

A draft strategy paper on simultaneous exploration and production of Coal Bed Methane (CBM) with Oil & Gas is placed below for inviting comments and suggestions from all the stakeholders. The comments/ suggestions may be forwarded by 15th October,2007 at the following email ids:

Shri Anil Kumar Jain, Joint Secretary(Exploration):

jse.png@nic.in

Shri Vivek Kumar Dewangan, Director(Exploration):

yk.dewangan@nic.in

DRAFT STRATEGY PAPER ON SIMULTANEOUS EXPLORATION AND PRODUCTION OF COAL BED METHANE (CBM) WITH OIL AND GAS.

In India, scope for simultaneous operations for CBM and oil and gas exploration/production in the same area exists in Cambay basin (Gujarat), Barmer Basin (Rajasthan) and Cauvery basin (Tamil Nadu) wherein both CBM and Oil & Natural Gas occur in the same basinal areas. As far as technical feasibility and horizontal/vertical separation of CBM operations and Oil & Gas operations are concerned it is very well established that both operations could be carried out simultaneously. . However, certain broad guidelines and procedures may have to be followed in this endeavor. In case CBM and oil and natural gas formations are separated by lithological column of sufficient thickness between the two horizons, exploration and exploitation of CBM and natural gas from the same area could be carried out simultaneously by two different operators or by the same operator by drilling separate sets of wells and by having separate infrastructure due to variance in pressure regime and different nature of operations involved for the two kinds of gas. It is to be noted that any sub-surface interference between CBM and oil/gas wells is not likely due to separate infrastructures for two operations. A minimum distance between CBM and P&NG wells may have to be stipulated to avoid any disputes/litigation in future specially with regard to safety and environmental obligations.

2. The simultaneous operations for exploration and production of CBM with Oil & Gas and vice-versa need to take care of safety related issues, horizontal/vertical separation of CBM/ Oil & Gas operations, the single or multiple operator ship of block, various fiscal/legal/contractual issues, any amendment required under existing Act/Rules/Regulations etc. The related issues have been summarized as follows:

(a) Safety related issues:

- (i) Vertical geological horizon for CBM and natural gas have to be clearly defined in the lease agreement. This is to be done by the lease granting authorities.
- (ii) CBM and natural gas wells close to each other may cause interference, which may result in dispute/litigation. Therefore, minimum distance between such wells may have to be stipulated. This is to be done in consultation with Directorate General of Mines Safety (DGMS).
- (iii) Agreement between parties is required for siting of CBM/ Oil & Natural Gas wells and laying of pipelines and other installations in the same area. A model joint interaction agreement covering all aspects need to be evolved with inputs from all stakeholders.
- (iv) CBM may be treated a Natural Gas and therefore Oil Mines Regulations shall be applicable. Suitable changes may have to be brought in the legislation to provide for working of two or more mines in the same area and also precautions to be taken to prevent transference of danger. As CBM is treated as Natural Gas and falls under the jurisdiction of Ministry of Petroleum & Natural Gas, therefore operations will be governed by the Oil Fields Regulation and Development Act (ORDA), 1948 and Petroleum and Natural Gas (P&NG) Rules, 1959. Safety aspects will be governed by Oil Mines Regulation 1984 as in the case of oil and gas operations.

(b) Horizontal/ Vertical Separation of CBM operations and Oil & Gas operations :

The following aspects need consideration:

- (i) While granting Petroleum Exploration License (PEL) for simultaneous operations of oil/gas and CBM, the granting authority, if possible, may define the geological horizon in the vertical column where each of the activities would possibly be carried out. Defining the geological horizon, in case of PEL, may not be a pre-requisite to the grant of PEL as in several cases, this may not be

possible in the initial stages of exploration. However, at the time of granting Mining Lease (ML) for each of the operation, granting authority will necessarily define the geological horizons in the vertical column where the operations would be permitted under each ML by each of the operators.

- (ii) There is no need for any major horizontal separation between the two types of wells (CBM and Oil & Gas blocks) on the surface of the ground. Generally speaking around 25 to 30 metres spacing would be sufficient. In case of different operators regular exchange of information will be necessary between the two operators while drilling wells and completing surface facilities. If any problem arises, then DGH/MOP&NG can resolve the issue within the frame work of lease/contract signed and approved by the Government.
- (iii) Interaction Agreement between the operators will be required for well site selection, erection of installations, laying of pipelines, approach roads and all other relevant aspects of mutual concern. A model interaction agreement need to be evolved in consultation with all stakeholders.

(c) **Operator ship (Single operator Vs. Multiple Operator):** Although it is preferable that the same operator carries out both the operations where vertical separation between two producing horizons is less than 100 metres as it is well versed with geology and reservoir conditions. However, if the vertical separation is of the order of more than 100 metres, the option of different operators is feasible. The issue of operatorship has to be examined on case to case basis and depending upon the sub-surface geological conditions, the vertical separation can be reduced. The following options may be considered :

- (i) The CBM block (overlapping with the existing Oil & Gas block) or Oil & Gas block (overlapping with existing CBM block) may be offered through transparent international competitive bidding system as followed in CBM policy or NELP respectively. In case different operator wins the bid, joint interaction agreement needs to be evolved.

- (ii) Cases where geological conditions are such that CBM and oil & Gas are in very close vicinity in the vertical geological sequence and different operators are not possible, the existing operator (either CBM or Oil & Gas block) may be given right of first refusal in the open transparent bidding process as envisaged in Para (i) above. Another option could be to award the block on nomination basis to the existing operator based on the best fiscal and minimum work commitment or the average of fiscal terms and MWP obtained through the last bidding rounds of CBM and NELP may be made applicable.
- (iii) Open acreage system for Oil & Gas blocks may be made applicable to overlapping CBM blocks.

(d) Contractual obligations and issues related thereto: Oil & Gas blocks Production Sharing Contracts (PSCs) have the features of cost recovery to the operator and share of profit petroleum to the Government. However, the existing contracts for CBM block have features of production linked payment (PLP) to Government and no cost recovery to the operator. The contractual and fiscal terms of CBM vis-à-vis pre-NELP, NELP (New Exploration Licensing Policy) and discovered fields PSCs may be required to be modified. Cost benefit analysis of joint operations vis-à-vis several operations would be required taking into account technical operational issues. The minimum work programme for CBM operation for already signed exploration block, PSCs would be dependant on a number of factors i.e. area of block, number of coal seams and nature of development, market survey, availability of infrastructure etc. which may be worked out and negotiated before the award of block. Therefore, all the related contractual, operational and practical issues need to be addressed to in consultation with all stakeholders and the following may also be considered :

- (i) Separate contracts will need to be entered into for CBM and oil/gas operations in both the cases- either with multiple operators or with the same operator. Only in cases with the same operator, the Production Linked Payment (PLP) to Central Government will need to be negotiated separately with the licensee/lessee, as bidding process for PLP may not be feasible. The PLP

would, however, remain as a biddable item where multiple operators are possible.

- (ii) In terms of contracts entered into separately for CBM and oil/gas operations, separate fiscal accounting and quantification of both the operations will be maintained.

- (iii) Well completion method, surface facilities installed for both the operations are different. Similarly, exploration and exploitation techniques are also different for CBM and Oil & Gas operation. Rig deployed for drilling CBM wells are truck mounted portable type of rig. Air drilling is also possible for CBM wells since there is least possibility of encountering high pressure zone. Hence, surface facilities, well head fittings etc., are of low pressure rating. Generally, each CBM well has to be fitted with a sucker rod pump or a submersible pump to pump out the water (dewatering). CBM wells also require a separator at the well head to separate gas and water and also a compressor to pressurize the gas to facilitate further transporting the produced gas through pipe. Thus, it may be noted that except for some difference in the fixed costs, there seems to be no sizeable difference in the total expenditure in case of joint vis-à-vis separate operations.

(e) **Amendments in existing Rules, Acts and Regulation etc:** The consequential legal, operational and practical issues would require amendments in the existing Rules, Acts and Regulations viz. ORD Act, 1948, PNG Rules, 1959, Oil Mines Regulations, 1984 etc. Therefore, the required amendments may be carried out in consultation with all the stakeholders.
