

SYSTEMS ANALYSIS of DRILLING PERFORMANCE of OIL AND NATURAL GAS COMMISSION and OIL INDIA LIMITED

A Comparative Analysis for the Eastern Region based upon data on operations up to 1975, with draft
Recommendations

SYSTEMS RESEARCH INSTITUTE
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- I Computerised Data Base for the Detailed Analysis – Time Data
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- III Index to basic Data Tables and Charts
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INTRODUCTION & SUMMARY

1. INTRODUCTION

In his letter of June 9, 1975, the Secretary to Government, Ministry of Petroleum supplied some background material relating to the recommendation of the Committee on Public Undertakings of Parliament that a comparative evaluation be undertaken of the drilling performance of ONGC and Oil India Limited.

Para 8 of the Note enclosed with this letter lists the Terms of Reference of the Study which SRI was requested to undertake:

“The problem may perhaps be best studied by a competent third party, preferably a systems specialist whose terms of reference would be as follows:

- a. To **make a comparative evaluation** of the past performance of the onshore rigs of ONGC and OIL.
- b. To **evolve on that basis a set of criteria** for the **evaluation of drilling performance of ONGC and OIL** in the future
- c. To recommend, an **appropriate system of data collection and accounting** and. cost procedures to facilitate such an evaluation for the future.
- d. To make such other recommendations that may be relevant to the subject.”

The proposed evaluation study was accepted by SRI with the terms listed above, and this report presents the findings of the study. It is based upon seven man-weeks of personal visits to the field, and on several months of analytic work supported by computer analyses.

The Analyses have been summarised in Chapter 4 (10 pages) leading to the Conclusions and Recommendations in Chapters 5 and 6 respectively, while the presentation of the detailed analysis is reserved for Chapter 7. Extensive use has been made of charts and graphs where they were relevant. Since it is neither practical nor necessary to present all the graphs, charts or printouts which were computed during our analyses, a listing has been given of them in the Appendix.

As befits the policy-orientation of all systems analysis work, we have in our presentation emphasised the policy-relevant aspects, rather than techniques of the analysis. Chapters 2-6 are therefore as brief as possible and intended for technical management, while chapter 7 may be reviewed by technical specialists.

2. SUMMARY

Field visits (7 manweeks) and field data collection as well as existing tabulations of well-wise histories by the ONGC and by OIL provided the raw materials for our analysis.

Since ONGC drills proportionately more exploratory wells, aggregated comparisons were made only for the

developmental wells. Here too, extreme cases were disregarded in the analysis. Comparison is made (Ch.4) of a 'typical' developmental well in ONGC and OIL, derived from median values which are not influenced by extreme points.

Times:

OIL median commercial speed (metrage per drilling day) is **twice that of ONGC**, while the OIL cycle speed (which covers also the time for rig movement, rig-building and well-testing) is over one and a half times that of ONGC. However, the OIL mechanical speed was only 20% faster, and the number of fishing incidents was equal, suggesting equal technical skills. Substantial differences build up in the times taken for activities requiring coordination and team work, namely 'auxiliary operations', 'round tripping', and 'casing and cementation'. A detailed analysis (Sec 7.3) shows that the lower mechanical speeds may be partly due to limitations of the rig equipment. ONGC rig equipment has lower power, and a shorter life span than OIL rigs. It also has shorter inter-overhaul periods.

Costs:

Excluding depreciation and interest, total drilling costs/M for development wells are 15% higher in ONGC. Substantial differences build up in salaries and wages and material costs other than casings. The **median Marginal cost per meter is 30% higher** in ONGC than in OIL.

Exploratory Wells:

A comparison of exploratory wells (Sec 7.4) shows that OIL saves considerable time in production testing as well as in drilling days. OIL spends considerably more on Schlumberger tests and on bits and other materials (other than casings and POL) contributing to a much higher commercial speed, resulting in lower costs/meter, apart from substantial savings in rig depreciation.

Wide Scatter in Timings:

Data on all ONGC well timings per 1000 M show a much wider spread or scatter than ought to be considered natural. The median time taken for each activity is also consistently longer than for OIL. This is partly accounted for by apparent under-manning in the drilling department, and by the absence of well-head telecommunication links with headquarters for effective coordination of activities.

Recommendations:

Capital-related or time-dependent costs form the largest part of the costs of drilling. Therefore speeding up of operations through tight control is the most important step to lower the costs. The Recommendations include a simple set of speed-related reports for the Commission/Board/Ministry, as well as monitoring parameters for the respective General Managers. The uniform costing procedure evolved by the Joint ONGC/OIL expert team has been implemented in OIL. It should be reviewed after it has been in use for about three years.

The drilling performance of ONGC (ER) can be substantially improved despite the wide geographical dispersal of its operations. Greater regional autonomy and full staffing in the Drilling department is essential. We have recommended a Management By Objectives approach be taken to target setting for departments and field staff. ONGC efficiency is adversely affected by the break up of its offices between Nazira and Sibsagar and the long distances commuted daily by shift-duty staff. We recommend that all the headquarters offices be grouped at Sibsagar and that housing be built or leased there for all headquarters officers. Other townships, such as Nazira, centrally located with respect to production-development oil fields, should be developed for housing the concerned offices and shift staff, and well-head campsites built when wells are farther away. Future rig purchases should take into account their inter-overhaul time and working life as well as power and flexibility.