



IndianOil

# Directors' review (research & development)

The year was a milestone for IndianOil-R&D with the beginning of research activities in Polymers and Petrochemicals, besides deeper forays into alternative and renewable energy. We witnessed the successful commercial demonstration of our ingenious DHDS/DHDT catalyst, INDICAT-DH-IV at CPCL. This catalyst, though developed for the production of Bharat Stage-III & IV grade HSD, is successfully producing diesel meeting even Bharat Stage-V specifications. Successful trials of a high metal tolerant RFCC metal passivation catalyst additive, IndVi, at Haldia refinery were conducted and helped in increasing the overall throughput besides increasing production of Total Cycle Oil (TCO) by 4% and LPG by 2%.

The Oil Industry Development Board (OIDB) has approved a grant of Rs. 88 crore for the demonstration of a novel adsorptive Sulphur reduction technology - INDAdept-G, developed by our scientists. This is the first ever OIDB grant of this kind and will help set up the first demonstration unit of INDAdept-G. During the year, we successfully conducted field demonstration of 12" & 14" prototype IPIG and CPIG, developed in association of BARC. The 24" IPIG and CPIG were tested with the help of a Wet Test Pipeline Loop of 24" commissioned at our R&D centre.

Product differentiation was the watchword of all our product development research. 181 lubricant formulations were developed and 65 OEM approvals obtained during the year. Some of the major highlights are - development of long drain gear box oil for Voith gear boxes of Delhi Metro Rail Corporation, Bharat Stage-IV compliant diesel engine oils, low pour transformer oils, specialised shock absorber oils for 4-wheelers and the global listing of our anti-wear hydraulic oils. IndianOil is also the first Indian company to commercially launch an indigenously developed food-grade grease with listing by the National Sanitary Foundation (NSF) International, USA.

IndianOil took the lead in enhancing use of ethanol in gasoline, by taking up elaborate engine performance and component

compatibility tests, backed by extensive field trials on vehicles of various vintage using 10% ethanol-blended gasoline. A final report has been submitted to the Government. We took up the challenging project of developing the Delhi driving cycle, which is a step towards redefining and replacing the conventional pattern of measuring automotive exhaust emission and fuel economy in Delhi and this initiative has been widely appreciated.

During the year, work for setting up a state-of-the-art Petrochemical and Polymer Research lab was initiated at our R&D centre and we are confident that it will emerge as a premier centre for research in the segment. We have also entered into collaborative research with national and international agencies like NREL, USA, Honeywell (UOP), USA and Pratt & Whitney, Canada, PetroAlgae, USA tapping the rich potential in biofuels.

Good talent and academia interface is vital for research and we have entered into Memorandum of Understanding with IISc, Bangalore, UPES, Dehradun and Deakin University, Australia for sponsoring IndianOil Golden Jubilee Fellowships for Ph.D and Post Doctoral level research on projects of interest to IndianOil.

Similarly, we firmly believe that Intellectual Property is our core strength. During the period, 18 patents were filed (including 3 US) and eight patents were granted, out of which five are Indian, two from US and one from Singapore, taking the total to over 215 active patents. We were richly rewarded for our efforts with prestigious awards from Petrofed for commercialisation of diesel Multi-functional Additive, and Golden Peacock Award for development of Agrospray oil and eco-friendly Jute Batching oil.



**Anand Kumar**

*Director (Research & Development)*

The major thrust for R&D in next decade would be on reducing the carbon footprint of our processes, products and technologies and licensing of our technologies on a larger scale; application of nano-technology for the development of superior, high performance catalyst and lubricant additives and improvement of overall efficiencies. Our endeavour in the next decade is to reduce our emissions by 20 to 25% from current level and join the league of the top 10 Global Green Oil Companies.



*Committed to collaborative research and product differentiation*