

**47<sup>TH</sup> MEETING**

**HELD AT**

**HPCL, VISAKH REFINERY**

**ON**

**NOVEMBER 18 - 19, 1999**

उ.प्रौ.के./एस.ए.सी./  
CHT/SAC/

दिसम्बर 17, 1999  
December 17, 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 47वीं वैज्ञानिक सलाहकार समिति के कार्यवृत्त का परिचालन ।

Sub.: 47th 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 18 और 19 नवम्बर, 1999 को हिन्दुस्तान पेट्रोलियम कॉर्पोरेशन लिमिटेड, विशाखापटनम रिफाइनरी, विशाखापटनम में हुई वैज्ञानिक सलाहकार समिति की 47वीं बैठक के कार्यवृत्त की प्रति आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Enclosed, please find a copy of the minutes of the 47th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and Natural Gas held at HPCL, Visakh Refinery on 18 & 19 November, 1999, for your information and necessary action.

धन्यवाद !  
Thanking you,

भवदीय,  
Yours faithfully,

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

संलग्न : यथोक्त  
Encl.: As above.



: 2 :

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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, OIBB
3. पेट्रोलियम और प्राकृतिक गैस मंत्रालय के सचिव के निजी सचिव को ।
3. PPS to Secretary, MOP&NG



**Minutes of 47<sup>th</sup> Meeting of the Scientific Advisory Committee (SAC) on Hydrocarbons of the Ministry of Petroleum & Natural Gas held on 18th – 19th November, 1999 at Visakh**

List of participants is attached.

Shri A.B. Sathe, General Manager (VREP), HPCL, Visakh Refinery extended a warm welcome to the Chairman SAC, other members of SAC and representatives of Oil Companies. He commended SAC for its endless effort for stimulating Research and Development activities. He further added that such meetings provide a common platform for the Oil Industry and R&D Institutions to discuss about the futuristic technological requirements for the Oil Industry. He also enumerated the challenges that would have to be faced by the Oil Industries in future with deregulations of APM by the Government.

He appreciated SAC for funding the projects on improving the performance of HDS catalyst, Reductions of SO<sub>2</sub> from the Refinery Off Gases, Flue gas Desulphurisation and Reduction of Sulphur in Gasoline. He said that these were some of the areas which will help Refineries to meet the tight air emission standards and specifications on effluent discharge imposed by the Government.

Shri V.V.R. Narasimhan, Chief Manager, HPCL, Visakh Refinery made a presentation on the salient features of HPCL, Refinery including performance highlights, projects implemented and future projects for the continuous improvement and steady growth of the Refinery.

Prof. M.M. Sharma, Chairman, SAC thanked HPCL for hosting the SAC meeting. He appreciated the growth of HPCL – Visakh Refinery from the status of the smallest of three refineries in 1950s with a crude processing capacity of 0.675 MTPA to 7.5 MMTPA (with addition of VREP) Refinery with FCC and Visbreaking units.

Chairman SAC while highlighting the role of SAC in giving thrust to the R&D activities in Oil Industry, mentioned that IIP was the first research institute to receive the fund from CHT to study the Hydrocracker Technology. He appreciated IOC's initiative in installing the first Hydrocracker plant at IOC-Koyali, and IOC-R&D's immense contributions to the Research & Development in the area of Lube, FCC and Hydrocracker.

Chairman also appreciated the financial participation of the Oil Companies in the CHT funded projects. He cautioned that with more and more tight fuel specification and air emission standards imposed by the Government, all Indian Refineries configuration will require a dramatic change with the addition of new units and integration with petrochemical and power plants for better profitability. In this new scenario, Indian R&D Centres will need to take a new turn to meet the new challenges so that the Refineries can maximize the profit per barrel of crude processed.



The Agenda Items were taken up for discussion:-

**47.1 Development of Advance Control Package to be Tested on Fired Heater by EIL – R&D.**

Dr. B.S. Gill, DGM EIL – R&D Centre made presentation on the revised proposal for Developing an Advanced Process Control Package for Fired Heater. The package will be tested and validated at a demonstration scale fired heater at EIL R&D centre. Later the same will be implemented on an Industrial scale Fired Heater at BPCL, Mumbai.

The estimated total project cost is 2.0 crores. BPCL has agreed to fund 25% of the project cost (Rs.50.0 lakhs). Fund requested from CHT is Rs. 1.50 crores.

EIL stated that the savings would be in the range of about 24 lakhs for each percent improvement in the heater efficiency and the module which EIL proposes to develop will cater to a wide capacity range of heaters in the Indian Refineries.

Chairman and other members of SAC recommended the proposal for funding by CHT / OIDB subject to :

- (i) The project completion period to be brought down from 30 months to 24 months.
- (ii) BPCL will fund 25% of total project cost i.e. Rs. 50 lakhs. Balance Rs. 1.5 crores will be funded by CHT / OIDB.
- (iii) EIL will forward to CHT the BPCL Board approval for funding the above project.

**47.2 Development of Catalyst for Reducing Sulphur in Gasoline with Minimum Octane Loss by IIP.**

Dr. Y.K. Kuchhal, Scientist, IIP, Dehradun made a presentation on the proposal for developing a catalyst for reducing sulphur in FCC Gasoline with minimum octane loss. This involves preparation of suitable fraction of FCC gasoline for hydrotreatment, hydrotreatment of above catalyst in pilot plant, preparation of suitable zeolite base catalyst for Isomerisation of normal paraffins, evaluations of catalyst, optimization of operating parameters and deactivation and regeneration studies. IIP informed that no such catalyst to selectively reduce sulphur with minimum change in octane number is commercialized in India.

Chairman SAC and other members felt that focus on R&D projects should be on future specification of gasoline and other petroleum products.



They felt that the project on 'Development of Catalyst for Reducing sulphur in FCC Gasoline with minimum Octane loss' should be supported by the end user i.e. Refining Industry. The estimated total project cost is about 91 lakhs. The Chairman SAC advised IIP to find a partner (Refinery) to work with, which will also provide a clear idea about the Refining Industry requirements to meet the future gasoline specifications.

**47.3 Studies on Effect of Gasoline Composition – Benzene, Aromatics Olefins on Vehicle Emissions by IIP.**

Dr. Sudhir Singhal, Acting Director, IIP made presentation on 'Studies on the effect of gasoline composition like Benzene, Aromatics and olefins on engine gaseous emissions (CO, HC & NOx), benzene emissions and low temperature deposits to predict the fuel quality requirements for future gasoline vehicles, and to establish the correlation of the above properties on emissions of various vehicles.

The studies will be carried out for entire range of gasoline having following composition :

Olefins	10-50%
Aromatics	20-50%
Benzene	1-5%

This study will be conducted on two and four stroke engines with and without catalytic converters for exhaust emissions. The study will concentrate only on exhaust emissions and not on fugitive emissions.

Chairman and other members of SAC felt that this project is of great merit to the Refining Industry. However IIP should come forward with a partner agreeing for financial participation to the extent of 25% of the total project cost.

**47.4 Heat Transfer Enhancement by Tube Inserts by EIL.**

Dr. B.S. Gill, DGM, EIL- R&D shared the results of the completed R&D project on Heat Transfer Enhancement by Tube Inserts.

A special purpose machine (SPM) was designed by EIL to manufacture different types of tube inserts. About 5 types of Tube inserts were manufactured to carry out above research. The case study was conducted for a range of viscosity at laminar flow. The study fluid was Tar. The result of this project indicated that the tube inserts increase the heat transfer by 120% and increase the pressure drop by 47%. Incidentally, also it reduces the heat exchanger scaling. The study was carried out only upto the Reynolds number of 4000 and this results are mainly applicable for high viscous fluids like crude, short residue, long residue, tar, etc.



The tube inserts increase heat recovery, reduce the approach temperature thereby reduces capital cost, operating cost and space requirement.

The committee appreciated the results obtained by the research study on Heat Transfer Enhancement by Tube Inserts by EIL. Chairman, SAC further added that EIL should quantify the results obtained to the extent possible for the benefit of Refineries.

**47.5 Boundary Lubrication Mechanism by IISc, Bangalore**

Prof. S.K. Biswas of IISc, Bangalore made a presentation on Boundary Lubrication Mechanism. He informed the members that as per decision taken in the 45<sup>th</sup> and 46<sup>th</sup> SAC Meeting, IISc had approached IOC and DRDO for possible funding in the above project and both have agreed to financially participate in the project. While IOC has given their consent in writing, IISc. has not received the final clearance from DRDO.

He further informed that the total cost of the present proposal has been brought down to Rs. 250 lakhs, which includes a contribution of Rs. 62.50 lakhs from IOCL. The above cost does not include Rs. 60.0 lakhs contribution expected from DRDO.

Chairman and other members of SAC approved funding of this project in principle, subject to a firm commitment for funding by IOCL and subsequently by DRDO.

**47.6 Status of SPD project by CSIR, Hqrs.**

CSIR explained that the delivery of Short Path Distillation Unit is delayed and the same is likely to be delivered in March 2000 against the earlier commitment date of December 1999. The delay is due to additional experimental work and testing required to be done by M/s UIC for seeking approval of Statutory Authority in Germany for 410 SS material. CSIR will put up paper to CHT for the extension of project completion period by 9 months.

47.7 Dr. S.Vardarajan, member, SAC desired that, henceforth status of all on-going projects as well as the projects recommended by SAC may be circulated by CHT along with the agenda for the meetings.

47.8 A Visit to HPCL Visakh Refinery was arranged on 19<sup>th</sup> November, 1999.

47.9 The next SAC meeting is proposed to be held in April 2000.



47th 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. Prof. K. Vasudeva
6. S.N. Sharma, Scientist, CSIR
7. Sudhir Singhal, Director, IIP
8. Ms.Lalitha. B. Singh
9. Dr. Ms. Malti Goel, Jt. Adviser, DST
10. K. Ravikumar, ED, CHT, New Delhi

Others

11. A.B. Sathe, GM (VREP), HPCL
12. A.K. Mishra, Dir (T), OCC
13. Ms. Vandana Singhal, Secretary, OIDB
14. S. Makhija, DGM, IOCL-R&D
15. Dr. D.K. Tuli, SRM, IOCL-R&D
16. S.K. Phull, ED, BPCL
17. Prof. S.K. Biswas, IISc., Bangalore
18. Dr. B.S.Gill, DGM, EIL(R&D)
19. Dr. K.C. Koshel, GM (Chem.), ONGC
20. Dr. G.G. Rajan, DGM (R&D), CRL
21. S.B.Das, Dy. Mgr, BRPL
22. B.Sairam, SM (R&D), MRL
23. Dr. A.Rastogi, DGM (Tech.), GAIL
24. Dr. Y.K. Kucchal, Scientist, IIP, Dehradun
25. Paramjit Singh, SM (R&D), PCRA, New Delhi
26. Dr. G.P.Rai, SM, R&D, BPCL
27. D. Manohar, Deputy Director, CHT, New Delhi