



उच्च प्रौद्योगिकी केन्द्र

(पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, भारत सरकार)

Centre for High Technology

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

No. CHT/EC/91/889

3rd July, 2018

To,

कार्यकारी समिति के सभी सदस्यगण (संलग्न सूची अनुसार)

All Members of the Executive Committee of CHT (As per list enclosed)

महोदय,

Dear Sir,

विषय: उच्च प्रौद्योगिकी केन्द्र की 25वीं कार्यकारी समिति का कार्यवृत्त

Sub: Minutes of 25th Meeting of the Executive Committee (EC) of Centre for High Technology

दिनांक 12 जून, 2018 को भाभा चैंबर, स्कोप कनवेंशन सेंटर, नई दिल्ली में संयुक्त सचिव (रिफाइनरीज) की अध्यक्षता में हुई उच्च प्रौद्योगिकी केन्द्र की 25वीं कार्यकारी समिति की बैठक का कार्यवृत्त आपकी सूचनार्थ एवं आवश्यक कार्रवाई हेतु संलग्न है।

Please find enclosed the duly approved Minutes of 25th Meeting of the Executive Committee (EC) of Centre for High Technology held on 12th June, 2018 at Bhabha Chamber, SCOPE Convention Centre, New Delhi under the Chairmanship of Joint Secretary (Refineries), MoP&NG, for kind information and necessary action.

भवदीय,

Yours sincerely,

(बृजेश कुमार)

कार्यकारी निदेशक

पदेन सचिव, कार्यकारी समिति- उ.प्रौ.के

(Brijesh Kumar)

Executive Director

Member-Secretary, Executive Committee - CHT

संलग्न यथोक्त

Encl: As above

सूचनार्थ प्रतिलिपि :

Copy for information to:

संयुक्त सचिव (रिफाइनरीज), पेट्रोलियम और प्राकृतिक गैस मंत्रालय के निजी सचिव

PS to Joint Secretary (Refineries), MoP&NG

श्री पवन कुमार, अवर सचिव (रिफाइनरीज), पेट्रोलियम और प्राकृतिक गैस मंत्रालय

Sh. Pawan Kumar, Under Secretary (Refineries), MoP&NG

Members of the Executive Committee of CHT

1. Shri Sandeep Poundrik,
Joint Secretary (Refineries),
Ministry of Petroleum & Natural Gas,
Shastri Bhavan,
New Delhi - 110 001
2. Shri Vijay Sharma,
Director (R),
Ministry of Petroleum & Natural Gas,
Shastri Bhavan
New Delhi - 110 001
3. Secretary,
Oil Industry Development Board,
OIDB Bhawan,
Plot No. 2, Sector-73,
NOIDA - 201 301
4. Shri B. V. Rama Gopal,
Director (Refineries),
Indian Oil Corporation Ltd.,
SCOPE Complex, Core-2, 5th Floor,
Lodhi Road,
New Delhi - 110 003
5. Shri V. S. Shenoy,
Director (Refineries),
Hindustan Petroleum Corporation Ltd.
Petroleum House,
17, Jamshedji Tata Road,
Mumbai - 400 020
6. Shri R. Ramachandran,
Director (Refineries),
Bharat Petroleum Corporation Ltd.
Bharat Bhawan,
4 & 5 Currimbhoy Road,
Ballard Estate,
Mumbai - 400 001
7. Shri Manoj Jain,
Director (BD),
GAIL (India) Ltd.,
16, Bhikaiji Cama Place,
R. K. Puram,
New Delhi - 110 066

- **Chairman**

8. Dr. Anjan Ray,
Director,
Indian Institute of Petroleum,
P.O. Mohkampur,
Dehradun - 248 005
9. Shri L. K. Vijh,
Director (Technical),
Engineers India Ltd.
EI Bhawan,
1, Bhikaiji Cama Place,
New Delhi - 110 066
10. Shri Brijesh Kumar,
Executive Director/Member-Secretary, Executive Committee
Centre for High Technology,
9th Floor, Tower-A, OI DB Bhawan,
Plot No. 2, Sector-73,
NOIDA - 201 301

Special Invitees

11. Shri S. N. Pandey,
Managing Director,
Chennai Petroleum Corporation Ltd.
536, Anna Salai,
Teynampet,
Chennai - 600 018
12. Shri M. Venkatesh,
Managing Director,
Mangalore Refinery & Petrochemicals Ltd.,
Regd. Office: Kuthethoor,
P.O. Via Katipalla,
Mangaluru - 575 030
13. Shri S. K. Barua,
Managing Director,
Numaligarh Refinery Limited,
122 A, R. G. Barua Road,
Guwahati - 781 005

**Minutes of 25th Meeting of the Executive Committee (EC) of Centre for High Technology (CHT)
held on 12th June 2018 at Bhabha Chamber, Scope Convention Centre, New Delhi**

Shri Sandeep Poundrik, Joint Secretary (Refineries), MoP&NG and Chairman of the Executive Committee of CHT chaired the Meeting. The list of participants is enclosed as **Annexure**.

Shri Brijesh Kumar, ED, CHT welcomed the Chairman and Members of the EC and other participants to the Meeting.

Thereafter ED, CHT made a detailed presentation on the Agenda Items.

The following points emerged out of discussions:

1.0 Review of Action Points of 24th Meeting of Executive Committee held on 16th February, 2018 (Agenda Item No. 1)

1.1 Energy Efficiency Improvement Study and Performance Audit of PSU Refineries (Point No. 1.1 of MOM)

ED, CHT informed that the Energy Efficiency Improvement Study and Performance Audit of 15 PSU Refineries by EIL, at cost of Rs 12.9 crore (excluding ST/GST), is in the final stages of completion. The latest status is as under:

- Study completed for 11 refineries and 100 % payment released
- IOCL-BR: Final Report accepted. Final 20 % payment under processing
- MRPL & CPCL: Final Report issued by EIL. Finalisation by mid-June 2018
- HPCL-V: Report finalisation by mid-June 2018

EIL made a detailed presentation on the outcome of the study and the savings identified under the following 3 heads:

- 1) Short-term/Quick-wins
- 2) Schemes implementable in Medium-term within 2 years and
- 3) Long-term that needs further detailed study by EIL/Refineries

Chairman advised all refineries to present the implementation schedule of all identified energy saving schemes by EIL and PCRA, including in-house schemes. CHT was advised to organise a meet by end June, 2018 for this purpose. A roadmap for implementation may be prepared.

Action: Refineries/CHT

1.2 Performance Improvement Programme of PSU Refineries (Point No. 1.3 of MOM)

ED, CHT presented the following refinery-wise schedule:

Baseline Year	Number of Refineries	Refinery
2017-18	9	IOCL : Guwahati, Digboi, Mathura, Panipat & Paradip Refineries BPCL : Mumbai & Kochi Refineries HPCL : Mumbai & Visakh Refineries
2018-19	6	IOCL : Barauni, Gujarat, Haldia & Bongaigaon Refineries CPCL : Manali Refinery NRL : Numaligarh Refinery

MRPL have already completed the study separately.

EOI and Tender Document have been finalised along with refineries. The time-lines for various activities are as under:

Milestones for Award of Job for 2017-18 Baseline Cycle	
Hosting EOI on CPP and CHT website	Completed (10-10-17)
Meeting of the Committee of refineries & CHT for evaluation of bids from consultants against EOI at CHT	Completed (12-12-17)
Shortlisting of Consultants meeting the PQC by the Committee (UOP, Axens, KBC, McKinsey and BCG)	Completed (21-02-18)
Issue of Tender to Shortlisted Consultants	Completed (26-03-18)
Pre-bid Meeting in CHT	Completed (12&24 April, 2018)
Refinery Visits by Consultants	Completed (3 rd to 16 th May 2018)
Bid Submission & Un-priced bid opening	13 June, 2018
Priced bid opening	26 June, 2018
Finalisation of refinery-wise consultant by the Committee of CHT and Refineries	1 July, 2018

EC took note of the above.

Action: CHT/Refineries

1.3 Compendium on Experience Sharing

ED, CHT informed that Compendium containing following prepared and shared with all refineries for idea generations:

1. Refinery wise Schemes under implementation/ planned
2. Best practices
3. Findings of Walk Through Audits
4. Innovations in refining sector
5. Takeaways from Activity Committee Meetings conducted by CHT

The Compendium has been finalised after feedback from refineries on Idea generations from cross sharing and has been circulated to all the refineries.

ED CHT informed that in addition, a Discussion forum is being launched on CHT portal in various areas where queries can be posted and a panel of domain experts would provide the response.

In order to institutionalise the learnings, EC advised CHT to include repetitive failures, operational problems at refineries in the Experience Sharing Compendium, based on which EIL would capture areas of improvement in designs of equipment/ processes.

EC also advised CHT to organise a meet on "Improvement in Project Execution Strategies" in association with EIL.

Action: CHT/Refineries/EIL

2.0 Items for Approval by EC / Recommendation to GC

2.1 New R&D Proposal on "Improving (Speedy) Leak Detection Time in Pipelines by deployment of Real Time Ethernet Protocols: HPCL-VSPL/ECIL" [Agenda Item 2(1)]

ED, CHT presented a brief about the proposal which has been recommended by SAC for funding by CHT. Currently finite element approach is used with statistical method and it takes about 15 minutes to detect leak. The leak detection time is proposed to be reduced to about 2-3 minutes with an accuracy of ± 200 meters compared to current range of ± 2 to 3 km by using acoustic & negative pressure wave calculation. ECIL will support in development of Electronics.

The proposal is for demonstration in HPCL's Vizag-Vijayawada-Secundrabad Pipeline (VVSPL), wherein Electronic Systems Design & Manufacturing (ESDM) device and Firmware will be developed.

ED, CHT informed that the Project was reviewed by the Expert Committee constituted by the Screening Committee of SAC before finalisation and putting up to SAC.

SAC deliberated on the proposal during the 81st Meeting on 14-03-2018 and recommended for consideration and funding. The project cost is Rs 1.17 crore (with CHT contribution of Rs 0.84 crore) with completion in 18 months.

EC considered and approved the proposal. However, CHT's contribution will be limited to 50 % of the project cost, i.e., Rs 0.585 crore.

EC also advised that for CHT funded R&D projects, the contribution from the commercial partner should be 50% minimum.

Action: CHT/HPCL

2.2 New R&D Proposal on "Creation of Solar based H₂ Production System & Dispensing Station for Refuelling H₂ Fuel Cell Vehicle: IOC R&D" [Agenda Item 2(2)]

ED, CHT presented a brief about the proposal which has been recommended by SAC for funding by CHT.

ED, CHT mentioned that the project aims at developing national facility which would enable PSU and other R&D institutes in demonstration of technologies in PV cells, Electrolyser, H₂ Storage, Fuel Cell Vehicles & integration of sub-systems and obtain approval from PESO.

Scope

- a) Procurement of Hydrogen infrastructure [Solar PV Panel, hydrogen generator (electrolyser), compressor, hydrogen dispenser]
- b) PESO approval for installation of above items
- c) Installation & Commissioning
- d) PESO approval for on-board hydrogen filling
- e) Fuel Cell Vehicle filling and data generation
- f) Performance monitoring, data analysis & report generation

SAC in its 81st Meeting on 14-03-2018 extensively deliberated on the proposal and recommended the proposal with following remarks:

- Project should have flexibility to adopt different pathways for hydrogen production and storage so as to derive cost benefit of innovation and cost cutting in future
- IOCL to procure the best electrolyser that would minimise energy consumption through EOI route even though there may be higher initial capital cost to start with. This could be brought down later through higher turnover.
- Estimated cost of project is Rs 44 crore, which may go up with suggested actions as above. CHT's share in the project to be capped at Rs 30 crore with the rest to be borne by IOCL. Project duration is 36 months.

EC asked that the project to be put up with firm cost post EOI and minimum contribution of 50 % by IOCL.

EC also advised that for CHT funded R&D projects costing more than Rs 10 crore, detailed project proposal has to be put up for approval by EC/recommendation to GC.

Action: IOCL (R&D)/CHT

2.3 Utilisation of HCF for CHT funded projects in the area of Hydrogen Research [Agenda Item 2(3)]

ED, CHT informed that the present mechanism of project approval under HCF (after technical recommendation by SAC), requires concurrence from OADB and approval from high level Steering Committee even for low cost project.

SAC, in its 80th meeting held on 6th Sept 2017, extensively deliberated on the issue and recommended continuation of programme under the HCF and suggested that:

- The process may be simplified and recommended that there is no need for separate mechanism of approval under HCF
- Same route, as currently followed for projects funded through OADB/ CHT, may be adopted.
- Fund under HCF may continue to be managed by OADB separately.
- Transferring OADB/ CHT funded ongoing hydrogen related projects to HCF.

It is proposed to transfer the following on-going OADB/CHT funded project to HCF:

“Scale-up studies and process development for hydrogen production by catalytic decomposition of NG by HPCL/IIT-D/CeNS” [Project Cost Rs 29.46 crore (CHT: Rs 16.92, HPCL: Rs 12.54)]

It is also proposed to transfer the new SAC recommended project “Creation of solar based H₂ production system & dispensing station for re-fueling H₂ fuel cell vehicle: IOC R&D” under HCF (Ref. Item 2.2 above).

After detailed deliberations, EC agreed with the above suggestions and advised CHT to put-up the proposal to MoP&NG for its consideration and approval.

Action: CHT

2.4 Development of Water Consumption Norms and Reduction of Water Footprint [Agenda Item 2(4)]

ED, CHT informed that EC, in its meeting held on 22.02.2017, advised EIL & CHT to develop norm for water consumption with a view to reduce water footprint of refineries. Data on water quality, usage, hardware and current technology/ practices employed by the refineries was collated by EIL. Consumption varies from 0.6 to 3.0 m³/MT of Crude processed. The various factors which affect water consumption are water quality, treatment practices, cooling water systems, condensate recovery, reuse and recycle.

It is proposed to carry out a study for "Development of Water Consumption Norms and Reduction of Water Footprint" by EIL as they have already put in huge efforts in terms of collating the data and preliminary analysis.

Tender document, including terms and conditions, has been finalised by the committee comprising refineries representative and CHT on 09-05-2018. The fees for the Study for 14 PSU Refineries (excluding MRPL who have already taken up the study separately) was negotiated by the Committee at a base cost of Rs 6.35 crore. CHT will reimburse 50% of base fee to the refineries and GST on the entire fees shall be borne by Refineries. The Study will be completed within 9 months after placement of work order.

EC accorded approval for the above.

Action: CHT/EIL

3.0 Special Studies for in-principle Approval by EC [Agenda Item 3]

3.1 Approach Paper on Reduction of Steam System at Refineries [Agenda Item 3(1)]

ED, CHT informed that EC, during its last meeting on 16-02-2018, advised that CHT may line-up consultant to prepare a focused approach paper on Reduction of steam consumption at refineries. So far refineries have worked with the approach of managing supply of steam, which lacked demand side management.

It is proposed to prepare an Approach Paper on demand side management based on the best practices and Indian realities by engaging a consultant through Limited Tender to reputed consultants (viz., Solomon, KBC, UOP, Shell, Axens, Bechtel). The Consultant will finalise the Best practices and the paper after discussions with PSU Directors/MDs at Mumbai. Schedule: 3 months after placement of Work Order. Estimated cost: US\$ 200,000 (Based on Budgetary offer from KBC) equivalent to ~ Rs. 1.58 crore, including GST. CHT proposed to bear the entire cost as it is not a refinery specific study and also cost of study is small.

EC accorded in principle approval for the above. EC advised CHT to follow tender/EOI route for engaging the consultant.

Action: CHT

3.2 Performance Benchmarking Study for Pipelines 2018 [Agenda Item 3(1)]

ED, CHT informed that it is proposed to carry out Performance Benchmarking Study for Liquid Pipelines in line with Study for Refinery Performance. So far, Pipeline benchmarking studies have been carried out by oil companies in a limited way -- by IOCL in 2000 (through M/s Cap Gemini Ernst & Young Canada) and 2004 & 2009 (through M/s Solomon Associates, USA) and by BPCL in 2016 for 4 pipelines through M/s Solomon Associates, USA.

EOI (including Scope of Work and Prequalification Criteria) has been finalised by a committee comprising officials from the participating PSUs (IOCL, BPCL and HPCL). The EOI has been issued on 10-05-2018. The Committee will scrutinize the offers received through EOI to shortlist the consultants for inviting competitive bids. It is proposed to obtain firm offer for 3 successive Benchmarking Study. However, CHT shall reserve the right not to undertake study in subsequent years.

The estimated Fee for the identified 16 pipelines & 5 SPMs (based on offer from Solomon Associates) is ~ Rs 1.3 crore (excluding taxes). Schedule: 9 months after placement of work order.

It is proposed that CHT may reimburse 50% of base fee to the participating companies. Applicable taxes on the entire fees shall be borne by these companies. Payment shall be made to the consultant by CHT upon receiving the base fees and applicable taxes from the participating PSUs.

EC accorded in-principle approval for the proposal. EC, however, advised CHT to include liquid, crude and LPG pipelines of all PSUs. CHT should explore inclusion of Gas Pipelines also.

Action: CHT

4.0 New Initiatives Taken by CHT [Agenda Item 4]

ED, CHT presented the following new initiatives taken by CHT:

- **Activity Committee on "Quality Control"**
 - In line with the demand expressed by the industry, a New Activity Committee on "Quality Control" has been initiated to keep abreast with the latest developments and sharing of best practices
 - Meeting is scheduled on 14th and 15th June, 2018 at MRPL.

- **Lab Co-relation Programme**

- As advised by SAC, CHT has initiated an inter laboratory correlation programme for better coordination of product quality at industry level.
- Programme shall be undertaken for 3 major fuel products (MS, HSD and ATF) at 2 levels.
- **First Level** : ILC would be conducted with one refinery from each zone and independent labs are as under;
 - North Zone: IOCL-Mathura
 - Central & Western Zone: BPCL-Mumbai
 - East & Southern Zone: HPCL-Vizag
 - North Eastern Zone: IOCL-Guwahati
 - Independent labs: IOC R&D, BPC-R&D, HPC R&D, CSIR-IIP, SFPL
- **Second level**: intra zone, involving refineries in the Zone, one R&D lab and major PPL/ Mktg. installations of the zone.
- For each product, a coordinating refinery lab has been identified for sending the samples and compiling results.

Schedule

- Sample dispatch by 30th June 2018
- Receipt time to participating labs: 31st July 2018
- Sample testing and submission of report by participating lab to coordinating lab: Latest by 30th September 2018.
- Result compilation and Z score calculation by coordinating lab and communication to participating labs and review: Oct 2018

- **Energy Saving Equipment for Tax Rebate to BEE**

A list of energy Saving Equipment has been compiled in consultation with refineries and forwarded to BEE for seeking Tax Rebate in GST/IT.

- **GT Optimisation along with BGGTS (BHEL -GE Gas Turbine Services)**

An Approach Paper with saving opportunities prepared in association with BGGTS has been circulated to all the refineries. A Customer Conference by BGGTS is proposed on 12th and 13th July 2018, where in refineries have been requested to present best practices and also discuss saving opportunities.

- **Development of Energy Efficiency Norms for Major Equipment**

Energy Efficiency Norms for major equipment like furnaces/boilers, GTs, motors is being developed in association with BEE by June 2018.

EC took note of the above.

CHT was advised to coordinate R&D activities of PSUs In biofuel area.

Action: CHT

5.0 CHT Budget [Agenda Item 5]

ED, CHT presented the Actuals for 2017-18 and BE for 2018-19 as under:

(Figs in Rs crore)

Particulars	2016-17			2017-18			2018-19
	BE	RBE	Actual	BE	RBE	Actual	BE
REVENUE EXPENDITURE							
Salary	9.00	7.67	8.48	8.05	11.00	8.79	9.80
Other than Salary	2.10	1.94	1.82	2.20	2.19	2.02	2.25@
Sub-total	11.10	9.61	10.30	10.25	13.19	10.81	12.05
CAPITAL EXPENDITURE	0.03	0.027	0.025	0.05	0.05	0.05	0.08
PROJECTS							
Funding of R&D Projects	11.82	9.33	9.17	15.00	15.15	14.68	15.00
Special Studies	5.00	2.40	1.40	7.05	6.21	6.12	4.77
Sub-total	16.82	11.73	10.57	22.05	21.36	20.80	19.77
TOTAL EXPENDITURE	27.95	21.37	20.88	32.35	34.60	31.66	31.90

Note: RBE is as considered in 24th meeting of EC held on 16-02-2018.

Reasons for deviation in Salary:

- Actual higher than BE due to revision in Salary w.e.f. Jan 2017
- Actuals lower than RBE due to payment of around Rs 40 lakh not claimed by companies and higher estimates towards Arrears and Year-end payment.

@ excluding OIDB contribution of Rs 25 lakh for 23rd RPTM scheduled in Jan 2019

FA&CAO informed that OIDB Board has approved Rs 31.90 crore for BE 2018-19 for CHT.

EC considered and recommended the above CHT Budget for approval by GC of CHT.

Action: CHT

6.0 Items for Information of Executive Committee [Agenda Item 6]

6.1 Status of New R&D Proposals through EOI

EOI has been issued 5 times since June 2016.

Summary Status of EOIs

	Publishing Month	Proposals Received	Shortlisted by Screening Committee	Recommended by SAC
EOI-1	June 2016	15	1	1
EOI-2	Feb 2017	10	-	-
EOI-3	June 2017	6	2	2
EOI-4	Nov 2017	6	-	-
EOI-5	Feb 2018	15	5*	-

*** Advised modifications for further consideration by Screening Committee**

EOI-1 & EOI-2 were published in newspaper. In November 2017, the details of CHT scheme including areas of proposals, eligibility, etc. for funding R&D projects / EOI were shared with all reputed academic institutes.

6.2 23rd Refining & Petrochemicals Technology Meet (RPTM) – Theme and Venue

MoP&NG has approved the proposal of organising the 23rd RPTM by CHT in association with BPCL in Mumbai during January, 2019.

The Theme of the RPTM will be “Aligning Refineries towards Sustainable Future”.

CHT was advised to explore holding RPTM during 19-21 Jan 2019 considering Petrotech, which is already scheduled during 22-24 Jan 2019.

Action: CHT

6.3 MOU with AMCHAM, India

A MOU was signed between CHT and AMCHAM (American Chamber of Commerce), India on May 8, 2018 for cooperation in the areas of technology, operations and access. The MOU would facilitate enhanced cooperation and specific studies for promoting technical exchange and absorption of technology. The MoU entail working across the entire range of downstream hydrocarbons, biofuels, petrochemicals, as well as digital control, internet of things and AI in the petroleum sector. The MoU also bring out specific studies identified at present that could be pursued.

The MOU was signed in the presence of Joint Secretary (Refineries), MoP&NG and Senior Officials from US Embassy & USTDA.

EC took note of the above.

6.4 Case with regard to Demand of Service Tax on Withholding Tax Paid by CHT to Shell Global Solutions International (SGSI)

CHT had engaged Shell Global Solutions International (SGSI) for carrying out Benchmarking/TSA/Performance Improvement Studies of PSU refineries.

During the Service Tax audit conducted by the Office of the Commissioner of Service Tax (OCST) on 23/28-12-2010, the Audit Group observed that CHT have not been discharging Service Tax liability towards the withholding tax under reverse charge mechanism. CHT contented that the value of taxable service under reverse charge is total amount of consideration paid by CHT. The total consideration should exclude the withholding tax paid by CHT as it is actually not income in the hands of SGSI and it was unreasonable to impose tax on taxes. CHT in their appeal referred to various court cases where it has been held that Service Tax liability needs to be discharged on amounts which have been billed by the service provider.

OCST did not agree to the contention of CHT and have been raising demand for payment of Service Tax on withholding tax starting from the period 2005-06 to 2014-15.

CHT filed an Appeal dated 26-05-2014 before CESTAT (Customs, Excise and Service Tax Appellate Tribunal) in consultation with OADB contesting demand made under Sr. No. 1 and 3 mentioned in Table above.

CHT filed an Appeal dated 02-12-2016 before CESTAT contesting demand made under Sr. No. 2 mentioned in Table above.

After repeated adjournment, the hearing of the above appeals is scheduled for 5th July 2018.

EC took note of the above.

7.0 Other Points with Permission of Chair

7.1 Pre-Qualification Criteria (PQC) for Deployment of Indigenous technologies developed by PSU companies

EC extensively deliberated on the issue. EC was of the opinion that while evaluating the technologies developed by other PSU oil companies, its captive commercialisation by the developing company is also to be considered. CHT was advised to put up a note on this to MoP&NG for taking up with PSU oil companies suitably.

Action: CHT

The meeting concluded with thanks to the Chair and the participants.

**25th Meeting of the Executive Committee (EC) of Centre for High Technology (CHT) held on
12th June, 2018 at Bhabha Chamber, Scope Convention Centre, New Delhi**

Participants

MoP&NG

1. Shri Sandeep Poundrik, JS(R) – Chair
2. Shri Pawan Kumar, US (R)
3. Shri Santanu Dhar, S.O.

OIDB

4. Shri Ajay Srivastava, FA&CAO

IOCL

5. Shri B.V. Rama Gopal, Director (R)

BPCL

6. Shri R. Ramachandran, Director (R)

HPCL

7. Shri V.S. Shenoy, Director (R)
8. Shri G.S. Joshi, GM (RCD)

MRPL

9. Shri M. Venkatesh, MD
10. Shri M. Vinayakumar, GGM (Ref In-charge)

CPCL

11. Shri S.N. Pandey, MD

NRL

12. Shri S.K. Barua, MD
13. Shri B.K. Phukan, Director (T)

GAIL

14. Shri M.R. Meshram, ED (R&D)
15. Shri Parivesh Chugh, GM (R&D)

EIL

16. Shri L.K. Vijh, Director (T)
17. Ms Vartika Shukla, ED (T)

CSIR-IIP

18. Dr Anjan Ray, Director

CHT

19. Shri Brijesh Kumar, ED
20. Shri R. Krishnamurthy, Advisor (T)
21. Shri D. Thakur, Advisor (T)
22. Shri R.K. Sharma, Joint Director (F)
23. Shri S.K. Varshney, Joint Director