CHAPTER VI

Oil and Natural Gas Corporation Limited

Onshore exploration activities

Highlights

Oil and Natural Gas Corporation Limited (Company) could drill only four of the 22 wells committed in the original re-grant period of four years in 15 nomination blocks. This led to payment of petroleum exploration license fee on extension of grant period. The Company also could not establish prospectivity of the area in two basins, after incurring an expenditure of Rs.404.89 crore.

(Paras 6.7.1.1 and 6.7.1.2)

The Company did not complete the minimum work programme in seven of the 17 New Exploration Licensing Policy (NELP) blocks reviewed in audit and paid penalty of Rs.1.68 crore in two blocks.

(Para 6.7.2.1)

The Company did not fix standards/norms for total field days in a field season, normal non-production days towards camp establishment and winding up, experimental work, topographical survey days and productivity of geophysical parties. As a result, the days utilised by the field parties on these activities were in wide variance in different basins and their reasonableness was not ascertainable.

(Paras 6.7.3.2 and 6.7.3.3)

Delay in finalisation of shot hole drilling contracts resulted in under achievement of data acquisition targets by 207 Ground Line Kilometre (GLK) and 49.29 Square Kilometre (SKM), besides idling of geophysical parties for 463 days with nugatory expenditure of Rs.1.85 crore.

(Para 6.7.3.4(i))

Delay in procurement of seismic data acquisition systems by the Company resulted in idling of two geophysical parties in a basin during 2005-06 and six geophysical parties in two basins during the field season 2006-07.

(Para 6.7.3.4 (iii))

The Company could not acquire the desired 3D seismic data during the field season 2006-07 due to delay in hiring of acquisition services.

(Para 6.7.3.5)

The Company awarded a shot hole drilling contract to an inexperienced party, which resulted in under achievement of targets by 67.75 GLK.

(Para 6.7.3.6)

Due to non-availability of ready drill sites, further programme, equipment and spare parts *etc.*, the rigs remained idle for 1,566 days incurring idling expenditure amounting to Rs.40.83 crore.

(Paras 6.7.4.1 to 6.7.4.5)

Due to not conducting site survey before award of civil construction contract, the Company had to incur infructuous expenditure of Rs.1.65 crore on civil works.

(Para 6.7.4.6)

The Company did not fix norms for production testing in terms of number of days to be spent per object of testing. In the absence of norms, there was a wide variation in four basins ranging from 4 to 70 days per object of testing.

(Para 6.7.5.1)

The Company did not achieve exploration objectives due to deferment of production testing after incurring expenditure of Rs.64.40 crore on three wells.

(Para 6.7.5.2)

Excessive time taken for production testing and non-availability of equipment before deployment of rig resulted in increase in well cost by Rs.10.90 crore.

(Para 6.7.5.3)

Summary of recommendations

The Company may:

1. ***ensure execution of exploration activities under nomination blocks taking into account its work commitments under the block in the original re-grant period of Petroleum Exploration License (PEL) so as to achieve exploration objectives and to avoid payment of additional PEL fee on renewals;***
2. ***ensure execution of exploration activities under NELP blocks taking into account work commitments under the block and completion of each activity as per Minimum Work Programme (MWP) targets to avoid penalty;***
3. ***fix norms for field days, non-production days, experimental days and productivity of the geophysical parties;***
4. ***ensure availability of state of the art data acquisition equipment with the geophysical parties before their deployment;***
5. ***finalise the shot hole drilling contracts before scheduled deployment of geophysical parties and also ensure that the contractor is of proven capability;***
6. ***ensure availability of locations and ready drill sites before release of rigs from the previous locations to avoid expensive idling of rigs;***
7. ***ensure availability of drilling equipment i.e. compressors, fishing tools, logging parties, etc. at the drill site to avoid expensive shut downs of the rigs;***
8. ***finalise the transportation contract before release of rigs from the previous locations to avoid expensive idling of rigs and adhere to the provisions contained in the Material Management Manual;***
9. ***prescribe norms in terms of number of days to be spent per object of production testing keeping in view the sub-surface conditions of various basins;***

10. ensure completion of conclusive production testing before release of rigs and avoid deferment of testing for long periods; and

11. fix reserve accretion targets in Frontier basins.

6.1 Introduction

6.1.1 Exploration activities in the Company

Oil and Natural Gas Corporation Limited (Company) is carrying out activities relating to exploration and production of hydrocarbon since 1956. Upto 1998, the National Oil Companies were offered exploratory blocks on nomination basis and were allowed to apply to the Government of India (GOI) for grant of Petroleum Exploration Licences (PELs) for these blocks.

In 1999, the Directorate General of Hydrocarbon (DGH) formulated and implemented New Exploration Licensing Policy (NELP) of the GOI. Under the NELP, the GOI offered 63 exploration blocks between 1999 to 2006 under round I to VI to the private as well as joint venture companies under Production Sharing Contracts (PSCs).

To achieve the committed work programme under the PEL/NELP blocks, the Company prepared a five-year plan (FYP) envisaging the exploration and production activities in the ensuing five-year period. On an annual basis, the Company entered into a Memorandum of Understanding (MOU) with the Ministry of Petroleum and Natural Gas in which it undertook to achieve the reserve accretion and production targets during the particular year in order to achieve the overall targets depicted in the FYP. For achieving the targets of MOU at Basin[1] level, a performance agreement was signed every year between Director (Exploration) of the Company and the concerned Basin Manager.

6.2 Scope of audit

Audit covered the review of the Company's transactions relating to nomination and NELP blocks in the onshore areas held by the Company in its individual capacity or with consortium partners, data acquisition, processing and interpretation, release and drilling of exploratory locations and estimation of reserve accretion. The records and documents relating to exploration activities of the Company during the 10th FYP (2002-2007) in six onshore basins were test checked.

6.3 Audit objectives

The performance audit was conducted to assess that:

- the planning and achievement of the exploration of nomination and NELP blocks was adequate;
- the Company had established systems and procedures for optimal seismic data collection, its timely processing and interpretation;

[1] Basin - An entity involved in exploration related activities, headed by a Basin Manager reporting to Director (Exploration).

- the rig deployment plan was inclusive of the inputs provided by different basins; was sufficient and met the Minimum Work Programme (MWP)/Work Programme (WP)/Corporate targets; and
- production testing, well completion and reserve estimation were in compliance with the prescribed procedure and schedules.

6.4 Audit criteria

The following criteria were used for the performance audit:

- Exploration of nomination blocks: WP committed under nomination blocks to achieve corporate objectives of reserve accretion of hydrocarbon.
- Bidding for NELP blocks/obtaining of PELs: MWP committed in the PSCs to achieve corporate objectives of reserve accretion of hydrocarbon.
- Acquisition, processing and interpretation of seismic data: Preparation of exploration work programme, award of shot hole drilling contracts, applicable provisions of Material Management (MM) Manual/Corporate directions, last purchase price (LPP), planned period of seismic data acquisition, its processing and interpretation and conditions of contract.
- Release and drilling of exploratory locations: FYPs, Annual plans, Regional Exploration Board (REXB) meetings, drilling plans and drilling of exploratory locations.
- Production testing and reserve creation estimation: Production testing programme, well completion reports and reserve estimation reports.

6.5 Audit methodology

Audit reviewed the records relating to acquisition of the blocks under nomination and NELP regime, contracts and payments for shot hole drilling for survey work, processing and interpretation of seismic data, plans and execution of deployment of drilling rigs, reports relating to production testing, well completion and reserve estimation. A representative sample of the blocks was selected on the basis of random sampling. The sample covered 50 *per cent* of Nomination/NELP blocks, 50 *per cent* of data acquired, processed and interpreted and 33 *per cent* of exploratory locations drilled and reserve accreted.

An Entry conference with the Management was held on 16 April 2008 wherein the audit objectives, scope and methodology were explained. Subsequently, during the Exit conference held on 29 September 2008, major issues incorporated in the report were discussed.

6.6 Acknowledgement

Audit is thankful for the cooperation received from the Management of the Company in providing information, records, clarifications and for arranging discussions with the concerned officers from time to time. Their cooperation facilitated the conduct of the review within the given time frame.

6.7 Audit findings

6.7.1 Exploration of nomination blocks

6.7.1.1 Non-drilling of committed wells in original re-grant period

Upto 1998, before the formulation and implementation of NELP, the Company was offered exploratory blocks on nomination basis and was allowed to apply to the GOI for grant of PEL for these blocks ***(Annexure IX).*** As on 31 March 2007, the Company was having 67 onshore nomination blocks acquired during January 2001 to April 2006, on re-grant basis, on which exploration activities were being conducted.

Audit observed that in 15 nomination blocks (***Annexure X***), the Company had drilled four wells against the eight wells committed in four blocks, within the initial four years of the re-grant period. It failed to drill any well in the remaining 11 blocks where it had committed to drill 14 wells within this period. Audit further observed that even the acquisition, processing and interpretation (API) of seismic data had not been completed in 11 blocks within the initial four years. To continue its exploration activities for fulfilling commitments beyond the initial period of four years, the Company had to pay additional PEL fees of Rs.1.14 crore (March 2007) in 10 blocks for obtaining extension of time.

The Management stated (September 2008) that most of the wells shown as shortfall had been drilled in the fifth year of the cycle. The Management further stated that as per the orders (March 2002) of the GOI, re-grant would be given for a period of four years with an extension for the next year based on a definite work programme to be submitted and approved by DGH. In case, any lead is obtained during the re-grant period, further extension of two years would be given.

The reply was not satisfactory, as these nomination blocks were awarded to the Company prior to formulation and implementation of NELP-1999. The Company, however, failed to drill the committed wells during the first four years of the re-grant period. As the Company had already worked on these blocks for seven years during the initial grant period, the committed wells should have been drilled during the extended four year period.

6.7.1.2 Non-establishment of prospectivity

The Krishna Godavari- Pranhita Godavari (KG-PG) basin drilled four wells in nominated block-1A, incurring an expenditure of Rs.60.64 crore (March 2007). In block-1B, the basin had drilled 21 wells incurring an expenditure of Rs.300.65 crore (March 2007). Further, the Cauvery basin drilled two wells in block L-X which were declared dry and abandoned. The basin had already incurred an expenditure of Rs.17.74 crore on survey and drilling under this block. The additional committed one well under this block was not drilled. In block L-XII, the basin drilled two exploratory wells which were declared dry and abandoned after incurring an expenditure of Rs.25.86 crore on survey and drilling of wells. The additional one well committed under this block was also not drilled.

The Management stated (September 2008) that out of the four wells drilled in block IA of the KG-PG basin, one well was a gas well and acquisition of new 3D data would provide multiple level of prospect evaluation in time to come. In case of block IB of KG-PG basin, out of the 21 wells drilled, eight were hydrocarbon bearing which had provided significant exploratory leads. The Management further stated that in two blocks in

Cauvery basin, the wells drilled had helped in fine tuning the geological model, in spite of the fact that they were devoid of hydrocarbons.

The reply was not convincing as the blocks IA and IB in KG-PG basin were received on re-grant basis in December 2003 and January 2004, respectively. Even after expiry of more than 11 years[2] from the initial grant, no prospectivity of the area could be established. Furthermore, the re-grant licenses of the block IA would expire in December 2010 and block IB in January 2011. Similarly, no prospects were established in Cauvery basin, although the re-grant licences of the blocks L-X and L-XII would expire in December 2010 and November 2010 respectively. As per orders (March 2002) of the GOI no further extension would be granted for those blocks.

6.7.2 Exploration of NELP blocks

6.7.2.1 Non-completion of Minimum Work Programme under NELP

Under NELP, the GOI offered blocks to private as well as joint venture companies. Against 63 blocks offered by the Government under NELP I to VI between 1999 and 2006, the Company submitted bids for 51 blocks and obtained 23 blocks under different rounds. In addition, the Company was a consortium partner in eight blocks where other companies were operators (***Annexure XI***).

The MWP in each exploration block consisted of commitments by the Company in terms of extent of surveys to be conducted and wells to be drilled within seven years, divided into three Phases. In the event of non-fulfilment of the MWP commitments for any Phase, the Company could be granted extension in the time schedule by the Management Committee of the block or the GOI, for a period not exceeding six months, subject to the provisions of the PSC. Further extensions envisaged furnishing of a bank guarantee equal to the value of shortfall in achievement of MWP commitments, besides liquidated damages (LD) ranging from 10 *per cent* to 30 *per cent*. In the event of non-extension of the completion schedule, the Company could offer the block for surrender or the GOI could also direct the Company to do the same.

Audit observed that out of 17 NELP blocks selected for review, the Company could not drill the wells committed under the MWP in seven blocks which are discussed in the succeeding paragraphs:

i) Non-drilling of a well due to delay in release of location leading to payment of penalty

Block AA-ONN-2001/1 in Eastern Tripura was awarded to the Company under NELP-III with 100 *per cent* participating interest. As per the MWP committed in the PSC (February 2003), the Company was to acquire and re-process 2D/3D seismic data and drill an exploratory well under Phase-I effective from May 2003 to April 2006.

As the Company could not drill the committed well in the first Phase, the GOI allowed first extension of six months upto October 2006, without penalty. Further extension upto April 2007 was granted by DGH on payment of 10 *per cent* penalty of Rs.1.06 crore.

Audit observed that though the Company had completed the API by May 2005, the location was released after seven months in January 2006. The Company commenced

---

[2] ***Seven years for initial grant period plus four years of re-grant period.***

drilling in February 2007 as against its scheduled completion by April 2006. Thus, due to delay in release of location/drilling of the well, the Company had to pay penalty of Rs.1.06 crore, besides extension fee of PEL of Rs.21.07 lakh due to non-completion of MWP of Phase-I.

The Management stated (September 2008) that the delay in taking up the well was a cumulative effect of delays in various stages of exploration and that DGH was apprised of the constraints while seeking extension and waiver of the penalty.

The reply was not convincing, as the Company lost seven months time in releasing the location for drilling and another one year in commencing drilling after the location had been released. Consequently, the commitment was not fulfilled within the first extension (without penalty) of Phase-I. DGH also did not agree with the justification given by the Management for the delays. As a result, the Company was constrained to seek a second extension by paying a penalty of Rs.1.06 crore against the unfinished MWP commitments.

ii) Delay in arranging a rig leading to non-drilling of a committed well

The GOI awarded the onshore block MN-ONN-2000/01 under NELP-II to the consortium of ONGC–IOC[3]-GAIL[4]-OIL[5] (OIL being operator) with 20 *per cent* participating interest of the Company. As per the PSC, the consortium was to complete the API between April 2002 to April 2005 in Phase-I and drill a well by the end of April 2007 in Phase-II. Another well was to be drilled in Phase III ending April 2009.

Audit observed that API was completed in Phase-I by availing of six months' extension adjustable in Phase-II. However, the operator could not arrange a rig for drilling a committed well within the remaining scheduled period of Phase-II. Due to this, the consortium had to obtain two more extensions of six months each in Phase-II also by paying 40 *per cent* penalty and 100 *per cent* bank guarantee of the unfinished MWP. The share of penalty to the Company was Rs.62 lakh.

The Management stated (September 2008) that OIL was the designated operator of the block and as per the PSC, the operator takes all the initiative and action for the committed work programme in a NELP block.

The reply was not convincing as being a consortium partner and member of the Management/Operating committee, as per the provisions of Article 6 and 7 of the PSC[6],

[3] Indian Oil Corporation Limited
[4] GAIL(India) Limited
[5] Oil India Limited
[6] Article 6 of the PSC provides that government shall nominate two members representing government in the management committee, whereas each company constituting the contractor shall nominate one member each to represent the contractor in the management committee. The operator on behalf of the contractor with the approval of operating committee shall submit to the management committee the documents relating to annual work programme and budget, annual work progress and cost incurred thereon, proposal for surrender and relinquishment of any part of the contract area, proposal for an

the Company was required to pursue the matter with the operator for completion of MWP, to avoid payment of penalty and other avoidable expenditure.

iii) Delay in conducting pre-drilling Environment Impact Assessment studies

According to Article 14.5 of the PSC, the Company was required to carry out Environment Impact Assessment (EIA) studies through persons having special knowledge on environment matters in order to determine the prevailing environment, human beings and local communities situation at the time of studies and establish the likely impact of exploration activities on the same. The time taken for completion of pre-drilling EIA studies are given in ***Annexure XII***.

Audit observed that in five blocks the time taken for pre-drilling EIA studies ranged from 21 to 60 months from the date of signing respective PSC. In case of one block, the study had not been completed even by July 2008, though the block had been acquired by the Company in July 2003. As considerable time had been lost in carrying out the EIA studies, the MWP commitment of drilling 11 wells in these blocks had not been fulfilled as of July 2008.

The Management stated (July 2008) that approval for extension from the DGH was awaited.

The fact, however, remained that the inordinate time taken in carrying out the EIA studies affected the achievement of MWP in these blocks.

Recommendation No. 6.1

The Company may:

(i) ensure execution of exploration activities under nomination blocks taking into account its work commitments under the block in the original re-grant period of PEL so as to achieve exploration objectives and to avoid payment of additional PEL fee on renewals; and

(ii) ensure execution of exploration activities under NELP blocks taking into account work commitments under the block and completion of each activity as per MWP targets to avoid payment of penalty.

6.7.3 Acquisition, processing and interpretation of seismic data

6.7.3.1 Acquisition of seismic data

The prime activity in exploration of hydrocarbons is acquisition of seismic data for which Geophysical parties (GPs) were deployed at basin level as per the work programme approved by the Director (Exploration) of the Company. The GPs remained

appraisal program or revisions or additions thereto, any other matter required by the terms of this contract and any other matter which the contractor decide to submit for review. Article 7 of the PSC further lays down the provisions relating to establishment of an operating committee comprising of an agreed number of representatives of the companies chaired by a representative of the operator, functions of the said operating committee taking into account the provisions of the contract, procedures for decision making, frequency and place of meetings.

in the field for data acquisition between November and June except Cauvery basin (March to October). The GPs were provided with departmental as well as contractual support services for shot hole drilling and job services for seismic data acquisition work. The 2D/3D seismic data acquired was processed and interpreted for analyzing hydrocarbon accumulation. Prospects were then generated for release of locations for drilling of wells. MWP for the NELP blocks stipulate targets for acquisition, processing and interpretation of seismic data in the first phase of the contract. Audit findings in this regard are discussed below:

6.7.3.2 Non-fixation of norms for field days and production days

The available field days in one field season were 240 days which included days for non-production like (i) camp establishment and winding up, (ii) experimental work, (iii) topographic survey, (iv) stoppage of work due to environmental problems, instrument failures *etc.* and (v) idling due to non-availability of contractual services. The production days of each GP were worked out by deducting non-production days from the total field days. Analysis of data relating to field days is detailed below in Table -6.1:

Table – 6.1

Sl. No.	Name of basin	Average field days	Average non-production days	Experimental days
1	Frontier basin	115 to 210	20 to 42	4 to 15
2	MBA basin	142 to 194	36 to 52	1 to 16
3	A&AA basin	151 to 220	44 to 104	5 to 18
4.	Western Onshore basin	191 to 237	23 to 35	5 to 18
5	Cauvery basin	129 to 233	11 to 34	2 to 11
6	KG-PG basin	170 to 222	09 to 23	2 to 12

As seen from the above table, the GPs remained in the field for 115 to 237 days as against the available 240 days. Similarly, non-production and experimental days ranged from 9 to 104 and 1 to 18 respectively.

Audit observed that no standards/norms were fixed for total field days in the field season, normal non-production days towards camp establishment and winding up and experimental work and topographical survey days. In the absence of standards/norms for target days, the reasonableness of actual days utilised for field operations, non-production days and experimental works by the different basins was not ascertainable.

6.7.3.3 Non-fixation of norms for productivity of the geophysical parties

The productivity of GPs was measured in terms of shot holes charged per production day for data acquisition. The contractual services were hired for the purpose of shot hole drilling. In addition, the departmental facilities were available for experimental work.

Audit observed that no standards/norms were fixed for the productivity in terms of shot holes charged to monitor the performance of GPs. Analysis of data relating to productivity of shot holes charged in different basins during the 10th FYP period revealed that in Frontier basin it ranged from 18 to 42, in MBA basin 16 to 24, in A&AA basin 22 to 48, in Western Onshore basin 55 to 96, in Cauvery basin 82 to 116 and in KG-PG basin 78 to 159. In the absence of standards/norms for productivity, the reasonableness of productivity achieved by the different basins was not ascertainable.

The Management, while accepting the audit comment and in response to the audit recommendation, agreed (September 2008) to review the position and fix norms for different geophysical field activities. It further assured formulation and implementation of the norms from the next field season, if feasible.

6.7.3.4 Idling of geophysical party due to delay in finalisation of tender

i) For conducting the seismic surveys, shot holes of pre-determined depths were drilled for laying the explosives. Earlier, the shot hole drilling work was carried out departmentally but since 1985-86, contractual shot holes drilling services were increasingly availed in all the six onshore basins.

The field season in the Company's various basins (except Cauvery basin) commences from 1 November and ends on 30 June next year. The GPs were provided with contractual support services for shot hole drilling and job services for the seismic data acquisition work. The award of shot hole drilling contract for this contractual service was required to be completed by October every year before commencement of the field season, so that the field season is utilised optimally by the GPs for acquiring the targeted data in time. In order to achieve the assigned targets, it was imperative to complete all administrative/tender activities for award of contracts well before the onset of the field season.

The details of contracts awarded for shot hole drilling and job services for seismic data acquisition work and the delays in placement of order in three basins are given in ***Annexure XIII***.

Audit observed that the shot hole drilling contracts were awarded in November/December. The contractors, however, mobilised the equipment in December/January by which 49 to 77 days of the field season were lost. Thus, delay in awarding the contracts affected the whole process of acquisition of seismic data in the respective Nomination/NELP blocks. As a result, there was under achievement of data acquisition targets of 207 Ground Line Kilometre (GLK) and 49.29 Square Kilometre (SKM), besides idling of GPs for 463 days, with nugatory expenditure of Rs.1.85 crore. Delayed finalisation of tenders also indicated lack of planning on the part of the Management which resulted in loss of a significant part of the field season.

The Management in their reply (September 2008) while detailing the procedural constraints at various stages, confirmed the delays in MBA basin and Frontier basin. The Management, however, stated that there was no delay in A&AA basin as the GPs were not deployed in November due to climatic conditions.

The reply was not satisfactory as the field season in onshore basins was November to June except in Cauvery basin which was from March to October. The contracts, therefore, should have been awarded well before commencement of the field season.

ii) As per the work programme for the field season 2003-04, GP-10 was planned to be deployed in Mizoram area (NELP block AA-ONN-2001/2 under NELP-III) to carry out 2D seismic survey. The party could not be deployed during the field season due to non-finalisation of integrated seismic job services and shot hole drilling contract.

Audit observed that proposal for shot hole drilling contract for GP-10 was first initiated in April 2003 for deployment in the field season 2003-04. However, tenders were invited in July 2003 *i.e.* after three months. As the Tender Committee (TC) found the rates

quoted by the lowest bidder on the higher side, it recommended (January 2004) for re-invitation of tender. The competent authority, while approving the recommendation of the TC, remarked that the complete case was dealt without considering urgency of the work, which was the requirement of the NELP block. The case was further initiated in January 2004 for the field season 2003-04. The TC met only in March 2004 to finalise the Bid Evaluation Criteria (BEC) for the above tender and the competent authority accorded the approval in May 2004. As the field season 2003-04 was almost over, the Notice Inviting Tender was floated for the field season 2004-05. The contract was finally awarded in September 2004 for the field season 2004-05.

Thus, due to abnormal delay in finalisation of tender for hiring of shot hole drilling services, GP-10 could not be deployed in the NELP block during the field season 2003-04, resulting in idling of the party with nugatory expenditure of Rs.36 lakh.

The Management stated (September 2008) that there was no delay till the stage of opening of price bid. Thereafter, TC meeting had to be held on seven occasions as the price quoted by the only bidder was 200 *per cent* higher than the estimated price. Even after negotiations, the rates offered were higher and hence, TC had recommended re-tendering.

The reply was not satisfactory in view of the fact that the Management took 193 days in recommending the re-invitation of tender as against 90 days for finalisation of the tender provided in the MM Manual of the Company. Invitation of fresh bids was also delayed due to delay in deciding BEC. As a result, the contract could only be awarded in September 2004 by which time a complete field season 2003-04 was lost**.**

iii) The Company acquired 2D/3D seismic data through its seismic crews to meet exploration work programs of different basins. These crews were equipped with seismic data acquisition systems (system) of different vintages (1991 to 1997) which had outlived their usable life of seven to eight years. The systems required replacement to equip the GPs with appropriate systems for acquisition of data considering the stringent and competitive environment in NELP regime. The Company decided to replace 16 systems during 2005-06 to 2007-08 at an estimated cost of Rs.366.85 crore.

The Executive Committee of the Company approved (April 2005) the proposal for procurement of all the systems at one time to minimise the time, cost and effort. Accordingly, an indent was raised (November 2005) for procurement of 16 systems (subsequently reduced to 14). The Board approved (August 2006) procurement of 14 systems at an estimated cost of Rs.407.68 crore with completion schedule of 12 months from the date of approval. The purchase orders were placed in December 2006 and the 14 systems were received in the basins between July 2007 and January 2008.

Audit observed that the two GPs in A&AA basin during the field season 2005-06 and three GPs each in A&AA basin and Western Onshore basin during the field season 2006-07, could not be deployed gainfully due to delay in procurement of the new systems.

The Management, while confirming the facts, stated (September 2008) that the parties could not be deployed because of their outdated systems. It further stated that the three parties of Western Onshore basin were merged with other parties for data acquisition and that manpower of one party of A&AA basin was loaned to another party.

The reply was not satisfactory as the other parties already had sufficient manpower, as per the norms of the Company. The fact remained that the grounding/merger of parties was an offshoot of the delay in procurement of required systems and should have been avoided.

Recommendation No.6.2

The Company may ensure availability of state of the art data acquisition equipment with the geophysical parties before deployment.

6.7.3.5. Non-acquisition of seismic data by the contractors

The Company decided to acquire 3D seismic data (5074 SKM) during the field season 2006-07 by hiring services from private parties through ICB[7] tender. Accordingly, the Company floated (July 2006) an ICB tender for acquisition of 3D seismic data in 10 sectors[8] covering, mainly, 10 nomination blocks. Executive Purchase Committee (EPC) of the Company found the offers received as technically/commercially unacceptable and directed (October 2006) that a limited tender be invited. The EPC approved (February 2007) award of contracts on the three lowest firms.

Audit observed that the contractor for sectors 1, 2, 3 and 4 (A&AA basin, 5 blocks) and sector 9 (Western Onshore basin, 2 blocks) did not mobilise the equipment in time and the period for mobilisation was extended upto 10 January 2008 (sector-1) and 18 January 2008 (sector- 2, 3, 4 and 9). The contractor for sectors 5, 6, 7 and 8 (KG-PG basin, 2 blocks) did not mobilise the services on the mobilisation date of 1 June 2007 and sought extension in the mobilisation period from time to time. Considering the urgency to cover the area by May 2008, the Company terminated the contract (November 2007). The contractor for sector-10 (Cauvery basin, one block) also did not acquire the data in time and sought extension in the contract period upto 31 May 2008. The Company granted the extension on 28 October 2007 with levy of LD.

The volume of data acquired by the two contractors as of April 2008 is given in Table - 6.2:

Table – 6.2

Particulars	**A&AA and Western onshore basin**					**Cauvery basin**
Sectors	**1**	**2**	**3**	**4**	**9**	**10**
Completion date as per contract	06.05.08	06.12.07	06.12.07	06.12.07	06.12.07	31.10.07

[7] ***International Competitive Bidding***

[8] ***Sectors – Bifurcation of area on geographical parameters viz: Sec-1: Sibsagar district PEL, Rudrasagar ML, Charali Ext ML, Lakwa ML; Sec-2: Cachar district PEL; Sec-3: Agartala Syncline-Agartala dom, Large area PEL; Sec-4: Sunderbari, Tichna east, south Bisalgarh, Kunzanban, Bamutiya in Tripura, Large area of PEL and West Tripura PEL under A&AA Basin. Sec-5: Bhimavaram-Lakshmipuram-Padatadaka-IBPEL; Sec-6: Kaza-Nandigama-IA PEL, Sec-7: Suryaraopeta-Mahadevapatnam-IA PEL; Sec-8: Keikalur-Lingala-Penduru-Bantumilli-IA PEL under KG-PG Basin. Sec-9: Dhinoj-Chanasma PEL, Patan Central PEL and Pantan North PEL under Western onshore basin. Sec-10: Puttur, West of Puttur and Pandanallur-L-I PEL under Cauvery basin.***

Work awarded (SKM)	1321	210	298	380	440	525
Work completed (SKM)	100.41	18.57	104.23	132.79	166.61	313.57
Per cent of work completed	7.60	8.84	34.98	34.94	37.87	59.73

As seen from the above table, the contractor for sectors 1, 2, 3 and 4 (A&AA basin) and sector 9 (Western Onshore basin) acquired only 7.60 *per cent* to 37.87 *per cent* of data. The contractor for sector 10 (Cauvery basin) acquired 59.73 *per cent* upto April 2008 against the contractual date of October 2007. Thus, the contractors did not discharge their contractual obligations despite the extensions given by the Company. In KG-PG basin the desired data could not be acquired due to failure on the part of contractor and the contract was terminated in November 2007. The delay in acquisition of data affected the exploration objectives of the Company in all the 10 nomination blocks.

The Management stated (September 2008) that the extensions were granted considering the requirement to meet the exploration objectives. As regards KG-PG basin, it stated that the departmental crew had been diverted to cover the priority areas and that the seismic data would be acquired during 2008-09.

The fact remained that the seismic data could not be acquired in the particular field season resulting in non-achievement of exploration targets.

6.7.3.6 Award of contract to an inexperienced party

Geophysical Services of Frontier basin planned to conduct 2D seismic reflection survey in Paror-Baijnath-Dharampur area of Himachal Pradesh (Kangra Mandi nomination block) during the field season 2005-06 and fixed a target of acquiring 75 GLK of seismic data. In order to execute the seismic survey and to acquire targeted data, GP-38 was deployed.

Audit, however, observed that the contract for providing services to the GP was awarded to a contractor who did not have sufficient experience of providing shot hole drilling and other job services in the area. The contractor, therefore, failed to provide the required shot hole services to the GP. As a result, the GP could achieve only 7.25 GLK of data in the field season 2005-06 as against the target of 75 GLK. The cost per GLK during the field season was Rs.65.35 lakh against the average cost of Rs.4.44 lakh per GLK for data acquired by the same party during the last three field seasons.

The Management, while confirming (September 2008) the facts, agreed that shot hole drilling contracts would be finalised before scheduled deployment of geophysical parties and also ensured that the contractor is of proven capability as recommended by Audit. It also stated that in future the terms and conditions for technical collaborators would be suitably modified when engaging a new contractor.

6.7.4 Release and drilling of exploratory locations -

Loss due to idling of rigs and failure to conduct site survey

As per the guidelines of the Company, release of a drilling location as category 'B' meant that location was a firm one for actual drilling where the spade work like land acquisition,

construction of civil works, *etc.* should be completed before release of the rig from the previous location as per the rig deployment plan, so as to avoid rig idling.

Audit observed that rigs remained idle for 1566 days for various reasons in respect of such locations scheduled in the rig deployment plan, as discussed below:

6.7.4.1 Idling of rig for want of ready drill sites

In two nomination blocks of A&AA basin, rigs remained idle for 235 days in 2004-05 for want of sites due to incomplete civil works/non-availability of alternate sites, *etc*. The idling resulted in a loss of Rs.7.18 crore.

Similarly, in Cachar Forward Base, after completion of the well TK-1A in Sector 5-C nomination block, the rig E-1400-XII was released on 31 May 2006. Thereafter, the rig remained idle for 195 days due to non-availability of location, thereby incurring an expenditure of Rs.4.89 crore on idling of rig.

The Management, while confirming the facts, stated (September 2008) that extra efforts were being made to make drill sites ready in time. It also agreed that audit recommendation for ensuring availability of locations and ready drill sites before release of rigs from the previous locations would be adhered to avoid expensive idling of rigs.

6.7.4.2 Idling due to non-availability of manpower/material

i) The Company released a 'B' category exploratory location, HRAA in 2003 for drilling in a nomination block *viz.* Cachar district. The well was spudded on 11 August 2005 and was hermetically[9] tested on 21 March 2006. Production testing started from the same date and was completed on 19 May 2006. The well was declared dry and abandoned and the rig was released on 31 May 2006.

Audit observed that the rig remained idle for 52 days during 11 August 2005 to 31 May 2006 for want of manpower, compressor and logging party which could have been avoided with better planning before the start of drilling. Idling of rig resulted in avoidable excess well cost of Rs.96 lakh.

The Management, while confirming the facts, stated (September 2008) that to avoid such delays additional compressor unit had been procured and also sufficient numbers of tubing had been stocked for ongoing and subsequent planned wells. It also assured that audit recommendation to ensure availability of drilling equipment *i.e.* compressors, fishing tools, logging parties, *etc*. at the drill site to avoid expensive shut downs of the rigs would be adhered to.

ii) The Company upgraded its own rig 'ARMCO' in October 2002 from DC-DC system to PLC/AC-SCR system[10]. The rig remained under shutdown for 92 days due to failure of its two engines during the period between 10 May 2006 and 29 October 2006 for want of key spare parts when it was deployed on the location ADAF_SUB in the 'Large Area' nomination block. The rig could be put into operation only on 30 October 2006 after repairs and replacement of the spare parts**.**

---

[9] Hermetical testing refers to the closed cycle pressure testing of casings of wells completed by pumping water at steady rate to detect leakage before handing over the well for production testing.

[10] A PLC (Programmable Logic Controller) is an industrial computer used to automate a machine or a process.

Audit observed that the rig was unique in nature, being the only rig upgraded to PLC/AC-SCR based system. Keeping this in view, its key spare parts should have been stocked for any emergency. Due to failure of the Company to maintain key spare parts, the rig remained idle for 92 days and incurred an idling cost of Rs.3.45 crore.

The Management stated (September 2008) that operational spares for two years were available and replenishment was also ordered in time. It attributed the delay to failure of the vendor to supply the parts even after one year of placing the purchase order.

The reply was not satisfactory as the Management did not maintain even the minimum requirement of the key spare parts for the said rig, when it was known that the original equipment manufacturer was normally taking lead time of one year for supplying the spare parts. The Company placed the order in June 2006 when the rig actually broke down. Apart from the idling cost, delays also affected the exploration efforts of the Company in the nomination block.

6.7.4.3 Idling due to non-availability of programme

Rig B-1-2001 took up drilling activities at well No. GB# 1 in Contai nomination block of MBA basin on 28 September 2003 and was released on 28 April 2004 after completing the drilling.

Audit observed that due to non-availability of further programme, the rig remained idle for 616 days upto 4 January 2006 before being handed over to BHEL[11] for refurbishment, resulting in unfruitful expenditure of Rs.10.53 crore.

The Management stated (September 2008) that the rig was due for refurbishment and upgradation (R&U) and was part of a 12 rig contract awarded to BHEL. Considering the fact that all the rigs could not be accommodated together and also priority of exploration commitment in various basins, the rig was taken by BHEL on 5 January 2006. However, there was no delay in commencing the shipment of rig material after the finalisation of the contract.

The reply was not satisfactory since the rig was released on 28 April 2004 and the first lot of rig equipment was sent on 15 September 2005. The rig B-1-2001 was, however, sent in the final lot on 5 January 2006, though it remained idle from April 2004 without any further programme.

6.7.4.4 Idling due to delay in handing over rig for repairs

Cachar Forward Base under A&AA basin released the rig E-1400-XI for R&U on 31 May 2006. The rig, however, was handed over to BHEL on 19 October 2006 after over four months from the date of release of the rig from the previous location. As per the contract, the R&U was to be completed by BHEL within 105 days from the date of handing over of rig. BHEL, however, took 498 days *(*19 October 2006 to 29 February 2008) for the same.

Audit observed that though the rig was planned for R&U from 1 May 2006 to 15 August 2006, the rig was actually handed over to BHEL on 19 October 2006 *i.e.* after 140 days from the date of rig release (31 May 2006) from the previous location. This resulted in idling cost of Rs.2.60 crore.

---

[11] ***Bharat Heavy Electricals Limited***

The Management attributed (September 2008) the delays to late movement of rig by BHEL.

The reply was not satisfactory as it does not take into account the fact that due to poor planning and co-ordination in the release of the rig for repairs, the Company failed to deploy the rig elsewhere and consequently incurred an avoidable idling cost of Rs.2.60 crore.

6.7.4.5 Idling due to delay in finalisation of transport contract

The Logistics Department of the Company initiated (September 2002) a proposal for inviting an open tender for transportation of a drilling rig from Sundernagar to Hamirpur drill site. The finalisation of the transport contract was unduly delayed and took 18 months as against the normal time of three months, due to non-observance of the tender procedures as laid down in the Manual.

Due to undue delay in finalisation of the contract, the rig remained idle from September 2003 to April 2004 (236 days) at the previous drill site, resulting in idling cost of Rs.11.22 crore.

While detailing the procedural delays, the Management accepted (September 2008) the audit recommendation by assuring that it would finalise the transportation contracts before release of rigs from the previous locations to avoid expensive idling of rigs and adhere to the provisions contained in the Material Management Manual.

6.7.4.6 Failure to conduct site survey prior to taking up of civil work

The Company released (August 2002) an exploratory location PBGO#3 (GOAB) in West Tripura nomination block in a hilly area covered by dense forest and surrounded by deep valleys. As no approach road was available for reaching the location, a new approach road was planned to connect the location from the existing road. After inviting tenders, the work orders for construction of the approach road and other civil works were issued in March 2005 and February 2006 respectively.

During execution of works, the Management felt that to make the approach road suitable for rig movement, huge work was required to be carried out by cutting the hill tops and filling in five deep valleys. The conventional earth/protection work was not sufficient to protect the approach road. In view of these constraints, the ongoing works were suspended in February 2006, July 2006 and August 2006. Therefore, the work orders were terminated after incurring an expenditure of Rs.1.65 crore. Audit observed that no site survey was carried out by the Company before taking up civil works.

The Management stated (September 2008) that the site survey for this location was not carried out due to dense forest, hilly and difficult terrain and deep valleys. Therefore, the estimates for civil construction were prepared based on visual inspection carried out by a team of civil engineers.

The reply was not satisfactory as the Management failed to visualise the constraints/difficulties. Therefore, site survey should have been ensured before undertaking civil construction work. This also affected the exploration objectives in the block as the Company could not drill the location as planned.

6.7.5 Production testing and reserve creation estimation

6.7.5.1 Non-fixation of norms for production testing

After completion of drilling, production testing of the wells is conducted to establish presence of hydrocarbon. During the 10th FYP, 439 wells were drilled in six onshore basins. In 43 wells (four basins), production testing of 167 objects[12] was carried out by taking 2718 days as detailed below in Table-6.3:

Table – 6.3

Sl. No.	Name of basin	No. of wells	No. of objects tested	Total days taken for testing	Minimum-maximum days taken per object
1.	KG-PG basin	14	72	1054	09-57
2	Cauvery basin	05	19	224	10-14
3	Western Onshore basin	13	39	404	04-20
4.	A&AA, basin (Tripura Asset)	11	37	1036	15-70
	Total	**43**	**167**	**2718**	

Audit observed that the days taken for testing per object ranged from 4 to 70 days. The Company had not prescribed any norms for testing in terms of number of days to be spent per object of testing. In the absence of norms, the reasonableness of days taken by various parties could not be assessed.

The Management in response to the audit recommendation to prescribe norms in terms of number of days to be spent per object of production testing keeping in view the sub-surface conditions of various basins, stated (September 2008) during the Exit conference that it would analyse the actual time taken for production testing *vis-à-vis* preparatory activities for the same and take action for fixing norms accordingly.

6.7.5.2 Non-achievement of exploration objectives due to deferment of production testing

The Company released three locations (MKAA, DSAB, and MPAA) in Sibsagar District nomination block of North and South Assam shelf during 1996-97 to 2002-03. These locations were taken up for drilling after two to four years from the date of release of respective location. After drilling the wells, rigs were released on 16 July 2005, 13 November 2006 and 29 September 2007 respectively. Audit observed that after incurring an expenditure of Rs.64.40 crore the wells were not completed and production testing was deferred due to well complications. The desired exploration objectives from these wells could, therefore, not be achieved.

The Management stated (September 2008) that out of the three locations, production testing at location MPAA had been completed in May 2008. As regards DSAB, the area around the well had been declared as an eco-fragile zone in November 2006 subsequent to drilling of the location and further work required approval of the Supreme Court. The location MKAA was planned to be taken up for production testing in November 2008 with a hired rig.

The reply was not satisfactory as the two wells could not be tested so far affecting the exploration objective of the Company in the block. The Company should have ensured conclusive testing of the wells before release of the rigs.

---

[12] Object is an interval or section of a well which indicates a likely presence of oil/gas through drilling data as well as study of logs. This section is generally a reservoir under different sedimentary environments and holds hydrocarbon pools.

Recommendation No.6.3

The Company may ensure completion of conclusive production testing before release of rigs and avoid deferment of testing for long periods.

6.7.5.3 Increase in well cost

The location TK#1 was released as an exploratory 'B' category location in Sector 5-C nomination block with target depth of 3500 metres to probe the hydrocarbon potential and six objects were identified for production testing. After completion of drilling in November 2004, production testing was taken up in December 2004. Six objects were planned for completion in 62 days. However, the first three objects could be tested in 164 days and were found to be devoid of any hydrocarbon. Therefore, the well was abandoned (10 June 2005) without testing the remaining three objects. The Company decided (10 June 2005) to sidetrack the well and test the remaining objects in the sidetracked well (TK-1A). The drilling in well TK-1A was started on 8 August 2005 *i.e.* 59 days after the date of the decision to drill the sidetracked well. The delay increased the cost of the sidetracked well by Rs.2.08 crore.

Audit further observed that drilling of the sidetracked well was completed on 2 December 2005 and the well was hermetically tested on 24 December 2005. As per plan, five objects were identified for testing within 75 days. Production testing was started on 24 December 2005 and completed on 12 May 2006 by taking 140 days. As all the five objects were devoid of hydrocarbon, the well was declared dry and abandoned. Thus, excess days in production testing increased the cost of both the wells by Rs.8.11 crore.

Audit also observed that due to failure in fishing out 2 7/8" tubing which fell inside the main well, a side tracked well TK#1A was drilled at a cost of Rs.12.55 crore which could have been avoided with better planning of fishing equipment before drilling the well. Further, the rig remained idle for 20 days between December 2005 and May 2006 in the sidetracked well for want of compressor, logging party, equipment, *etc*. from the A&AA basin. Idling of rig resulted in avoidable excess cost to the well to the tune of Rs.70.60 lakh.

Thus, excessive time taken for production testing, delayed decision and non-availability of equipment resulted in increase in well cost by Rs.10.90 crore.

The Management admitted the facts and stated (September 2008) that it was being ensured that regular items like tubulars, casings, chemicals, *etc*. were procured as per plan, in advance, to avoid idling of the rig. Action was also being taken to keep stock of items like general fishing tools, *etc*.

6.7.5.4 Reserve accretion

The position of reserve accretion targets projected by the Company and actual reserve accretion thereagainst during the 10th FYP period in the six onshore basins is detailed below in Table-6.4:

Table – 6.4

Units in MMTOE[13]

[13] ***Million Metric Tonne Oil Equivalent***

Name of basin	Projections by Company	Actual accretion	Percentage of achievement
Western Onshore basin	71.10	127.15	178.83
Assam and Assam Arakan (A&AA) basin	85.30	62.17	72.88
Krishna Godavari and Pranhita Godavari (KG-PG) basin	64.00*	17.03**+174.32	298.98
Cauvery basin	26.00	29.10	111.92
Frontier basin	Nil	Nil	-
Mahanadi Bengal and Andaman (MBA) basin	Nil	Nil	-

**** Includes onshore and offshore as no separate targets were fixed.***
*****Onshore accretion.***

The Company achieved reserve accretion targets in Western Onshore basin, Krishna Godavari and Pranhita Godavari basin and Cauvery basin during the 10th FYP. However, it could not achieve reserve accretion targets in the Assam and Assam Arakan basin.

There was no reserve accretion in the Frontier and Bengal basins, even though exploration activities were being carried out by the Company in these basins since 1960s. The Company had also not projected any reserve accretion in these basins during the 10th FYP period.

The Management stated that reserve accretion targets were not fixed as the Frontier basins were still in the 'lesser known' domains as far as their petroleum system and hydrocarbon generation potential were concerned.

Recommendation No.6.4

The Company may fix reserve accretion targets in Frontier basins.

6.8. Conclusion

The Company did not complete the work commitments in nomination blocks and MWP under NELP blocks which led to avoidable payment of PEL fee and penalties. The Company had also not fixed standards/norms for assessment of performance of GPs resulting in wide variation in geophysical field activities in different basins. Similarly, no standards/norms were fixed for production testing. The Company took an abnormally long time in finalising the shot hole drilling and data acquisition service contracts resulting in idling of GPs for considerable periods of time. As a result of improper planning, delay in preparation of drill sites, non-availability of materials and tools and delay in finalisation of transport contract, various rigs of the Company remained idle for 1566 days.

The matter was reported to the Ministry in December 2008; reply was awaited.