19TH MEETING

HELD AT

COCHIN REFINERIES LIMITED, COCHIN

ON

FEBRUARY 12, 1988

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No. J-13013/1/87-Gen-XIX
Government of India
Ministry of Petroleum & Natural Gas
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New Delhi, 11th April 1988

To

(1) All Members of Scientific Advisory Committee (by name)

(2) All participants as at Annexure (by name)

Subject:- Minutes of the 19th Meeting of the Scientific Advisory Comm- ittee held in Cochin Refineries Ltd Office, Cochin on 12.2.88

Sir,

I am directed to forward herewith a copy of the Minutes of the Scientific Advisory Committee of the Ministry of Petroleum & Natural Gas held at Cochin, on 12th February 1988

Yours faithfu lly,

T. N. Parameswaran

(T.N.PARAMESWARAN)
UNDER SECRETARY TO THE GOVT. OF INDIA
TELE: 382583

Copy alo ngwith a copy of the minutes to :

1. Adviser(R)
2. Adviser(E)
3. JS(E)
4. JS(M)
5. JS(R)
6. JS(FA)
7. PS to Secretary(Petroleum)
8. FA & CAO, Oil Industry Development Board, World Trade Centre, Barakhamba Lane, New Delhi.

MINUTES OF THE 19TH MEETING OF THE SCIENTIFIC ADVISORY COMMITTEE HELD IN COCHIN REFINERIES LIMITED ON 12TH FEBRUARY 1988.

The list of participants in the meeting is attached as Annexure.

19.1 Welcome

19.1.1 Shri J.Jayaraman, Chairman & Managing Director, Cochin Refineries Ltd. welcomed the members and invitees to the meeting of the Scientific Advisory Committee of the Ministry of Petroleum and Natural Gas. He expressed happiness over the opportunity given to CRL to host this meeting. He said that the topics to be discussed by the Committee were wide ranging and was hopeful that clear recommendations will emerge from the deliberations. He briefly described the past performance and growth pattern of CRL and mentioned about the various on going projects including the Aromatics Recovery Project and the Micro-processor based Distributed Digital Control System. CRL also had proposals for diversification into petro-chemical areas. In conclusion, he assured the Committee of the atmosphere they required for the serious discussions.

19.1.2 Prof. Sharma thanked Shri Jayaraman for his warm welcome and said that the regular meetings of SAC at different refinery locations gave members an opportunity to interact and gain from refinery experiences.

19.2 Confirmation of Minutes

19.2.1 There were no comments on the minu tes of the previous meeting circulated earlier. The minutes were declared as confirmed.

19.3 Perspective of Lubricants and Additives

19.3.1 The members appreciated the efforts of Dr. P.K. Mukhopadhyay and Dr. A.K.Bhatnagar of IOC(R&D) in preparing a detailed report on the subject within a short time period. They then gave a presentation on the chosen area of "Lubricant Ad ditives and Evaluation of Automotive Lubricants in India- A Status Report".

19.3.2 The classification of additives in terms of Deter gents, Dispersants, Pour Point depressants, Fricti on Modifiers, Antioxidants, Viscosity index impr overs, Corrosion/Rust inhibitors, Metal deactivators,, Tackiness agents etc. was explained at length.

19.3.3. The current import of additives components is about 9000 tonnes per annum in the present total demand of 40,000 tonnes/annum.

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19.3.4 Lubrizol currently is manufacturing succininide type dispersants as well as neutral and overbased sulphonates/ phenates of calcium with TEN upto 200. There is a need for 250 TEN or above overbased detergents and their Magnesium salts.

19.3.5 On the basis of a survey of Engine Oils(SF quality), it is observed that in the Japanese market 62% of oil is a combination of magnesium salt and calcium salt; 21% used only Magnesium salt and 27% used only Calcium salt. Thus there appears to be preference to use a combination although some formulations can be made using only calcium salt. Similarly, Mannick base type dispersants are known to be used by one company, namely AMOCO, while others seem to be managing without this.

19.3.6 There exists a gap in the case of other additives. For example, for antiwear, EP and antioxidants there is need for the following:

Stabilised Zn DPP-		For engine and industrial applications.
S/P Compounds	-	For gear oils
Antioxidants Phenolics & Amines	-	For all types of mineral based lubricants.

19.3.7 The requirements of VI Improvers comprising of three different chemical classes is likely to increase. Except for some laboratory efforts of Lubrizol on PMA class, no serious R&D efforts have been taken up in the country. In the area of the pour point depressants, there is a need to take up manufactures of improved PPD such as alkylated polystyrene etc. With the introduction of frioties modified lubricants, there will be need for friction modified lubricants, there will be need for friction modifiers as well which predominantly comprise of Soluble Mo salt, Acid, Amine, etc. There are some small volume additives also like corrosion inhibitors (e.g. alkyl benzotriazole), tackiness agent(Polyisobutylene) etc. Non-availability of pure isobutylene is hindering the manufacture of dispersants, antioxidants, tackiness agent etc.

19.3.8 In the fast changing area, it may be appropriate to intentionally import 10 to 20% of the additives from abroad even when the indigenous manufacture of similar compounds is being carried out. This will help to keep track of the latest international developments in imporving the quality of oil and protect consumer interests.

19.3.9 The importance of component based formulations was pointed out & extensive scope for R&D work was projected in several calsses of additive formulations. It was also mentioned that IOC(R&D) and LIL have the capability for

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formulation of component based additive packages. However, the biggest limitation is the non-availability of adequate performance evaluation facilities. A need was also expressed to develop tests for gasoline and diesel engine oils around Indian engines. In the area of gear oils there are no indigenous test facilities presently available.

19.3.10 The need to minimise the oil/fuel ratio for two-wheelers is vital. Prof. Sharma expressed concern at the large quantity of unburnt fuel (in the range of 15 to 35%)being emitted by the two stroke engines. Dr. Krishna said that IIP was embarking on a programme funded by PCRA regarding optimum octane requirement for two wheelers.

19.3.11 After discussions, it was decided to have the following:

(a) To organise a meeting of different chemical laboratories with the objective to plan for taking up development of technology for synethesis of additives of contemporary and anticipated requirements in different laboratories.

(b) To organise a meeting with different engine laboratories with the objective of taking up development of engine tests using indigenous engines and to develop capability for performance evaluation.

(c) To take up with technical service departments of marketing eompanies on the issues of quality improvement of lubricants in the country.

19.3.12. As the subject concerned was wide ranging and complex the Committee decided to constitute a sub-group to further study the details of this subject. It was decided to include a person from the automobile sector also. The sub-group will consist of the following:-

(a) Dr. P.K.Mukhopadhyay IOC(R&D) : Convenor
(b) Dr. Bhatnagar, IOC(R &D)
(c) Dr. Joshi, IIP
(d) Dr. Mallick, Lubrizol
(e) Dr. Paranjape, Automobile Research Institute.

They will present some interim information at the next SAC meeting.

19.4 <u>Status of IIP catalyst evaluation at IPCL</u>

19.4.1 Dr. Balamalliah explained that the Platinum/ Rhenium Bimetallic reforming catalyst developed by IIP was passed on to IPCL for evaluation tests. The members were appreciative of the efforts made by IPCL in testing the 5 kg. impregnated sample, this catalysit has been found to be very promising. It is planned to later impregnate 100 kg. of catalyst, IIP expressed confidence that the scale-up of impregnation will not pose any performance problem.

19.5 <u>Better opportunities for young scientists in chosen areas of Science and Technology (Boyscast)</u>

19.5.1 It was agreed that members would send their suggestions on topics of interest to Chairman & Adviser(R) and these could be considered at the next meeting.

19.5.2 While he agreed with the programme, Dr. Doraiswamy expressed the need for recognition of young Scientists in Government undertakings. He said that young Scientist recognition awards could be instituted in Public Sector Undertakings and agreed to present a paper on the subject at the next meeting.

19.5.3 The need for a Centre for Expert Syste-ms was also mentioned.

19.6 ATF dearomatisation.

19.6.1 Dr. Krishna gave an encouraging picture of experiments carried out for extraction of Aromatics from ATP with sulpholane. The preliminary results are positive and work is continuing. Additionally extraction of napthalene from the extracted stream also appears feasible.

19.7 Status of Hydrocracking project funded by OIDB at IIP

19.7.1 Dr. Krishna stated that commissioning of all equipment is complete and IIP is all set to embark on the catalyst development programme. The Committee appreciated the fast progress of the project at IIP.

19.7.2 Dr. Krishna explained the differing reactivities of various hydrocarbon types and the benefits of using modified Zeolities catalysts for Bombay High type of paraffinic feeds. He explained that similar trends have been noticed for both Cat- cracking and Hydrocracking of Bombay High feed stocks. We should exercise gr care on selecting appropriate catalyst for our new hydrocrackers.

19.7.3 Dr. Krishna mentioned that Zeolities are to be bought commercially and modified. Dr. Mukhopadhyay suggested that zeolite catalysts produced at NCL could also be soreened and tested at IIP.

19.8 Progress of R&D Centre, EIL

19.8.1 Dr. Rihani said that all equipments have been installed and phase wise commissioning activities are in progress. The research studies are initially proposed to centre around unit operations and process equipment, as per the original programme.

19.9 Fuel and asphalt additives

19.9.1 Dr. Mallik of Lubrizol India Ltd. presented the paper on "Fuel Quality in India : Additive Approach for Performance Improvement". He gave an account of the increased need for fuel additives with an increase in the cracked components as constituents of gasoline and diesel fuels.

19.9.2 While discussing about the current and future fuel demands in India, the gasoline, diesel and fuel oil quali , he mentio ned about the field problems encounte-red by the users arising out of quality of fuels. He then mentioned the role of additives in providing cost-effective solutions to the problems of fuel quali-ty. In conclusions, it was stated that additive treatment offered considerable scope to conserve fuels and improve equipment utilisation.

19.9.3 After the presentation, there was some discussion on the subject & it was agreed that the following three reports should be prepared for the next SAC:

(a) Diesel Fuels : Dr. P.K.Mukhopadhyay-IOC(R&D)

(b) Gasoline : Shri R.A.Rao Lubrizol

(c) Kerosene : Dr. R.Krishna-IIP

19.9.4 Dr. Mallik presented the paper on "Asphalt Modifiers" which covered a general introduction on the chemistry of asphalt and improvement of physical and rheological properties by blending asphalt with different types of synthetic and natural polymers. The cost of additional binders(modifiers) may be for outweighed by the benefits of the reduced layer thickness and the extended life.

19.9.5 Dr. Mukhopadhyay of IOC R&D mentioned that their Laboratory was jointly working with CRRI on the improvement of the asphalt by using several types of additives.

19.10 Programme for Development of CCR tech-nology

Dr. Rihani stated that a paper will be presented at the next SAC meeting.

19.11 Next meeting.

19.11.1 The next meeting of the Scientific Advisory Committee will be held at NCL, Poona(subsequently the meeting has been fixed for Monday, 23rd May 1988. The following items will be included in the topics taken up for discussions:-

i) Development of CCR Technology - EIL

ii) Enhanced Oil Recovery Chemicals-RRL, Jorhat.

iii) Preliminary Report of Sub Committee on Lube Additives } IOC (R&D)

iv) Fuel Specifications Diesel - IOC(R&D)
Gasoline - Lubrizol
Kerosene - I IP

v) Feedstock for Carbon Black Production -Adviser(PC)

vi) Fugitive Emissions from Refineries.

ANNEXURE

List of participants

1)	Prof. M.M.Sharma	-	Chairman
2)	Dr. G.Jayarama Rao	-	Centre for High Technology
3)	Dr. L.K.Doraswamy	-	NCL
4)	Dr. P.K.Mukhopadhyay	-	IOC
5)	Dr. R.Krishnamoorthy	-	EIL
6)	Dr. R.Krishna	-	IIP
7)	Prof A.P.Kuchadkar	-	IIT Bombay
8)	Dr. P.V.Krishna	-	Deptt. of Petrochemicals
9)	Shri V.Subramanian	-	RRL
10)	Dr. Bhatnagar	-	IOC
11)	Shri S.N.Mathur	-	Ministry of Petroleum & Natural Gas
12)	Dr. Mallick	-	LIL
13)	Mr. S.K.Mukherji	-	HPCL
14)	Dr. D.N.Rihani	-	EIL
15)	Dr. Balamalliah	-	IIP
16)	Shri A.P.Krishnan	-	CRL
17)	Shri A. Rebello	-	CRL
18)	ShriP.M.Mani	-	CRL
19)	Shri Tony Mathews	-	CRL
20)	Shri George Paul	-	CRL
21)	Shri V.Mohandas Menon	-	CRL
22)	Shri Pandarinathan	-	MRL

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No.J-13013/1/87-Gen.
Government of India
Ministry of Petroleum & Natural Gas
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New Delhi, the 17th November, 1987

To

(1) All Members of the Scientific Advisory Committee (by name).

(2) All participants as at Annexure I(by name)

Subject:- Minutes of the 18th Meeting of the Scientific Adviosry Committee held in the Ministry of Petroleum & Natural Gas at 11.00 A.M. on 29th October, 1987.

Sir,

I am directed to forward herewith a copy of the Minutes of the Scientific Advisory Committee of the Ministry of Petroleum & Natural Gas held at 11.00 A.M. on 29th October, 1987.

Yours faithfully,

T.N.Parameswaran

(T.N.Parameswaran)
Under Secretary to the Government of India
Tel.No.382583

Copy alongwith a copy of the minutes to:

(1) Adviser(R)
(2) Adviser(E)
(3) JS(E)
(4) JS(M)
(5) JS(R)
(6) JS(FA)
(7) PS to Secretary(Petroleum)
(8) FA & CAO, Oil Industry Development Board, World Trade Centre, Barakhamba Lane, New Delhi-1.