44TH MEETING

HELD AT

GAIL, UPCC COMPLEX, PATA

ON

FEBRUARY 19 - 20, 1999

उच्च प्रौद्योगिकी केन्द्र

(पैट्रोलियम एवं प्राकृतिक गैस मंत्रालय)
पाँचवां तल, कोर 6, स्कोप कॉम्पलैक्स, 7, इन्स्टीट्यूशनल एरिया, लोधी रोड, नई दिल्ली - 110 003

Centre for High Technology

(Ministry of Petroleum & Natural Gas, Govt. of India)
5th Floor, Core 6, SCOPE Complex, 7, Institutional Area, Lodhi Road, New Delhi - 110 003
Telegram : CENTHITECH, Fax : 4362879, 4697350

उ.प्रौ.के./एस.ए.सी./ 732
CHT/SAC/

मार्च 9, 1999
March 9, 1999

सेवा में,
TO,

1. पेट्रोलियम और प्राकृतिक गैस मंत्रालय की वैज्ञानिक सलाहकार समिति के सभी सदस्यों को ।
1. All Members of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas.

2. सभी तेल कंपनियों के मुख्य कार्यकारियों को ।
2. Chief Executives of all Oil Companies.

विषय : पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 44वीं वैज्ञानिक सलाहकार समिति के कार्यवृत्त का परिचालन ।

Sub.: 44th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas - Circulation of Minutes.

महोदय,
Dear Sir,

पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 19 और 20 फरवरी, 1999 को यू.पी.पी.सी. कॉम्पलैक्स, गैस ऑथारिटी ऑफ इण्डिया लिमिटेड, पाटा में हुई वैज्ञानिक सलाहकार समिति की 44वीं बैठक के कार्यवृत्त की प्रति आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Enclosed, please find a copy of the minutes of the 44th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and Natural Gas held at UPPC Complex, GAIL, Pata, on 19 & 20 February, 1999, for your information and necessary action.

धन्यवाद !
Thanking you,

भवदीय,
Yours faithfully,

(के. रविकुमार)
कार्यकारी निदेशक
(K. Ravikumar)
Executive Director

10/3/99

संलग्न : यथोक्त
Encl.: As above.

प्रतिलिपि : प्रो. एम.एम. शर्मा,
502, सौरभ,
प्लॉट नं. 39, कुन्दुर मार्ग,
स्वास्तिक पार्क, चैम्बूर,
मुम्बई - 400 071.

Copy to : Prof. M.M. Sharma,
502, Saurabh,
Plot No. 39, Kundur Marg,
Swastik Park, Chembur,
Mumbai - 400 071.

1. सलाहकार (आर) / सलाहकार (इ) / संयुक्त सचिव (आर)/संयुक्त सचिव(इ) / सहायक सचिव (एम) / उप सचिव (सी.सी.)
1. Adviser(R) / Adviser (E) / JS (R) / JS (E) / AS (M)/ DS (CC)
2. एफ.ए. एवं सी.ए.ओ., ओ.आई.डी.बी.
2. FA & CAO, OIDB
3. पेट्रोलियम और प्राकृतिक गैस मंत्रालय के सचिव के निजी सचिव को ।
3. PPS to Secretary, MOP&NG

Minutes of the 44th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas held on 19 and 20 February, 1999 at GAIL, UPPC Complex, Pata

List of participants is attached.

Shri C.K. Prasad, CMD, GAIL, extended a warm welcome to the Chairman, Scientific Advisory Committee (SAC), other distinguished members of the SAC and all the invitees. He highlighted that Gas transmission and distribution formed the bulk of GAIL's business today followed by gas processing and LPG production. He informed that the company operated around 4000 KM of pipelines in all four regions of the country supplying about 60 million cubic meters of gas per day as fuel for power plants for generation of about 700 MW of power and as feed stock to fertilizer plants to produce about 10 MMTPA of urea and to about 150 industrial units to meet their energy and power demands. He further emphasized that GAIL has now diversified into the area of petrochemicals and the UPPC Complex , which is only one of its kind in northern India, is under commissioning and will enter the market shortly. The plant is gas based with a capacity to produce 300,000 TPA of ethylene, 100,000 TPA of HDPE, 160,000 TPA of HDPE/LLDPE and about 10,000 TPA of chemical grade propylene. He also mentioned that GAIL is currently involved in setting up Piped Gas Distribution Systems for domestic consumption in Mumbai, Delhi and Agra and is also one of the lead agencies for introduction of CNG for the automotive sector. He informed that GAIL is entering into joint ventures for accelerating the growth of the company into related business areas such as import of LNG, distribution of Natural Gas etc.

Shri C.N. Trivedi, Executive Director, UPPC Complex, GAIL, gave an overview of the GAIL petrochemical plant. During the presentation, he emphasized that the commissioning activities of UPPC complex at Pata was completed in a record time of 36 months. He shared with the members the industrial experience on the quality aspect and transportation of equipment during construction of the UPPC complex. He also shared the details on the various processing units, application of products, erection experience of equipment at site and the environmental and social development activities at UPPC complex.

Prof. M.M. Sharma, Chairman SAC thanked the GAIL management for hosting the meeting. He said that UPPC complex at Pata exemplified the case of an environmentally clean plant. He emphasized that it is a fact that in the pursuit of valorization of natural gas, none of the C_2 and C_3 hydrocarbons should be burnt as fuel or given to fertilizer plantsand that is how the UPPC complex at Pata has come up. He further added that though the complex was complementary to world standards when the plant was conceived, the capacity of ethylene plant today is as high as 750,000 MTPA. He also expressed the concern of SAC members with the concept of utilization of natural gas for power generation when ample scope exists for utilisation of natural gas for ammonia. In view of the massive expansion projects of GAIL with respect to pipeline network, he informed that

SAC has encouraged the R&D institutes to come up with R&D projects for upgradation of existing pipelines.
He further added that enormous opportunity exists for further improving the economics of the UPPC complex by production of additional ethylene and catalytic dehydrogenation of propane to propylene for production of polypropylene. Option for import of propylene from Mathura and Panipat refineries of IOCL can be explored by GAIL. With respect to LPG production, he said that tremendous opportunity exists, since the LPG requirement of 10 MMTPA in near future may well be a reality.

Shri H.P. Chandana, Director, Planning, GAIL, thanked chairman, SAC and all the other members for their suggestions for improving the profitability of the complex, and said that the same, specially w.r.t. polypropylene production was worth pursuing.

The Agenda items were then taken up for discussion.

44.1 **Proposal on "Development of Polymer Modified Bituminous Binder" by IIP-Dehradun /CRRI / CRL**

Shri U.C. Gupta, Scientist, IIP, Dehradun made a presentation on the above proposal. Initial presentation was made in the 41st meeting of the SAC at CRL. Subsequently, presentation on a joint proposal by IIP /CRL was made in the 43rd SAC meeting at EIL, R&D Centre, Gurgaon. SAC had advised IIP to interact with CRRI in view of their expertise in this field. IIP informed that the proposal has been supported by CRRI and also CRL has agreed for participation in the project.

The project, a collaborative effort amongst IIP/CRL/CRRI, involves development of a process for making improved quality bitumen by incorporating polymeric materials like SBS, EVA, ADP etc. into the available feed stock at CRL, at a cost of Rs. 35 lakhs only.

Shri Gupta detailed out the work plan and responsibilities of each of the companies viz. IIP/CRL/CRRI and mentioned that for laying the bitumen, structurally adequate test track for comparing performance with conventional bitumen will be selected by CRRI.

Shri Arya of CRRI, presented results of field study showing better performance of the PMB as compared to neat Bitumen, both in hot and cold climates. He also shared with the members, the details of the facilities available at CRRI for performance monitoring of PMB. With respect to use of PMB, Chairman, SAC informed that all over the world modified asphalt is preferred over cement / concrete for road laying because of ease of laying and also ease of repair and replacement of asphalt as compared to cement /concrete.

Chairman, SAC and other members suggested that the cost of the project has to be revised to include the cost of bitumen and additive. IIP shall forward the

revised cost estimate to CHT for further action. IIP will also obtain firm commitment from CRL that 25% of the total revised cost will be borne by CRL. IIP shall provide enough input to CRL for putting up the proposal to Board

44.2 **Proposal on "Development of Zeolite based Catalytic Reforming Catalyst" by IIP-Dehradun .**

Presentation on the above proposal was initially made in the 43rd SAC meeting in October 1998. SAC had advised IIP to bring down the project cost estimate to 65 lakhs and furnish detailed cost break up of each item. While presenting the details of the revised cost estimate, Dr. S.K.Kapoor of IIP clarified the following points based on queries raised by the participants :

i) C1 and C2 yield with zeolite catalyst is lower as compared to Alumina catalyst

ii) Feed stock to the reformer shall be C6-170 deg. C cut

iii) The zeolite catalyst can be used for SR as well as CCR.

iv) Patent for the catalyst can be obtained by IIP

v) Benzene selectivity is 60-70% as compared to 30% with Alumina catalyst.

vi) Hydrogen yield is 20-30% higher than with Alumina catalyst.

vii) The catalyst is for aromatic production and not for octane enhancement.

Chairman, SAC and other members were of the view that since performance of the bimetallic reforming catalyst developed by IIP has already been established, the element of risk in use of this catalyst is minimal. They requested IOCL and BPCL to consider participation in the above project.

The proposal has been recommended, by SAC, for funding by CHT/OIDB at a cost of Rs. 65 lakhs only.

44.3 **Proposal on "Development of Catalyst and Technology for Deep Catalytic Cracking (DCC)" by IIP-Dehradun .**

Dr. R.P.Badoni, Scientist, IIP made presentation on the above proposal. Detailed technical presentation of the proposal was made by IIP in the 40th SAC meeting at Hadia in December 1997 and subsequently the financial proposal, giving the fund requirement for the project was submitted in the 43rd SAC meeting in October 1998. SAC had advised IIP to bring down the project cost to Rs. 50 lakhs from Rs. 84 lakhs.

Chairman, SAC and other members while recommending the project for financing by CHT/OIDB at a cost of Rs. 50 lakhs only, made the following observations :

i) Completion time of 36 months is too long and needs to be reviewed

ii) Not only VGO but also residue feed stock to be considered for DCC.

44.4 **Proposal on "Identification and Estimation of Polynuclear Aromatic Hydrocarbons in Fuel and Engine Exhaust Emissions" by IIP-Dehradun .**

Dr. Pradeep Kumar, Scientist, IIP had made a presentation on the above proposal for setting up appropriate methods and generation of data of total aromatics and Polycyclic Aromatic Hydrocarbons (PAH) in diesel fuel and study the variation of particulate matter and individual PAH content of diesel fuel and engine variable in the 43rd SAC meeting. SAC had advised IIP to bring down the project cost from Rs. 105 lakhs to 45 lakhs.

After deliberations, Chairman SAC and other members recommended the proposal for funding by CHT/OIDB at a cost of Rs. 45 lakhs only.

44.5 **Proposal on "Establishing a New Mechanism of Boundary Lubrication" by IISC Bangalore / IIP-Dehradun .**

Prof. S.K.Biswas, IISC, Bangalore made the above presentation. The presentation covered the recent findings in the area of boundary lubrication and considered evolving an understanding of boundary lubrication, evaluate the new boundary lubricants and develop designer lubricant molecules.

In the first phase, a methodology for study of boundary lubricants would be established, which would then be applied to study practical EP additives. The second phase involves studying the role of surfactant on a metal substrate. The budgetary requirement of the project is around Rs. 3.095 crores.

Chairman SAC and other members felt that the project merits consideration, being potentially very useful and interesting. In view of the importance of the project and high science involved in it, it was recommended that DRDO and IOCL should be involved in the project. Chairman, SAC recommended IIP to approach Scientific Adviser, DRDO, Govt. of India, for participating in the project since DRDO may have special requirements of lubricants for defense purpose.

Chairman SAC and other members further advised that one or two additional problems could be taken up with IISC, Bangalore,. IOCL could think of funding small projects in the area, for which solution was still not available to them.

44.6 **Proposal on "Catalyst and Technology Development for Isomerisation of Naphtha" by IIP-Dehradun.**

44.6.1 Shri N.Ray, Scientist, IIP made the above presentation, which covered need and impact of limiting benzene in gasoline and options available for low benzene MS production.

The proposal considers development of catalyst formulation viz. development of modified Pt. - Modernite catalyst to address the problem of benzene reduction with low hydrocracking activity. The total cost of the project is estimated at Rs. 68.24 lakhs, with completion schedule of 30 months.

Chairman SAC suggested that IIP may consider merging of this proposal with other proposals on Reformer as an add-on to take care of the isomerisation part.

44.6.2 Taking into consideration, the requirement of reduction of benzene in gasoline, based on environmental stipulation, and cost of hydrogenation being high, Chairman ,SAC requested IOCL, R&D to develop a study paper on "Production of Alkylates in India". The study would cover details w.r.t the requirement, possible quantity, location etc. IOCL- R&D shall make the presentation in the next SAC meeting.

44.7 **Proposal on "Development of a Biocatalyst for Desulphurisation of Diesel in Near Non-aqueous System" by IIP-Dehradun / IIT, Delhi**

Dr. D.K.Adhikari, Scientist, IIP and Dr. J.K.Deb, Asso. Prof. IIT-Delhi made presentation on the above proposal. The presentation covered the details of the Biodesulphurisation (BDS) process, the advantages of BDS over Hydrodesulphurisation, work already carried out by IIP and future work plan etc.

Chairman SAC and other members felt that the proposal in its present form did not merit consideration. IIP shall submit a revised proposal at a lower cost taking into consideration requirement of post treatment facilities for BDS.

44.8 **Presentation by IIP-Dehradun on "DPR on National Lube Testing Facility (NTLF)"**

Based on the recommendation of SAC, the job of preparation of DPR for establishment of National Lubricant Test Facility was awarded to IIP, Dehradun at a total cost of Rs. 15 lakhs and with time schedule of 8 months, in January 1995. The DPR was to cover the proposed activities, suggest structure and program of work including time and cost requirements for the NTLF.

The draft report was submitted by IIP in February 1998 and distributed to all oil companies. IIP informed that comments on the draft report have been received by them and the final report after incorporation of the comments will be submitted by February 1999.

SAC advised IIP to discuss with Adviser (R), MOP&NG and ED, CHT for further action.

44.9 Shri S.N. Sharma, Scientist, CSIR made a presentation highlighting the areas identified along with the groups and nodal agencies comprising different organisations for evolving / formulating R&D projects for consideration of SAC in

the area of Enhancing Capacity of Pipelines for transportation of hydrocarbons. The above presentation was based on the interactive meet held on 23rd November, 1998 at CSIR, New Delhi, with participation from oil companies, R&D institutions and Academia.

Shri Sharma mentioned that in all ten proposals are expected to be received by CSIR in the areas of Enhancing Life of Pipelines and Enhancing Throughput of Pipelines. As advised by Chairman, SAC, the nodal agencies will be requested to develop detailed project proposals for presentation to SAC.

44.10 It was decided that the 45th SAC meeting will be held at IOCL- Barauni on 28-29 May, 1999.

44.11 Shri C.N.Trivedi, Executive Director, UPPC Complex, thanked Chairman, SAC and other members for giving GAIL the opportunity to hold the meeting at UPPC Complex at Pata and for giving guidance and showing the direction for improvement .

44.12 Pro. M.M.Sharma, Chairman, SAC thanked the GAIL management and the whole GAIL team for the efforts made in making the 44th SAC meeting successful inspite of the on-going commissioning activities of the UPPC plant.

Annexure - I

44th Meeting of the Scientific Advisory Committee on Hydrocarbons of Ministry of Petroleum & Natural Gas

List of Participants

Members

S/Shri

1. Prof. M.M. Sharma, Chairman, SAC
2. Dr. S. Vardarajan, President, INSA
3. K.P. Shahi, Adviser (R), MOP&NG
4. Dr. S.K. Singhal, Acting Director, IIP, Dehradun
5. S.N. Sharma, Scientist, CSIR
6. K. Ravikumar, ED, CHT, New Delhi

Others

7. Dr. S.Ghosh, ED, IOCL-R&D
8. A. Soni, ED,EIL (R&D)
9. Dr. S. Banik, AGM, EIL (R&D)
10. Dr. K.C. Koshel, GM (Chem.), ONGC
11. Dr. G.P. Rai, Sr. R&D Mgr., BPCL (R)
12. G.G. Rajan, DGM (R&D), CRL
13. N.S.J. Rao, CM (t), HPCL
14. S.R. Rao, Mgr.(R&D), HPCL- MR
15. Dr. M.O.Garg,Dy. Dir., IIP, Dehradun
16. A. Datta, Sc. G, IIP, Dehradun
17. Dr. K.S. Jauhri, Dy. Dir., IIP, Dehradun
18. Dr.V.K. Kapoor,Dy. Dir IIP, Dehradun
19. Dr.Pradeep Kumar, Sc. 'F', IIP, Dehradun
20. R.P. Badoni, Sc.E-II, IIP, Dehradun
21. D.K.Adhikari, Sc. E-I, IIP, Dehradun
22. U.C. Gupta, Sc. E-I, IIP, Dehradun
23. N.Ray,Sc.E-II, IIP, Dehradun
24. Dr.M.R.Tyagi, IIP, Dehradun
25. R.L.Mendiratta, Sc.E-II, IIP, Dehradun
26. Prof. S.K.Biswas, IISc., Bangalore
27. S.Sampath, Asst. Prof., IISc, Bangalore
28. P.S.S. Sastry, Geologist, OIL
29. Dr. J.K. Deb, Asso. Prof. IIT-Delhi
30. V. Moudgil, Mgr. (Engg.), IBP, Delhi
31. B. Saha, Mgr. (Tech. Services), BRPL
32. Arya, CRRI, Delhi
33. A.K. De, ED (E&I), GAIL
34. R.G. Rajan, SM (Tech.), GAIL
35. Ms. Gita Dutta, Joint Director, CHT, New Delhi