46TH MEETING

HELD AT

MADRAS REFINERIES LIMITED, CHENNAI

ON

AUGUST 19 - 20, 1999

उच्च प्रौद्योगिकी केन्द्र
(पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय)

Centre for High Technology
(Ministry of Petroleum & Natural Gas, Govt. of India)

उ.प्रौके/एस.ए.सी./ 1320
CHT/SAC

सितम्बर 6, 1999
September 6, 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 वैज्ञानिक सलाहकार समिति की 46वीं बैठक के कार्यवृत्त का परिचालन ।

Sub.: 46th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas - Circulation on Minutes.

महोदय,
Dear Sir,

पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 19 व 20 अगस्त, 1999 को मद्रास रिफाइनरीज लिमिटेड, चेन्नई में हुई वैज्ञानिक सलाहकार समिति की 46वीं बैठक के कार्यवृत्त की प्रति आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Enclosed, please find a copy of the minutes of the 46th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and Natural Gas held at Madras Refineries Limited, Chennai on 19 & 20 August, 1999, for your information and necessary action.

वैज्ञानिक सलाहकार समिति के अध्यक्ष प्रो0 एम.एम. शर्मा द्वारा बैठक दौरान जारी किए गए **"भावी वाहन ईंधन"** सम्बन्धी लेख की प्रति भी संलग्न है ।

Also enclosed is copy of article on **"Future Transport Fuels"** , circulated by Prof. M.M. Sharma, Chairman, SAC during the meeting.

धन्यवाद ।
Thanking you,

भवदीय,
Yours faithfully,

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

संलग्न : यथोक्त
Encl.: As above.

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Copy to : **Prof.: M.M. Sharma,**
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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. सचिव., ओ.आई.डी.बी.
2. **Secretary, OIDB**
3. पेट्रोलियम और प्राकृतिक गैस मंत्रालय के सचिव के निजी सचिव को ।
3. **PPS to Secretary, MOP&NG**

Minutes of the 46th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas held on 19 and 20 August, 1999 at MRL, Chennai

List of participants is attached.

Shri A. Vardarajan, ED (Ops), MRL extended a warm welcome to the Chairman, Scientific Advisory Committee (SAC), other distinguished members of the SAC and all the representatives from the oil companies.

Shri C.R.Prasad, CMD, MRL highlighted the major changes witnessed by the oil industry and refining industry in particular w.r.t. mergers and acquisitions taking place to meet the pressures on refinery margins. He emphasised the important role being played by SAC in the liberalised scenario, specially in view of the requirement of new technologies for improved quality fuels and other products to meet the environmental demands and improved operational efficiency. While highlighting the important role of R&D in refining processes, Shri Prasad informed that MRL has put up several pilot plant facilities for various refinery processes and effluent treatment. He further added that MRL has achieved notable results through collaborations with National Scientific Laboratories like IIP, NCL and Academic Institutions like IIT etc. The development of lube extraction technology is worth mentioning in this regard. This technology, a collaborative effort of MRL, EIL, IIP has proved to be commercially successful with the commissioning of the new lube plant at IOCL -Haldia Refinery. He also highlighted the R&D efforts of MRL in improving waste water treatment processes and indigenisation of Reverse Osmosis membranes through collaboration with CSMCRI.

A video presentation was made covering the salient features of MRL including the environmental activities at MRL, in view of the Golden Peacock Award for environmental control won by MRL in the recent past.

Prof. M.M. Sharma, Chairman SAC thanked MRL for hosting the meeting. While recalling the constitution of SAC on Hydrocarbons under the then Ministry of Petroleum and Chemicals, he highlighted the sincere efforts for proactive manoeuvres made by SAC specially in the areas of product quality improvements for production of designer fuels, creation of R&D in EIL etc. He also added that the benzene / toluene plants in BPCL and later at CRL opened a legendary chapter in the history of SAC. He further stressed on the need for integration of power plants and petrochemicals within the refineries for sustained profitability in the competitive market. Highlighting the recent major changes that have taken place world-wide viz. AMOCO-BP merger, shutting down of around 25% refineries in Germany due to non-economic operation, he emphasised that mergers of refineries in India is also to be given importance since it is very difficult to justify the existence and profitable operation of small refineries. He also emphasised the need for commercialisation of the indigenous technology and said that the

indigenisation of aromatic technology and also the lube extraction technology are great achievements in this area.

The Agenda items were then taken up for discussion.

46.1 **Proposal of MRL / CSMCRI on "Commercialisation of Indigenous Reverse Osmosis Membrane Technology".**

Dr. V.J. Shah, Scientist, CSMCRI made the presentation on the above proposal.
CSMCRI has developed and commercialised Reverse Osmosis (RO) membrane technology based on Cellulose Acetate and also developed the Aromatic Amide Thin Film Composite membrane indigenously. MRL is collaborating with CSMCRI in their indigenous efforts. A pilot plant unit fabricated by CSMCRI is in operation at MRL for past eighteen months.

The present proposal considers setting up of a demonstration plant at MRL for desalination of sewage water using the RO membrane technology and scaling up of indigenous RO elements to meet the performance of imported RO elements, particularly w.r.t. life of the membranes.

Chairman SAC pointed out that RO membrane technology can also be used in the solvent extraction process for removal of residual solvents from lube oils.

After detailed deliberations, Chairman, SAC and other members recommended the proposal for funding by OIDB/CHT at a total cost of Rs. 60.0 lakhs. On a query from Secretary, OIDB, it was clarified that MRL has already invested in the project for setting up the pilot plant. Hence any additional investment by MRL in the project has not been made mandatory.

46.2 Shri S.K.Singhal, Director (Acting), IIP-Dehradun, made a presentation on Technology Evolution in Petrol and Diesel Engines to meet the emission standards emerging in India and elsewhere w.r.t gasoline and diesel fuels.

46.3 **Proposal of EIL-R&D on "Development of Advanced Controls Package" to be tested on fired heaters**

Dr. B.S.Gill, DGM, EIL-R&D, made presentation on the above proposal. The project is proposed to be carried out in two phases. In Phase -1, it is proposed to develop Advanced Control Packages viz. PRBP, QDMC and PEMS and test and validate the fired heater at EIL-R&D. In Phase-2, the Advanced Control technology is proposed to be implemented on an industrial scale in the fired heaters at BPCL.

Chairman, SAC and other members felt that the proposal merits consideration. However, financial participation of user industries in both phases of the project have to be brought in by EIL.

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

As advised by Chairman SAC during the 45th meeting, IIP put up a revised proposal on the above after consultation with IOCL-R&D. Shri V.K. Kapoor, Scientist, IIP informed that IOCL is in complete agreement with the revised proposal and has agreed to fund 25% of the total project cost.

The proposal considers development of a catalyst for C5/C6 isomerisation and study its performance for octane gain and benzene reduction. The project will be carried out by IIP in collaboration with UCIL.

Chairman, SAC and the other members recommended the proposal for funding by OIDB/CHT. The total cost of the project, taking into consideration the norms set up by OIDB, the total cost of the project works out to Rs. 55.42 lakhs, out of which Rs. 13.86 lakhs will be borne by IOCL-R&D. The balance of Rs. 41.56 lakhs will be funded by OIDB/CHT.

46.5 **Proposal on "Development of a Biocatalyst for Desulphurisation of Diesel in Near Non-aqueous System" by IIP**

The project will be jointly carried out by IOCL-R&D, IIP and IIT-Delhi.

Dr. D.K Adhikari, Scientist, IIP made presentation on the above proposal. As advised in the last SAC meeting, the revised proposal was developed after discussions with Energy Bio System Corporation (EBS) of USA, IIP and IOC-R&D. The proposal focuses on Desulphurisation of HDS treated diesel and cracked distillates for reduction of sulphur from 2500 to 100 ppm in finished HSD.

The project is proposed to be taken up in two phases. Phase 1 would cover screening and isolation of micro-organisms, Development of bio catalyst and bio process whereas Phase -2 considers Process scale-up to pilot plant . Phase -2 is proposed to be taken up based on results obtained from bench scale studies.

Chairman SAC and other members felt that the BDS process has merit for super refining of diesel for reduction in sulphur level to very low values and the proposal has been developed as a result of proactive role played by SAC and deserves to be supported as a futuristic technology. Phase -1 of the proposal was recommended for funding by OIDB/CHT, with 25% of the total project cost being borne by IOCL-R&D. The members, however, felt that 5 years completion period was too long for the project and needs to be revised. IIP shall forward to CHT the revised completion schedule and cost estimates for Phase-1 of the project.

46.6 **Proposal on "Corrosion Inhibitors for Transportation Pipelines"**

Participating organisations in the above project are IIP,IOCL-PPL, IOCL-R&D, ONGC, CECRI and NML.

SAC during its 45th meeting had advised IIP to put up a revised proposal on the above, bringing in user industries viz. IOCL and ONGC as financial partners, sharing a minimum of 25% of the total project cost. Dr. V.K.Bhatia, Scientist, IIP, Dehradun made a presentation on the revised proposal.

Chairman, SAC and other members of SAC recommended the proposal for funding by OIDB/CHT. The total cost of the project, revised as per norms set up by OIDB, works out to Rs. 84.0 lakhs, out of which Rs. 28.0 lakhs will be borne by IOCL and ONGC. Balance Rs. 56.0 lakhs will be funded by OIDB/CHT.

46.7 **Proposal of IIP on "Development of Additives and Chemicals for Enhancing Flow in Pipelines"**

IIP-Dehradun, IOCL -PPL, IOCL -R&D, ONGC and RRL, Jorhat will participate in the above project. Dr. V.K. Bhatia, Scientist, IIP -Dehradun made the presentation on the proposal which considers development of flow improver additives viz. pour point depressants and wax dispersants for crude oil transportation and study of wax deposition problems in crude oil pipelines. Also, development of drag reducers for crude oil and product pipelines has been considered.

The total cost of the project will be revised as per norms set up by OIDB.

Chairman, SAC and other members recommended the proposal for funding by OIDB/CHT subject to firm commitment from IOCL and ONGC regarding participation in the project and sharing of funds to the extent of minimum 25% of the total project cost.

46.8 **Proposal of EIL -R&D on "Development of Sulphur Degassing Process"**

Dr. P.K. Sen, DGM, EIL-R&D made presentation on the above proposal. GNFC, Bharuch will be associated with EIL in the above project. The project considers development of process / operating parameters for non-catalytic process in phase-1 and catalytic process in phase-2 for sulphur degassing to bring down the H2S content of the liquid sulphur to less than 10 ppm.

The total cost of the project, revised as per norms set up by OIDB, works out to Rs. 75.0 lakhs, out of which 25% will be borne by GNFC and balance 75% funding will be by OIDB/CHT.

Chairman, SAC and other members recommended the proposal for funding by OIDB/CHT subject to firm commitment by GNFC to contribute 25% of the total project cost.

46.9 **Presentation by IOCL-R&D on "Review of Alkylation Technology and Its Relevance in India"**

In line with the request made by Chairman, SAC during the 45th SAC meeting held at GAIL Petrochemical Plant, UPPC, Pata, Dr. S.Ghosh, ED, IOCL-R&D made the above presentation.

Dr. Ghosh, in his presentation covered in details the scope of Alkylation, Availability of raw materials for alkylate production in India, Advantages of Alkylation process over the other processes for manufacture of high octane gasoline, Development of solid Acid based Alkylation process and comparison with HF/H_2SO_4 processes.

As per the study, Alkylation technology was not found favourable due to certain specific issues viz. high LPG demand, surplus gasoline by 2000, higher CIF cost of LPG as compared to gasoline, economics of use of FCCU light olefins as petrochemical feed stock rather than alkylation feed etc.

Considering the above, it was decided by Chairman, SAC and other members not to pursue any further in this direction.

46.10 **Presentation by EIL-R&D on "Development of DeNOx Technology for Fired Heaters"**

Dr.B.S.Gill, DGM, EIL-R&D made the above presentation. He explained the relevance of the above project for NOx abatement for better environment in chemical process, refinery heaters and boilers. The presentation covered the various NOx control technologies, flue gas treatment processes and advantages and disadvantages of the various processes.

Chairman, SAC advised EIL to get in touch with NTPC, who might have interest in the project.

46.11 **Proposal of IIP on "Studies to Develop Aquafining Process"**

Shri M.M.Kumar, Scientist, IIP, made a presentation on the Aquafining Process for producing stable visbroken products with high conversion levels. The process was first developed by INTVEP and later jointly marketed globally by UOP, FWUSA and INTVEP. The project is proposed to be by IIP in collaboration with UDCT and EIL.

Chairman, SAC and other members emphasised that the proposal cannot be considered without financial participation by user organisations.

46.12 **Proposal on "Establishing a New Mechanism of Boundary Lubrication"**

IIP informed that meetings had been held with IOC-R&D and DRDO for their participation in the project and both IOC-R&D and DRDO have shown interest in the project.

Chairman, SAC and other members emphasised that financial participation by the above organisations was a must and IIP may take up with them in this matter.

46.13 EIL (R&D) and IIP made brief presentations on the status of the various CHT funded R&D projects. Also, Shri S.N.Sharma, Scientist, CSIR, briefed the members on the latest status of the SPD project.

46.14 Secretary, OIDB, remarked that the financial contribution from the user industries for the various R&D projects should be minimum 50% of the total project cost. Chairman, SAC explained that earlier the R&D projects were totally funded by the OIDB. However, since last 2-3 years, it has been made mandatory that the executing organisation has to bring in a financial partner for sharing minimum 25% of the total project cost for all R&D projects. In due course, this contribution will be gradually raised to 50%.

46.15 It was decided that the 47th meeting of the SAC will be held on 18 & 19 November, 1999 at Reliance Petroleum Limited, Jamnagar. CHT will put up a note to Ministry of Petroleum and Natural Gas, for obtaining necessary approvals for holding the next meeting at RPL, Jamnagar.

Annexure - I

46th 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. Dr. S.J.Chopra, Director (Tech.), EIL
4. Prof. A.P. Kudchadker
5. S.N. Sharma, Scientist, CSIR
6. Sudhir Singhal, Director, IIP
7. Ms.Lalitha. B. Singh
8. K. Ravikumar, ED, CHT, New Delhi

Others

9. Dr. S. Vardarajan, ED (Ops), MRL
10. Dr. K.S. Balaraman, DGM (R&D), MRL
11 Ms. Vandana Singhal, Secretary, OIDB
12. Dr. S.Ghosh, ED, IOCL-R&D
13. S. Makhija, DGM, IOCL-R&D
14. Dr. D.K. Tuli,SRM, IOCL-R&D
15. S.C. Tandon, GM, IOCL
16. M.K. Goel, CTSM, IOCL-Ppl
17. S.K. Phull, ED, BPCL
18. Dr. Himmat Singh, BPCL
19. A. Soni, ED,EIL (R&D)
20. Dr. B.S.Gill, DGM, EIL(R&D)
21. Dr. S. Banik, DGM, EIL (R&D)
22. Dr. P.K.Sen, DGM, EIL (R&D)
23. Dr. K.C. Koshel, GM (Chem.), ONGC
24. Dr. G.G. Rajan, DGM (R&D), CRL
25. N.S.J. Rao, CM (T), HPCL
26 K. Subramanyam, Mgr. (R&D)
27. Dr.M.O.Garg, Area Co-ordinator, IIP, Dehradun
28. V.K. Kapoor,Dy. Dir IIP, Dehradun
29. Dr.V.K.Bhatia, Sc., IIP, Dehradun
30. Dr.D.K. Adhikari, Sc., IIP, Dehradun
31. M.M. Kumar, Sc., IIP,Dehradun
32. S.B.Das, Dy. Mgr, BRPL
33. V.J.Shah, Sc., CSMCRI
34. Dr. A.B. Halgeri, Sr. Mgr. (R&D), IPCL
35. Dr. U.S. Rao, DGM (R&D), Lubrizol India Ltd.
36. K.C. Dutta, CPNM, IOC - Digboi
37. Dr. S.Muralidharan, Sc., CECRI
38. Dr.S.D.Baruah, Sc., RRL, Jorhat
39. S.A.A. Rizvi, Sc., RRL, Jorhat
40. Dr. A.V. Ramaswamy, Dy. Dir., NCL
41. M.M. Bhat, GM, GNFC
42. Dr. P.R. Nambiar, GM, IBP
43. Ms. Gita Dutta, Joint Director, CHT, New Delhi