42ND MEETING

HELD AT

INDIAN INSTITUTE OF PETROLEUM, DEHRADUN

ON

JUNE 25 - 26, 1998

उच्च प्रौद्योगिकी केन्द्र

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

Centre for High Technology

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उ.प्रौ./एस.ए.सी./
CHT/SAC/ 871

जुलाई 14, 1998
July 14, 1998

सेवा में,
To,

1. पेट्रोलियम और प्राकृतिक गैस मंत्रालय हाइड्रोकार्बन्स की वैज्ञानिक सलाहकार समिति के सभी सदस्यों को ।
1. All Members of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and 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 42वीं वैज्ञानिक सलाहकार समिति के कार्यवृत्त का परिचालन ।

Sub.: 42nd Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas - Circulation of minutes.

महोदय,
Dear Sirs,

पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 25 और 26 जून 1998 को कोचीन में वैज्ञानिक सलाहकार समिति की 42वीं बैठक के कार्यवृत्त की प्रति आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Enclosed, please find a copy of the minutes of the 42nd Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and Natural Gas held at IIP, Dehradun on 25 & 26 June 1998, for your information and necessary action.

धन्यवाद !
Thanking you,

भवदीय,
Yours faithfully,

(के. रविकुमार) 15/7/98
कार्यकारी निदेशक
(K. Ravikumar)
Executive Director

संलग्न : यथोक्त
Encl.: As Above.

प्रतिलिपि :

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

Copy to :

Prof. M.M. Sharma,
502, Saurabh,
Plot No. 39, Kunder 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.ठी.
2. FA & CAO, OIDB
3. पेट्रोलियम और प्राकृतिक गैस मंत्रालयं के सचिव के निजी सचिव को ।
3. PPS to Secretary, MOP&NG

Minutes of the 42nd Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas held on 25 and 26 June, 1998 at IIP, Dehradun

List of participants is attached.

Dr. T.S.R. Prasada Rao, Director, IIP extended a warm welcome to the Chairman, Scientific Advisory Committee (SAC), other distinguished members of the SAC and all the invitees. He expressed his gratitude to SAC in supporting the various R&D programmes of IIP.

He mentioned that IIP is making continuous endeavors in meeting the expectations of the industry, and requested the members to visit some of the latest facilities put up at IIP. He mentioned that IIP was in a process of transition and with effect from 31st March, 1998, IIP has become an ISO-9001 organisation, which shows its commitment to quality and customer satisfaction. Dr. Prasada Rao also emphasized that IIP has now resorted to aggressive marketing of their technologies, both within the country & abroad.

Dr. K.S. Jauhri, Dy. Director & Area Leader, IIP, made a brief presentation about IIP. The presentation covered the historical background of IIP, aims and objectives, organisational structure, profiles of the scientists & staff, area wise work being done w.r.t. separation, conversion, catalyst development, product application and combustion systems, chemical sciences viz. development of additives, specialty chemicals and Biotechnology. He also highlighted the major achievements of IIP, IIP technologies licensed to the industry and also IIP's global links.

Prof. M.M. Sharma, Chairman SAC thanked Dr. T.S.R. Prasada Rao and IIP for hosting the meeting. He congratulated IIP on signing the IIP-MOBIL agreement on 17.6.98 for joint technology marketing, which is a very good starting point for globalisation. He mentioned that it was a matter of great disappointment that inspite of lengthy discussions in the past, no R&D proposals on Syngas have been received. He pointed out that there is ample merit in conversion of syngas because of its wide feedstock base and can be used for production of Hydrogen, Ammonia, Methanol, DME etc.

He further mentioned that Biodesulphurisation of products for low sulphur is an interesting area and proposals on Biodesulphurisation of diesel should be taken up on priority basis, as already taken up by IIP with Deptt. of Biotechnology.

Shri K.P. Shahi, Adviser (R), MOP&NG informed that MOP&NG has expressed deep concern on the inordinate delay in completion of most of the projects sponsored to the R&D institutions by CHT. He stressed that the problems being faced by the R&D institutions in completion of R&D project be discussed in detail in the SAC meetings. This is more so necessary, specially while recommending the new proposals. Shri Shahi also requested IIP / EIL-R&D / IOCL-R&D to revert to MOP&NG's letter requesting for furnishing details on the achievements w.r.t. R&D projects recommended by SAC, value of monetary implications of the

technological development and also details of implementation / commercial application of the developed technology, at their earliest.

(Action : IIP / EIL-R&D / IOCL-R&D)

Prof. Sharma and all the SAC members agreed that it is a matter of grave concern when most of the projects get delayed and such reviews are being done in the SAC meetings. Thanking the Ministry for giving due consideration for the inordinate delay in the MCW project, Prof. Sharma said that this SAC on Hydrocarbons has been doing a very good job, especially w.r.t. collaboration between the operating oil companies, R&D institutions, Engineering companies & Government and will keep in mind the expectation of the Ministry from the committee. He mentioned that it was a matter of pride & pleasure to see the impact of some of the R&D projects undertaken in the past & present viz. production of Food Grade Hexane at HPCL - M, extraction technology, catalytic cracking etc. He requested IIP, EIL-R&D and CHT to jointly look into the track records of these projects and prepare the tangible and intangible benefits derived out of the same.

(Action : IIP / EIL-R&D / IOC-R&D / CHT)

The Agenda items were then taken up for discussion.

42.1 Revised proposal on "Technology Development for Use of Dimethyl Ether as Diesel Engine Fuel"

A proposal "to study technical feasibility and develop suitable technology for application of DME in diesel engines and to demonstrate its feasibility for introduction on a national level" was presented at the 40th SAC meeting at IOC-Haldia. A revised proposal was subsequently presented in the 41st meeting at CRL-Cochin in March, 1998. The committee, in principle, agreed to the importance and relevance of the proposal. However, IIP was asked to provide details w.r.t. purchase, storage & handling and safety precautions in handling DME in the 42nd meeting, i.e. the current meeting of SAC.

The presentation by Shri K.K. Gandhi, Sc. F., IIP, dealt with purchase, transport, storage & handling and safety precautions in handling DME.

Shri Gandhi mentioned that the properties of DME were similar to that of LPG and hence it needs the same handling and safety care as LPG. With regard to procurement of fuel grade DME, Prof. Sharma informed that instead of importing DME, IIP may get in touch with a factory located in Mumbai for supply of around 48 tonnes DME as per requirement of IIP.

(Action : IIP)

Shri K.P. Shahi, observed that at present, it was not economic to use DME in place of HSD. Also the Cost Benefit Analysis (CBA) of DME as a substitute for HSD is not very satisfactory, and further studies on this is required since 0.05%

wt. 'S' HSD is going to be produced in the country, & thus the CBA should be based on DME Vs. 0.05% HSD, if pollution was the key problem.

However, keeping in view the importance and relevance of the proposal, the SAC members recommended the project for funding by OIDB / CHT at a cost of Rs. 4.5 crores. IIP will furnish to CHT details of revised cost break up of Rs. 4.5 crores.

42.2 Presentation by Indian Institute of Chemical Technology (IICT) on IICT's work on DME Synthesis.

Dr. K.V. Raghavan, Director, IICT, made a brief presentation on IICT's work in the field of Dimethyl Ether Synthesis. The presentation also covered IICT's work on development of various catalysts and Micro reactor studies.

Chairman, SAC and the members felt that IICT's study was a purely academic study and in future, they may submit a proposal to SAC, if they desire so, on Novel Catalyst developed for synthesis of DME.

42.3 Presentation on "Development of Multigrade Bitumen" by IOCL - R&D

Dr. A. Krishnan of IOCL - R&D shared with the group the various R&D work undertaken by them for development of Multigrade Bitumen.

Dr. A.K. Bhatnagar, ED, IOCL apprised the group that as a result of increased traffic loading conditions, variations in nature of crudes and quality consciousness, the recent trends all over the world are to move from simple to performance based specifications, which besides taking care of key performance factors such as thermal cracking, fatigue cracking, premature aging, rutting etc. also enables to control construct ability and safety aspect of bitumenous road construction.
The presentation covered the target specification drafted by a tripartite working group of IOC, IIP & CRRI for Multigrade Bitumen, phisico-chemical properties of the developed product vis-a-vis conventional bitumen. IOCL - R&D could successfully develop Multigrade Bitumen meeting target specifications by optimizing feed & certain process conditions.

The SAC members noted with great interest the good technical development work done at IOCL - R&D for production of Multigrade Bitumen by manipulating the feed and process conditions.

42.4 Presentation on "High Performance Bitumen" by IIP-Dehradun

Dr. U.C. Gupta, Scientist, IIP made a brief presentation on "High Performance Bitumen- Addition of newer facilities for characterisation".

IIP informed the committee members that they have received new instruments costing about Rs. 1.0 crore from World Bank Loans for characterisation of Bitumen and development of high performance bitumen in collaboration with the oil industry.

Proposals on Polymer modified Bitumen & compositionally controlled Bitumen are being formulated by IIP for presentation in the next SAC meeting.

(Action : IIP)

42.5 IIP had made a presentation on Developing Catalyst and Technology for Hydrotreatment of Atmospheric Residue in the 41st meeting of the SAC at Cochin in March, 1998, at a total cost of Rs. 18.97 crore for the project.

The committee, while acknowledging the utmost importance and need of research in this area, had agreed to support the project subject to participation by one or two oil companies upto an extent of sharing minimum 25% of the total project cost.

Dr. Prasada Rao informed that IIP has taken up with BPCL to obtain their consent for technical participation along with sharing 25% cost of the project. A meeting was held with the BPCL management & a positive response has been received. BPCL will put up the proposal to its Board for approval. Further action on proposal will be decided after receiving BPCL's clearance.

(Action : IIP / BPCL)

42.6 Dr. S. Banik, AGM, EIL-R&D presented the status of the various CHT sponsored R&D projects.

Chairman, SAC and the other members expressed grave concern about the long delays in a number of projects.

Chairman, SAC observed that for a company of EIL's stature and standing, such long delays are unacceptable and surprising.

Dr. S.J. Chopra, Director (T), EIL stated that the main reason for the delay in the projects was on account of the existing procedure for procurement of equipment / hardware for the R&D projects and also in many instances, the response from the vendors is very poor as the requirement of the material is of special nature & volume of material required is small.

Shri S.K. Sil, Director, CHT informed that, in line with the decision taken by the Secretary (P&NG) during the 15th Governing Council Meeting of CHT, CHT has constituted a committee comprising members from EIL-R&D, IIP, IOC-R&D to review the existing procurement procedures for the specialty R&D items and suggest modified systems / procedures for speedy procurement. The Ist meeting of the committee had taken place on 9.6.98 & the 2nd meeting is scheduled on 13.7.98 wherein the committee is expected to finalize its recommendations. Once the committee finalizes its recommendations, the problem of delay due to procurement procedures will be solved to a great extent.

Chairman, SAC, requested CHT to write a letter to CMD, EIL expressing the grave concern of the SAC members regarding inordinate delay in the completion

of most of the projects. Dr. S. Vardarajan, suggested that EIL will have to develop multiple vendors including foreign parties for material supply for the R&D projects.

(Action : CHT)

42.7 Presentation by HPCL-Mumbai on "Production of Food Grade Hexane through NMP Extraction"

Shri Ilyas Ali, Mgr. (Tech.), HPCL-M shared the operating experience of production of Food Grade Hexane through NMP extraction process at Mumbai Refinery.

The Hexane unit in HPCL-Mumbai was installed in 1962 based on conventional oleum treatment process. This was switched over to NMP Extraction technology in Nov. 1997, due to operating problems experienced with oleum, specially w.r.t. corrosion due to acid carry over, disposal problems of caustic & acid etc.

The process was developed based on collaborative research studies done by HPCL-Mumbai, IIP-Dehradun, and quality of Hexane produced was almost reaching international standards.

Chairman, SAC and other members expressed their pleasure in the implementation of indigenous technology for Food Grade Hexane manufacture. Hexane has Benzene content much lower than normal spec.

Shri A.S. Rao, DGM, HPCL-Mumbai informed that the refinery is producing hexane with Iran light crude source. However, dialogue is on with IIP for production of Food Grade Hexane using the BH crude source also.

(Action : HPCL-Mumbai / IIP)

42.8 Presentation of HPCL-Mumbai on "Adoption of NMP Solvent for LOBS Extraction"

Chairman SAC & other members appreciated the presentation made by Sh. Ilyas Ali, Mgr. (T), HPCL-Mumbai on Solvent Extraction of LOBS using NMP as solvent in place of phenol. The change over to NMP has resulted in increased LOBS operating capacity, significant reduction in overall energy consumption, reduction in maintenance cost and reduced solvent losses, the process is environmentally friendly.

42.9 Presentation on "Studies on Development of Co-solvent with NMP / New Solvent for Lube Refining" by IIP- Dehradun

Dr. M. Anwar, Sc. F., IIP made a presentation on "Studies on Development of Co-solvent with NMP / New Solvent for Lube Refining"

Literature data and preliminary experimental investigations at IIP indicates that good potential exists for development of Co-solvent with NMP / new solvents for improving the yield as well as raffinate quality.

IIP presented the proposed action plan for development of Co-solvents and also the additional facilities required for the same.

Chairman, SAC and the members felt that since IIP already has the NMP Lube Extraction Technology and entered into commercial deal with EIL and MRL, IIP should come forward with details of financial participation from its parties in the next meeting.

(Action : IIP)

42.10 Shri A.K. Vohra, shared the experiences of EIL, R&D in Fired Heater Efficiency Improvement Studies.

His presentation included the various facilities existing at EIL, R&D Centre for carrying out the efficiency improvement studies, details of studies already completed, and studies in progress etc.

The first study was successfully completed in Sept. 1995 for IOCL - Gujarat Refinery which resulted in efficiency improvement by 10% in the atmospheric unit IV furnace. The study with the BPCL furnaces is in progress.

Chairman, SAC and other members expressed their appreciation for the work done by EIL in the Furnace improvement studies and suggested that refineries may consider utilizing this expertise.

(Action : Refineries)

42.11 Presentation by EIL-R&D on the proposal on "Development of Technology for Tracer Studies in FCCU"

Dr. S. Banik of EIL, R&D shared the details of the tracer studies to be undertaken in FCCU and also the benefits thereof. The studies would help in identifying optimum operating parameters. The data could also be used for gauging accuracy of process modeling & simulation and for trouble-shooting of FCCU. The studies are also useful in predictive maintenance and comparing performance of subsystems of various designs.

The projects would be a collaborative effort of BARC, EIL, BPCL & an international expert. The total cost of the project is around Rs. 64.6 lakhs with FE component of US $ 80,000, and completion schedule of 18 months. EIL mentioned that BPCL was approached for their participation in the proposed developmental programme. They have agreed in principle. However, BPCL's participation in sharing of project cost is yet to be cleared by BPCL board. Chairman, SAC and other members suggested that the proposal will be taken up only after BPCL's clearance on financial participation.

(Action : EIL-R&D / BPCL)

42.12 Presentation by IIP on "Studies on Effect of Gasoline Fuel Properties on Evaporative & Exhaust Emissions of Indian Vehicles".

Shri K.K. Gandhi, Sc. F., IIP made the above presentation covering the proposed emission limits for passenger cars in India in 2000 and the EU emission limits, effect of fuel quality / vehicle technology on mass emission etc.

IIP in the proposal proposed to study the effect of gasoline fuel characteristics which significantly affect evaporative and exhaust emissions from automotive engines / vehicles which are RVP, composition, volatility and use of oxygenates.

SAC members felt that the generation of petroleum data as in the above proposal, falls under the purview of PCRA and IIP should consider putting up the proposal to PCRA.

(Action : IIP)

42.13 Presentation on Project Proposal on "Studies on Effect of Soaker Internals - Improved Design and Kinetic & Hydrodynamic Studies for Modeling of Visbreaking Process" by IIP / UDCT / EIL.

Dr. M.M. Kumar, IIP made the above presentation. The earlier study on "Effect of Soaker Geometric & Internals on Visbreaking process" showed substantial energy saving possibilities through reduced operating temperatures, considerable improvement in overall visbreaking rates etc. However, the applicability and fundings of the earlier project can be extended, leading to complete understanding of the process, the exact effect of different vacuum residues characteristics on product distribution, study for determining scale up factor etc. The total project cost, which is a collaborative effort of EIL / UDCT & IIP is Rs. 180.0 lakhs, completion schedule being 36 months. Prof. Joshi & Dr. Pandit of UDCT also mentioned that IOCL - Gujarat Refinery has agreed to make their VBU available for carrying out the kinetic studies.

Chairman, SAC and members felt that the IIP cost of Rs. 133.0 lakhs was on a high side and needs review. The project was recommended for funding at a total cost of Rs. 137.0 lakhs. Rs. 5.0 lakhs for EIL, Rs. 42.0 lakhs for UDCT, Mumbai and Rs. 90.0 lakhs for IIP.

IIP shall furnish the details of readjustment of cost.

(Action : IIP).

42.14 Presentation by UDCT, Mumbai on "Treatment of Alcohol Distillery Waste".

Dr. A.B. Pandit & Dr. J.B. Joshi, Professors of UDCT, Mumbai discussed the various technologies available for conversion of alcohol distillery waste to recover energy. A request for Rs. 1.0 lakh for the project was made. Chairman,

SAC and all the members felt that the proposal was worthwhile taking up. Director, IIP volunteered to support the project from IIP.

42.15 Shri K.P. Shahi thanked Director, IIP and all the other members of IIP for their efforts in making the meeting successful. He acknowledged the useful work being done by IIP and also the significant contributions of IIP to the industry.

42.16 It was decided that the next meeting of the Scientific Advisory Committee will be held on 9 & 10 October, 1998 at EIL, R&D Centre, Gurgaon.

Annexure - I

42nd 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.J. Chopra, Director (T), EIL, New Delhi
5. Dr. T.S.R. Prasada Rao, Director, IIP, Dehradun
6. K.K. Dhingra, ED, PCRA, New Delhi
7. S.N. Sharma, Scientist, CSIR
8. K. Ravikumar, ED, CHT, New Delhi

Others

9. Mohit Sinha, FA&CAO, OIDB
10. Dr. A.K. Bhatnagar, ED, IOC(R&D), Faridabad
11. Dr. R.P. Verma, GM (R&D), IOC
12. S. Makhija, DGM (CED), IOC (R&D)
13. Dr. A. Krishna, SRO, IOC (R&D), Faridabad
14. Dr. B.S. Gill, DGM, EIL (R&D)
15. Dr. S. Banik, AGM, EIL (R&D)
16. Dr. A.K. Vohra, EIL (R&D)
17. Prof. J.B. Joshi, UDCT, Mumbai
18. Prof. A.B. Pandit, UDCT, Mumbai
19. Dr. K.C. Koshel, GM (Chem.), ONGC
20. R.K. Modi, Ch. Tech. Mgr., BPCL (R)
21. Dr. G.P. Rai, Sr. R&D Mgr., BPCL (R)
22. G.G. Rajan, DGM (R&D), CRL
23. A.S. Rao, DGM (HQO), HPCL
24. Ilyas Ali, Mgr. Tech., HPCL- MR
25. P.K. Tripathi, Sr. Mgr., HPCL - MR
26. S.A.A. Rizvi, Sc. RRL, Jorhat
27. Dr. K.S. Jauhri, Dy. Dir., IIP, Dehradun
28. Dr. Himmat Singh, Sc. 'F'. IIP, Dehradun
29. K.K. Gandhi, Sc. 'F', IIP, Dehradun
30. O.N. Anand, Sc. 'F', IIP, Dehradun
31. Pradeep Kumar, Sc. 'F', IIP, Dehradun
32. V.K. Jain, Engr. 'F', IIP, Dehradun
33. M. Anwar, Sc. 'F', IIP, Dehradun
34. Dr. M.L. Sagar, Sc. 'F', IIP, Dehradun
35. Dr. V.R.K. Sashy, Engr. 'F', IIP, Dehradun
36. Dr. Uma Shanker, Sc. 'F', IIP, Dehradun
37. K.M. Agarwal, Sc. 'F', IIP, Dehradun
38. P.C. Sapra, Sc. 'F', IIP, Dehradun
39. A. Datta, Sc. G, IIP, Dehradun

40. Dr. D.C. Madhwal, Scientist, IIP, Dehradun
41. M.M. Kumar, Engineer, IIP, Dehradun
42. V.K. Kapoor, Scientist, IIP, Dehradun
43. Dr. A.K. Gupta, Scientist, IIP, Dehradun
44. M.P. Saxena, Scientist, IIP, Dehradun
45. Dr. V.K. Bhatia, Dy. Director, IIP, Dehradun
46. Dr. B.S. Rawat, Emiritus Sc., IIP, Dehradun
47. D. Tandon, Sc. E-I, IIP, Dehradun
48. S.M. Nanoti, Scientist, IIP, Dehradun
49. S.S. Sachdeva, IIP, Dehradun
50. J.Sharma,Sc.E-II, IIP,Dehradun
51. R.N. Roy, Engineer E-II, IIP, Dehradun
52. Mukesh Saxena, Engineer E-II, IIP, Dehradun
53. S.K. Bej, Sc. E-I, IIP, Dehradun
54. U.C. Gupta, Sc. E-I, IIP, Dehradun
55. Dr. S.K. Singal, Engineer E-II, IIP, Dehradun
56. Dr. K. Narsimha, Scientist, IIP, Dehradun
57. S.K. Sil, Director, CHT, New Delhi
58. Ms. Gita Dutta, Joint Director, CHT, New Delhi