Sharing Contracts (PSCs) attached to the NELP blocks.
- (iii) ONGC did not explore completely the nomination blocks. In seven blocks which were surrendered (2007-11) after being held for 12-14 years, the API and drilling commitments for wells had not been completed. There was slow progress of exploration in six other blocks which had been held for 13 to 25 years as brought out in *Annexure II*. The performance of ONGC also needs to be seen in the context of its being a well established E&P player since 1959, while the private operators are new entrants.

3.3 Reserve Replacement Ratio¹⁵ (RRR)>1 due to downward trend of production

RRR measures the relationship between new reserves accreted and oil produced, reflecting how well an oil company is replacing its production. Arithmetically, it is calculated by the following formula:

$$\text{RRR} = \frac{\text{Ultimate Reserve accreted during a year}}{\text{Total production of hydrocarbons during the year}}$$

It is essential for an E&P company to replenish its reserves from which it produces oil and gas. One of the main objectives of exploration policy under 'India Hydrocarbon vision-2025' was to achieve the RRR above 1.

ONGC achieved a RRR of more than one during all the years under audit examination. The production of crude oil and natural gas as against the Ultimate Reserve (UR) and the RRR of ONGC for the last four years ended 2007-11 is tabulated below:

¹⁵ Reserve Replacement Ratio is the quantity of hydrocarbon added to ultimate reserves divided by the quantity of hydrocarbon extracted during a year.

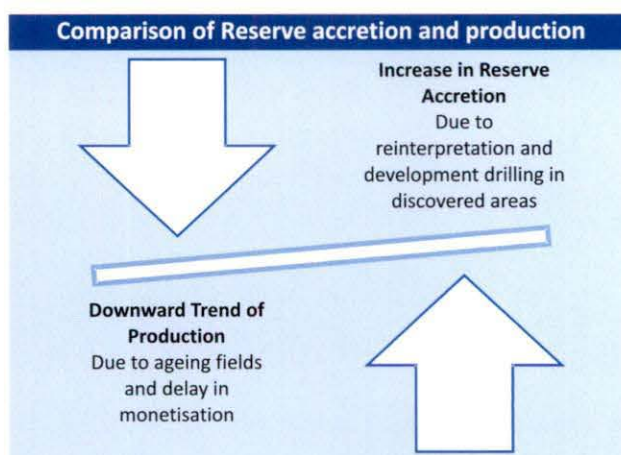
Oil and gas production

Sl. No	Particulars	2007-08	2008-09	2009-10	2010-11
1.	IIH (MMtoe)	182.23	284.81	250.6	236.92
2.	UR (MMtoe)	63.82	68.90	82.98	83.56
3.	Oil Prod.(MMtoe)	25.96	24.42	23.93	23.58
4.	Gas Prod. (MMtoe)	22.33	22.28	22.91	22.90
5.	Total Prod.(MMtoe)	48.29	46.71	46.84	46.48
	RRR (Sl.No.2/Sl.No.5)	1.32	1.48	1.77	1.80

Source: Data furnished by ONGC for 2007-2011 in December 2011.

On analyzing this performance further, it is seen that the ratio has increased over the years while the production levels in ONGC showed a downward trend. The reserve accreted was mainly on account of reinterpretation and development drilling (as explained in chapter 6), rather than exploration activities in new acreages. In fact, the reserve accreted from new discoveries was only 80.93 MMToe. On the other hand, ageing fields and ONGC's failure to monetize discoveries resulted in a downward trend in production.

In fact, the issue of static production in spite of steady increase in RRR has been deliberated at various forums viz. Standing Committee of the Lok Sabha/Rajya Sabha, Strategy Meets and Quarterly Progress Review Meetings (QPRM) with MOPNG and in Parliamentary Questions. During the 6th Strategy Meet (August 2007), the Secretary



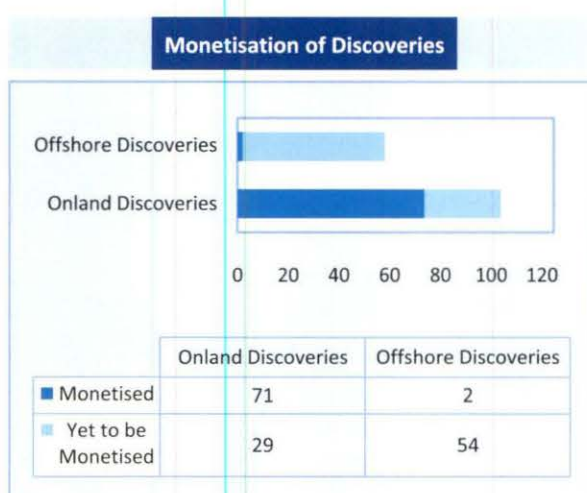
(MOPNG) stated that reserve accretion is to be translated into production. He also stated that ONGC's reserve factor is a matter of concern and issue to be addressed on priority. In the 7th Strategy Meet (September 2008) the Additional Secretary (MOPNG) pointed out that despite having several nomination and pre-NELP blocks, ONGC has not been able to increase production and that in the proposed production plan for 2009-14, not a single NELP block is coming on production. Non increase in substantial level of production of the Company was also deliberated in the Lok Sabha report of 2009. In response to Lok Sabha questions, ONGC reported that majority of its producing fields in onshore and offshore areas were two-to three decades old and had passed their peak production and that major accretions in recent years were in the offshore areas where more lead time was required for monetization.

In reply to Audit, ONGC stated (March 2012) that reserves accretion through reinterpretation is nothing but an exploration effort and that such accretion has a

direct contribution in production and indicated the increase in production and reserve accretion in respect of five major ONGC fields *viz.* Cambay, Upper Assam, Mumbai Offshore, Cauvery Onshore and Assam-Arakan-Forward Base over the last 12 years from 2000 to 2011.

The increasing trend of RRR mainly due to downward trend of production cannot be an appropriate barometer to assess the growth of reserve replacement. Besides, masking the results of exploration by supplementing it with development drilling and re-interpretation does not present the actual exploration results. Diminishing trend in find size, reduction in number of nomination blocks, dissatisfactory performance in NELP regime, delay in monetization of discovery/marginal fields, slippages in implementation of ongoing development schemes and major producing fields and higher exploration risks in deepwater and frontier areas, are some of the challenges that ONGC needs to address for a steady future performance. The suitability of RRR as it exists now as a performance parameter also needs to be reviewed in this context.

3.4 Discovery to stream



Source: Data furnished by ONGC in December 2011.

One of the main reasons for declining production is delay in monetization¹⁶ of discoveries. As seen from the chart alongside, more than 50 *per cent* of the 158 discoveries (100 onshore and 58 offshore, including two offshore discoveries surrendered) made during 2002 to 2011, were yet (March 2012) to be monetized. Majority of the non monetized discoveries were located in offshore acreages, where major reserve was accreted.

Delay in monetization of discoveries is one of the major concerns for ONGC and repeatedly deliberated at various forums by internal and external stakeholders *viz.* Executive Committee Meetings, Board Meetings, Quarterly Progress Review Meeting with MOPNG, Standing Committee of the Lok Sabha and the Rajya Sabha. All stakeholders have stressed on development of fields expeditiously and reduction in the timeline for discovery to stream.

ONGC in reply stated (March 2012) that there were delays in monetizing the discoveries due to lead time on logistics, isolated areas, non feasibility of technology for offshore fields development, non-viability of discoveries forbidding stand alone development, governance of NELP discoveries under provisions of PSC,

¹⁶ Monetization: The process involved in bringing the hydrocarbon discoveries of a field/block to production.

requirement of innovative technology for deep water discoveries and marketing issues *etc.* ONGC also added that many of the offshore discoveries by private operators were yet to be monetized due to reasons similar to ONGC's, though ONGC does not have any means for getting authentic information.

The reply is to be viewed in the backdrop of monetization of only 2 out of 58 offshore discoveries so far while two other discoveries were surrendered/mining lease was not granted. ONGC had not monetized 18 discoveries (onshore – 4, offshore Shallow water – 7 and Deepwater blocks – 7) with IIH¹⁷ of 171.81 MMToe which were discovered prior to 2005-06. In this regard, DGH had also commented (31 August 2009) that ONGC's efforts in conversion of discoveries into production were found to be lagging behind in comparison to achievement of other private companies operating in India.

¹⁷ *IIH:- Initial –in –place Hydrocarbons 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.*

EFFICIENCY IN EXPLORATION PROCESS & REASONABLENESS OF COSTS OF EXPLORATION

The exploration process consists of the following steps – Acquisition, Processing and Interpretation of data (API) and Exploratory Drilling. Audit examined the efficiency and economy of the exploration process and studied the performance of ONGC in both Nomination and NELP blocks. The following issues have been addressed in this Chapter:

- Whether ONGC is efficient in conducting surveys for meeting exploration goals;
- Whether exploratory drilling is adequate and efficient in meeting the work commitments of ONGC; and
- Whether ONGC has carried out its exploration activities efficiently in NELP and Nomination blocks.

4.1 Acquisition, Processing and Interpretation (API) of seismic data

In the API process, seismic data is collected through 2D/3D surveys done by hired or ONGC's owned survey vessels/equipment. The Company formulates targets in respect of exploration activities for NELP/Nomination blocks based on (i) results obtained in the previous years; (ii) prospectivity analysis carried out acreage-wise; (iii) physical resources identified by the Basin Managers; (iv) physical work program committed to achieve the desired results; and (v) dovetailing the exploration program with Petroleum Exploration License (PEL) life cycle and the committed work program in NELP blocks. The table below shows that there was significant shortfall in the survey conducted vis-à-vis planned during the period under audit.

Plan and Actuals of survey

Year	Plan Target		Revised Plan Target		Actual		Difference	
	2D (LKM)	3D (SKM)	2D(LKM)	3D(SKM)	2D(LKM)	3D(SKM)	2D(LKM)	3D(SKM)
2007-08	32500	24497	20643	25373	8157	19353	-12486	-6020
2008-09	54935	22822	68844	26382	77125	26785	8281	403
2009-10	32030	32016	30666	24831	24951	21741	-5715	-3090
2010-11	6715	21196	25465	23361	13116	19355	-12349	-4006
Total	126180	100531	145618	99947	123349	87234	-22269	-12713

Source: Annual Plan of ONGC for 2007-11 and ONGC reply. LKM –Line Kilometre; SKM- Square Kilometre.

As seen from the above table, except for the year 2008-09, the Company could not achieve its targets.

4.1.1 Basin wise performance

The Basin-wise performance of ONGC with reference to 2D and 3D surveys is shown in the table/graphs given below. Cauvery and KG-PG Basin fulfilled the targets for 2D

during 2007-11 while the 3D targets could be met by Cauvery and MBA Basin alone over the same period. There was, thus, a shortfall in achievement of survey targets in more than 50 per cent of the Basins.

Basin	2D data acquisition in Line Kilometre (LKM)			3D Data acquisition in Square Kilometre (SKM)		
	Target	Achievement	(Shortfall)/Excess	Target	Achievement	(Shortfall)/Excess
WOB	24033	20307	(3726)	28089	25871	(2218)
WON	2150	1720	(430)	5423	4772	(651)
A&AA	2385	1166	(1219)	3734	1985	(1749)
KG-PG	37013	39007	1994	27071	17369	(9702)
CAUVERY	46845	47116	271	11438	12481	1043
MBA	25412	10270	(15142)	23672	24353	681
FB	7780	3805	(3975)	520	403	(117)
Total	145618	123391	(22227)	99947	87234	(12713)

Source: Annual Plan of ONGC for 2007-11 and ONGC reply.



ONGC replied (November 2011) that all the commitments of API of seismic data in majority of the NELP/Nomination blocks had been completed. The exceptions were blocks where work could not be carried out due to non grant of statutory clearances etc.

ONGC's reply is not acceptable as reasons for non-fulfillment of minimum work programme (MWP) and work commitment were controllable and rectifiable factors such as non fixation of norm for API cycle, delay in processing of tender for charter hire of seismic vessels for offshore, non acquisition of offshore survey vessel, delay in hiring of contractual services for on-land survey, under utilization of field parties etc. These issues are discussed in detail below:

4.1.2 Time taken for API cycle

Timely completion of API cycle is essential for subsequent exploration activities and fulfilling MWP¹⁸/work commitments in the exploratory blocks. Delay in API cycle has a

¹⁸ MWP:- Minimum Work Programme

cascading effect on total exploration period available and leads to relinquishment of blocks besides payment of liquidated damages (LD) to MOPNG.

Out of 129 projects of ONGC reviewed during audit, 103 projects related to NELP blocks. Normally, the duration of Phase I of the NELP was 3 years for shallow water and onshore blocks and 4 years for deepwater blocks. In nearly 40 per cent of the projects ONGC took more than 2 years for completion of the API cycle. This left a little time for drilling the committed wells within the stipulated time which led to extensions and payment of LD to MOPNG. ONGC paid liquidated damages of ₹ 133.03 crore for not drilling 24 wells in 13 blocks within the committed period.

Time taken for API cycle		
Basin	No. of projects	API Months taken
Western Offshore	33	9 to 35
Western Onshore	13	10 to 27
KG-PG	15	12 to 46
Cauvery	9	43 to 46
MBA	48	4 to 56
Assam & Assam Arakan	4	14 to 25
Frontier	7	9 to 36
	129	

Source: Data furnished by Basins of ONGC.

In Para No. 8.7.2.2 of C&AG Report No. 10 of 2010-11 on Exploration of Shallow Water Blocks by ONGC, Audit had recommended fixation of Basin wise norms for the API cycle. ONGC had assured (December 2009) that the feasibility of formulating Basin specific norms for API cycle would be reviewed.

ONGC stated (March 2012) that API cycle may vary from area to area and from Basin to Basin. Considering the steps involved starting from Environment Impact Assessment (EIA) studies, tendering for survey, getting the obligatory clearances, mobilization of parties, fair weather window, usual hazards of operations, the time required for basic/special processing culminating into a meaningful interpretation, API cycle completion time of about 2 years was optimum.

While Audit agrees that the API cycle will vary from Basin to Basin, it is possible for ONGC to lay down Basin specific API norms to encourage timely completion of API cycle. During the Exit Conference, ONGC Management agreed that they would fix norms for acquisition and processing and expressed difficulties in fixing norms for interpretation. Audit is of the view that while it may be difficult to fix norms for subsequent reinterpretations, it is desirable to fix norms for the first interpretation as a part of the API cycle. ONGC's contention that the API time of 2 years is optimum has to be viewed in light of the fact that ONGC has paid LD of ₹ 133.03 crore to MOPNG due to its failure to complete its work commitments in time.

4.1.3 Need to enhance norms for Geophysical parties

Survey work for onshore areas is carried out by Geophysical Parties (GPs). As a follow up action¹⁹ on our recommendations, ONGC fixed (January 2009) norms for field days for GPs in each Basin. The field days consist of mobilization, survey work, experimental work, production work, non-production and demobilization days.

¹⁹ Para No.6.7.3.2 of Performance Audit of Onshore Exploration Activities(C&AG Audit Report No.PA27 of 2009-10).

A review of the Basin wise performance of the GPs during 2009-10 and 2010-11 revealed that the norms were set at a much higher level than required:

Basin wise performance of GPs		
Basin	Norms for field days	Actual time taken for field days
A & AA Basin	140	81 to 129
MBA Basin	160	79 to 151
Frontier	140-160	101-139

Source: Norm prescribed by ONGC in January 2009 and data furnished by Basins of ONGC.

This leads to the inescapable conclusion that the norms have been fixed very leniently. A tightening of the norms will not only enhance efficiency but also enable timely completion of exploration.

ONGC stated (March 2012) that norms were fixed for field days for GPs for each Basin on the recommendation of Government Audit. They further added that lesser number of days were required in the Basins due to various initiatives taken by ONGC and improvement in the performance of the field parties.

In view of the response of ONGC, there appears to be a strong case for reviewing the norms for GPs.

4.1.4 Delay in purchase of Seismic Survey Vessel

ONGC floated (June 2004) a tender for construction of New Dual Source 6-streamers Seismic Survey Vessel with on-board processing system and awarded (February 2005) the contract to M/s. Amur Shipbuilding Plant (ASP) (US \$ 89.9 million). The contract was terminated (August 2007) as M/s ASP kept on revising the change order without proper justification. In the second tender invited (June 2008) ONGC received three offers of which the lone bid of M/s Nordic Maritime, Singapore consortium was techno commercially acceptable. The consortium quoted US \$ 142.30 million and reduced (April 2009) it to US \$ 127.63 million after negotiation which was within the estimated cost of US \$ 130.20 million. The delivery of the vessel was 36 months from the date of Letter of Award (LOA). The Tender Committee (TC) of Western Offshore Basin (WOB) recommended (April 2009) for award of contract but the Executive Purchase Committee (EPC) of ONGC did not accept the recommendation and cancelled this tender on the ground of lack of competition. Subsequently, ONGC invited Expression of Interest (EOI) in February 2009. Eight companies made (March/April 2009) their presentations. ONGC considered four vessels (1 with 6 streamers and 3 with higher number of streamers). With such a large variation in numbers of streamers, their price could not be reasonably compared. As such, the EOI exercise remained a futile one. Subsequently, a limited tender for Ready Built/Under construction 6/8/10/12 streamers seismic survey vessel with onboard processing system was invited on 14 October 2010. The consortium of Bharti Shipyard and Great Offshore, Mumbai was the L-1 bidder (US \$ 185.895 million for 12 streamers) out of 2 bids found acceptable. ONGC, however, rejected the bid of Bharti Shipyard as the party had quoted 0.183 per cent and 23.44 per cent of vessel cost and seismic equipment cost as spare parts against the Bid Evaluation Criteria (BEC) of 2 per cent and 25 per cent respectively for these expenses and cancelled the tender. Thus, even after eight years ONGC could not procure an appropriate survey vessel and continues to depend on hiring of such vessels. It was also

seen that ONGC spends an additional ₹ 128.98 crore annually on hire charges of such a vessel, besides remaining dependent on contractual partners for survey functions.

ONGC replied (January/March 2012) that against the tender invited in June 2008, M/s. Nordic Maritime was a techno commercially acceptable bidder, however, EPC did not agree to award the contract to this bidder due to lack of competition and reasonableness of rates. In the third tender invited in 2010, fixation of spares in quantitative terms was difficult.

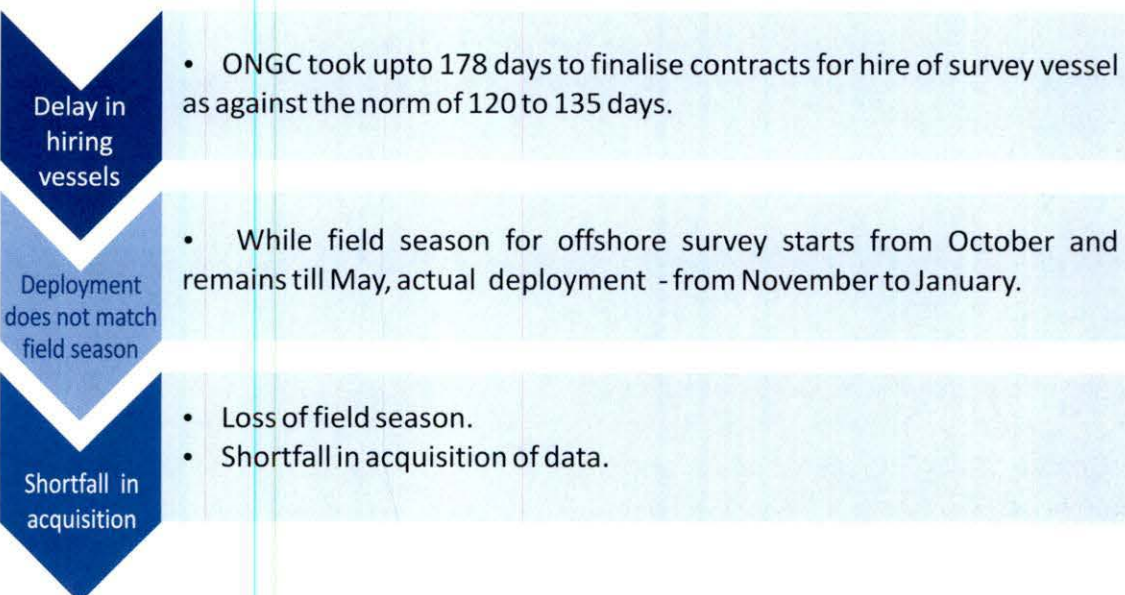
While taking on board the response of the Company, Audit is of the opinion that the procurement in the instant case has been inordinately delayed which has also impacted the performance of core activities of ONGC. As such, it is important to review the procurement system to ensure that such delays do not plague the Company.

ONGC has accepted the suggestion by Audit to consider grading each criterion in the bid evaluation in the entire scheme of things and also stated that it is reviewing changes in bid criteria relating to percentage money value of the spare parts and other BEC conditions so as to allow good shipyards to qualify and participate in the forthcoming tender for the seismic survey vessel.

4.1.5 Loss of field season due to delay in award of contracts

A. Offshore

Delays in API



The field season for acquisition of seismic data from offshore areas commences from mid October and lasts till mid May every year. ONGC finalized 20 survey contracts during the period (2007-11) for acquisition of 2D/3D data from offshore areas held both under Nomination and NELP blocks. Of this, only 18 survey contracts were finalized during September to February of that year. As against norms of 125 to 140 days for finalization of contracts, ONGC took upto 178 days in 7 cases. In four cases where the contracts were for more than one field season, Audit noticed that the mobilization

dates in the contracts were specified as 15 November even though the field season commences from mid October. As a result of delays in finalizing contracts, the survey work for one season spilled over to subsequent field seasons.

ONGC replied that the delay was unavoidable and, wherever there was delay, appropriate liquidated damages (LD) were levied on the contractors. They also stated that during rough sea condition (mid June to mid Oct) vessel movement was restricted and since the vessel was to be mobilized from east coast or any other part, one month mobilization time is logical. ONGC added (March 2012) that in the contracts spread over more than one field season, the contractors were persuaded to mobilise the vessels in time and LD was imposed for late mobilization.

The reply is not convincing as in 90 per cent cases the placement of the contract was delayed, indicating systemic weaknesses. Further Management's contention that movement of vessel before 15 October was not possible is not in sync with their planned deployment which was from 1 October to 1 November as observed from the Annual Geological and Geophysical (G&G) Programme of the Basin. ONGC's contention that it levies LD on the contractor needs to be viewed in the context of its non-performance on work commitments leading to ONGC paying liquidated damages to MOPNG. Besides, the exploration period gets extended leading to surrender of blocks and non-achievement of exploration objectives.

B. Onshore

In case of Western Onshore Basin (WON), the service contracts for Seismic Job Services (SJS) and Shot Hole Drilling (SHD) for the field season of 2007-08 and 2008-09 was issued during 23 to 26 November 2007 as against the commencement of field season in October. This resulted in loss of two months during the field season 2007-08. The contract for one GP was finalised only in February 2009 for the field season of 2008-09. The delay in finalisation of contract resulted in underachievement of acquisition of seismic data of 158.81 Sq. Km.

ONGC stated (March 2012) that all efforts were underway for timely placement of orders and completion of data acquisition and processing.

The issue on delay in award of contracts and resultant loss of field seasons for onshore, deepwater and shallow water has been commented by Audit in the earlier PA Reports on exploration activities of ONGC (Para 7.7.2.1 of Report No.PA9 of 2008, Para 6.7.3.4 of Report No.PA 27 of 2010-11 and Para 8.7.2.3 of Report No.10 of 2010-11.) However, ONGC was still (March 2012) to take corrective action on timely placement of orders.

4.1.6 Reasonableness of costs of survey

The contract for survey vessels generally contain a fuel escalation clause. Audit noticed that when ONGC awarded the contract on nomination basis for long term leasing of Q-marine vessel for the field seasons 2006-2008 and 2007-2010, it continued with the fuel escalation clause at the old rate of US\$680/MT²⁰ as the base rate of earlier contract awarded on nomination basis in August 2005. However, when ONGC contracted

²⁰ MT – Metric Tonne.

chartered vessels with other firms viz. Fugro Geotem, Wavefield, PGS²¹ and CGG²² during May 2007 to September 2008, the base rate adopted for escalation of the fuel cost was with reference to fuel rate ruling one day prior to naval inspection of the vessel at Indian Port. By continuing with the old base, ONGC incurred an avoidable extra expenditure of ₹35.35 crore during 2006-07 to 2009-10.

ONGC replied (March 2011/March 2012) that during negotiation for first award (EB-2091), ONGC had requested for absorbing the fuel escalation rate within the monthly rentals but the contractor did not agree. In subsequent contracts, the contractor had enhanced other rates which were negotiated and brought down but the fuel rate continued at base rate of US \$ 680/MT and no specific fuel escalation costs were negotiated. ONGC also stated that a comparison between nomination and limited tender is not justified.

The reply does not address the audit concern regarding failure of ONGC to protect its interests leading to an avoidable extra expenditure of ₹35.35 crore during 2006-07 to 2009-10.

4.2 Drilling of exploratory wells

After API of seismic data, the next step in exploration process is the release of prospective exploratory locations for drilling. The target for drilling of exploratory wells is based on the work commitments made in the NELP and Nomination blocks by the respective Basins.

It was observed that there were significant shortfalls in the drilling of exploratory wells during the period under audit.

Plan and Actuals of exploratory drilling

Year	Plan		Actual		Shortfall	
	Metres	Wells	Metres	Wells	Metres	Wells
2007-08	348977	138	253410	98	-95567	-40
2008-09	362525	128	298952	106	-63573	-22
2009-10	440436	150	368657	128	-71779	-22
2010-11	481599	150	379663	125	-101936	-25
Total	1633537	566	1300682	457	-332855	-109

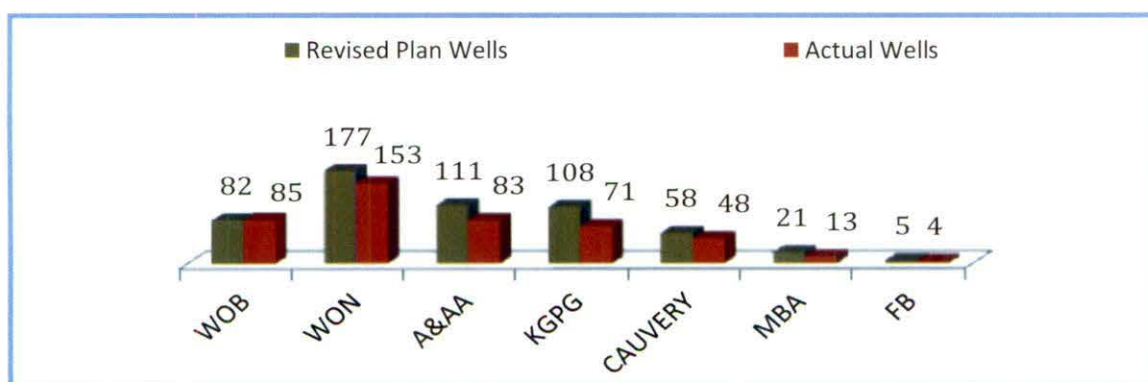
Source: Annual Plans of ONGC for 2007-11 and actuals furnished by ONGC.

The shortfall in meterage was to the extent of 3,32,855 metres and in terms of wells it was 109 wells.

Basin wise performance towards achieving physical targets for drilling of wells is depicted in the chart below. Except WOB, all Basins showed a shortfall in drilling of wells against the targets fixed during the four years from 2007-2011.

²¹ PGS-Petroleum Geo-Services.

²² CGG-Compagnie Generale de Geophysique.



Source: Annual Plans of ONGC for the years 2007-11 and actuals furnished by ONGC.

In the 12th Exploration Board Meeting (EBM), the Director (Exploration), ONGC had observed that unless the exploratory efforts culminate in the timely drilling of a well, they were meaningless. ONGC, while discussing (January 2011) the strategy for business development plan for the next ten years, had observed that in order to meet the reserve accretion targets, it would have to drill about 200 wells per year. Considering the trend of wells drilled in the past four years, the target of 200 wells appears difficult to achieve.

ONGC admitted (March 2012) that there were shortfalls in exploratory drilling vis-à-vis the planned targets for the four years and attributed it to a set of uncontrollable factors viz. delay in hiring onshore and offshore rigs, delay in refurbishment, frequent and severe drilling complications, excessive time in production testing of deepwater wells and onshore basins mainly in Assam, KG-PG and Cauvery basins, shortage of drilling rigs in Cauvery onshore, delay in getting environmental clearance for locations planned in Gulf of Cambay and Bengal, acute shortage of suitable rigs for taking up drilling in deep water blocks etc.

Audit noted that majority of the factors were not uncontrollable as substantiated in the subsequent paras.

4.2.1 Efficiency of drilling operations

A. Operational efficiency

The success of drilling operation depends on the efficiency of rigs which is measured in terms of commercial speed²³ and cycle speed²⁴. ONGC operates a mixed fleet of owned and charter hired rigs. During the year 2010-11, 131 rigs were in operations [90 onshore (68 owned and 22 chartered hired) and 41 offshore (9 owned and 32 chartered hired)]. The table below compares the efficiency of ONGC's owned rigs with that of hired rigs.

²³ Commercial speed is the efficiency of operations during the drilling phase and is calculated in terms of meterage/rig months.

²⁴ Cycle speed is the time taken during the entire cycle of rig deployment i.e. rig building, drilling and production testing and is calculated in terms of rig months.

Efficiency of ONGC owned and hired rigs in offshore and onshore drilling

			Metres per Month			
Drilling performance indicator			2007-08	2008-09	2009-10	2010-11
Offshore	Cycle	Owned rigs	411	414	502	346
		Hired rigs	1229	1202	978	1008
	Speed	Owned rigs	628	556	708	649
		Hired rigs	1488	1431	1273	1399
Onshore	Cycle	Owned rigs	759	740	775	749
		Hired rigs	796	923	747	699
	Speed	Owned rigs	1135	1100	1105	1120
		Hired rigs	1190	1348	915	952

Source: Data furnished by ONGC for the years 2007-11 in February 2012.

The table shows that the rigs hired by ONGC were more efficient than ONGC's owned rigs.

ONGC attributed reasons for poor performance of its owned rigs to (i) old age of the rigs (ii) shortage of skilled manpower at working level, (iii) imbalance in composition of rig crews, (iv) non availability of quality spares on time, (v) non availability of resources due to complicated tendering and sourcing mechanism.

The poor performance of ONGC's drilling activities was discussed at various forums such as Strategy Meet, Quarterly Performance Review Meeting with MOPNG, Executive Committee Meeting and Board Meeting of the Company as well as in the Standing Committee of the Lok Sabha and the Rajya Sabha. Considering the need for optimum utilization of rigs, MOPNG desired (September 2008) that ONGC's drilling performance be benchmarked with global standards. In response, Company had stated that benchmarking with international companies was not possible in view of different geological conditions and stated that the estimated days in the Geo Technical Order (GTO) were its norms.

Audit analysed the GTO days vs. actual days for the period 2007-10 and observed that actual days taken to drill the planned exploratory locations were more than GTO days i.e. the norms accepted by ONGC. The meterage drilled was also less than planned as given below.

Meterage planned and drilled as per GTO

GTO Analysis						
Year	Target Depth (metres)	Actual Depth (metres)	GTO Days	Actual Days	Excess days	Excess meterage
2007-08	239742	238928	6909	7417	508	-814
2008-09	272956	269661	8264	9591	1327	-3295
2009-10	356613	345743	10561	12032	1471	-10870

Source: Annual Report of Drilling Services of ONGC for the years 2007-10.

The excess days in terms of total GTO days ranged from 7 to 16 per cent. This resulted in drilling of less number of wells than planned. On the directions of MOPNG, DGH

carried out (September 2009) comparative analysis of drilling performance of ONGC *vis-à-vis* Oil India Limited (OIL) & other Indian private companies and concluded that performance of ONGC in terms of average drilling meterage/day was below the level that has been achieved by the private E&P operators as well as CPSE OIL for similar wells as shown in the table.

Average drilling days of ONGC and Private/JV operators

Area	Depth range (in metres)	Average meterage/day (well depth/total drilling days)	
		ONGC	Private/JV operators
Ahmedabad	1000-2000	61.9	GSPCL 65.37 SELAN 63.00
	2000-3000	54.43	GSPCL 56.45
	3000-4000	-----	GSPCL 57.25
Mehsana	2000-3000	35.4	JOGPL 62.17
	3000-6000	-----	JOGPL 37.14
Cambay	1000-2000	48.58	NIKO 40.20 SELAN 66.65 EOL 49.50
	2000-3000	-----	RIL 86.42 EOL 36.49
Jodhpur	2000-3000	27.27	PEL 42.58
	3000-6000	----	PEL 23.02
KG (off.)	2000-3000	47.36	HEPI (Cauvery off) 40.48 GAZPROM(Mahanadi) 16.44
Assam Arakan	3000-6000	14.84 (Sivasagar)	OIL 56.42 Canoco (Amguri) 28.37
Assam Arakan	3000-6000	32.35 (Jorhat)	OIL 28.68 Canoco 31.13

Source: DGH report of September 2009.

ONGC while accepting the shortfall in exploratory drilling during 2007-11 attributed (March 2012) it to rig availability, delay in mobilization of charter hired rigs and inadequate availability of deep water rigs in international market. ONGC also stated that its performance in most of the areas is comparable to other private operators.

Reply of ONGC is not tenable as seen in the subsequent paras (para 4.2.2, 4.2.3, 4.2.5) highlighting deficiencies in planning and in hiring of rigs leading to delay in hiring/mobilization of rigs due to mistimed placement of contracts and excessive non productive time. Further, ONGC's contention that its performance is comparable to other private operators is in variance with the findings of DGH in the comparative analysis done in September 2009.

B. Cost efficiency

The Executive Committee directed (May 2008 and July 2009) the Basins to submit the GTO variance analysis report in case of variance of >10 per cent of the well cost estimates along with corrective measures taken. Audit observed that though the variance in drilling cost per metre as per the Performance Contracts ranged between

(-) 222.95 per cent and 49.42 per cent during 2009-10 and 2010-11, the Basins did not submit variance analysis reports. No action was taken despite this non compliance with Executive Committee's (EC) directions.

ONGC stated (April 2012) that Basin-wise variances were due to ambiguity in components of plan vs. actual well cost format in SAP system and had been taken up for early solution. ONGC also assured that due steps would be initiated at the earliest so that Basins submit these variance reports and take corrective measures at regular intervals.

4.2.2 Idling of Rigs - Excessive Non Productive Time (NPT)

As per service level agreements, the target for rig down time was fixed at less than 10 per cent of actual rig availability during the year. Audit found that during the period from 2007-08 to 2008-11 the non productive time was much higher than the internal norm of the Company.

Excessive NPT (in hours)

	2007-08			2008-09			2009-10			2010-11		
	Total Time	NPT	per cent of NPT	Total Time	NPT	per cent of NPT	Total Time	NPT	per cent of NPT	Total Time	NPT	per cent of NPT
Offshore	3308.55	746.70	22.57	3858.00	995.10	25.79	3915.07	1232.36	31.48	3971.58	963.85	24.27
Onshore	8877.13	995.78	11.22	11091.80	1973.80	17.80	13237.39	2479.67	18.73	13840.58	2474.84	17.88
Total	12185.68	1742.48	14.30	14949.80	2968.90	19.86	17152.46	3712.03	21.64	17812.16	3438.69	19.31

Source: Data furnished by ONGC in February 2012

As against the international norm of less than 5 per cent and ONGC norm of less than 10 per cent, the actual NPT of rigs (average for four years) was 19 per cent.

In response to the Performance Audit on shallow water exploration, ONGC had stated (November 2009) that its drilling services were making all efforts to ensure reduction in non-productive time after coordination with logistic and other service providers of rigs. It was observed in audit that though the NPT has come down over the earlier years (from 30.5 per cent to 20.9 per cent) it was still higher than the ONGC norm of 10 per cent which led to a loss of 186 drilling months.

In reply (March 2012), while endorsing the audit observation, ONGC stated that most of the wells being drilled are deeper and in logistically difficult and high pressure/high temperature (HP/HT) environment leading to more complications. ONGC also stated that it planned for 95 per cent rig utilization considering 5 per cent provision for capital repairs and additional provision of 5 per cent for upgradation of onshore and dry dock of offshore rigs.

The reply is not tenable as ONGC targeted 10 per cent down time of rigs which was more than the international norm and failed to maintain even its own norm. Actual down time was still higher which led to more NPT and underutilization of rigs.

A. Idling of Onshore rigs

Analysis of causes for idling of onshore rigs showed that in case of onshore rigs, availability of locations and ready drilling sites were the main reasons for idling.

- In Cauvery Basin onshore rigs idled for want of ready drill-sites at five locations for a total of 87 days ranging from 12 to 24 days.
- In KG-PG Basin onshore rigs idled for want of ready drill-sites at six locations for a total of 59 days ranging from 2 to 18 days.
- In Assam and Assam Arakan Basin, due to non-availability of land/ ready sites three rigs remained out of cycle for 180 days during 2007-08 to 2010-11 resulting in unfruitful expenditure of ₹10.29 crore. The Management also admitted in its reply (January 2012) that the rigs remained out of cycle due to non availability of land/ready sites mainly because of delay in land/diverted land acquisition, delay in start of civil works due to difficulties faced in negotiations with land owner and obtaining permission from the local administration, and delay in getting clearance from forest authorities etc.
- In Frontier Basin, 154 additional days were taken in rig building/ transportation/dismantling of rigs E-2000-VIII and SUVL-3 and in the process incurred an extra expenditure of ₹27.45 crore.
- In Ankleshwar Asset of Western Onshore, one onshore rig was out of cycle for total of 497 days during 2007-10 for want of ready drill sites.

Idling of rigs for want of ready drill sites in onshore areas was commented vide Para 6.7.4.1 to 6.7.4.5 of the C&AG's Report No. PA27 of 2009-10 on Onshore Exploration Activities. ONGC Management agreed to ensure minimal time loss in future. Current findings indicate that ONGC was yet to address this problem.

B. Idling of Offshore rigs

While onshore rigs idled mainly due to problems with land acquisition and readiness of sites, the offshore rigs idled for 4,595 hours during 2007-11 for want of supply of material and men etc. resulting in a loss of ₹ 75.73 crore.

ONGC attributed limited availability of equipment to delays during transportation from one location to another location. ONGC added that some down time was due to non-availability and transportation of capital items during monsoons which was not a controllable factor.

Audit is of the opinion that non availability of equipment or services could have been addressed by ONGC by better planning and coordination. The reply that monsoon affected the transportation of materials is not correct since Audit has commented only on the period during which the rig was waiting for men or material and not due to weather.

4.2.3 Deficiencies in Planning for rigs

A. Incorrect assessment of availability of rigs

In its Five Year Plan (2007-08 to 2011-12) ONGC envisaged a requirement of 84.75 rig months for drilling 38 wells in deep water locations during 2007-08 to 2009-10. It was proposed to meet this requirement by deploying ONGC's owned rig Sagar Vijay and a hired rig DSS for the period 2007-08 to 2009-10. As per ONGC's records, Sagar Vijay was available only for 21 months during 2008-10 and rig DSS was available for 33.5 months leaving a shortfall of 30.25 months. ONGC did not plan acquisition of required rigs to replenish the short fall of 30.25 rig months for deep water drilling and drilled 14 deepwater wells during 2007-08 to 2009-10.

ONGC in reply stated (March 2012) that actual availability of rig month from the rig Belford Dolphin or its substitute was not available resulting in shortfall of availability of rig month. Although order was placed for the substitute rig Sevan Driller –II but the contractor could not mobilize the rig and the contract was terminated.

The failure of the contractor to mobilise the rig and termination of contract as brought out by the Company are post-plan scenario and cannot be considered to have impact on the planning process retrospectively.

B. Incorrect assessment of time taken to re-hire

In order to meet the 11th Plan targets, it was necessary for ONGC to re-hire rigs. ONGC provided 1.5 months for rehire and assumed availability of 98.5 rig months from re-hiring. Audit found that the contracts did not have a provision for extension on expiry of the contractual period and also that there was no confirmation from the contractor regarding re-hire on the date of planning. As per Material Management (MM) Manual, the time required for rig hiring and mobilization is 12 months and ONGC should have reckoned this time while assessing the rig availability. ONGC, on an average, took 7-9 months for re-hiring and mobilization of rigs even as the planned provision was 1.5 months for rehire. The Company fell short of 40 rig months in the process.

ONGC replied (March 2012) that generally it considers mobilization of the rigs after re-hiring of the existing contracts after a gap of 30 to 45 days. However, availability of some of the rehired rigs was delayed due to dry dock/modification/repair to fulfill the requirement of the new tender.

The reply is unacceptable because during 2007-08 to 2010-11 all the contracts for re-hire of rigs were awarded with rig mobilization period of 120 days against the plan of 45.6 days. In all the 5 cases of re-hire, the actual mobilization period availed by the contractor ranged between 236 and 476 rig days against the planned 45.6 days. Thus, there is a need for considering the past experiences while planning the time schedule for rehiring of rigs.

4.2.4 Non acquisition of Rigs

A. Offshore rigs

ONGC conceptualized (January 2002) requirement of acquiring owned rigs in addition to existing fleet of 9 rigs and decided to acquire 3 jack up rigs under the advice of a consultant for which Notice Inviting Tender (NIT) was issued in April 2003. The tender invited (April 2003) for appointment of consultant was cancelled since the lowest bid of the four offers received (₹ 36.82 crore) was much higher than the estimated cost. The requirement of rigs was revised (August 2006) to four shallow water cantilever type jack up rigs and one deep water drill ship by the Executive Committee (EC) after deliberations in September 2005 and March 2006. M/s Modu Spec was hired in July 2008 as consultant who submitted cost estimates in October 2009. ONGC was yet (March 2012) to come to a firm decision on this proposal. The consultant had been paid fees of US\$ 884,945 (₹3.80 crore). Considering the construction period of 22-24 months and time involved in tendering process, acquisition of four rigs for drilling operations cannot be anticipated in next two years, thereby depriving ONGC of better equipped rigs of latest technology.

As worked out by ONGC (October 2009), the procurement of rigs had a significant positive Net Present Value (NPV). Thus, based on the positive NPV worked out by ONGC, the delay in acquisition of the four rigs deprived an annual saving of ₹709.65 crore.

ONGC replied (March 2012) that the proposal for acquisition of four jack up rigs has been submitted to the Board for expenditure sanction.

The reply of ONGC needs to be viewed in the context of the problems that the Company had been facing in hiring deepwater rigs. ONGC is silent on the delay in acquisition of rigs and consequential loss. As the acquisition process was still at the initial stage, possibility of having owned offshore rigs in the next 2 to 3 years is remote.

B. Onshore rigs

ONGC had purchased 75 rigs during 1978 and 1995 of which 52 rigs were from Bharat Heavy Electricals Limited (BHEL). Considering the age of the rigs, conditions of rig equipment and availability of new technologies with better efficiency, ONGC identified 44 rigs for refurbishment and 10 rigs for replacement. Accordingly, ONGC initiated (2003) a proposal for replacement of 10 rigs (of more than 20 years old) during the period from 2003-04 to 2006-07. While the proposal was initiated in 2003, the EC approval was obtained in July 2006 for purchase of 10 onshore rigs on nomination basis from BHEL. The techno-commercial bid was invited from BHEL only in September 2008 for 6 rigs which was opened in May 2009. The Board accorded (September 2011) expenditure sanction of ₹ 796 crore for purchase of six rigs on nomination basis from BHEL. The proposal for purchase of remaining 4 mobile rigs was planned to be submitted to the Board separately.

ONGC in reply stated (March 2012) that acquisition of 6 onshore rigs had been firmed-up and LOI (Letter of Intent) placed on BHEL and requirement for additional mobile onshore rigs was being reviewed.

The reply of ONGC needs to be viewed in the context of the acquisition being a advantageous proposition since the sensitivity analysis carried out by M/s Deloitte in February 2011 in regard to performance of new rigs over hired rigs revealed high positive NPV (₹ 319.71 crore) with rate of return of 15 *per cent* in purchase of rigs.

4.2.5 Lacunae in Hiring Rigs

Audit found the following gaps in hiring of rigs for exploratory drilling:

A. Delays in hiring of rigs

- ONGC hired Hercules 258, Hercules 260, Greatdrill Chetna and Energy Driller during 2007-11 by inviting tenders. The entire process of tender finalisation of these four rigs took 203 days to 520 days from the date of initiating the indent to the date of firm order, thus, exceeding the norm of 160 days prescribed in the MM manual. The delays in finalization of tenders were mainly due to incomplete indents and non readiness of the well material which eventually affected the exploratory drilling.
- Rajahmundry Asset was to mobilize two hired rigs in April 2007. It was observed that while the indents were placed in January 2007, contract was awarded belatedly only in April 2008 with mobilization by November 2008. The rigs were, however, mobilised in June 2009 and October 2009 respectively. Consequently, there was shortfall in drilling meterage of 26,300 metres and nine wells in 2007-08 and 2008-09 as compared to work commitment or Budget Estimate (BE)/Revised Estimate (RE) or Rig Deployment Plan (RDP).
- Cauvery Asset was also to mobilise one hired rig in July 2007 and drill five wells in 2007-08 and 2008-09. The indent was sent only in April 2008 and contract awarded belatedly in March 2009. Consequently, there was a shortfall in achievement of drilling meterage to the extent of 21,150 metres and five wells as compared to work commitment or BE/RE or RDP.

ONGC in reply stated (March 2012) that the rig for Cauvery Basin was hired but the contractor did not mobilize the rig resulting in less exploratory target achievement. Similarly, onshore rigs (11 Nos.) in different work centers were mobilized late by the contractor during 2008-11, the delays ranged between 203 and 610 days resulting in less target achievement.

ONGC only explained the delay in mobilization and did not address the issue regarding the delay in indenting and finalization of contracts.

B. Delays in mobilization due to mistimed contracts

ONGC contracts for charter-hire rigs prescribed a minimum mobilization period of 120 days for rigs to be mobilized from outside the Indian waters and 180 days for the rigs to be mobilized from within the Indian waters. The contracts provided for automatic

extension of mobilization period up to 15 October (in some cases up to 31 October) in cases where the mobilization period falls within the monsoon period i.e. 15 May to 15 October (31 October). The contract also provided payment of LD by the contractor in case of failure to mobilize the rig by the stipulated date. It was seen in audit that in 8 out of 14 cases, ONGC awarded contracts in mid January - August. As a result, the contractors were allowed 904 extra rig days on account of monsoon intervention for mobilization of rigs. Further, ONGC granted extension of 1,688 rig days in 10 cases as per the contract. Thus, the delay of 2,592 (904 +1,688) days in rig mobilization due to monsoon intervention and extensions granted amounted to loss of 86.4 rig months and loss of 21.5 wells (at the rate of 4 rig months /well).

Audit is of the view that ONGC needs to review the timing for award of contracts so that the additional time taken due to monsoon can be avoided and imposition of LD become meaningful. Considering this, the present provision of charging LD only to the extent of 5 *per cent* of annual contract value could also be reviewed by ONGC so that it truly deters delay in mobilization.

ONGC replied (January 2012) that the contractual provisions regarding rig mobilization period including monsoon period and LD for delayed mobilization of rigs are maintained as per the approved guidelines. Management also assured that the LD provisions/modifications suggested by Audit will be discussed and deliberated at the appropriate level for a decision. The Company also stated (March 2012) that the mobilization period of rehired rigs fell in monsoon period as these rigs were de-hired late due to well in progress or seeing the increasing trend of day rates.

The reply is not acceptable as the cases pointed out include hiring (10 Nos.) and rehiring (4 Nos.) cases. Audit is of the opinion that ONGC needs to review the timing for award of contracts so that the additional time taken due to monsoon can be avoided and imposition of LD become meaningful.

C. Avoidable hiring of OSVs under integrated service contract

ONGC hired (December 2007) rig Hercules-258 with Offshore Supply Vessels (OSVs) for deployment along with the rig as an integrated service contract. ONGC paid a day rate of US \$ 6,450 for OSVs that were hired. However, in the integrated service contract the company agreed to an average rate of US \$ 19,300 per OSV, three times the usual rate. This led to extra expenditure of ₹ 189.96 crore.

ONGC replied (March 2012) that at the time of hiring of rig H-258 (HPHT rig) there was shortage of logistic vessels in ONGC and the Company was not in a position to provide the logistic services for uninterrupted operation of this rig. During that period the rig rate was very high and non-availability of vessels might have caused idling of rigs leading to well complications and also huge financial loss. Moreover, idling of rig for the logistic support, ONGC would have incurred a loss at the rate of US\$ 4,604 per hour considering rig day rate of US\$ 1,10,500. Considering above, it was beneficial for ONGC to hire the rig along with marine logistic services.

The reply is not tenable as shortage of OSVs was within the organization. ONGC, as per practice hires the rigs and OSVs separately and had hired 12 offshore rigs and five OSVs separately during the same period (2007-2011). Considering this practice and also the higher rate of OSV under the integrated service contract, ONGC could have explored the possibility of hiring the OSV independently for this rig.

4.2.6 Refurbishment of rigs

ONGC refurbished 22 rigs for improving their efficiency. However, the Company did not assess the efficiency factor of refurbished rigs while carrying out the cost benefit analysis. On a comparison of plan vs. actual performance, it was observed that in 2008-09 the actual commercial speed and cycle speed of most of the refurbished rigs was lower than the target fixed by the Company. Moreover, as per the rig performance data for 2009-10 provided to M/s Deloitte, the cycle speed of ONGC's refurbished owned rigs (532.8) was lower (11 per cent) than chartered hired rigs (598). Similarly, for owned mobile refurbished rigs the cycle speed was much lower (1641.9) than hired rigs (2098.0).

ONGC in reply stated (March 2012) that the refurbishment and upgradation project was taken up mainly with a view to give new lease of life to rigs and safety during operations. Along with refurbishment, overhauling & replacement of major equipment and induction of new equipment due to technological advancement was also planned to increase the operational capability of the rigs with a view to take up drilling of Hi-tech wells in onshore area. Out of 49 rigs planned for refurbishment in four phases, refurbishment of 33 rigs had already been completed and another 7 rigs were in progress. Balance 9 rigs was being taken up. Performance of ONGC owned rigs in onshore is comparable with charter hired rigs.

ONGC explained the status of refurbishment of onshore rigs. ONGC's contention regarding comparable performance of its owned rigs with the charter hire rigs is not convincing as it contradicts the report of M/s Deloitte which has been accepted by the Company. Audit is of the view that ONGC needs to undertake a cost benefit analysis of refurbishment of rigs and decide the investment accordingly.

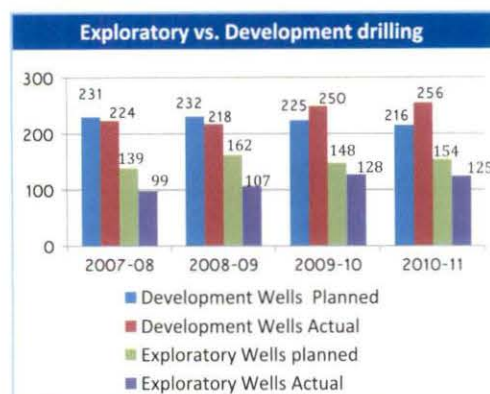
4.2.7 Failure to take expert opinion for deepwater drilling

In the various meetings held during July 2009 and April 2010, Exploration Board had desired that any deep water prospect to be cleared for drilling should have second opinion from empanelled consultants/experts before drilling the proposed deepwater locations keeping in view the huge cost involved in deepwater drilling. Audit observed that though 8 experts had been empanelled and an expert had been engaged for deepwater drilling operations, ONGC obtained second opinion only in respect of four out of 24 deepwater prospects/locations drilled during 2009-11. Of the four wells drilled on the proposed prospects, one was found to be hydrocarbon bearing and another was still (March 2012) under evaluation. In respect of 14 locations where ONGC did not obtain second opinion, 11 wells were found to be dry and abandoned.

ONGC in reply (April 2012) did not furnish reasons for not obtaining second opinion in respect of cases pointed out by Audit.

4.2.8 Ratio of exploratory drilling and development drilling

In the 8th Key Executive Meeting (21 January 2009) it was brought out that development drilling activities get preference over exploratory drilling. The details of exploratory and development wells drilled as against planned during 2007-11, as given in the chart, indicated substantial shortfall in achievement of exploratory drilling target as compared to development drilling.



Source: Annual Corporate Plan Performance Reports of ONGC for the years 2007-11.

ONGC in reply explained (April 2012) the year-wise percentage rig months availability and cycle speed of rigs for exploratory and development wells. However, they failed to explain why less number of rigs was available for exploratory wells, as against development wells.

4.2.9 Foreclosure of re-entry option

Owing to improper planning and execution of the drilling programme in KG basin, ONGC had to permanently abandon four hydrocarbon bearing wells. In the wells which involved expenditure of ₹ 1,267.57 crore in drilling, it was imperative to safeguard the option of re-entry into such wells to avoid incurring of further expenditure in case the wells are found to be hydrocarbon bearing. However, Audit noticed that the Company did not proceed with the drilling operations in a professional manner leading to permanent abandonment of these wells.

ONGC in reply stated (January 2012) that it makes efforts to keep provision for re-entry in exploratory wells wherever technically feasible for any likely future use, but these are only additional attempts and are not the objective for drilling of exploratory wells; development of discovery is taken up only at a later date and also depends on size of discovery, cost of development and market for product; and that corrective action involves additional costs.

Reply of the Management is not acceptable since ONGC planned drilling of these wells with re-entry option. In two wells (YS-6-1 and YS-5-1A) the Company could not save the option of re-entry due to non-availability of requisite mud line suspension system at the time of drilling. In respect of other two wells (GS-59-1A and GS-KW-6) the Company failed to take corrective action on observing short landing of casing which, in these cases too, resulted in foreclosure of the re-entry option. Audit is of the opinion that ONGC should have taken all precautions at the time of drilling the wells to have the option of re-entry as the cost of drilling fresh wells is significantly higher.

4.2.10 Non Formation of subsidiary for Drilling Services

In the 8th Strategy Meet held in November 2009 with MOPNG, in principle decision was taken to evaluate formation of subsidiary companies for improved efficiency in operating areas like-Drilling Services, Field Development, Engineering & Construction, and Assam operations so that ONGC is able to focus on its core activity i.e., exploration & production of oil and gas. It was desired that concept note be submitted within a month for consideration of approval so that formation of subsidiaries can be brought to the logical conclusion at the earliest.

Accordingly, ONGC submitted (December 2009) the concept papers to MOPNG for formation of a wholly owned subsidiary of Drilling Services to overcome the poor performance viz. shortage of skilled manpower at working level, imbalances in the composition of the rig crews, non availability of quality spares on time, poor synchronization of support services with drilling operations. MOPNG had not communicated its view on the proposal so far (March 2012). No further action had also been taken by the Company to pursue the proposal with the Ministry. Hence, the benefits of independent subsidiary for drilling services as envisaged could not be availed even after a lapse of over two years.

4.3 ONGC's Performance in NELP Blocks

Under the New Exploration Licensing Policy (NELP) for exploration of oil and natural gas, the Government of India announced eight rounds between 1999 and 2009, inviting companies to bid for exploratory blocks under deepwater, shallow water and onshore category in various basins. ONGC participated in all the eight NELP rounds either alone or in consortium with other companies. Out of 326 blocks offered up to NELP round VIII, ONGC submitted bids for 189 blocks and won 120 blocks.

Audit found that in the 69 blocks that ONGC lost, the reason was lower work commitments in the bid proposal as compared to the work commitments of the successful bidders. In 17 of the blocks lost by ONGC, the other operators made 67 discoveries. Scrutiny of records revealed that in 14 out of 17 blocks with discoveries, ONGC got maximum points in fiscal package but lost the bids due to lower work programme commitments which led to the other bidders winning the blocks. In respect of the balance three blocks ONGC performed badly on both fiscal parameters and work commitments. An internal committee constituted (November 2010) to study ONGC's existing bidding strategy under NELP recommended to ONGC's Executive Committee in its report (February 2011) that the best category blocks should be bid with more aggression so that more number of good quality blocks can be won.

ONGC won 120 out of the 189 blocks that it bid for. As such ONGC holds the largest acreage under NELP. Despite having a portfolio consisting of 89 blocks (74 per cent) with good prospectivity, ONGC made only 11 discoveries in 8 blocks. One of the reasons for the poor performance was that 37 per cent blocks of ONGC are in deepwater acreages. While these acreages have high prospectivity, ONGC had not been able to complete its work programme in these blocks.

ONGC in reply stated (March 2012) that under any competitive regime, it was not possible for any company to win all the blocks as that would perhaps kill the very idea of having a competitive regime. ONGC also stressed that bids for exploration blocks were made after a very thorough technical and techno-economic evaluation of the blocks based on the prospectivity and assured that recommendation for aggressive bidding would be kept in mind, but the technical prospectivity and the techno-economics would still be the guiding factor for bidding.

The reply of Management may be viewed in the context of ONGC having had the experience and knowledge to be well aware of the prospectivity of these blocks and failed to aggressively bid for the prospective blocks as evidenced from the finding of the internal committee of ONGC. Audit is of the view that ONGC ought to ensure better analysis of available data and information as a precursor to bidding to optimize its leverage in getting better blocks.

4.3.1 Delays in completing work commitments

Delay in completion of MWP within the Phases and eventual payment of LD to MOPNG was pointed out earlier in audit, vide Para 6.7.2.1 of C&AG's Report No. PA27 of 2009-10 – PA on Onshore Exploration Activities and also vide Para 8.7.1.3 of C&AG's Report No. 10 of 2010-11, PA on Exploration in Shallow Water Blocks.

A review of MWP completion status in respect of 34 blocks of Category (bidding priority) I & II acquired up to NELP V revealed that only in 9 blocks (7 Deepwater blocks, 1 Shallow water and 1 Onshore blocks) ONGC completed the committed work within the Phase period. In respect of the balance 25 blocks (11 Deepwater Blocks, 10 Shallow water blocks and 4 Onshore blocks), ONGC drilled only 30 wells against the commitment of 90 wells within the phase period. ONGC paid LD of ₹133.03 crore to MOPNG for non completion of the MWP within the Phase period in respect of 13 NELP blocks. Case wise details are listed at *Annexure I*.

ONGC in reply stated (March 2012) that they strive their best to complete the work programme in the earliest possible timeframe. However, due to several constraints, there were some delays in blocks and extensions were sought. Most of these blocks had also been covered during the three earlier audits on ONGC's deepwater, shallow water and onshore exploration.

The reply is not acceptable in audit as it is noticed that the Company continued to pay liquidated damages to MOPNG on four blocks (MN-DWN-2002/1, NEC-DWN-2002/2, MN-DWN-2002/2, CB-OSN-2003/1) even after being reported in earlier audits which indicated that systemic corrections were yet to take place. ONGC's contention that there were delays in the blocks due to several constraints has to be seen in light of the fact that ONGC was unable to complete its committed work programme within the phased period in 74 per cent of the blocks.

4.3.2 Role of DGH & MOPNG

It was noticed in audit that a set of issues which need resolution by the oversight bodies have delayed the exploration efforts under NELP as detailed below:

- Non clarification by DGH for the survey conducted** -The blocks MB-OSN-2005/1, MB-OSN-2005/5 & 2005/6 were awarded in December 2008 in NELP-VII to consortium of ONGC and GSPC/HPCL. The acquisition of 3D data was completed by the end of April 2010 in MB-OSN-2005/5 & 2005/6 and by the end of December 2010 in MB-OSN-2005/1. DGH did not accept the 3D survey carried out by the consortium on the ground that the data acquisition parameter did not fulfill the requirement of High Resolution 3D survey. Though ONGC clarified (May 2011) to DGH that the 3D survey was with high resolution, the decision of DGH was still (March 2012) pending. As ONGC had committed to drill 8 wells in these blocks before January 2013, the matter needed to be resolved early so that the Company could fulfill its work commitments within the exploration phase in these blocks.
- Lack of Ministry of Defence (MOD) clearance:** MOPNG awarded two shallow water blocks viz. KG-OSN-2005/1 and KG-OSN-2005/2 under NELP-VII to the consortium consisting of ONGC and other Public Sector Undertakings (PSUs) in January 2009. Before awarding the blocks, MOPNG should have ascertained the availability of clearances for carrying out the exploratory activities. As these two blocks are situated in the approach area to a classified project of the Navy, MOD did not give clearance (April 2010) for deploying survey vessels despite repeated requests (November 2009 and February 2010). ONGC had incurred expenditure of ₹10.54 crore and committed ₹1.75 crore as of December 2011 in these two blocks. Due to non-availability of MOD clearance, future of these blocks remains uncertain.

In their reply (December 2011), the Basin stated that the process of obtaining necessary clearances and subsequent finalization of the exploration blocks under NELP is the exclusive domain of DGH/MOPNG. Once the blocks are on offer, it is presumed by a bidding company including ONGC that the necessary clearances would be easily obtained for carrying out exploratory activities in them. It was under this presumption that the consortium consisting of ONGC submitted the bids for these two blocks.

Though the Management's reply highlighted an important issue under NELP – viz., failure to receive necessary clearances, the MOPNG was yet (July 2012) to address the issue which should have been ensured by the MOPNG before awarding the blocks.

- Delay in decision on work done beyond extension period** - In three blocks (GS-OSN-2001/1, KK-OSN-2001/2 and KK-OSN-2001/3, ONGC had drilled (March 2008, December 2008 and May 2009) three wells (one in each block) after expiry of extension period. DGH had, therefore, not accepted the work done as part of MWP and claimed LD and cost of unfinished work programme. ONGC had accordingly made a provision to the extent of ₹ 381.42 crore and requested DGH

to reconsider the same citing excusable delays for EIA studies. The decision of DGH was awaited (March 2012).

4.4 ONGC's Performance in Nomination Blocks

In the pre NELP era, MOPNG awarded exploration acreages to the NOCs on nomination basis. The physical performance of survey and exploratory drilling in Nomination blocks during the four years ended 31 March 2011 with reference to targets set in the revised estimates and actual is tabulated below:

ONGC's Performance in Nomination Blocks

(Physical)	2007-08			2008-09			2009-10			2010-11		
	Target	Actual	Difference	Target	Actual	Difference	Target	Actual	Difference	Target	Actual	Difference
Total-2D	1125	1243	118	4234	3398	-836	527	421	-106	85	44	-41
Total-3D	12057	8116	-3941	11544	9629	-1915	5251	5153	-98	2573	3258	685
Exploratory Wells	117	88	-29	108	90	-18	130	113	-17	126	108	-18

Source: Data furnished by Corporate Budget Section, ONGC in October 2011.

As can be seen from the above table, there was a shortfall in 2D and 3D data acquisition as well as drilling in all the four years.

Audit scrutiny revealed the following issues specific to nomination blocks:

- **Relinquishment of blocks without fully exploring their prospectivity** – ONGC surrendered 7 blocks viz. Patan-Tharad Extn-1, Patan, Khambel of Western Onshore basin, Rampur-Pachmarhi-Anhoni (Frontier basin), C-OS-IX (Cauvery basin) and KK-DW-12 & 17 and ED-A (Western Offshore basin) without fully exploring the potential of the blocks even after holding the same for 12 to 14 years. ONGC did not drill the wells committed/location released in two blocks, did not carry out 3D survey as envisaged by ONGC or as directed by DGH in two blocks, could not use 3D data acquired as DGH did not grant extension in one block, not quantified the in place hydrocarbon volume while applying the mining lease for one block and not delineated the extension due to non mobilization of resources that led to surrender of the blocks without completing the exploration. The surrender of Nomination blocks without fully exploring the prospectivity was commented earlier (vide Para No. 6.7.1.1 of the C&AG's Report No. PA27 of 2009-10 – Performance Audit (PA) on Onshore Exploration Activities and Para No. 8.7.1.1 of C&AG's Report No. 10 of 2010-11, PA on Exploration in Shallow Water Blocks).

In its reply ONGC (March 2012) stated that it had not relinquished any Nomination exploration block without fully exploring its prospectivity. The Company also provided block-wise reply that detailed reasons for not fully exploring the prospectivity of certain blocks.

The reply is not acceptable since ONGC did not fully explore these blocks as explained in *Annexure II*. Though these blocks were with the Company for 12-14

years, it neither completed the API nor drilled the committed wells. It had also not converted the discoveries (*Annexure II*).

- **Slow progress of exploration** – ONGC's exploration efforts in 6 blocks were very slow. These blocks *viz.* Cachar District (Assam-Assam Arakan basin), L-1 (Cauvery basin), GK-DW-1, BB-OS-DW-1, BB-OS-DW-2 and WO-9 (Western Offshore basin) were with ONGC for 13 to 25 years and ONGC was yet to complete exploration efforts in these blocks. This is to be viewed with reference to only 7 to 8 years allowed for exploration under NELP regime. The slow progress of exploration efforts in these blocks is detailed in *Annexure II*.
- **Undue delays in obtaining clearances** – In two blocks (Merapani and Golaghat Extension IIA- Assam and Assam Arakan basin) ONGC applied for Mining lease (January 2006/April 2007 and December 2009) and was yet (January 2012) to obtain the license. Ministry's response was awaited (July 2012).



ONGC's CAPACITY FOR EXPLORATION

As discussed in the previous Chapters, delays and inefficiencies adversely impacted exploration efforts and its results in ONGC. In order to examine whether these process lacunae were a result of lack of capacity in ONGC, Audit looked at the following issues:

- Whether ONGC has required human resource for exploration;
- Whether ONGC has sufficient financial resources for exploration; and
- Whether ONGC has the latest relevant technology for exploration.

5.1 Human Resources (HR) in Exploration & Drilling Services

Exploration efforts in ONGC are carried out by the Exploration Group and the Drilling Services. Both these groups together form 40 *per cent* of ONGC's human resources. Audit revealed the following issues with human resource management in exploration and drilling services.

5.1.1 Comparison with international best practices

In 2005, ONGC in association with M/s McKinsey & Company had undertaken a study (ARCUBE²⁵) to align its HR practices with international benchmarks. The report indicated significant gaps in capabilities, process, ownership and infrastructure of the exploration group. It also pointed out significant over-manning in some areas which constrained resources in critical areas *e.g.* rig operating crew, sub surface teams. The study had made a set of recommendations for improvement in HR practices in exploration and drilling services.

Based on these recommendations, ONGC initiated the practice of peer review at Basin level. The Company also carried out skill mapping exercise for exploration group. However, ONGC did not address the issue of manning in both the groups. Even after a lapse of more than five years from the submission of the ARCUBE study, the recommendations were still (March 2012) under review by the Management.

ONGC replied (March 2012) that ARCUBE study primarily focused on two aspects – manning norms and skill mapping. The manpower studies being carried out to work out recruitment of Executives and staff is based on the manning norms suggested under ARCUBE study. Skill mapping exercise too was carried out for exploration group of Western Offshore Basin based on ARCUBE recommendations.

The reply indicates that the issue of manning remains to be addressed by the Company. Improper manning has had a significant impact on the operational efficiency of ONGC as can be seen in para 5.1.2 below.

²⁵ ARCUBE- R³ means Rosters, Roles and Responsibilities.

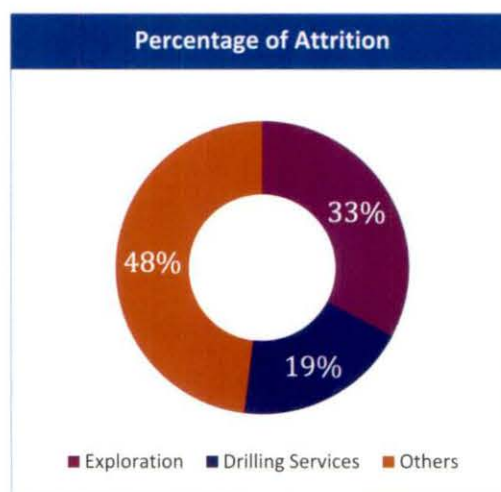
5.1.2 Acute shortage at operational level in Drilling Services

In the 6th conclave held in October 2006, Director (Technical & Field Services), ONGC had brought out that total requirement of Rigman and Topman was 1,600. Against this requirement, ONGC had less than 200 Rigman and Topman which directly affected operations. In 2009, the Director (T&FS) again stressed that the drilling services group was forced to deploy Q3 Executives (those with lower qualifications) against Q1-Q2 positions affecting the operating efficiency of drilling rigs. Thus, the issue remained to be addressed over 2006-09.

ONGC stated (March 2012) the need of staff in drilling and production functions have been met by hiring of Tenure Based Field Operators. The Company also mentioned that the numbers of Rigman increased to 309 in 2011 from 234 in 2007 and assured of plans to recruit another 190 staff in Drilling Services in 2012. Even with the augmentation of rig staff through hiring and recruitment, the actual numbers remain way below the projected requirement of the Company which has contributed to Company's low performance in drilling.

5.1.3 Attrition

There were 598 cases of employee attrition in ONGC during the period 2007-08 to 2010-11. More than half of the personnel who left belonged to exploration (196) and drilling services (115). The highest level of attrition took place in E4-E5 cadres (63 and 68 *per cent* in drilling and exploration cadres respectively) which form the core cadre for knowledge and skills at the Executive level. While discussing the reasons for attrition, Director (HR) mentioned (2007) that rising E&P activity and growing demand for skilled professionals in oil industry has resulted in large scale exodus of trained drilling engineers, geoscientists and other core professionals from ONGC.



ONGC replied (March 2012) that as a corporation, out of the total manpower of approximately 33,000, the attrition in ONGC is just 0.02 *per cent* only. ONGC also opined that certain disciplines like drilling & exploration may attract cyclic attrition peaks but assured that the situation was well under control.

Audit concern is specific to the attrition occurring at the key skill levels. In the Exit Conference held in March 2012 with Audit, Director (T&FS) admitted that the attrition in drilling services had affected them adversely and stated that the tenure based/new

recruits would take time to fill the gap created with the mid level personnel leaving the organization who were the core cadre with rich experience of more than 20 years.

5.1.4 Lack of succession planning at top level

The ONGC Board comprises of Executive and Non-executive directors, viz. functional directors, official nominee directors and non-official directors. MOPNG is responsible for appointments to these positions. In a public listed Maharatna like ONGC, the stewardship and leadership role of the Board is crucial. Moreover, since E&P industry is a specialized sector, suitable understanding of the sector is also important. As such, providing scope for succession planning would be a good practice while appointing new incumbents to the Board positions. Audit noticed that many Board members, including the Chairman and Managing Director (CMD), held additional charge of important posts for long periods as given below:

Vacancy position at Board level				
Sl. No.	CMD/Director	Duration of vacancy		
		From	To	Period (days)
1	CMD	25.05.2006	04.07.2007	406
		01.02.2011	02.10.2011	245
2	Director (HR)	15.07.2010	25.05.2011	315
3	Director (Exploration)	01.02.2011	24.02.2011	24
4	Director (Finance)	16.09.2011	21.05.2012	249
5	Director (Offshore)	03.10.2011	31.05.2012 (was continuing)	242

Source: Data furnished by ONGC in February 2012.

Audit also observed that the position of Chief, Deepwater Drilling lay vacant during the period 16 October 2009 to 03 June 2010 for a period of 231 days due to delay in identification of a successor.

ONGC replied (March 2012) that Board level positions are filled by the Public Enterprises Selection Board. However, ONGC did not comment on the delay in appointing Chief, Deepwater Drilling which was within the purview of the Company. The Ministry did not respond on this issue so far (July 2012).

5.1.5 Gaps in hiring consultants/domain experts

Being a knowledge intensive industry, ONGC hired external expertise from time to time. As per the existing procedure, domain experts/consultants were shortlisted by a committee for empanelment. The list of empanelled consultants was circulated to various work centres for hiring based on their requirement. Thus, a transparent system of competitive bidding was not adhered to in hiring consultants.

Fifty *per cent* of the consultants hired were ex-ONGC employees. The ex-employees of ONGC were paid as per the rates prescribed in February 2007 (revised in May 2010) while rates were negotiated with non ONGC domain experts/consultants. The user

Basins did not send appraisal reports on consultant services. There was, thus, no record of the effectiveness of services provided.

ONGC itself found (August 2010), the empanelment approach limiting and considered a robust matrix based approach for actual hiring/keeping the top 2-3 experts on priority retainership basis. A decision in this regard was yet (March 2012) to be taken.

ONGC in reply (March 2012) stated that appraisal reports on consultant services would be ensured in future. While assuring that Audit's view regarding hiring the consultants would be considered, the Company stated that consultancy in the E&P industry had not reached a professional stage in India and that ex-ONGC employees who had acquired the domain expertise through years of experience were the best suited for the purpose. It also added that the method of empanelling such consultants was transparent and that quality services were received at the most competitive prices.

Audit is of the opinion that ONGC being an E&P company with global reach, the maturity of consultancy in E&P sector in India should not restrain ONGC's ability to hire international consultants/ experts.

5.2 Underutilisation of financial resources

A critical input for the exploration process is financial resources. A comparison of ONGC's budget (based on work commitments) with the actual expenditure shows that ONGC had been unable to utilise the budgeted funds.

Financial and physical performance													(₹ in crore)
Activity	2007-08			2008-09			2009-10			2010-11			
	Plan	Actual	Shortfall	Plan	Actual	Excess	Plan	Actual	Shortfall	Plan	Actual	Shortfall /Excess	
Financial Performance													
Survey	2387	2346	-41	2766	3072	306	3159	2234	-925	2036	1667	-369	
Exploratory Drilling	2951	2432	-519	3244	4299	1055	7687	7288	-399	8328	8638	310	
Total	5338	4778	-560	6010	7371	1361	10846	9522	-1324	10364	10305	-59	
Percentage shortfall/Excess			-9.5 per cent			22.6 per cent			-12.2 per cent			-0.3 per cent	
Physical Performance													
Survey in physical Qty.	2D (LKM)	20643	8157	-12486 (-60%)	68844	77125	8281 (12%)	30666	24951	-5715 (-19%)	25465	13116	-12349 (-48%)
	3D (Sq Km.)	25373	19353	-6020 (-24%)	26382	26785	403 (2%)	24831	21741	-3090 (-12%)	23361	19355	-4006 (-17%)
No. of Exploratory wells		138	98	-40 (-29%)	128	106	-22 (-17%)	150	128	-22 (-15%)	150	125	-25 (-17%)

Source: Data furnished by Corporate Budget Section, ONGC in October 2011.

The above table also indicates that though the shortfall in budget utilization was within a range of 0.3 per cent to 12.2 per cent in 2007-08, 2009-10 and 2010-11, the shortfall in achieving physical targets was much higher (upto 60 per cent in surveys and 29 per cent in exploratory wells). On the other hand, though actual budget utilization during 2008-09 was higher than the estimates by 22.6 per cent, the Company failed to achieve the physical targets of exploratory wells during this year too by 17 per cent. This

indicated that the expenditure on exploratory activities was disproportionately higher than the physical achievements and reflected lack of budgetary control on these vital activities. This may be viewed in the context of Company's performance in surveys and drilling of wells reviewed by Audit in paragraphs 4.1.1 to 4.1.6 and 4.2.1 to 4.2.5 of this report.

ONGC in reply confirmed (April 2012) the audit observation by stating that the under utilization was due to under achievement of physical targets.

5.3 No independent assessment of state of technology in ONGC

ONGC mission includes 'Achieving excellence by leveraging competitive advantages in R&D and Technology with involved people'. Technology induction is, thus, a strategic goal and an essential requirement in the cutting edge field of exploration. In April 2007, the Deputy Chairman of Planning Commission (DCPC) wrote to the Minister of Petroleum and Natural Gas drawing his attention to the need for assessing the current status of technology in energy producing public sector undertakings. It was, therefore, suggested that the Board of ONGC be asked to commission an independent evaluation of the technology in ONGC and benchmark them against global best practices. ONGC Management responded stating that as they were fully confident that they had up-to-date technology, there was no need for an independent study. DCPC, however, reiterated (October 2007) his earlier views stating that *'in a world of rapidly changing technology it is only normal practice to submit management decisions to some type of external assessment'*.

In June 2008, ONGC Board decided that an independent consultant M/s Gaffney Cline and Associates (GCA) would be advised to make an independent assessment of the technology in ONGC. However, the work had not progressed till date (March 2012). It was, however, noticed that in their strategic meet with the Ministry (November 2009), the Executive Director & Chief Corporate Planning pointed out that ONGC as a PSU was not able to get best of the technology/expertise using current procedures and, hence, was severely constrained in adopting best practices, absorbing technology and hiring of domain experts. This lends an urgency to the issue of evaluation and assessment of technical capacity so that adequate steps at correction can be initiated.

ONGC in reply (April 2012) stated that the reference to engagement of GCA for independent assessment of technology induction as agreed in the 179th meeting of the Board had been noted and would be addressed.



ROBUSTNESS OF GOVERNANCE FRAMEWORK & LEADERSHIP ROLE IN HYDROCARBON EXPLORATION

The following issues have been reported upon in this chapter:

- Whether ONGC placed sufficient emphasis on its exploration efforts vis-à-vis Vision of the Government;
- Whether there were gaps in strategic and operational planning for exploration in ONGC;
- Whether the MoU targets of ONGC were fixed appropriately; and
- Whether ONGC has met the targets fixed and whether there is a robust system for performance measurement.

6.1 Mismatch between strategic objectives and planned targets of ONGC

6.1.1 Hydrocarbon Vision 2025 implemented in 2000 articulates an objective of undertaking a total appraisal of Indian sedimentary basins for tapping hydrocarbon potential and to optimize production of crude oil and natural gas in the most efficient manner so as to have Reserve Replacement Ratio²⁶(RRR) of more than 1. In order to achieve the objectives set out in the Hydrocarbon Vision, ONGC formulated an Exploration & Production Strategy in July 2001. The document articulated a short, medium and long term exploration strategy spanning 2002 to 2020 (three phases). The strategy envisaged doubling of initial in-place volume of hydrocarbons (IIH)²⁷ from 6 Billion Tonnes (BT) to 12 BT by 2020. This doubling is to be done in three phases – 1.2 BT by 2007, 2.2 BT by 2014 and 2.6 BT by 2020. Audit noticed that while ONGC's strategic objective envisaged 2.2 BT by 2014, ONGC's XI Five Year Plan (2007-2012) projected only 1.001 BT IIH by 2012. This leaves 1.2 BT IIH to be achieved in the remaining two years if the strategic objective is to be met. The possibility of achievement of 1.2 BT IIH in two years (averages 0.6 BT IIH per year) was, however, remote considering its performance of the last four years (2007-11) which averaged 0.239BT IIH per year.

6.1.2 While discussing the reserve accretion targets for the XI Plan, the CMD, ONGC mentioned that private players set a target of 3 Million Metric Tonne (MMT) reserve accretion per well as against ONGC's target of 1.537 MMT per well. This also supports the view that ONGC's planned targets did not have the required stretch for achieving envisaged reserve accretion.

In its response, ONGC stated that (March 2012), strategic goals could by no means be equated to the achievement of an assigned target. ONGC achieved its first 6 BT of IIH

²⁶Reserve Replacement Ratio is the ratio of new reserves accreted to hydrocarbon produced.

²⁷Initial in-place hydrocarbons 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.

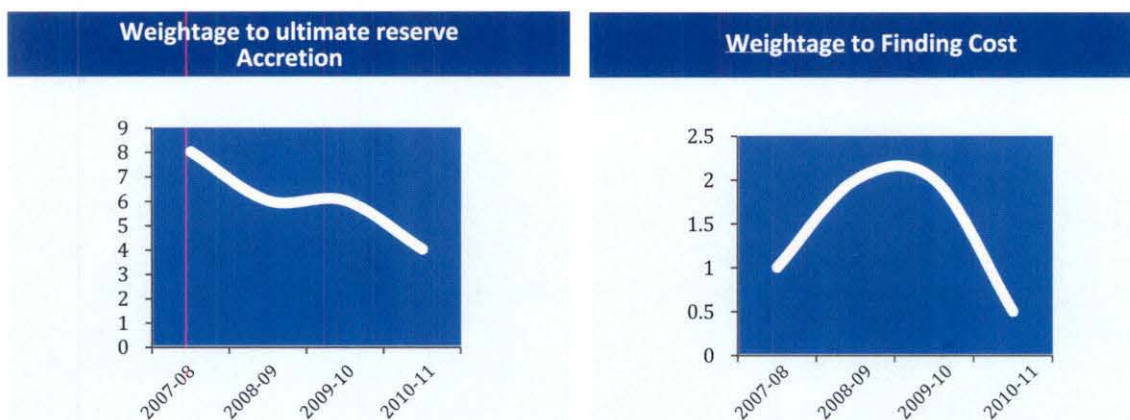
accretion after close to five decades of exploration and, hence, the same to be achieved in two decades was clearly an ambition but not insurmountable “Strategic Goal”.

The response of ONGC is not acceptable as the Company had set itself long, medium and short term E&P strategy to meet the strategic goals. A road map for this had also been drawn up by the Company which includes improved management of existing major fields, fast tracking of production from deep water wells, field specific cutting edge technology in marginal fields, etc. Besides, the fact that the Company took five decades to achieve 6BT of IIH accretion should not colour its future outlook, given the phenomenal improvements in technology and E&P experience gained by the NOC.

Thus, ONGC did not align the five year and annual plans with the envisaged accretion of IIH in its strategic goals.

6.2 Declining emphasis on exploration in the MOU between MOPNG and ONGC

6.2.1 There were only two exploration parameters included in the MOU targets of ONGC – (i) ultimate reserve accretion²⁸ and (ii) finding cost. Though exploration is a core business of ONGC, the weightage given to these parameters has reduced over the period 2007-11, from 8 per cent to 4 per cent for reserve accretion and 2 per cent to 0.5 per cent for finding costs. In fact, the MOU for 2010-11 indicated a weightage of 5 per cent for Corporate Social Responsibility while the combined weightage for the core activity of exploration remained at 4.5 per cent as depicted below:



Source: MOUs signed by ONGC with MOPNG during 2007-11.

ONGC in reply stated (March 2012) that the MOU parameters of Central PSUs like ONGC are drafted as per the MOU Guidelines issued every year by the DPE. The Ministry was yet (July 2012) to respond to this audit comment.

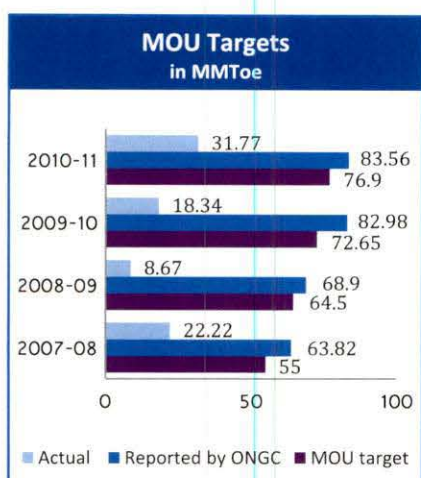
Reply of ONGC is not acceptable as exploration is the core activity of ONGC employing 22.9 per cent of the total financial resources and 20 per cent of the manpower (over 2007-11). As such, performance on exploration parameters ought to be measured and monitored closely and given due weightage in the MOU. The MOU provided a 50 per cent weightage on non-financial parameters. Given that exploration is a fundamental

²⁸Ultimate reserve accretion is an approximation of the quantity of oil or gas that is potentially recoverable from a reserve or well.

activity of ONGC, a 4.5 per cent weightage to it was entirely lop-sided and its compliance would further dilute the emphasis on exploration.

6.3 Difference in criteria for setting and reporting on MOU target

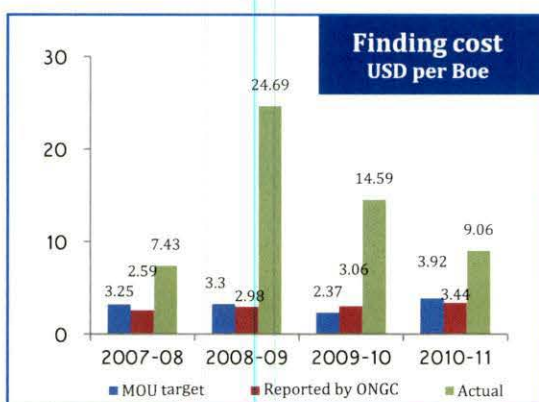
6.3.1 Audit observed that the MOU targets for reserve accretion were based on the BE targets in ONGC's annual plans.



Source: MOUs and data of ONGC for 2007-11

The BE targets pertained to reserves accreted through exploratory wells, wildcats and appraisals and were further divided into Basin wise targets. However, while reporting on reserve accretion, ONGC considered reserve accretion not only through exploratory wells, wildcats and appraisals, but also through development drilling and reinterpretation misleading the stakeholder. It is interesting to note that reserves accreted by ONGC through exploratory wells, wildcats and appraisals actually formed only 13 per cent to 38 per cent of the reported reserve accretion. The reserve accretion through reinterpretation was 59 per cent to 63 per cent and through development 3 per cent to 27 per cent during 2007-11. Thus, actual reserve accretion by ONGC fell far short of the MOU targets. This is further alarming in the backdrop of the low prioritization of its exploration efforts in MOU targets.

6.3.2 ONGC computed the finding cost by dividing the cost of exploration efforts



Source: MOUs and data of ONGC for 2007-11

by reserves accreted from exploratory wells, wildcats and appraisals, reinterpretation and development drilling. However, as pointed out in para 6.3.1 above, the actual exploration efforts included only exploratory wells, wildcats and appraisals. If ONGC considers the actual cost of exploration based on the above the finding cost would range from US \$ 7.43 to US \$ 24.69 per boe which was much higher than the MOU target of US \$ 2.37 – US \$ 3.92 per boe during all the years from 2007-08 to 2010-11 and exceeded by US \$ 4.84/boe (129 per cent) to US \$ 21.71/boe (648 per cent).

6.3.3 ONGC got an 'excellent' grading on reserve accretion and mixed grading of 'poor' to 'excellent' on finding cost during the four years period under consideration. This contributed to a 'very good' grading of the Company during 2007-11 which led to an eligibility for a high percentage of Performance Related Pay (PRP of 80 per cent) for the executives. If the reporting were to be matched to the targets, the actual grading on both the parameters would have been 'poor', leading to depressed rating which would adversely impact the PRP of employees.

6.3.4 ONGC in its reply (March 2012) stated that there was no differing criteria for target setting and reporting on exploration parameters and added that reserves accreted were reported under four broad heads of 1) new find, 2) new pool, 3) delineation and 4) reinterpretation. All these four represent exploration efforts. The Management also contended that in the target of BE, only exploratory well, wildcats or appraisals were taken into account. Accretion of reserves through reinterpretation is due to re-assessment of the area with new concept, new additional seismic data, reprocessing of seismic data and re-evaluation of all G&G data obtained till date, which form a part of exploration.

6.3.5 The reply is not acceptable as ONGC contradicted its own stand in the reply. While on one hand it stated that there was no differing criteria for target setting and reporting on exploration parameters, on the other it admitted that in the target of BE, only exploratory well, wildcats or appraisals were taken into account. Thus, accretion targets did not include accretion through development drilling and reinterpretation as per Company's own admission. There was, thus, a mismatch between the criteria for setting MOU targets for reserve accretion and reporting on them. Moreover, in review by the Executive Committee (EC) on 17 May 2010, the fixation of performance benchmarking of the Basins, Assets, etc., the EC was of the opinion that in order to assess the real performance of the Basins through exploration efforts, reserve accretion through re-assessment and reinterpretation may need to be segregated from those due to fresh discoveries.

6.4 System of Performance Assessment

6.4.1 The existing performance assessment mechanism in ONGC consisted of Basin-wise performance contracts signed between Director (Exploration) and the Basin Manager every year. The contracts were based on Key Performance Indicators (KPIs) formulated under the four balanced scorecard perspectives of operation, process, finance and people. Each KPI was given a separate weightage. The KPIs during the period 2007-11 are detailed below:

KPI during 2007-11	
Perspectives	KPIs
Operational	Ultimate reserve accretion, new prospects generated and O+OEG production of associated assets.
Process	PEL ²⁹ to ML ³⁰ area conversion, 2D/3D acquisition, exploratory wells drilled, exploratory wells success ratio, exploratory discovery index, interpretation projects completed, out of box ideas.
Financial	Finding cost, exploratory wells cost, 2D/3D survey cost, austerity in non plan expenditure and bills clearing.
Human resources	Oil Industry Safety Directorate (OISD) audit compliance, Lost time, injury frequency, knowledge management.

²⁹ PEL: Petroleum Exploration License.

³⁰ ML: Mining Lease.

6.4.2 Audit observed the following gaps in the performance measurement system:

(a) KPI's without target – In three out of seven Basins, namely Frontier Basin, MBA Basin and Western Onshore Basin, there was no activity on a set of KPIs (*viz.* new prospect success ratio, finding cost and 3D survey in respect of Frontier Basin, PEL to ML conversion in MBA Basin and 2D seismic acquisition in Western Onshore Basin). Thus, there could be no targets against these indicators for the above Basins. However, these Basins continued to be assessed with these critical parameters. This led to a curious situation where the Basins got full marks on the KPIs without carrying out any activity. In the Exit Conference ONGC accepted the aberrations and mentioned that same had been since rectified.

(b) Targets based on previous performance instead of current year projections – The KG Basin was allowed to set previous year's performance as the target for the current year. The Management replied (October 2011) that finding cost target could not be projected as it was based on reserve accretion. The reply is not tenable since for ONGC as a whole, the finding cost target for MOU was fixed on the targeted reserve accretion which could be set for this Basin also.

(c) Uniform target for exploratory well success ratio – A uniform target of 33 *per cent* of exploratory wells success ratio had been fixed for all the seven Basins instead of setting a target as per the prospectivity of each basin. The Management replied (October 2011) that target of 33 *per cent* were assigned to Basins based on achievement envisaged for ONGC. The reply is not tenable as assignment of uniform success ratio to all Basins was not correct since the Basins were assigned different reserve accretion targets for the ONGC's overall envisaged achievement. In the Exit Conference, ONGC agreed that 33 *per cent* success ratio for Frontier Basin was very high as no E&P Company had met with success in this region.

6.4.3 While evaluating the performance of the units, EC desired (November 2009) that the exploration's success be benchmarked with international norms. In the 369th EC meeting (May 2010), EC desired the benchmarking of E&P performance vis-à-vis international norms of 10 KPIs. However, Performance Management & Benchmarking Group had not benchmarked these KPIs with international norms. In April 2012, ONGC stated that they did carry out Internal Peer Benchmarking for parameters for similar units, the reports of which were presented to the EC every quarter. For external benchmarking, the Company had suggested a common body of the Government who could unambiguously standardize parameters for all domestic E&P companies and carry out benchmarking studies impartially.

6.5 Oversight on Hydrocarbon Exploration in ONGC

6.5.1 The Board of ONGC³¹ plays a leadership role in its exploration efforts and is responsible for strategic planning and approval of five year and annual plans. The Board also deliberates and decides on the MOU targets and results. As such, the Board is appropriately placed to address the planning and reporting gaps brought out by Audit at para 6.1 to 6.3 above. The Board is also in charge of monitoring performance and can address the comments brought out at para 6.4 above.

6.5.2 The DPE guidelines on Corporate Governance require the ONGC Board to have a formal statement of Board Charter which clearly defines the roles and responsibilities of the Board and individual directors so as to enable the Board to effectively perform its role. Audit observed that ONGC did not have such a Charter. While the CMD, at the 172nd Meeting held on 30 October 2007, informed the Board that the broad functions and responsibilities of the functional directors would be identified shortly – the Charter was yet (March 2012) to be prepared. ONGC stated (March 2012) that necessary action for formulating a Board Charter was on hand. As the matter had been pending since October 2007, the Charter needs to be prepared expeditiously.

6.5.3 The induction of independent directors on the Board is considered essential in order to make the Board more professional. As per requirement of clause 49 of the Listing Agreement, the Board of Directors of a company where the CMD is an executive director, at least half of the Board should comprise of independent directors. However, Audit observed that during the period 2007-08 to 2010-11, the Company did not have the requisite number of independent directors.

ONGC in reply brought out the compliance with the provisions of clause 49(IA) of the Listing Agreement for the subsequent period *i.e.* after 30 June 2011. The fact remains, however, that pre June 2011, ONGC was not in compliance with the SEBI guidelines.

ONGC further stated (March 2012) that the programme of work comprising RE & BE were put up for approval of the Board on annual basis, during which performance of the preceding year was also put up and deliberated. In addition, the MOPNG took Quarterly Performance Review Meeting every quarter which was attended by the entire EC including CMD where the exploration activities and shortfalls are discussed in great details. Thus, lack of monitoring could not be attributed to ONGC.

³¹ Board of ONGC consists of Functional Directors and Non-executive Directors (Part time official nominee Directors and Independent Directors).

CONCLUSION & RECOMMENDATIONS

A performance audit of ONGC's hydrocarbon exploration efforts (2007-08 to 2010-11) was conducted ***to ascertain whether ONGC's exploration efforts had been taken up with proper planning and executed efficiently and effectively to achieve the nation's and its own envisioned hydrocarbon goal.***

7.1 CONCLUSION:

Audit noted that ONGC did not place the desired emphasis on its core exploration activity. Coupled with the low priority on exploration are the anomalies in MOU target setting and reporting as well as performance measurement (through RRR) which can potentially mislead the stakeholder. The Company showcases a healthy RRR, while production continues to remain static. ONGC was also tardy in monetizing its discoveries which contributed to low production. While external benchmarking of performance was not done, nationally ONGC had among the lowest efficiency in drilling compared to private as well as CPSE (OIL) which led to non-achievement of work commitments and payment of liquidated damages. Several deficiencies in operations (procurement, hiring, contracting, etc.) were also noticed. The Company had adequate financial resources which it could not utilize and sustained heavy attrition in core manpower which led to operational challenges. Though ONGC operates in a field of cutting edge technology, it did not have a system of independent assessment of its technical capacity which fails to assure its stakeholders.

ONGC mainly operates in its producing fields to meet both, reserve accretion and production targets. Lack of adequate efforts and results in new fields, coupled with the ageing of producing fields, is a matter of concern for future.

7.2 RECOMMENDATIONS:

MOPNG and ONGC should ensure that ONGC's exploratory efforts/activities which is the core concern for Company's sustenance receives its due attention as recommended below:

- *A review of Reserve Replacement Ratio (RRR) as a performance parameter for ensuring performance in exploration efforts is warranted.*
- *Audit reiterates its recommendation that ONGC should formulate Basin wise norms for the API cycle. It is further recommended that these norms should have a link with the performance parameters. This is particularly relevant in a performance driven scenario where the Basins are paid performance related pay and ONGC has to pay*

liquidated damages if it does not fulfill its work commitments within a given time frame.

- *ONGC should speed up its processes for placement of survey contracts to ensure timely completion of exploration commitments, focused planning and efficient co-ordination to bridge the gap between requirement and availability/ utilisation of the equipment and services procured to meet its exploration goals.*
- *ONGC should leverage its experience and resources to be able to operate in the competitive regime and bid aggressively for highly prospective blocks. The Company should adhere to the work commitments schedule so as to fully explore the blocks within the given phases and also to avoid liquidated damages.*
- *A regime of closer coordination with oversight bodies is essential for smooth implementation of exploration programmes under NELP.*
- *MOPNG should ensure the availability of clearances for carrying out the exploratory activities before awarding the blocks.*
- *Considering its hydrocarbon success in Nomination blocks and the non likelihood of extension for exploration in these blocks, ONGC should explore the potential in the other Nomination blocks presently with it to accrete maximum hydrocarbon reserves.*
- *Urgent action is recommended to set right the manning deficiencies to ensure better efficiency of exploration.*
- *The Company should introduce transparency and competitive tension in the process of hiring consultants/experts.*
- *Closer watch on utilization of the budget is called for to avoid shortfalls particularly in view of the high cost of funds.*
- *ONGC should carry out an early independent assessment of technology to assure the stakeholders that its technological capabilities are up-to-date.*
- *ONGC should drive performance to meet the ambitious strategic objective that it has communicated to its stakeholders.*
- *MOPNG/ ONGC ought to do a de-novo review of MOU targets placing desired emphasis on performance parameters directly linked to exploration. It should also be ensured that such targets and achievements are measured and reported on a appropriate basis to avoid misleading the stakeholders.*

- *ONGC should take suitable initiatives to institutionalize internal peer benchmarking across the organization and draw suitable linkages to target setting and performance evaluation based on the benchmarks. As the regulator of the upstream sector, DGH may be the body which is ideally positioned to standardize performance parameters and benchmarks for the E&P industry.*

New Delhi
Date : 6 August, 2012



(A.K. PATNAIK)
Deputy Comptroller and Auditor General
and Chairman, Audit Board

Countersigned

New Delhi
Date : 6 August, 2012

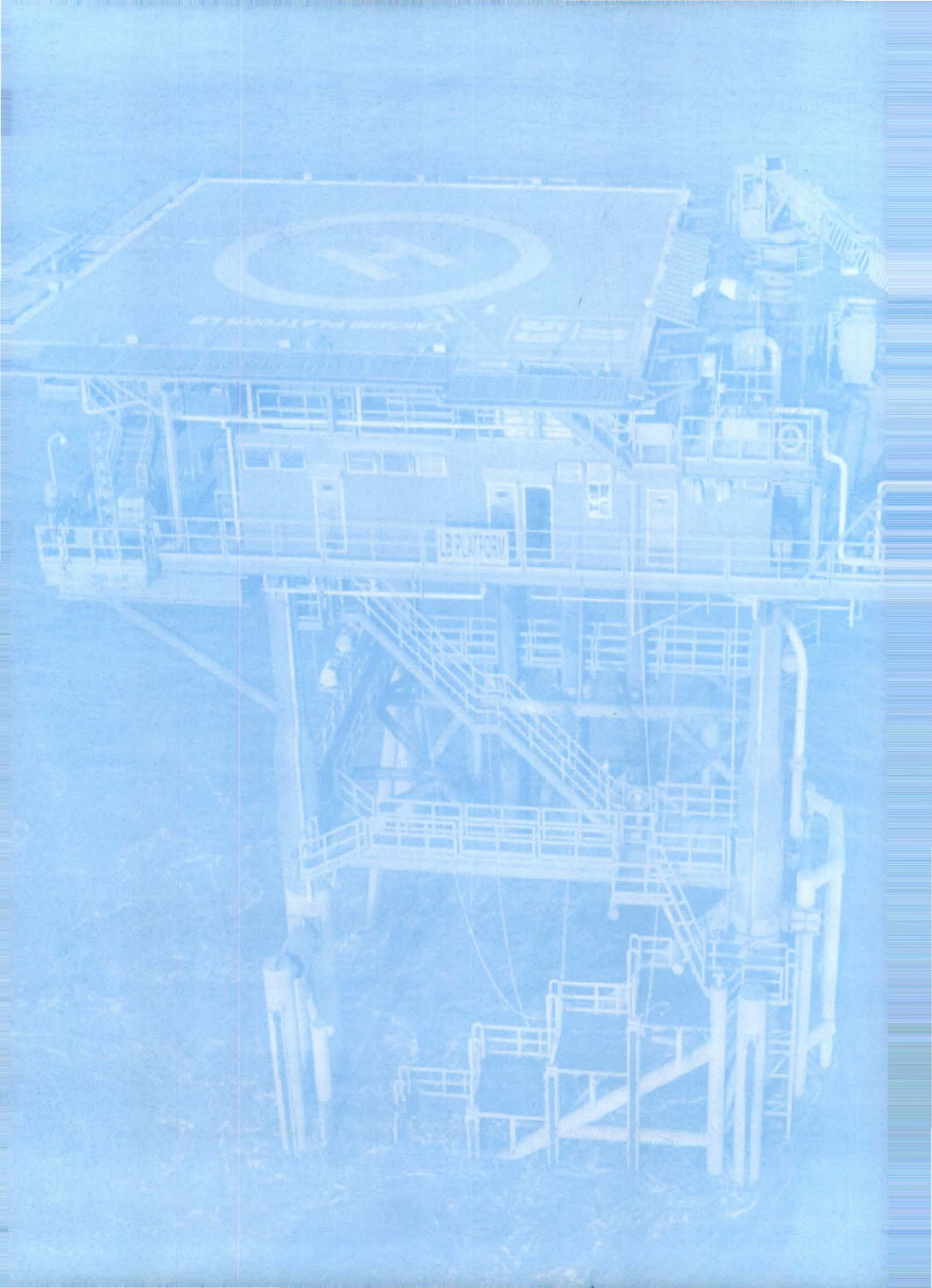


(VINOD RAI)
Comptroller and Auditor General of India





ANNEXURES



Annexure-I

(Refer Para 4.3.1)

Statement showing the avoidable payment of Liquidated damages in NELP Blocks

Sl No	Name of the block	Extension period	Liquidated damages (US\$)	Audit remarks
1	AA-ONN-2001/1	01.11.06-30.04.07	236572	ONGC released the location in January 2006 and as against scheduled completion of April 2006, spudded in February 2007. Hence, due to non completion of MWP of Phase-I, ONGC had to pay penalty, besides extension fee for petroleum exploration licence. Ref: Para 6.7.2.1 (i) C&AG Report no. PA 27 of 2009-10 Chapter VI titled 'Performance Audit of Onshore Exploration Activities in ONGC'
2	MB-OSN-97/4	08.05.06-07.11.06	3496201	ONGC did not drill the two committed wells in phase II i.e. up to 7 May 2006 and availed of extension by paying LD. Ref: Para. 8.7.1.3 of C&AG Report No. 10 of 2010-11, Chapter 8 titled 'Exploration in Shallow Water Blocks'
3	GS-OSN-2001/1 (Provision made in accounts)	i) 12.09.06-11.03.07 ii) 12.03.07 to 11.09.07	i)3336582 ii)1703197	After completion of drilling of the third well (11th October 2007) the fourth well was spudded (22nd March 2008) after a lapse of five months. Drilling of the well was not considered as part of MWP by DGH as it was drilled after expiry of extension period without the permission of DGH. Hence, DGH claimed payment of LD and unfinished MWP. ONGC made provision of ₹ 68.19 crore towards unfinished work programme and LD of ₹11.62 crore. The matter was still pending with DGH.
4	KK-OSN-2001/2	12.09.06-11.03.07	1249689	ONGC sought 591 days of excusable delays for the period involved in fresh EIA studies but DGH approved (03.02.2009) extension of 108/111 days and asked ONGC to surrender the block. However, ONGC drilled the well (CSPE)/(KLA-1) on 17.12.2008/9.5.2009 without the permission of DGH. DGH did not consider this well as part of MWP and demanded ₹ 114.65 crore/₹ 186.96 crore towards unfinished cost of MWP. ONGC made a provision for the same. The matter was still pending with DGH. Ref: Para 8.7.2.2 (iii) of C&AG Report No. 10 of 2010-11, Chapter 8 titled "Exploration in Shallow Water Blocks"
5	KK-OSN-2001/3	12.09.06-11.03.07	1293275	
6	MN-OSN-97/3	19.11.05-18.11.06	5090455	The location MN-OS-G (released on 16 August 2005), was planned for drilling by rig Sagar Vijay which, however, was sent for mandatory dry docking in October 2005. Hence, the rig Transocean Nordic was lined up (26 November 2005) to drill the location. But, the rig could actually spud the location only on 26 November 2006 due to delay in retrieval of its leg at its previous location. Further, against one well of 4500 m (MWP of Phase-III), two wells (MN-OS-J) upto 1390 m and (MN-OS-I) 2234 m were drilled (25 May 2007) with a shortfall of 876 m after the expiry of exploration cycle. REF: Para No. 8.7.3.2 of C&AG Report No. 10 of 2010-11, Chapter 8 titled "Exploration in Shallow Water Blocks"

Sl No	Name of the block	Extension period	Liquidated damages (US\$)	Audit remarks
7	MN-DWN-98/3	19.11.06-18.05.07	2230000	ONGC awarded contract for acquisition of data in two blocks (KG-DWN-98/2 and MN-DWN-98/3) of NELP-I and one block (MN-DWN-2002/1) of NELP-IV. However, the acquisition work was taken up by the contractor only in the following field season. Consequently, there were delays in interpretation of data, identifying and release of locations and drilling. This delay led to non completion of drilling of six wells before expiry of the block (September 2007).
8	MN-DWN-2002/1	17.09.11-16.03.12	1296990	Ref: Para 7.7.2.1(c) , C&AG Report No. PA9 of 2008 Chapter VII titled 'Deep Water Exploration' Further, in respect of MN-DWN-2002/1 block (i) MC had not yet approved drilling of third location, (ii) Approval for the second extension of Phase I was not received so far and (iii) the Basin could not complete committed MWP of wells despite having availed three years on account of rig holiday policy.
9	NEC-DWN-2002/2	17.09.11-16.03.12	2693096	Similar to the points brought out at Sl No.7 above, in this case too the contractor failed to complete the acquisition of data in the contracted field season due to onset of monsoon. Ref: Para 7.7.2.2 of C&AG Report No. PA9 of 2008 Chapter VII titled 'Deep Water Exploration' Further, though ONGC availed the Rig Holiday Policy (1.1.08 to 31.12.10) it could not drill all the wells and had to pay LD and take extension of phase-I up to 16.03.12 to drill the fourth well.
10	CY-DWN-2001/1	12.09.07-11.03.08	3056403	The exploration phase-I of the block was up to March 2007. The first extension of six month was availed up to September 2007 and another six months extension was availed up to March 2008 by payment of LD. The location was released only in January 2008 after end of 1st extension. The delay was on account of delay in interpretation of seismic data and delay in approval of location by more than 18 months after acquisition and processing of data.
11	KK-DWN-2001/3	12.09.07-11.03.08	620027	The exploration phase-I of the block was up to March 2007. The first extension of six month under PSC was availed up to September 2007 and another six month extension was availed from September 2007 to March 2008 by payment of LD. The location was proposed in September 2007 and released in May 2008. There was delay in interpretation of seismic data and approval of location which led to 1st extension with resultant payment of LD.
12	MN-DWN-2002/2	17.09.11-16.03.12	5480660	Award of the contract to a party in disregard of its financial position led to a delay of more than two years in acquisition of 2D data. Consequently, till September 2007, the Company could not drill any well in the first phase (March 2004 to March 2008) of block MN-DWN-2002/2 against the commitment of two wells. Similarly,

SI No	Name of the block	Extension period	Liquidated damages (US\$)	Audit remarks
				under block NEC-DWN-2002/2, the Company could drill one well against commitment of four wells. (Ref: Para 7.7.2.2 of C&AG Report No. PA9 of 2008, Chapter VII titled 'Deep Water Exploration') The Company failed to achieve its MWP despite grant of Rig Moratorium. Further though the Company hired a rig on assignment basis and mobilised the same in July 2009 it could not drill the required number of wells.
13	CB-OSN-2003/1	14.2.11-13.8.2011	Rs 5.90 crore	The location North Degam-1 (released on 13.02.2007) was not drilled due to very difficult logistics. Gulf-B1 (released on 23.09.2009) was also not drilled even though the soil coring survey was completed and the ultra-shallow water rig Hercules-260 was hired (mobilised in April 2008) considering two locations in this block. This resulted in delay in completion of MWP of wells. Further, delay in completion of API resulted in delay in release of locations (released during 2010-11) and finally drilling of last two wells Aliabet-2 (13.12.2010) and Aliabet-3 (03.04.2011) was delayed which resulted in second and third extension and payment of LD.
	Total		31783147 x ₹40 + ₹5.90 crore = ₹133.03 crore	

Annexure-II

Refer Para (4.4)

A. Surrender of blocks without fully exploring the potential

Sl. No.	Nomination Block	Period	MWP	Actual	Audit comment
1	Rampur-Pachmarhi-Anhoni	Initial period 1.4.1998 to 31.3.2004	No commitment	API 448.55 LKM 2D seismic data; Drilled well (Anhoni-1) which indicated little gas.	1. During the regrant period of six years from 2004-05 including extensions, the prospectivity of the block could not be explored fully. Another released location R-BM-A, could not be drilled due to non-grant of 6 th year extension. 2. Though the block was with ONGC for twelve years, yet the exploration remained to be completed. The acreage under petroleum exploration licence (PEL) was relinquished on 26.02.2010 without fully exploring. The expenditure incurred in the block was ₹116.37 crore.
		Re-grant and extension period 1.1.2004 to 26.2.2010	API of 50 LKM of 2D seismic data 1 well	API completed Well Jhirna was drilled after re- grant period was over and terminated prematurely.	
2	Patan-Tharad Ext-I 9.973KM	Initial grant period 25-09-1995 to 25-09- 2001.	No commitment	Wells:01 (testing not completed)	DGH denied extension for 6 th and 7 th year as the 5 th year extension was given to acquire 3D seismic data over the entire area which was not carried out. Hence, ONGC had to surrender the block (1.04.2007) without fully exploring the block.
		Re-grant period 24-09-2001 to 23-09- 2005	2D-10 LKM Wells:01	2D-30 LKM Well: 0 (Completed testing of the well drilled in initial cycle).	
		Extension period 24.09.2005 to 23.09.2006	Nil	Nil	
3	Patan 3275km	0.10.1998 to 06.10.2004 (Initial grant period)		329 LKM Wells: 01 (dry) one well under drilling.	1. Only three wells drilled during the entire period of 12 years and 69.63 Sq.km of 3D data was acquired against commitment of 200 Sq.Km during the regrant period of four years. 2. The processing and interpretation of the 3D data acquired during the regrant period was completed in the fifth year extension and one location released. The location was drilled during the extended period due to delay in land acquisition. Further, 200 Sq.km of 3D data acquired during the fifth year extension did not serve any purpose as the block was relinquished after fifth year extension as per the directions of DGH.
		07-10-2004 to 06-10- 2008 (Re-grant period)	3D-200 SKM Wells:02 (firm) 01-indicative.	3D-69.63 SKM Wells:01(Compl eted the well under drilling in the initial cycle)	
		07-10-2008 to 31-03- 2011 (Extension period)	Wells:01	3D-200 SKM Well:01 (Dry)	

Sl. No.	Nomination Block	Period	MWP	Actual	Audit comment
4	Khambel 206.135 SKM	29-12-1994 to 28-12- 2000 (Initial grant period)	No commitment	Wells:06 (5 dry 1 Oil)	1. During the initial cycle of six years, ONGC drilled six wells of which well Khamboi-1 produced oil. 2. During the 6 th & 7 th year extension DGH observed that the proposed program was not sufficient from exploration point of view and suggested to carry out 3D API (about 100 Sq.Km) focusing on Khamboi-1 well, and submit modified program. However, 3D survey was not conducted and the well Kamboi-6 drilled during the sixth year of re-grant period well was dry. 3. PEL was relinquished on 27.12.2007 even though the well Kamboi-1 drilled during the year 1995-96 was oil well.
		29-12-2000 to 28-12- 2004 (Re-grant period)	Wells: 2	Wells: 2 Dry	
		Extension 29.12.2004 to 28.12.2007	Wells 3 (1 firm and 2 indicative)	Well 1 Dry	
5	C-OS-IX	01.01.04 - 30.04.2011	Wells 5	Wells 6	Block was relinquished without delineating extension of Nannilam pay-sand in the Block as it failed to mobilize the required resources to complete a well. Expenditure incurred in the block ₹ 276.06 crore.
6	KKDW-12 & 17	(Effective Date: 1997)	Well 1	3D (Acquisition) 487 Sq.Km 2D (long offset) 1200 LKM Well 0 (work done till 12.8.2009)	Block surrendered at the instance of DGH without completing MWP.
7.	ED-A	Effective date: 11 -11- 1996 Regrant 2004-05 to 2010-11	Wells 6 2D 3550 LKM 3D (Ocean Bottom Cabling(OBC) 340 SKM	Wells 6, 2D 3550 LKM, 3D (OBC) 340 Sq.Km	The block was held for 14 years (from 1996) with staggered activities over the grant period. Only after assessing the results of well completed in March 2011 & May 2011 ONGC ascertained the likely existence of hydrocarbon accumulation in open acreage area and applied for ML on 09.05.2011. However, the case was not recommended by DGH as the quantifiable in-place hydrocarbon volumes, was not established and the part of the requested PML area was falling in open acreage (95.0 Sq. Km) beyond the PEL boundary of the block. ONGC had to ultimately surrender the block.

B. Slow exploration progress in blocks

Sl. No.	Nomination Block	Period	MWP	Actual	Audit comment
1.	Cachar District	1 April 1997 to 31 March 2003 Initial grant period	No commitment	2D: 560 LKM, Wells: 4	During the 6 th & 7 th year PEL cycle, well NT-1(NTAA) and BK-13 (BKAB) with gas indication, was drilled. Further, ONGC sought extension of 2 years beyond 7 th year with effect from 01.04.2010 to 31.3.2012 with MWP of 2 wells and the same was granted by GOI. No well was drilled by the Company and the chances of non-fulfillment of MWP could not be ruled out as PEL was expiring on 31.3.2012.
		Re-grant period 1.4.2003 to 31.3.2007	Wells: 2 2D: 3D:10 SKM	Wells:2* (* 1 well was completed in extension period in 2009-10)	
		Extension period 1 April 2007 to 31 March 2012 (5 th to 7 th year and two years further extension)	Wells: 2	Nil (upto 31.12.2011)	
2.	L-1	01.04.04 to 01.04.11 Extension granted up to 31.03.2013	2D 200LKM 3D 509 Sq.Km Wells 12	2D 499LKM, 3D 1481 Sq.Km Wells 7.	Shortfall in drilling to the extent of five wells over a period of seven years indicated slow progress of work in the block.
3.	BB-OS-DW-I	Effective date: 1998 Regrant 2004-05 to 2010-11	Well 1 2D 200 LKM 3D 1868 SKM Re-evaluation of G&G data 3D 500 SKM (RP) 1500 LKM	Well 0 3D -2447 Sq.Km (Acquisition) 3D - 1288 SKM (Processing) 2D -765 LKM (Reprocessing) Re-evaluation of G&G data based on old 2D data	These blocks were with ONGC for more than ten years and could not drill the committed wells Further due to Non-Extension of Rig Holiday Policy to these Nomination Blocks by MOPNG there was no plan to drill the same. PEL fees of ₹13.21 crore had been paid for these blocks.
4.	BB-OS-DW-II	Effective date: 1998 Regrant 2004-05 to 2010-11	Well 2 3D 2368 SKM	Well 1 3D- 986 SKM 2D -765 LKM (Reprocessing)	
5.	GK-DW-1	Effective date: 1998 Regrant 2004-05 to 2010-11	Well 2 2D 200LK 3D 1420 SKM	Well 1	
6.	WO-9	Effective date: 1998 Regrant 2004-05 to 2010-11	Wells 2 Re-evaluation of G&G data based on drilling	Wells 2 3D 8700 SKM (Processing) 3D – 241 SKM (Interpretation)	The block was with ONGC for more than 14 years. However, the Company was still in the process of reviewing the prospectivity.

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GLOSSARY OF TECHNICAL TERMS

Technical Terms	Description
Appraisal Programme	A programme carried out following a Discovery in the Contract Area for the purpose of appraising Discovery and delineating the Petroleum Reservoirs to which the Discovery relates in terms of thickness and lateral extent and determining the characteristics thereof and the quantity of recoverable hydrocarbon therein.
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.
Approved Programme and Approved Budget	Work and A work programme or Budget that has been approved by the Management Committee pursuant to the provisions of Production Sharing Contract (PSC) entered into between the Government and the joint venture parties to the contract.
Asset	It refers to an entity that is involved in production activities from the existing wells and transportation of oil and gas on onshore plants.
Barrel	A quantity equivalent to forty two (42) United States gallons, corrected to a temperature of sixty (60) degrees Fahrenheit under one (1) atmosphere of pressure.
basin	A Depression in the earth's crust where sedimentary materials are accumulated over the years.
Basin	Entity/Unit involved in exploration related activities.
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.
Cantilever Rig	A jackup drilling unit in which the drilling rig is mounted on two cantilevers that extend outward from the barge hull of the unit.
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.
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 isobath.
Delineation Well	Delineation well refers to the well drilled to determine the boundaries or the extent of reservoir of the new oil or gas field.
Development	Following discovery, drilling and related activities necessary to begin production of oil or natural gas.
Development Area	It is a part of the Contract Area corresponding to the area of an Oil Field or Gas Field delineated in simple geometric shape, together

	with a reasonable margin of additional area surrounding the Field consistent with petroleum industry practice and approved by the Management Committee or the Government, as the case may be.
Development Plan	A plan submitted by the Contractor for the development of a Commercial Discovery, which has been approved by the Management Committee or the Government in terms of PSC.
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 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, faces 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.
Finding Cost	Finding cost would include expenditure incurred on Acquisition Processing and Interpretation of seismic data and exploratory drilling to access the quantum of reserve that could be produced after creating the infrastructure required for its production. Exploration cost/reserve found.
G & G Data	Geological, geophysical and geochemical data.
Geo Technical Order	An order which indicates the well drilling plan in terms of days, depth indicating lithology vis-à-vis depth, pressure vis-à-vis depth, casing/cementing policy, mud requirement, bits required etc.
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.
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.
Marginal Field	Marginal fields are those discovered fields which are considered uneconomical for development at one point of time under

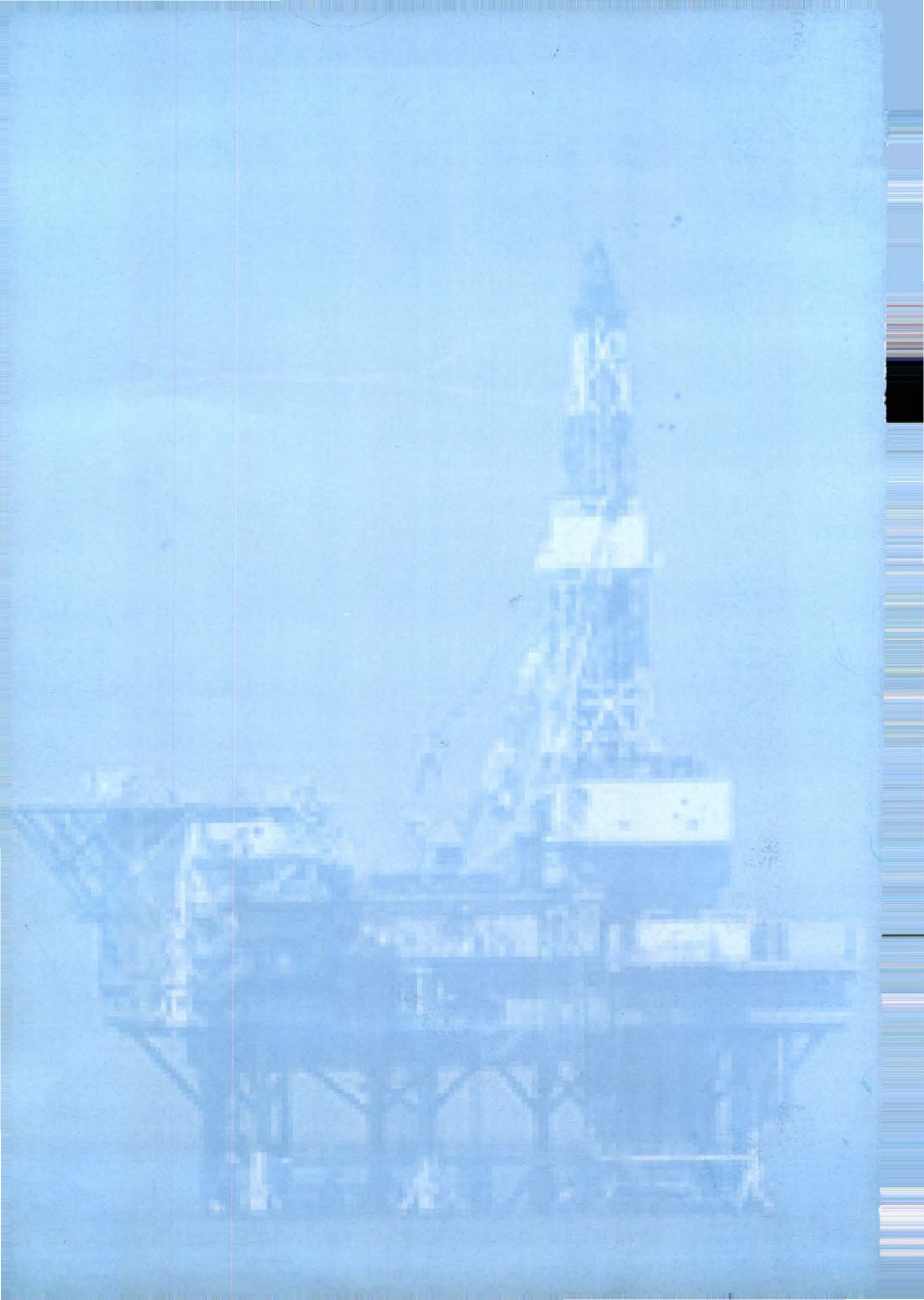
		prevailing fiscal, technology or regulatory regime.
Minimum Obligations	Work	Phase-wise/year-wise minimum work obligations as determined by the Operator Board and the Management Committee of NELP blocks in pursuance of PSCs.
Minimum Programme	Work	With respect to each Exploration Phase, the work programme 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.
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.
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.
Petroleum Cost		Costs and expenses incurred by the parties and allowed to be recovered pursuant to the contract.
Pool		In general, the term "pool" is synonymous with the term "reservoir" i.e. a naturally occurring discrete accumulation of Petroleum; however, in certain situations, a pool may consist of more than one reservoir.
Prognostication		The process of forecasting or estimating the hydrocarbon potential of an area.
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.
Reservoir		A naturally occurring discrete accumulation of hydrocarbon.
Regional Exploration Board (REXB)		REXB consists of experts from various basins as well as from institutes (GEOPIC & KDMIPE) of the Company
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.
Rig Moratorium/ Holiday Policy	Due to global shortage of offshore drilling rigs, the Government of India decided (July 2010) to give a 3-year i.e. 2008-2010 drilling holiday or moratorium to E&P companies.
Sedimentary basins	Sedimentary Basins are depressions in the earth's crust where organic matters are deposited.
Shallow Water Well	Wells of water depth less than 400 metres.
Streamer	Series of chains with hydrophones which receives reflective signals from the sub-surface strata.
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.
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 Programme	A work programme formulated for the purpose of carrying out Petroleum Operations
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

A&AA, AAA	Assam & Assam Arakan
API	Acquisition, Processing and Interpretation
ATN	Action Taken Note
BE	Budget Estimates
BOE, boe	Barrel of oil equivalent
BT	Billion Tonne
C&AG	Comptroller and Auditor General of India
CEC	Corporate Exploration Centre
CMD	Chairman & Managing Director
Canoco	Canoco Philips
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
EC	Executive Committee
EOL	Essar Oil Limited
EXCOM	Exploration & Contract Management
FB	Frontier Basin
G&G	Geological & Geophysical
Gazprom	Gazprom EP International BV
GEOPIC	Geo-data Processing and Interpretation Centre
GND	Government Nominee Director
GOI	Government of India
GSPC	Gujarat State Petroleum Corporation
GTO	Geo-Technical Order
HEPI	Hardy Exploration & Production (India) Inc.
HR	Human Resources
IDT	Institute of Drilling Technology
IIH	Initial In-place Hydrocarbon
IOGPT	Institute of Oil & Gas Production Technology
IRS	Institute of Reservoir Studies
JOGPL	Jubilant Oil & Gas Private Limited
JV	Joint Venture
KDMIPE	Keshav Dev Malviya Institute of Petroleum Engineering
KG-PG	Krishna Godavari Pranahita Godavari
KPI	Key Performance Indicators
LKM	Line Kilometre

MBA	Mahanadi Bengal Andaman Basin
ML	Mining Lease
MMT	Million Metric Tonne
MMTOE	Million Metric Tonne Oil Equivalent
MOPNG	Ministry of Petroleum and Natural Gas
MOU	Memorandum of Understanding
MTOE	Metric Tonne Oil Equivalent
MWP	Minimum Work Programme
NELP	New Exploration Licensing Policy
NIKO	Niko Resources Limited
NOC	National Oil Companies
OBC	Ocean Bottom Cabling
OIL	Oil India Limited
OISD	Oil Industry Safety Directorate
ONGC	Oil and Natural Gas Corporation Limited
ORD Act	Oil Regulation & Development Act, 1948
PEL	Petroleum Exploration License
PMBG	Performance Management and Benchmarking Group
PNG Rules	Petroleum & Natural Gas Rules
POs	Purchase Orders
PRP	Performance Related Pay
PSE	Public Sector Enterprises
R&D	Research & Development
RE	Revised Estimates
RGL	Regional Geosciences Laboratory
SBU	Strategic Business Unit
SELAN	Selan Exploration Technology Limited
Sq.Km./SKM	Square Kilometre
SPIC	Seismic Data Processing and Interpretation Centre
WOB	Western Offshore Basin
WON	Western Onshore Basin



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