

X

50TH MEETING
HELD AT
IOCL, DIGBOI REFINERY
ON
APRIL 9, 2001



उच्च प्रौद्योगिकी केन्द्र
(पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय)



Centre for High Technology

(Ministry of Petroleum & Natural Gas, Govt. of India)

उ.प्रौ./एस.ए.सी./

CHT/SAC/ 1449

मई 3, 2001

May 3, 2001

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. अपर सचिव/संयुक्त सचिव (वी)/संयुक्त सचिव (एस)/संयुक्त सचिव (एम)/संयुक्त सचिव एवं वित्त सलाहकार / सलाहकार (ई)/ओ.एस.डी. (रिफाइनरी), पेट्रोलियम और प्राकृतिक गैस मंत्रालय
2. AS / JS (V) / JS (S) / JS(M) / JS&FA/Adviser (E) / OSD (R) - MOP&NG.
3. सचिव, तेल उद्योग विकास बोर्ड ।
3. Secretary, Oil Industry Development Board
4. सभी सार्वजनिक क्षेत्र की तेल कंपनियों के मुख्य कार्यकारियों को ।
4. Chief Executives of all PSU Oil Companies.
5. पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय के सचिव के निजी वैयक्तिक सहायक को ।
5. PPS to Secretary, MOP&NG

विषय : पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 50वीं वैज्ञानिक सलाहकार समिति के कार्यवृत्त का परिचालन ।

Sub.: 50th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum & Natural Gas - Circulation of minutes.

महोदय / महोदया,

Dear Sir / Madam,

पेट्रोलियम और प्राकृतिक गैस मंत्रालय की हाइड्रोकार्बन्स पर 9 अप्रैल, 2001 को इण्डियन ऑयल कॉ. लि. की दिग्बोई रिफाइनरी में हुई वैज्ञानिक सलाहकार समिति की 50वीं बैठक के कार्यवृत्त की प्रति आपकी सूचना एवं आवश्यक कार्रवाई हेतु संलग्न है ।

Enclosed, please find a copy of the minutes of the 50th Meeting of the Scientific Advisory Committee on Hydrocarbons of the Ministry of Petroleum and Natural Gas held at IOCL - Digboi Refinery on 9 April, 2001, for your information and necessary action.

धन्यवाद !

Thanking you,

भवदीय,

Yours faithfully,

(एस.के. सिल)
(एस.के. सिल)

निदेशक

(S.K. Sil)

Director

संलग्न : यथोक्त

Encl.: As Above.

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**Minutes of 50th Meeting of the Scientific Advisory Committee (SAC) on
Hydrocarbons of the Ministry of Petroleum & Natural Gas held
on 9th April, 2001 at IOCL- Digboi Refinery**

List of participants is enclosed as Annexure-I.

Shri A.N. Das, ED, IOCL-Digboi Refinery, extended warm welcome to Prof. M.M. Sharma, Chairman-SAC, Members of SAC and other participants from oil industry and research & academic institutions. He stated that it was a privilege to host the 50th SAC meeting, during the Centenary year of operations of Digboi Refinery. Reminiscing the guidance and advice given by SAC during its 16th meeting held at Digboi Refinery in 1987, he remarked that Digboi Refinery would again look forward to valued guidance of Prof. M.M. Sharma and other SAC members in the years ahead. He observed that this SAC meeting is being held while Vacuum Residue Short Path Distillation Unit, the first of its kind in the petroleum refining, is under commissioning. He thanked the scientific community for encouragement in installing the SPD Unit and mentioned that without the guidance and support of Prof. M.M. Sharma, Dr. S. Varadarajan, Prof. K. Vasudeva and others, this unit might not have seen the light of the day. He expressed gratitude for the assistance and cooperation rendered by CSIR, CHT, OIDB and EIL in this endeavour. He stated that installation of this new unit will not only be a milestone for Digboi Refinery, but will also provide renewed vigour to the Refinery to continue the hundred year old story with greater zeal and enthusiasm. Concluding his remarks, he said although Digboi is a small town, with limitations of accommodation and other facilities, all possible arrangements have been made for the meeting, so that SAC Members and other participants carry back happy memories of their visit to Digboi Refinery.

Prof. M.M. Sharma, Chairman, SAC thanked Digboi Refinery for hosting the 50th SAC meeting and remarked that this was a significant occasion in many respects. This is the 50th (Golden Jubilee) meeting of SAC and is being held at Digboi Refinery in year 2001, which is the centenary year of this crude oil processing company. The refinery was installed in 1901 in a region with very difficult terrain, hardly accessible from other parts of the country by the arduous efforts of the enterprising people of that bygone era. With the dedicated efforts of the people of this area, the refinery has continued to be in operation for last 100 years and is perhaps the oldest refinery in the world, which is still functional. He observed that the Centenary year of Digboi refinery is a landmark in the history of Oil industry in our country and it is heartening to find that the refinery is still throbbing with renewed vitality after various modernisation activities. He was happy to note that this meeting of the SAC has coincided with the commissioning of the SPD Unit, which will result in value addition to the bottom of the barrel. He was confident that the Unit would bring tangible returns to the refinery shortly. He took this opportunity to thank MOP&NG, CHT, OIDB, IOCL, EIL, CSIR-HQ and various National Laboratories, which have supported in funding and

implementation of this project. He made a particular reference to the role of Prof. K. Vasudeva and other members of the task force and applauded their contributions in project execution and commissioning of the SPD Unit.

In regard to the SAC meetings, he remarked that MOP&NG is perhaps the only Ministry where SAC has continued to hold regular meetings for the last 20 years and its functioning has been purposeful in providing various suggestions and recommendations for the benefit of the Oil Industry. He commented that Members of SAC deserve to be thanked for their contributions, which had both tangible as well as intangible effects on the functioning of the Oil Industry. He stated that, by organising SAC meetings at different locations all over the country, there had been opportunities for direct interaction of the Committee members with the people working at the field level. While recalling various achievements of the SAC, he stated that adoption of indigenous technology on aromatic extraction developed by IIP / EIL at BPCL at an investment of around Rs.65 crores was a legendary chapter in the annals of the SAC meetings. This had a cascading effect and a unit based on the same technology was later installed at KRL also.

He appreciated the support given by the MOP&NG in accepting various recommendations of the SAC and funding R&D projects through OIDB funds.

Shri B. Barpujari, DGM(TS), IOCL-Digboi Refinery presented an overview of the Digboi Refinery. Narrating the history of discovery of oil fields in the upper Assam, he stated that the saga of Digboi Refinery began in 1901, when it went on stream with a capacity of merely 500 barrels / day. The refinery was rebuilt during the years 1923 – 1940, by installing Crude units, Delayed Coker, KTU, Wax Units, Boilers, Power Houses. In 1981, Assam Oil was nationalised and merged with IOCL. In pursuit of modernisation, the refinery has recently implemented a number of projects to remove technological obsolescence, so as to focus on improving the product quality as also production of high valued speciality products.

The various Agenda items taken up for presentation / discussions and decisions emanating from the deliberations during the meeting are described hereunder :-

50.1 Technology Development for production of Microcrystalline Wax using Short Path Distillation Technology : IOCL-Digboi Refinery, CSIR-HQ, and IIP, Dehradun

50.1.1 Presentation and discussions

After the site visit to the SPD Unit by Members of the SAC and other invitees, inhouse audio-visual film on the Unit prepared by Digboi Refinery was screened. The presentation covered various technical features of the

Unit viz., process flow, equipment details, operating conditions and commissioning activities.

Shri K.C. Dutta, DGM(Prod.), IOCL-Digboi Refinery gave an account of various teething problems faced during commissioning of the Unit and in particular, mentioned the problems of hot oil pumps and broken carbon pieces of wiper rollers found in the suction of the pumps. While the problem of pumps could be resolved by changing over from ceramic bearings to graphite bearings to withstand thermal stress, a strainer will be installed on the residue side of the vapour basket to take care of the carbon pieces. The results of operation of the first stage of the Unit during January-February, 2001 were presented, which showed that the asphaltene content of few distillate samples was 0.22% wt. as against the specified value of 0.26% wt.

Shri H.R. Bhojwani, Head-R&DBPD, CSIR-HQ expressed gratitude to Prof. M.M. Sharma, Late Sh. Lovraj Kumar, Dr. S. Vardarajan, Prof. K. Vasudeva and others for their support and guidance during past so many years, as a result of which the Project on Short Path Distillation, with its commissioning at Digboi Refinery, could finally see the ray of light. He stated that this vacuum residue processing SPD unit, is the first of its kind in the petroleum refining industry and the largest Project executed by CSIR. He thanked the project task force comprising members from IOCL-Digboi Refinery, CHT, EIL, RRL-Jorhat, IIP and CSIR-HQ, for their contributions in various project activities, viz., engineering, procurement, erection and commissioning. He also thanked the team from Germany having members from UIC and other German companies for their contributions in successful implementation of the Project. He commented that this Project has been a major achievement of CSIR since for the first time, SPD technology is being used for processing vacuum residue at such high temperature and high vacuum, which is so far an untried technology involving processing of a highly risky cokable material.

Dr. S.A.A. Rizvi, Scientist E-II, RRL-Jorhat informed that a laboratory scale SPD Unit with a capacity of 5 kg/hour has been installed at RRL-Jorhat. The unit can be operated at a temperature of 320°C under vacuum of 0.001 mbar. He informed that RRL-Jorhat is well equipped to give analytical backup to the SPD unit at Digboi Refinery.

Prof. K. Vasudeva remarked that after troubleshooting of various teething problems during commissioning stage and stabilising operating conditions, many other developmental activities would need to be taken up with different types of feedstocks.

Dr. S. Varadarajan remarked that it might be interesting to carry out detailed analysis of the residue obtained from the unit in respect of its metals content.

Observations of the Committee

Chairman, SAC complimented the multi-organisation team associated with implementation of the project and remarked that the Project would yield benefits to Digboi Refinery after two years when the other facilities viz., Solvent Dewaxing / Deoiling Unit would be commissioned. The spirit of cooperation exhibited by the German companies, involved in project implementation was greatly appreciated by the Committee. The Committee also noted that the Guarantee trial run of the unit will be undertaken in the near future and advised that all the operational data and troubleshooting activities during commissioning of the Unit should be rigorously documented, since such information will be useful for developmental activities to be carried out in future. It would be necessary to be on continuous 'alert' in coming months.

50.2 Proposal on Development of Fuel Cell Reformer for converting Natural Gas to Hydrogen – GAIL (in association with NCL, Pune)

50.2.1 Presentation and Discussions

Shri BSG Ramaprasad, Dy.Manager, GAIL made a presentation on the project proposal. The objective of the proposal is to develop and demonstrate a prototype natural gas based fuel processor to generate Hydrogen suitable in quality and adequate in quantity for running a 5 KW Polymer Electrolyte Membrane Fuel Cell. The proposed R&D project is to be carried out at NCL, Pune under Dr. V.R. Choudhry, where extensive research on conversion of Methane / Natural Gas to Syngas and CO-free Hydrogen has been carried out in the last 10-12 years. The proposal envisages development of a compact fuel processor for producing hydrogen for use in Polymer Electrolyte Membrane Fuel Cell. The fuel processor is to include desulphuriser, reformer, carbon monoxide clean-up system and CO₂ absorption system.

Chairman, SAC observed that CSIR had earlier given fairly large support to NCL for catalyst development for methane reforming, which needs be looked into by GAIL.

Dr. A.K. Bhatnagar, Director(R&D), IOCL and Prof. K. Vasudeva remarked that it would be desirable to undertake an integrated programme on development of fuel cell as a National project. Such a project should bring together various agencies working in this area so as to consolidate their efforts and avoid duplication of research efforts. In this context, Dr. H.R. Bhojwani informed that CSIR has already planned to undertake a

multi-organisation "New Millennium Technology" programme for developing static Fuel Cells of 5-25 KW capacity.

50.2.2 Decisions of the Committee

In the light of above discussions, the Committee decided that at this stage it would not be prudent for SAC to give consideration to the subject proposal. It was suggested that a new proposal may be developed by GAIL taking into consideration the earlier catalyst development activities already undertaken by NCL and the New Millennium Technology programme of CSIR.

The Committee also opined that there is urgent need to undertake research studies for development of Fuel Cell Technology for various applications and observed that Intellectual Property Rights for such studies should be obtained to keep pace with developments in other countries.

50.3 **Proposal on Development of Adsorbed Natural Gas (ANG) Technology – GAIL (in association with IISc., Bangalore & IIP, Dehradun)**

50.3.1 Presentation & Discussions

Sh. P. Chugh, Sr.Dy.Manager, GAIL made a presentation on the project proposal. He informed that the main advantage of ANG Technology lies in adsorption of substantial quantity of natural gas at a pressure of 35 kg/cm² as compared to much higher pressure (200 Kg/cm²) required in the case of CNG. Earlier for development of Adsorbed Natural Gas (ANG), GAIL had undertaken, under Phase-I, developmental work in association with M/s. CHEMISAR Laboratories Inc., Canada, which resulted in development of a low cost carbon adsorbent made from coconut shell giving storage capacity of 164 v/v.

The objectives of the subject project are :

- Development and demonstration of ANG technology for storing natural gas in cylinders for domestic purpose in place of LPG.
- Development and demonstration of ANG technology for use in vehicles in place of CNG.

The work required to be carried out for above stated objectives involves :

- Design and fabrication of cylinders for ANG
- Manufacture of adsorbent pellets
- Setting up of experimental facilities for conducting various tests on large quantities of adsorbent
- Building a prototype unit for domestic usage of ANG
- Building a prototype unit for usage of ANG in vehicles
- Securing necessary Govt. approval

As regards the design and fabrication of cylinders required for storing ANG, the project has already been awarded by GAIL to CMERI, under which three types of cylinders of aluminium alloy are being designed.

For development of ANG Technology as substitute of LPG, the project team would consist of members from Indian Institute of Science, Bangalore and ISRO.

For development of ANG Technology for usage in vehicles in place of CNG, various tests are to be performed in association with IIP, Dehradun on the engine running on natural gas derived from an ANG cylinder.

50.3.2 Decisions of the Committee

The Committee opined that as such the concept of ANG is good and merits consideration. However, justification of ANG for domestic application is unlikely to be of any practical significance because of LPG being a very convenient household fuel.

As regards vehicular usage of ANG, the proposal needs to be further developed by providing detailed data and information on various aspects such as design of ANG cylinder suitable for vehicles, system of filling natural gas in ANG cylinders, natural gas desorption from pellets, refilling of ANG cylinders with fresh adsorbent pellets, etc. It was, therefore, decided that GAIL may present a fresh proposal for application of ANG for vehicles usage after critically examining the various issues mentioned above.

50.4 Presentations on recently completed projects

50.4.1 Hydrocracker Pilot Plant / Laboratory Project – IOCL(R&D)

Dr. R.P. Verma, GM, IOCL(R&D) made a presentation on the subject project completed in December, 2000. He informed that this Project was undertaken at IOCL(R&D), as per the recommendations of the SAC with the objective of absorption and adaptation of complex process technology of Hydrocracking. The Project has been commissioned in November, 2000, with CHT contributing funds of Rs.15 crores, out of the total cost of Rs.34.35 crores. The facilities under the Project comprise six units: Micro Reactor Units (MRU) – 2 Nos., Catalyst Screening Units (CSU) – 3 Nos. and Bench Scale Reactor Unit (BSU) – 1 No..

The major research work already completed on these facilities include feed maximisation, pour point reduction, optimisation studies of Gujarat Refinery Hydrocracker. The facilities under this project have also been utilised in a limited way for other Hydroprocessing activities such as development of technology for Food Grade Hexane through

hydrogenation, evaluation of deep DHDS catalysts and feedstocks of Mathura Refinery. It was informed that IOCL(R&D) is planning to undertake Second Phase of the project at a cost of about Rs.40 crores.

Chairman, SAC congratulated IOCL(R&D) for successfully completing the Project of great importance. He expressed satisfaction with the various research studies already completed under the Project and hoped that these facilities would provide versatility to the refineries in respect of Hydrocracking process. The Committee appreciated implementation of this Project, which will be of great significance for conducting hydroprocessing studies on product quality conforming to stringent international norms.

50.4.2 Development of Computational Fluid Dynamics Capabilities – EIL(R&D)

Sh. Avinash Pathak, Manager(R&D), EIL made a presentation on the above Project completed in January, 2001. The primary objectives of the project were to harness the flow and heat transfer modeling capabilities of a well validated, commercial CFD to model representative problems relevant to refining industry and also to develop a pool of personnel trained in CFD by associating with experts in the field.

He mentioned the advantages of CFD viz., full scale modeling at actual operating conditions, more efficient parametric studies, Shri Pathak enumerated various applications of CFD, e.g.. temperature distribution in fired heaters / boilers, heat transfer enhancement studies, design of syngas reformers for ammonia & methanol plant etc.

The following problems relevant to refining industry were studied under this project :

- Flow manifold for furnace air distribution
- Modeling of Flash zone entry device for a typical vacuum column
- NOx prediction in furnaces

While appreciating the CFD capabilities acquired by EIL, it was emphasised by the Committee that the knowledge gained through this Project should be used by undertaking commercial studies. The expertise acquired needs to be gainfully utilised and tangible benefits should accrue from the Project through its commercial applications.

50.5 Other Presentations

50.5.1 Joint R&D Projects – DST, New Delhi

Dr. (Mrs.) Malti Goel, Advisor/Scientist 'G', DST, New Delhi made a presentation on the subject. She stated that the objectives of the joint technology projects undertaken by DST with various socio-economic

Ministries are to make investments on science and technology with a view to enhance profitability of the industry as also to take care of the socio-economic needs.

During her presentation, she covered a number of such projects viz., Development of Indigenous Column Flootation Technology for industrial applications at Hindustan Zinc Limited, Application of Pressure Swing Adsorption for extraction and purification of Helium from Geothermal and Natural Gas sources.

The committee commended the efforts of DST in sponsoring R&D projects. In response to the suggestion by Advisor-DST for sponsoring joint project on Recovery of Helium from Natural Gas, the Committee advised that it would be imperative to involve those organisations who would be the beneficiaries of the project and the major portion for the project cost should be contributed by them.

50.5.2 Highlights of Achievements / Contributions of the SAC on Hydrocarbons of MOP&NG – CHT, New Delhi

Sh. P.N. Dodeja, Addl. Director, CHT made a presentation on achievements/ contributions of SAC on Hydrocarbons, which was constituted in 1981 and has been meeting regularly since its inception mostly under the chairmanship of Prof. M.M. Sharma. The SAC has provided a very important forum to the Oil Industry for various technical discussions, open exchange of ideas and sharing of R&D experience between the Oil industry and R&D institutions, National Laboratories and Academic institutions.

He dwelt on the contributions of the SAC in recommending various R&D projects/ studies and other activities related to the Hydrocarbons in the areas of : Product Quality Improvement, Environmental Protection (including fugitive emissions) & Safety, Energy Conservation, Fluid Catalytic Cracking, Hydrocracking, Lubricants, Waxes & Additives, Catalytic Reforming & Production of Aromatics, Petrochemicals, etc.

Some of the notable achievements/ contributions of the SAC have been :

- Commercialisation of Technology for Aromatics Extraction developed by IIP & EIL at BPCL and KRL
- Development of Bi-metallic Reforming Catalyst
- Development of Catalyst for Xylene Isomerisation
- Emphasis on proper analytical facilities in refineries
- Emphasis on use of ethane as a feedstock for petrochemicals rather than sale as component of natural gas
- Valorisation of refinery streams, including propylene, butylenes and isobutylene from cat-crackers
- Development of NMP Extraction Technology

- Technology Development for production of high quality Microcrystalline Wax using Short Path Distillation
- Development of Catalytic Process for Isomerisation of Waxy Stocks into Lube Oils
- Studies on FCC operations for optimising middle distillates
- Studies on Hydrocracker Technology Development at IIP
- Setting up of Hydrocracker Pilot Plants / Laboratory Project at IOCL(R&D) and its impact on the commercial units
- Production of designer fuels taking into consideration the future developments taking place in various European countries and USA.
- Development of CFPP / PPD Additives for Diesel Fuel
- Rigorous audit of Fugitive Emissions in Refineries
- Furnace Efficiency Studies in Refineries
- Removal of H₂S and recovery of sulphur from lean streams
- Recommendation for establishing EIL Research Centre
- Recommendations for Expansion of IOCL's Research Centre
- Endorsement and support for proposal to set up Centre for Technology Upgradation & Forecasting

50.6 **Other Points :** With the permission of the Chair, the following points were also taken up during the meeting.

50.6.1 Energy, Environment and Development Perspectives

Dr. S. Varadarajan made a reference to the extremely rapid changes taking place in India's Economy and Social Development and expectations on the energy demand and utilisation in the next decade. Petroleum products requirement, which was 1 million tonne in 1950 when the population was 350 million, has increased to around 100 million tonnes in the year 2001. It is expected to grow further to 200 million tonnes by 2007 and perhaps to 300 million tonnes in 2010. In the next two years, with the adoption of policies on globalisation, more free trade, removal of price control and import controls, as well as the general aspirations, to achieve International standards in Petroleum products quality, there will be massive new requirements in technologies and in operations of pipelines, transport, storage and processing. There are alignments for integration of exploration, production of oil & gas, transport, processing to fuel products, chemicals, polymer fibres, composites etc. The aim would be to meet high environmental quality, efficient energy management, zero waste, full recovery of all valuable materials such as sulphur and high value metal non-organic components. New technologies of separation, selective adsorption, online ultra micro analysis, continuous monitoring and process control would be evolved. The advances in fuel cells, new automobile engines, use of high strength fibre components, as in aircrafts and aeronautics, are intimately connected with petroleum products utilisation. There is also very rapid obsolescence of equipment and knowledge base.

Urgent replacement, modernisation will become mandatory for survival in world trade.

There are also simultaneous developments in energy generation and distribution in India from hydropower, coal, agro byproducts and solar systems. There are technologies for in situ power generation from deep underground coal and gas hydrates from offshore. The option of nuclear power also remains an option.

Since energy and special materials are the most essential components for the National security, economic growth and societal development and harmony, the Centre for High Technology and Scientific Advisory Committee of MOP&NG could consider the issues listed briefly above at a future meeting and outline methodologies for creating awareness and appreciation of the issues and explore specific areas requiring scientific inputs.

50.6.2 Old approved projects not commenced so far :

CHT presented the list of projects which were approved by SAC and MOP&NG long back, but work on those projects has not commenced so far due to the problems being faced by the nodal agency in signing MOU with various collaborating partners from oil industry. The members expressed concern over inordinate delay and emphasised that MOUs should be finalised without any further delay.

50.6.3 Projects scheduled for recent completion :

CHT presented the list of projects which have either been recently completed or are scheduled for completion shortly. It was also informed that in the case of the project on "Assessment of Residual Life of Turbine Oil", although the Project was completed in October 2000, the final report has not been submitted by IIT-Delhi to CHT so far. The Committee took a serious note of this delay and advised CHT to write to Dean, R&D, IIT-Delhi for expediting the project report and till the time this report is submitted by IIT, Delhi, no project proposal from IIT-Delhi should be considered for presentation to SAC.

50.6.4 Revised project proposal on Add-on Facilities for Development of Trickle Bed Reactor (TBR) Technology :

(a) Presentation and Discussions :

Dr. S. Banik, DGM(R&D), EIL made a presentation on the subject proposal, which was received by CHT on 5th April, 2001 and thus could not be included in the agenda papers.

He informed that Hydrodynamic Studies of TBR using Cold Flow, which were earlier funded by CHT under Phase-I to IIT-Delhi, for conducting experimental work on 50 mm & 100 mm (2 & 4 inch) diameter columns

and under Phase-II to EIL(R&D) for conducting experimental studies on 150 mm & 300 mm (6 & 12 inch) diameter columns are nearing completion and the subject proposal is a follow up for development of liquid distributor and redistributor / quench system. Under this project, large scale hydrodynamic studies are proposed to be undertaken in a 1200 mm (48 inch) diameter column at a pressure of 6 kg / cm² pressure. The proposed study includes use of radio tracer technique for evaluation of distributor / redistributor systems, at a project cost estimate of Rs.135.48 lakhs.

During discussions, Director, CHT informed that the proposal on "Add-on Facilities for Development of Trickle Bed Reactor Technology" was earlier recommended by SAC in June, 1997, with cost of Rs.46 lakhs for Part-I involving large scale hydrodynamic studies and Rs.170 lakhs for Part-II involving VLE studies for Hydroprocesses. Subsequently, in February, 1998 the Governing Council of CHT, in its 16th meeting, approved the project for funding through 50% contribution by OI DB / CHT and balance 50% by oil companies on the basis of Devi Dayal Formula.

The proposal had been discussed in all the subsequent meetings of the Governing Council of CHT wherein EIL had talked of fresh submission of their revised proposal and even in the last (19th) meeting held on 5.3.2001, EIL informed that it would submit Part-I of the proposal to SAC with an increase in estimated cost by 8-10 lakhs as compared to the original cost of Rs.46 lakhs. As regards Part-II, they proposed to take up the proposal in association with IIP utilising DHDS bench scale unit installed there as a part of an earlier CHT/ OI DB funded project. Director, CHT expressed concern that just after a month of discussions in the GC meeting, EIL has now come out with a proposal of Part-I, involving a much higher cost of Rs.135.48 lakhs.

(b) Decisions of the Committee :

The Committee noted the concern expressed by CHT and it was felt that any further proposal on TBR Development should be considered by SAC after critically examining the final reports on Phase-I and Phase-II of TBR Development, which are being completed by IIT-Delhi and EIL respectively. It was also observed that the cost estimates should be suitably modified and examined, taking into consideration the existing facilities.

50.6.5 Project proposal on Development of Continuous Film Contactor – IIT-Delhi

(a) Presentation :

Prof. K.D.P. Nigam, IIT-Delhi made a presentation on the subject proposal, which was also received by CHT on 5th April, 2001 and hence could not be included in the agenda papers. As per the proposal the Fundamental studies would be taken up by IIT, Delhi under Phase-I,

Large scale hydrodynamic studies (cold flow model) would be taken up by EIL(R&D) under Phase-II and Process related studies would be taken up by IOCL(R&D) under Phase-III. The project involves a cost of Rs.200.38 lakhs with a completion schedule of 24 months.

(b) Decisions of the Committee :

The Committee observed that these contactors have limited applications since these are used only in certain special cases. It was stated that the proposal needs to be reviewed and should include the comparison of continuous film contactors with other types of contactors. It was also pointed out that financial contribution of the collaborating partners should be incorporated in the proposal. In view of these observations, It was decided to defer the proposal for consideration.

50.6.6 Presentation on Microwave / Gamma Radiation Based Desulphurisation of Petroleum Products – IIP, Dehradun

The purpose of the presentation made by Dr. M.O. Garg, Dy. Director, IIP was to explore alternative, cost effective and energy efficient method for desulphurisation. He gave references of such work being done in USA for desulphurisation of coal, petroleum/petroleum fractions.

In India, CFRI has been the first research institution to report use of Gamma Radiation for coal desulphurisation and has reported desulphurisation to the extent of 70% in case of Gamma Radiation and 24% through Microwave.

The Committee noted that the presentation is based mainly on literature survey and advised that CFRI / IIP may further probe this concept.

50.7 The meeting concluded with proposing Vote of thanks to the Chair.

Annexure-I

50th Meeting of the Scientific Advisory Committee on hydrocarbons of Ministry of Petroleum & Natural Gas

List of Participants

Members

1.	Prof. M.M. Sharma (Chairman)	Ex-Director	UDCT, Mumbai
2.	Dr. S. Vardarajan	Ex-consultant	Planning Commission
3.	Prof. A.P. Kudchadker	Emeritus Professor	IIT, Mumbai
4.	Prof. K. Vasudeva	Ex-Head, Chem.Engg. Dept.	IIT, Delhi
5.	Mrs. Lalitha B. Singh	Ex-Advisor (PC)	Dept. of Chem & Petro.
6.	Dr. A.K. Bhatnagar	Director (R&D)	IOC(R&D), Faridabad
7.	Sh. S. Singhal	Director	IIP, Dehradun
8.	Sh. K.K. Dhingra	Executive Director	PCRA, New Delhi
9.	Sh. S.N. Sharma	Scientist	CSIR, New Delhi
10.	Dr. Mrs. Malti Goel	Jt. Advisor	DST, New Delhi
11.	Sh. S.K. Sil	Director	CHT

Delegates / Invitees

1.	Mrs. Vandana Singhal	Secretary	OIDB
2.	Sh. A.N. Das	Executive Director	IOC-Digboi Refinery
3.	Sh. S.C. Tandon	Executive Director	IOCL(R), New Delhi
4.	Dr. R.P. Verma	General Manager	IOCL(R&D), Faridabad
5.	Sh. S.K. Phull	Executive Director	BPCL, Mumbai
6.	Dr. Himmat Singh	Advisor (R&D)	BPCL, Mumbai
7.	Dr. G.P. Rai	Sr. R&D Manager	BPCL, Mumbai
8.	Sh. H.R. Bhojwani	Sc. Secretary & Head, RDBPD	CSIR-HQ, New Delhi
9.	Dr. K.S. Jauhri	Dy. Director	IIP, Dehradun
10.	Dr. M.O. Garg	Scientist 'G'	IIP, Dehradun
11.	Sh. G.S. Dang	Engineer E-II	IIP, Dehradun
12.	Dr. P.K. Sen	Head(R&D)	EIL(R&D), Gurgaon
13.	Dr. S. Banik	DGM	EIL(R&D), Gurgaon
14.	Sh. Avinash Pathak	Manager(R&D)	EIL(R&D), Gurgaon
15.	Dr. S.A.A. Rizvi	Scientist E-II	RRL-Jorhat
16.	Dr. A. Borthakur	Scientist E-II	RRL-Jorhat
17.	Sh. R.C. Borah	Scientist E-I	RRL-Jorhat
18.	Dr. S.D. Baruah	Scientist E-I	RRL-Jorhat
19.	Sh. A.K. De	ED (E&T)	GAIL, New Delhi

20.	Sh. R.G. Rajan	DGM (E&T)	GAIL, New Delhi
21.	Sh. P. Chugh	Sr.Dy.Manager (Chem.)	GAIL
22.	Sh. BSG Ramaprasad	Dy.,Manager (Chem.)	GAIL
23.	Dr. K.C. Koshel	General Manager	ONGC, Dehradun
24.	Prof. K.D.P. Nigam	Head of Chem. Engg.Dept.	IIT- Delhi
25.	Dr. K.S. Balaraman	DGM(R&D)	CPCL, Chennai
26.	Sh. Vinod S. Shenoy	Sr.Manager, RCD	HPCL, Mumbai
27.	Dr. A. Mukherjee	Sr.Manager	KRL
28.	Sh. S.B. Das	Dy.Manager(R&D)	BRPL, Bongaigaon
29.	Sh. P.N. Dodeja	Addl.Director	CHT