15TH MEETING

HELD AT

HPCL REFINERY, BOMBAY

ON

DECEMBER 15, 1986

15th

By Registered Post

No.J-13013/1/85-Gen.XV
Government of India
Ministry of Petroleum & NaturalGas
...

Dated New Delhi the 28th Jan.1987.

To

1. All the Members of the Committee (by name)
2. All the participants listed at Annexure.

Sub: Brief Record of the 15th meeting of the Scientific Advisory Committee for the Ministry of Petroleum & Natural Gas held on 15-12-1986 in HPCL Refinery in Bombay.

Sir,

A copy of the brief record of the 15th meeting of the Scientific Advisory Committee for Ministry of Petroleum & Natural Gas held on 15th December, 1986 is sent herewith. Comments, if any, may kindly be furnished, immediately.

Yours faithfully,

(K.L.Gupta)
for Under Secretary to the Govt.of India

Encl: as above.

Copy alongwith copy of the minutes to:

1. Adv(EDP) 2. Adv(R)/Adv(E) 3. JS(M)/JS(E)/JS(R)/JSFA
4. PS to Secretary(P&NG)
5. US(R) for follow-up action the proposal for a new Technology Transfer Agreement(item 15.2)
6. FA&CAO, OIDB, 210, Ansal Bhawan, 16, Kasturba Gandhi Marg, New Delhi-110001.

(K.L.Gupta)
for Under Secretary to the Govt.of India

MINUTES OF THE 15TH MEETING OF THE SCIENTIFIC ADVISORY COMMITTEE HELD IN HPC REFINERY IN BOMBAY ON 15TH DECEMBER, 1986.

Participants:

List of Participants enclosed in Annexure.

At the outset Shri G. R. Raote, Director (Production) of HPCL expressed his appreciation for holding this SAC Meeting in their Refinery and welcomed members of the Scientific Advisory Committee(SAC). He also extended a warm welcome to the invitees and hoped that the deliberations would help in further progressing the technology. Prof. Sharma warmly responded to the welcome words of Shri Raote and said that he was happy to see so many technocrats participating in this meeting. Prof. Sharma indicated that due to some reasons Dr. Krishna, Director, IIP, could not participate in this meeting and requested the Ministry to clarify the position to Dr. Krishna to enable him to be present at the next meeting.

15.1 Confirmation of minutes of the 14th Meeting of SAC.

15.1.1 At the request of Chairman, Dr. Mukhopadhyay who presided over the 14th Meeting briefly mentioned the salient features of the discussions held in the 14th Meeting of SAC at Faridabad. After this the minutes were approved.

15.2 Proposal for a new Technology Transfer Agreement of Lubrizol India Limited.

15.2.1 At the request of Chairman, Shri P. K. Rudra, Chairman and Managing Director, LIL, presented the concepts and the scope of the assistance needed from the collaborators, under the proposed Technology Agreement. He also presented the present status of R & D.

Shri P. K. Rudra stated that the decision to have company's own R&D setup was envisaged only during the end of 1979 as a part of the current Technology Transfer Agreement. Though only a skeleton set-up was envisaged at that time, scope and content of R&D has been greatly enlarged during the years.

The R & D really started functioning effectively from 1982 and since then LIL has spent about Rs.6 crores and have built up reasonably good product development facilities, analytical facilities, rig testing and engine evaluation facilities. In addition, LIL also set up Pilot Plant further. LIL has a plan to spend another Rs. 3 Crores during the remaining period of the Seventh Plan on its R & D programme. At present, 79 people constituting 17% of the total manpower employed by the Company are employed in R & D. Shri Rudra stated that LIL is sparing no efforts in building up a strong R & D base as it is realised that a strong R & D with adequate

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engine evaluation facilities is a pre-requisite for a progressive additive manufacturing company. The Company's R & D efforts are not only confined to absorption of technology in the areas specified in the agreement but also working on development of new additive and additive systems outside the scope of the agreement. He also indicated that in addition to own R & D programme, the company has also sponsored a few projects with Indian Institute of Petroleum and National Chemical Laboratory.

15.2.2 Shri P. K. Rudra and Dr G. Jayarama Rao elaborated on the scope and objectives of the 8 year Technology Transfer Agreement currently in force and how effectively LIL has absorbed the technology. A Sub-Committee of the Board with a representative nominated by the Government of India has been reviewing the progress of transfer and absorption of technology and noted with satisfaction the progress made by LIL R&D with particular reference to the stated objectives.

The Agreement currently in force (and due to expire in Aug.1987) has limited scope and does not include transfer of technology with regard to some important additives. Additionally new additive systems have emerged and this has become more important in view of the recently introduced fuel efficient cars and two wheelers. There is a need to acquire expertise in the manufacture, formulation, testing and evaluation of these new additive systems in order to effectively serve the Indian market. While the Company's R & D is working in advancing its level of technology, it is felt necessary to acquire immediately the technology for the products not covered under the current Agreement by a new agreement. Acquiring these technologies from Collaborator would enable setting up the manufacturing facilities within a very short period. Engine Testing facilities which are generally very expensive, have to be built up over a period of years consistent with the company's resources, this activity is highly relevant to company's business and has considerable R & D element in it. Hence continued technical assistance for evaluation and advice for some high performance lubricants have also been suggested in the proposed agreement.

It has been seen that certain amount of in-flow of information and knowledge is continuously required to up-date the level of technology in view of continuous development in the existing product range. Also, in recent years, Lubrizol Corporation has been putting intensive efforts to improve the operational safety which has required considerable R & D work apart from engineering expertise. The treatment of effluent in the additive manufacture is also a highly specialised area. Continued assistance in these respects from the collaborator is desirable in view of the toxic nature of the chemicals handled by LIL.

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15.2.3 A detailed discussion took place on the general approach, need and scope of the agreement. All the members and some invitees very actively participated in this discussion and made several important and useful points concerning the scope of the agreement and also the need to strengthen the base and collaboration work to progress towards the objective of self-reliance in a short period. It was emphasised that in view of the rapid progress taking place in the Western countries and Japan both in the introduction of new additives and lubricants and equipment and system design, consistent with the contemporary standards of safety and cost effectiveness, there is a clear need to have a formal agreement with a world renowned company. The need for another Technology Transfer Agreement is established but the content should be suitably modified to include such items which are required by us and also on which the Lubrizol Corporation is having expertise. The agreement also should indicate the level and extent of capabilities expected to be achieved at the end of the agreement period. It was also considered that the duration of agreement should not be too short but be of about 7 years as proposed since installation and commissioning of additional facilities itself may take about 3 years.

There should be annual review of the progress of implementation under the agreement. It is realised that Technology Transfer Agreement and the indigenous R&D efforts are not mutually exclusive and equal stress should be laid on the development of products and applications through collaborative programmes, etc with R&D laboratories/Institutions in India. In this connection, the expertise available at CSIR laboratories in synthesis and scale-up should be effectively utilised by LIL. There is a need for LIL to be more open in exchange of information for successfully developing and completing collaborative projects. It was also stressed that the agreement should provide clear scope for undertaking the manufacture of products successfully developed through these collaborative arrangements. Also enough safeguards may be incorporated to avoid utilisation of such know-how by the collaborators without professional interaction.

15.2.4 After detailed discussions, it was agreed to recommend a new Technology Transfer Agreement on the following conditions:

(a) The Preamble may contain as an objective, the extent and capabilities to be attained at the end of the Agreement.

(b) The total duration of the agreement should be for 7 years.

(c) The agreement should provide for annual review of the progress.

(d) Under on-going support and technical services, the scope for providing assistance in possible hazards, hazards analysis, effluent treatment, etc. have to be more sharply defined.

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It will be necessary to include specifically the screening test procedures in the development of additives.

(e) Technology for Crude Flow Improver, V.I. Improver and Lube Pour Point Depressant may not be included within the scope of the proposed Technology Transfer Agreement. With regard to synthetic lube technology the proposal should include only poly-alpha olefins. Other synthetic oils eg. di-esters could be developed indigenously.

(f) The new agreement should include technology transfer and technology assistance in defined/specific areas. Clear emphasis should be laid on indigenous development wherever necessary outside these areas. The agreement should not be restrictive on the manufacture and introduction of products developed out of such indigenous efforts.

15.2.5 The Committee noted that LIL has been collaborating with some of the National Laboratories in the development work. It was, however, stressed that the linkages with National Research Laboratories, leading educational insitutions and IOC(R&D) have to be strengthened and the areas of co-operation enlarged. It was recommended that LIL should identify the areas for indigenous development in collaboration with such institutions.

15.3 Report of the High Powered Committee on assessment of Research potential in Petroleum.

At the request of Chairman, Dr. G. Jayarama Rao, mentioned that a high powered committee under the Chairmanship of Dr. Sidhu has submitted its report on assessment of research potential in the field of Petroleum. The terms of reference of the Committee included:-

1) identification of gaps in research with recommendations on strenghthening the base.

2) co-ordination of research activities in the various laboratories and the flow of information for the results to be utilised by the various organisations.

3) development of linkages between CSIR laboratories and public sector undertakings.

15.3.2 Dr. Rao also said that the report of the Committee is to be considered by the Scientific Advisory Committee to give its views on the various recommendations taking into account what they have already suggested in the previous meetings and also taking into account the work done on the creation of Centre for High Technology which was also earlier considered by SAC.

15.3.3 The Chairman suggested that this SAC may confine itself to that part of the report dealing with aspects of refining and gas processing. The petro-chemical part will be the

responsibility of the Department of Petro-chemicals for which there is a separate SAC and the exploration and production will be considered by the SAC for geo-sciences.

15.3.4 The recommendation on gas processing was considered in detail. Dr. Krishnamurthy mentioned that the direct removal of hydrogen sulphide and its conversion to sulphur has been adopted in the Hazira plant. No pilot plant facilities are envisaged to be set up along with the unit at Hazira. It is considered desirable to discuss various aspects of gas processing and the research and development needs for this in the next meeting of the SAC. For this purpose a EIL will prepare a paper for circulation to the members. The need for work of conversion of gas to middle distillates was raised in this context. It was mentioned that NCL has been asked to prepare a detailed report on conversion of olefines to middle distillates which is the second step in the conversion of gas to middle distillates. The location of the pilot plant facilities for such conversion and funding thereof can be decided after the receipt of this report.

15.3.5 The various recommendations of Dr. Sidhu Committee were considered in detail and the views of the SAC are as follow:-

1. Equipping some of the selected laboratories with modern analytical facilities may not be considered in isolation. Such assistance may be given whenever projects are sponsored in those laboratories.

2. The principle of taking people from the universities into the R&D laboratories of Public Sector Undertakings and assignment for a limited period is good. Similarly deputation of persons from manufacture and design companies to the universities is also good in principle. There seems to be some difficulties in implementing this.. These organisations should consider to get over those difficulties and implement such exchange of personnel in an effective manner.

3. It was again stressed that the refineries should equip themselves adequately with modern analytical facilities as they are making petro-chemicals and also supplying petro-chemicals feedstocks and these need identification of components. It was clarified that these need not be highly elaborate as in the centralised research laboratories but should meet the minimum requirements with reference to characterisation of various streams in a functional way.

4. The Centre for High Technology the creation of which was deliberated and recommended by SAC earlier - can develop detailed programmes of work in the gaps identified by the Committee. After deliberation by SAC, the financial assistance and the monitoring of the progress of implementation of the projects can also be done by this proposed Centre.

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5. Regarding the proposed development of hydrocracker technology, it was mentioned that OIDB has already approved on the recommendation of SAC, assistance of Rs.2.24 crores to IIP. Rs. 1.5 crores out of this has already been released. It was reiterated that IOC should purchase and install a pilot plant along with the purchase and installation of the first commercial hydrocracker. Dr. Mukhopadhyay of IOC, R&D was requested to follow it up.

6. Effective linkages on the projects completed can be developed through the mechanism of Centre for a High Technology on which the users and desitn organisations will be actively represented.

7. SAC endorses the recommendation that the major organisations should have a Director, R&D on their Board.

8. SAC did not want to express an opinion on the recommendation of the High Powered Committee that the SACs be replaced by research boards by the Ministry. Chairman suggested that the work done by the SAC in its fifteen meetings may be taken into account (by the Ministry) while considering this recommendation. It was mentioned that the Secretaries Committee was strongly advoacting the creation of SAC in all the ministries. Effective linkages between the SAC and the Centre for High Technology should be established for organisation of development work and its utilisation.

15.4 Operation of FCC Units.

15.4.1 Chairman said that although Dr. Krishna of IIP was not present, we may discuss the progress in the optimisation of catalysts and operations of FCC. He requested the representatives of the refineries to elaborate on the basis of the notes circulated.

15.4.2 Shri Vasudeva of IOC said that the new catalyst blend has reduced the coke formation and reduced the yield of LPG. Further it has marginally reduced the yield of slurry oil and also enabled an increase in the throughput. They are also providing multiple nozzle entry. With the new system and the operating conditions, they are able to operate the unit at 140% of the capacity and thus save Rs.55 crores on investment which was earlier estimated by UOP as required for increasing the capacity of 125%. Shri Kumar from CRL, Shri Raghavendran of MRL, Shri Raote of HPG and Shri Garg of BPC have also mentioned that they are trying zeolite blends and details will be given in the next meeting. Shri Raghavendran of MRL said that they have installed and commissioned the FCC pilot plant costing Rs. 1.5 crores. They will work on catalyst blends for optimisation.

15.4.3 Chairman enquired whether there is any experience on the use of Davisons catalyst systems which are Silicamagnesia type. They are supposed to be more slective for middle distillates. Shri Raghavendran of MRL said they will build up data on these catalysts, namely, DA 100, 240 and 300 in their pilot plant. Dr. Ratnaswamy was of the view that such catalysts may prove to be useful.

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15.5 C.I. Chemistry.

15.5.1 Dr. Chaudhari from NCL presented the paper on C-1 chemistry and highlighted the opportunities of producing a range of petro-chemicals starting from natural gas (methane).

15.5.2 Chairman said that petro-chemicals is the responsibility of a different Ministry and that they has reconstituted another Advisory Committee. Hence it is appropriate that detailed discussions on this paper and the decisions thereon are taken by that Advisory Committee. We may confine our discussion in this Advisory Committee on the other uses of C-1 from natural gas and olefines from the refineries. Dr. P.V. Krishna elaborated on licences given for conversion of methanol to acetic acid. Dr. P.V. Krishna agreed to consider this proposal to the extent it involves the production of petro-chemicals in the Scientific Advisory Committee for petro-chemicals.

15.6 Other points and next meeting.

15.6.1 On a point of information, Dr. Awasthi of IPCL said that evaluation of the reforming catalyst of IIP has not yet been started by them as their reactors are tied up with NCL catalyst and due to non-receipt of proper naphtha feedstock from IOC and the catalyst from IIP. He hoped that the proper feedstock will be made available soon for them to start the evaluation as soon as the reactors are free.

15.6.2 It was agreed to hold the next meeting of the SAC on 13th March 1987 at Digboi. Shri Vasudeva of IOC has offered to make all arrangements. The following topics will be considered at the next meeting. The necessary papers for discussion will be prepared by the organisations noted against each and sent to the Ministry of Petroleum before the end of January, 1987, to enable them to circulate to the member in time.

1. Gas Processing - EIL.
2. Olefines to middle distillates. - NCL.
3. Upgradation of cracked naphtha to middle distillates. NCL.
4. New strategies in reforming - IIP.
5. Naphthalene from petroleum fractions - Dr. Kothari.
6. Hydrogenation of ATF - NCL and MRL.

Chairman on behalf of SAC thanked Shri Raote of HPCL for their hospitality.

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ANNEXURE - 3

LIST OF PARTICIPANTS - SAC MEETING

1.	Prof. M. M. Sharma	Chairman,	UDCT, Bombay.
2.	Dr. A. V. Rama Rao	Member	RRA, Hyderabad.
3.	Dr. P.K. Mukhopadhyay	Member,	Director, IOC R&D.
4.	Prof. Goverdhan Mehta	Member,	Central University, Hyderabad.
5.	Dr. P.V. Krishna,	Member	Adviser, Min. of Industry
6.	Shri P. K. Goel,	Member	GM, PCRA, New Delhi.
7.	Dr. H. S. Rao,	Member	Consultant.
8.	Dr. G. Jayarama Rao,		Adviser(R), Min. of P & NG.
9.	Shri G. R. Raote,		HPCL, Bombay.
10.	Shri S. K. Mukerjee,		HPCL, Bombay.
11.	Shri P. K. Rudra		LIL, Bombay.
12.	Dr. K.L. Malik		LIL, Bombay.
13.	Shri B. Sanghavi		LIL, Bombay.
14.	Dr. D. N. Rihani		EIL, New Delhi.
15.	Dr. R. Krishnamurthy		EIL, New Delhi.
16.	Shri G. Raghavendran		MRL, Madras
17.	Shri S. R. Setlur		Consultant, OCC.
18.	Shri A. C. Kapadia		GAIL, New Delhi.
19.	Shri R. P. Garg,		BPCL, Bombay.
20.	Shri P. S. Karthikeyan,		BPCL, Bombay.
21.	Shri A. Rebello		CRL, Cochin
22.	Shri K. L. Kumar,		CRL, Cochin.
23.	Dr. G.R. Venkatakrishnan		NCL, Poona
24.	Dr. R.V. Chaudhari		NCL, Poona.
25.	Dr. P. Ratneswamy		NCL, Poona.
26.	Dr. R.A. Mashelkar		NCL, Poona.
27.	Shri J. L. Vasudeva,		IOC, New Delhi.
28.	Dr. N. C. Kothari		OIDB, Bombay.
29.	Shri S. K. Awasti,		IPCL, Koyali.

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