**Item 0 OPENING OF THE MEETING**

* 1. **Welcome address**

Shri Chinmay Dwivedi, Head, PCD, welcomed all Convenor and all members to the 39th meeting of PCD 3:1 and thanked everyone for attending the meeting. He introduced himself as the new Head of PCD, joined from 1 July 2024 after the superannuation of Smt Meenal Passi. Shri Dwivedi mentioned that there are several important items in the agenda related to alternate fuels for which MoPNG is following up with BIS; hence he requested the Subcommittee to expedite the relevant subjects as they have implications on sustainability.

* 1. **Opening remarks by the Convenor**

Dr. Y.P. Rao, Convenor, welcomed all members to the 39th meeting of PCD 3:1. He welcomed Shri Chinmay Dwivedi to PCDC. He requested the subcommittee members to deliberate the subjects by keeping the end consumers’ interest in view. He also requested members to fulfil the responsibilities taken by them within the timeline decided and provide drafts/inputs to BIS as required. Dr. Rao also emphasized that whenever a standard is amended or revised, it has to be backed by data and empirical evidence. Hence, he requested members to provide adequate data for any proposed change in standard/working document. With these remarks, he requested BIS to proceed with the meeting.

* 1. Attendance of the meeting is given in **Annex I**.

**Item 1 TITLE, SCOPE AND COMPOSITION OF PCD 03:1**

* 1. The Subcommittee ***REVIEWED*** the title, scope, and composition of Automotive, Aviation and Industrial Fuels Subcommittee, PCD 3:1, as given in Annex Iof agendaand ***RECOMMENDED*** the following:
1. Update name of Bharat Oman Refineries as BPCL Refinery, Bina
2. Seek fresh nomination from CPCL as Shri H Ramakrishnan has superannuated
3. Seek fresh nomination from Directorate of Indigenization as Gp Capt Asheesh Shrivastava has been transferred from the organization
4. Seek fresh nomination from Honda Cars, Noida
5. Update name of Mahindra & Mahindra, Mumbai as Mahindra & Mahindra Research Valley, Chennai
6. Seek fresh nomination from Numaligarh Refinery Limited, Golaghat

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| **(PETROLEUM, COAL & RELATED PRODUCTS DEPARTMENT)** |
| **MINUTES** |
| **29 July 2024, Monday, 1100 - 1600 h** |
| **Automotive, Aviation and Industrial Fuels Subcommittee, PCD 3:1** | **39th Meeting**  |
| **Convenor: Dr Y.P. Rao, In personal Capacity** | **Member Secretary: Ms. Kreeti Das** |

**1.2** **Panels and Working Groups under PCD 3:1**

The Subcommittee ***NOTED*** the panels and working groups under PCD 3:1.

**Item 2 ACTIVITIES OF AUTOMOTIVE, AVIATION AND INDUSTRIAL FUELS SUBCOMMITTEE, PCD 3:1**

**2.1** The Subcommittee ***NOTED*** the list of Indian Standards published under PCD 3:1 as given in Annex II of agenda.

**2.2 Draft Standards/Amendments for Finalization**

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| --- | --- | --- |
| **Sl. No.** | **Indian Standard/Document Number** | **Recommendation of Subcommittee** |
|  | **PCD 03(24139) WC****First Revision of IS 11489: 1985****Specification for heavy petroleum stock (Hps)** | * The Subcommittee ***NOTED*** that the document has been finalized and sent for printing.
 |
|  | **PCD 03(22730)WC****Fourth Revision of IS 1593 : 2018****Fuel Oils - Specification** | * The Subcommitee ***REVIEWED*** the MoEFCC notification dated 18 Mar 2008 and it was observed that the notification is for internal oil refineries only. Whereas this document prescribes fuel oil specification for industrial applications.
* Dr. Jhala, IOCL, informed that states have set their own limits for the sulphur content which vary among states, e.g., Haryana has set a limit of max 1.8 percent by mass, for Delhi-NCR, it is max 1 percent, in Himachal Pradesh, it is max 1.8 percent. Hence, OMCs will have to comply to the state regulatory requirements while marketing the fuel.
* As the MoEFCC notification dated 18 Mar 2008 is applicable only the emission and effluent control at refinery, it is not applicable to PCD 03(22730)WC. The Subcommittee ***RECOMMENDED*** BIS to check with CPCB if there is a notification with respect to sulphur limit in furnace oil for industrial use and put up to the Subcommittee in next meeting.
 |
|  | **PCD 03 (19658)WC2****Seventh Revision of****IS 1460 : 2017** **Automotive Diesel Fuel – Specification** | * The Subcommittee ***NOTED*** that the document has been finalized and sent for printing.
 |
|  | **PCD 03 (23723)WC****Fifth Revision of****IS 1459 : 2018** **Kerosene – Specification** | * With respect to the comments on test methods received on the WC document, the Subcommittee ***RECOMMENDED*** BIS to first table the comments in the test method WG meeting and put up the recommendations of the WG to Subcommittee.
 |
|  | **PCD 03 (24988)WC****First Revision of IS 16861 : 2018****High flash high speed diesel fuel - Specification** | * With respect to the comments on test methods received on the WC document, the Subcommittee ***RECOMMENDED*** BIS to first table the comments in the test method WG meeting and put up the recommendations of the WG to Subcommittee.
 |
|  |  **PCD 03 (26244)F****First Amendment to IS 17081 : 2019****Aviation Turbine Fuel (Kerosene Type, Jet A-1) containing Synthesized Hydrocarbons — Specification** | * The Subcommittee ***NOTED*** that the document has been finalized and sent for printing.
 |
|  | **PCD 03 (22875)WC****Amendment – 2 to IS 17021 : 2018****E 20 fuel - Admixture of anhydrous ethanol and gasoline - As fuel for spark ignited engine powered vehicles - Specification** | * The Subcommittee ***NOTED*** that the document has been finalized and sent for printing.
* Dr. Jhala informed that he had discussed regarding testing of ethanol in E20 with a Brazilian expert in ISO Committee. In ISO, one test method is available that is capable of testing 1-80% ethanol in ethanol-gasoline blends. He has shared this method with refineries to carry out testing and the results will be analyzed in the WG meeting, and if satisfactory, will be recommended for inclusion in next Subcommittee meeting.
* Convenor thanked Dr. Jhala for bringing the new test method to the notice of the Subcommittee and also requested the WG to evaluate the test kits are available for testing of ethanol in gasoline and invite representatives from Mahindra and Ultra Plus Lubricants to demonstrate test kit in WG and recommend to Subcommittee.
 |
|  | **PCD3(17838)P****Automotive fuels —****Paraffinic diesel fuel from synthesis or hydrotreatment****— Specification** | * The Subcommittee ***NOTED*** the status of the project.
 |

**2.3 Draft Standards/Amendments for Approval for Wide Circulation**

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| **Sl. No.** | **Indian Standard/Document Number** | **Recommendation of Subcommittee** |
|  | **Fifth Amendment to IS 1571 : 2018****Aviation turbine fuels kerosene type jet - A - 1 - Specification**  | * The Subcommittee ***THANKED*** Dr. Jhala for the draft Annexure to be issued as an amendment and briefly ***REVIEWED*** the contents of the Annexure.
* Convenor highlighted the statement in the Annexure where it is mentioned “using a single feedstock for a single batch of ATF”, and questioned whether it will cause problems in downstream storage locations where it’s possible that more than one batch exists in the tanks at any given time. He recommended Dr. Jhala and other members to deliberate on this and provide their inputs.
* With the above remarks, the Subcommittee ***RECOMMENDED*** to issue the draft amendment into WC for 30 days as the subject is of priority for MoPNG.
 |
|  | **PCD 03 (23286)WC****Amendment – 5 to IS 2796 : 2017****Motor gasoline - Specification** | * The Subcommittee ***REVIEWED*** the communications sent by BIS to MoPNG and vice versa.
* Shri P K Banerjee, SIAM, appreciated the efforts of the nation in achieving ethanol blending targets and informed that automotive industry has converted around 2 Cr vehicles annually to be compatible with E20 fuel. He referred to Hon’ble PM’s report that cited two dates – 1 April 2023 (conversion of vehicles to be material compliant with E20) and 1 April 2025 (rollout of engine and material compliant vehicles for E20). Engine compliance with E20 means recalibration of engines to provide better spark ignition and more efficient combustion. It also involves hardware change with reduction in piston volume which will increase the compression ratio and improve thermal efficiency of engine. A vehicle with high compression ratio will suffer from knocking and engine failure if run on lower RON fuel. Hence, SIAM has time and again requested, keeping in view Govt’s target to rollout E20 vehicles from April 2025, to remove RON 91 for E10 EBMG from IS 2796. He appreciated the efforts of the Committee that amendment was issued into WC after removal of the RON 91 grade. However, MoPNG’s stance on need to retain RON 91 for E10 EBMG is a matter of grave concern for automotive industry.
* Shri Banerjee further emphasized that in view of this stance of MoPNG and OMCs, automotive industry will not be able to execute engine redesign and hardware change to achieve engine compatibility with E20. If E20 fuel is used on current engines, there will be loss in fuel efficiency and country will lose out with respect to decarbonization. Hence, Shri Banerjee requested the Subcommittee and OMCs to consider the report on “Feasibility of Production and Marketing of Ethanol Blended Gasoline – RON 95” prepared by Committee headed by Dr. S S V Ramakumar, Former Director IOCL R&D, and take a progressive decision for sake of consumer and to remove RON 91 grade and retain only RON 95 for E10 EBMG.
* Representatives from Mahindra & Mahindra, Renault-Nissan, Maruti-Suzuki, Dr. Mathew Abraham also supported the views of SIAM and requested for a final decision on the subject as it has been pending for a long time.
* Shri Rajesh Manocha, MoPNG, referred to letter from MoPNG and emphasized that Ministry has asked to retain RON 91 for a limited period only, i.e., till pan India implementation of RON 95. So, retaining RON 91 will not be a regressive decision as already 15000 outlets are dispensing E20 and soon India will be able to roll-out E20 throughout the country.
* SIAM enquired whether MoPNG can guarantee a time frame upto which RON 91 is to be retained, to which Shri Manocha replied that time frame can only be decided by the Govt. SIAM mentioned that unclarity in terms of timeframe is creating problem for automotive industry as they are not able to determine regarding engine redesign and hardware change.
* Convenor listened to the viewpoints of members and emphasized that by April 2025, automotive industry has to attain both material and engine compatibility. Redesigned engines used on RON 91 will lead to knocking and engine damage which will be detrimental to consumers. He also highlighted that Govt is pushing for CAFÉ 3 norms that are expected by 2027. All these initiatives are interrelated with the overall objective being reduction of carbon footprint. In view of this, the unclarity in terms of timeframe cannot be accepted as OEMs have to roll out engines compatible with E20. Hence, there has to be a clear time frame and it has to be till April 2025 as specified in the “Roadmap for Ethanol Blending Program” issued by Niti Aayog.
* He also considered the letter from MoPNG citing instances of shortage of ethanol leading to OMCs blending 9% ethanol, in which case RON 95 cannot be met. For such instances, he recommended that instead of keeping RON 91, RON 94 should be kept as even with 9% blending of ethanol with base gasoline having RON 91.5, RON 94 is achievable. Hence, RON 94 grade may be kept for E10 EBMG, however, only upto 31 March 2025 as the Niti Aayog Roadmap mentions roll-out of E20 from April 2025. From 1 April 2025 onwards, only RON 95 grade will be applicable.
* SIAM conceded that if OMCs and MoPNG concerns of ethanol shortage cannot be allayed, the automotive industry may be willing to accept the introduction of RON 94 grade till 31 March 2025 only and after that only RON 95 will be applicable.
* Shri Rajesh Manocha, MoPNG, raised concern with the deadline of 31 March 2025 and mentioned that instead of giving a date, it should mention “as per directives issued by Govt. from time to time”. He mentioned that BIS does not have the authority to prescribe a date.
* Shri Chinmay Dwivedi, Head PCD, informed the Subcommittee that BIS is not empowered to prescribe a date upto which a grade of fuel may be applicable or removed. This is a policy matter and outside the purview of BIS. Hence, in absence of an official notification of Govt., BIS cannot prescribe a date, such as 31 Mar 2025. The “Roadmap for Ethanol Blending Program” issued by Niti Aayog is an expert committee report and cannot be treated as an official notification or order. Instead, he suggested that the Subcommittee may record in the minutes that “RON 94” that is introduced now for E10 EBMG will be again reviewed by Subcommittee in March 2025 OR the Subcommittee may recommend to write to MoPNG with the proposal of introducing RON 94 for E10 EBMG with the condition that the grade is applicable only till 31 March 2025 and seek comments.
* SIAM countered that if a fixed timeline in the form of a date is not mentioned till which period the proposed RON 94 grade will be applicable, SIAM cannot support the proposal.
* Dr. Jhala informed that as MoPNG, being the regulator, has communicated to BIS for retaining RON 91 for E10 EBMG, OMCs are currently not able to comment on the proposal by Convenor to introduce RON 94 instead of RON 91. He mentioned that OMCs will deliberate with their management and MoPNG and inform their viewpoints on the proposal. Convenor requested OMCs to come back with their view point in PCD 3 meeting.
 |
|  | **IS 2796 : 2017****Motor gasoline - Specification**  | * BIS informed that as per BIS Standard Formulation Manual, a revised draft of Indian Standard may be circulated directly into WC, without circulation within Committee/Sub-Committee/Panel (equivalent to P-draft).
* However, the Subcommittee ***RECOMMENDED*** that revised drafts provided by experts should be first reviewed in panel and Subcommittee before being put up to Committee for circulation into WC to ensure that quality draft goes for wider circulation after incorporating the suggestions/ changes, if any, from the experts.
 |
|  | **IS 16731 : 2019 /** **ISO 8217 : 2017****Petroleum products - Fuels Class F - Specifications of marine fuels** | * The Subcommittee ***RECOMMENDED*** that the latest ISO 8217 : 2024 may be circulated into WC for adoption and revision of IS 16731.
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**2.4 Comments on Published Indian Standards**

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| **Sl. No.** | **Indian Standard** | **Recommendation of Subcommittee** |
|  | **IS 1460 : 2017** **Automotive Diesel Fuel – Specification** | * The Subcommittee ***REVIEWED*** the requirements specified for winter grade diesel and compared them with EN 590
* The Subcommittee ***AGREED*** with the recommendations of the panel to issue an amendment for incorporation of clause and Annexure for winter grade diesel in IS 1460 after the necessary data for lubricity and 10% v/v recovery and wording for clause for winter grade diesel is discussed and resolved in panel. The WC to be circulated for a period of 60 days
* The Subcommittee also ***REQUESTED*** MoPNG representative to kindly expedite the reply from Ministry for the guidance sought for marking clause of the standard.
 |
|  | **IS 17021 : 2018** **E 20 fuel - Admixture of anhydrous ethanol and gasoline - As fuel for spark ignited engine powered vehicles - Specification** | * The Subcommittee ***REVIEWED*** the deliberations and recommendation of panel with respect to changing E70 recovery to 10-60 vol% for all months and ***AGREED*** with the same.
* For oxygen content, the Subcommittee observed that oxygen content was revised from 7.4% to 7.6% in the past. Now, panel further recommended, as requested by OMCs, to revise it to max 7.7%. The Subcommittee ***AGREED*** with the recommendation.
* For water content in E20 samples, the Subcommittee ***NOTED*** that data is awaited from OMCs and ***REQUESTED*** OMCs to provide the data within the given timeline to enable the panel to conclude on the limit of water content.
* For the comment from OMCs to change the colour from “Red” to “Orange” for MG95 E20 in the standard, the panel and Subcommittee could not reach a consensus as OEMs highlighted colour as a visual differentiating parameter between different varieties of motor gasoline and OMCs insisted that use of red dye is giving problem with filter paper test and customers do not see colour of fuel at the time of filling. OEMs desired a different colour for E20 other than the ones used for RON 91 grade and E10 grade. As there is no consensus, sub-committee referred the matter to PCD 3 for the advice/ decision.
* Revised draft updated with agreed upon changes may be issued into WC once data on water content is discussed and resolved in panel. Approval for WC may be taken from PCD 3:1 and PCD 3 by email (timeline of reply to email to be one week).
 |
|  | **IS 17821 : 2022****Ethanol as a fuel for use in positive ignition engine****powered vehicles****specification** | * The Subcommittee ***NOTED*** and ***REQUESTED*** automotive fuel panel to take up the comments received on the standard in next meeting.
 |
|  | **IS 17586 : 2021****E12 and E15 Fuel -****Admixture of Anhydrous Ethanol and Motor Gasoline****- For Positive Ignition****Engine Powered Vehicles - Specification** | * The Subcommittee ***NOTED*** that the letter has not been sent to MoPNG yet and requested BIS to send the letter at the earliest.
 |
|  | **IS 17076 : 2019****M15 fuel - Admixture of anhydrous methanol and motor gasoline as fuel for spark ignited engines - Specification** | * SIAM confirmed that the study was completed and report was submitted to Niti Aayog based on which they decided not to pursue with use of this fuel in automotives.
* The Subcommittee ***RECOMMENDED*** BIS to procure the study report from ARAI.
* Based on inputs from SIAM, The Subcommittee ***RECOMMENDED*** to archive the standard.
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**2.5 New Subjects for Standardization**

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| **Sl. No.** | **New Subject** | **Recommendation of Subcommittee** |
|  | **Methanol/Ethanol Fuel for Cooking / Heating** | * The Subcommittee expressed concernthat inputs are awaited from relevant experts of the panel for dye recommendation, density, boiling point range, and acidity whereas responsibility was taken by them to give the inputs within fixed timeline.
* Head PCD informed that he had talked to the relevant experts over call and they have confirmed submission of relevant inputs within 2 weeks’ time.
* Hence, the Subcommittee ***REQUESTED*** the relevant experts to provide the required data within 2 weeks’ time as this is a subject of priority under MoPNG. Dr. Ajay Arora, IOCL R&D, clarified that Dr. Jhala would be providing the data on behalf of IOCL.
 |
|  | **Pyrolysis Oil** | * The Subcommittee ***NOTED*** that Terms of Reference (ToR) for R&D project on the subject is hosted on BIS website for seeking proposals.
 |
|  | **MD 15 - Admixture of****Methanol with Diesel fuel for compression ignition powered engine vehicles.** | * The Subcommittee ***NOTED*** and ***REQUESTED*** automotive fuel panel to take up discussion on the draft spec received in their upcoming meetings.
 |
|  | **M85 Fuel Grade -****Specification** | * SIAM informed they will get the input from Brazil on whether the existing flex fuel vehicles are able to use both E85 and M85 in the same engine/vehicle by end of week.
* Dr. Abraham mentioned that he tried to get information from global contacts on M85, unfortunately no current information is received. In the absence of which, Dr. Abraham expressed difficulty in providing draft.
* The Subcommittee ***RECOMMENDED*** to wait for inputs from SIAM and take this subject for discussion in next meeting.
 |
|  | **MD95 Methanol** | * Considering that the MD95 spec has been developed by and exclusive to SCANIA and they are not willing to share the specs, test methods or additives details, the Subcommittee ***RECOMMENDED*** for dropping the project.
 |
|  | **Reference E5, Reference E10 gasoline fuels and Reference B7 diesel** | * IOCL R&D informed that they will provide the working drafts by 15 Aug 2024.
* SIAM informed that there is no requirement of Indian Standards on these reference fuels, as reference fuel standards are going to be used between test agencies, OEMs, and manufacturers of such reference fuels (OMCs). However, Convenor pointed out that PCD 3 and PCD 3:1 comprises of these stakeholders only.
* Hence, Subcommittee ***RECOMMENDED*** that once the working draft is received from IOCL R&D, it is to be circulated in PCD 3 and PCD 3:1 and comments will be resolved.
* The Subcommittee ***RECOMMENDED*** BIS to seek appropriate approval from Competent Authority of BIS for waiver of WC circulation.
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* 1. **Technical Issues**

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| **Sl. No.** | **Subject** | **Action Taken/Current Status** |
|  | **Flash Point Studies of Diesel** | * The Subcommittee ***NOTED*** that workshop among OMCs was conducted on 26 June 2024 and report of workshop will be put up in next meeting of PCDC for consideration of the Council.
 |

**Item 3 CREATION OF PANEL FOR MARINE FUEL**

The Subcommittee ***NOTED*** items **3.1**, **3.2**, and **3.3** of the agenda and ***AGREED*** to the following composition of the panel for marine fuel:

* DG Shipping
* TERI
* GE Shipping
* Ambuja Shipping - Adani Cement
* INSA
* IOCL (Dr. Jhala)
* BPCL (Shri K Adalazaghan)
* HPCL (Shri Shitanshu Pati Tripathi)

**Item 4 ANY OTHER BUSINESS**

Shri Ramaprabhu, M&M, drew the attention of Subcommittee to some MoPNG Notifications in which definitions of terms related to fuels is given which is not aligned with Indian Standards. Hence, he recommended that BIS should write to MoPNG informing them of the definitions given in Indian Standards and the standards should be referred in MoPNG notifications. He also informed that SIAM has written to MoPNG on this matter.

The Subcommittee ***REQUESTED*** SIAM to share the communications sent to MoPNG with BIS so that BIS can circulate to Committee for information and necessary recommendation.

**Item 5 VOTE OF THANKS**

The meeting ended with a vote of thanks from the Convenor and BIS to all members.

**ANNEX I**

**Meeting Attendance**

**(Clause 0.3)**

**Subcommittee Members:**

1. Dr. Y P Rao, In Personal capacity (***Convenor***)
2. Shri Senthil Kumar G, Ashok Leyland Limited, Chennai
3. Shri Faustino V, Ashok Leyland Limited, Chennai
4. Shri Yogesh. R. Mahajan, Bajaj Auto Limited, Pune
5. Shri Ramesh Goykar, Bajaj Auto Limited, Pune
6. Shri Adalazhagan K, Bharat Oman Refineries Limited, Bina
7. Shri R Subramanian, Bharat Petroleum Corporation Limited, Mumbai
8. Shri Mella Lokesh Kumar, Bharat Petroleum Corporation Limited, Mumbai
9. Dr. Venkatesh R, Bosch Limited, Bengaluru
10. Shri Nagesh A, Bosch Limited, Bengaluru
11. Dr. Srinivas Padala, CSIR - Indian Institute of Petroleum, Dehradun
12. Shri Shekar Kulkarni, Centre for High Technology, New Delhi
13. Shri M Abdul Kareem, Chennai Petroleum Corporation Limited, Chennai
14. Shri Dharmendra Singh Yadav, Directorate General of Civil Aviation, New Delhi
15. Shri Rakesh Kumar, Directorate General of Civil Aviation, New Delhi
16. Shri CT Chidambaram, Gulf Oil Lubricants India Limited, Mumbai
17. Shri Jencen Mathai Arivannoor, Gulf Oil Lubricants India Limited, Mumbai
18. Shrimati Pallavi , Hero Motocorp Limited, New Delhi
19. Shri Shitanshu Pati Tripathi, Hindustan Petroleum Corporation Limited, Mumbai
20. Shri A. S. Krishnamoorthy, Indian Oil Corporation (MKTG), Mumbai
21. Dr. Ajay Kumar Arora, Indian Oil Corporation (R and D Centre), Faridabad
22. Dr. Maya Chakradhar, Indian Oil Corporation (R and D Centre), Faridabad
23. Dr. Y S Jhala, Indian Oil Corporation Limited - Refineries and Pipelines Division, New Delhi
24. Shri Deep Malik, Indian Sugar Mills Association, New Delhi
25. Shri Anand Redkar, Lubrizol India Limited, Mumbai
26. Shri R. Ramaprabhu, Mahindra and Mahindra Limited, Mumbai
27. Shri Karuppasamy Thangaraj, Mahindra and Mahindra Limited, Mumbai
28. Shri R.M. Prakash, Mangalore Refinery and Petro Chemical Limited, Mangalore
29. Shri Ajay Kumar, Maruti Suzuki India Limited, Gurugram
30. Shri Nishant Sarna, Maruti Suzuki India Limited, Gurugram
31. Shri Vipin Dwivedi, Maruti Suzuki India Limited, Gurugram
32. Dr. S. R. Meena, Ministry of New and Renewable Energy, New Delhi
33. Shri Rajesh Manocha, Ministry of Petroleum and Natural Gas, New Delhi
34. Shri Pratik Shah, Nayara Energy Limited, Mumbai
35. Shri Arpan Shah, Nayara Energy Limited, Mumbai
36. Shri Bimlesh Kumar Gupta, Numaligarh Refinery Limited, Golaghat
37. Shri Srinivas K, Numaligarh Refinery Limited, Golaghat
38. Shri Ravishankar V Desai, Reliance BP Mobility Limited, New Delhi
39. Shri Balasubramanian K, Reliance Industries Limited, Mumbai
40. Shri Sanjai Tiwari, Reliance Industries Limited, Mumbai
41. Shri Rajendra Khile, Renault Nissan Technology and Business Centre India Private Limited, Chennai
42. Shri Gnanasekaran K, Renault Nissan Technology and Business Centre India Private Limited, Chennai
43. Shri Prashant Kumar Banerjee, Society of Indian Automobile Manufacturers (SIAM), Delhi
44. Dr. Sandeep Garg, Society of Indian Automobile Manufacturers (SIAM), Delhi
45. Shri Mukti Prasad, Society of Indian Automobile Manufacturers (SIAM), Delhi
46. Shri T. Sethuramalingam, Tata Motors Limited, Pune
47. Shri Shailendra Dewangan, Tata Motors Limited, Pune
48. Dr. Mathew Abraham, IN PERSONAL CAPACITY

**BIS Secretariat**

1. Shri Chinmay Dwivedi, Sc. E and Head, PCD
2. Ms. Kreeti Das, Sc. C, Member Secretary, PCD 3