



सत्यमेव जयते

सीएचटी न्यूज बाइट्स CHT

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उच्च प्रौद्योगिकी केन्द्र
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Centre for High Technology
Ministry of Petroleum & Natural Gas, Govt. of India

From the desk of the Executive Director



Esteemed Readers,

Greetings!!

There is vast opportunity for Indian Refining and petrochemicals sector; on the one hand driven by growing demand; on the other hand, there is an issue of long-term sustainability pushing for a relook in to configurations and alternative feedstocks, improvement in conventional technologies for better energy efficiency, lower water and carbon footprints, electrification and also integration with biofuels, SAF, Green Hydrogen, etc. However, when we talk of sustainability, it is

driven by Govt. policies & regulatory measures, and above all by techno-economic viability. Use of AI and ML and advanced analytics is already bringing huge gains to Operational Availability. Digitalisation, modularisation, and innovative tools are the key to effective Project management and Contractor management. CHT continues to play its role to share information and encourage innovation in areas like biofuels, hydrogen, efficiency improvement in refineries and petrochemicals, Carbon Capture & Energy Storage, digitalization of processes and such other segments of Oil & Gas industries.

This edition of CHT News Byte (CNB) highlights some of the key events held during the past two quarters viz., ACM on Offshore Pipeline & SPM System; Apex Body Meet on Best Procurement Practices; Asset Reliability Management Program; Workshop on Best Practices in AI-ML in Oil and Gas PSUs; Furnace Efficiency Survey 2025; Compendium on Indian PSU Refinery; Meeting of the Committees formed by MoP&NG on blending of DME in to LPG; R&D Projects; Implementation of Govt. Schemes viz., PM JI-VAN Yojana for promotion of advanced biofuels, Direct Pipeline Infrastructure and Biomass Aggregation Machinery for promotion of CBG; Status of GTE proposals and DPIIT (Department for promotion of Industries and Internal Trade) proposals, etc.

CHT celebrated Republic day on 26th January, World Environment Day on 5th June in which a tree plantation was done. The International Day of Yoga on 21st June was also celebrated with lot of zeal by CHT employees.

I would like to thank the patronage and guidance received from MoPNG and support and co-operation received from Indian Refining sectors.

Your suggestions are most welcome.

(Rajesh Agarwal)
Executive Director, CHT

1. R&D Projects

Two new R&D Projects were reviewed and approved in 37th Executive Committee meeting of CHT, held on 21st Jan, 2025.

The Memorandum of Agreement (MoA) of following R&D projects were signed during the quarter:

- (i) Real-time Corrosion Visibility and Forecasting in Overhead Distillation Columns using Artificial Intelligence Tools – **Corrosion Intel/ BPCL**
- (ii) Pilot-scale Process Development for Generation of



The R&D project titled “Design, Development and Demonstration of an Indigenous Electrolyzer for Hydrogen Production”, funded under HCF and executed in collaboration with High Energy Batteries (HEB) and ONGC Energy Centre (OEC), has been successfully completed. The Project achieved all defined objectives and demonstration of the hydrogen production technology along with Balance of Plant (BOP) systems. HEB team has submitted the Project closure report to CHT.

Pyrolysis Oil from Multi-feedstock, Its Co-processing in Refineries, and Valorization of Biochar with Life Cycle Assessment (LCA) – **TERI/IOCL**

- (iii) Sustainable and Competitive PET Plastic Waste Depolymerization – Pilot cum Demonstration Plant – **MRPL**
- (iv) Light weight novel Multicomponent High entropy alloy for hydrogen storage application – **CSIR-IIP/GAIL**



2. Implementation of Govt. Schemes

CHT is involved in promotion of following Govt. schemes providing financial assistance;

- PM JI-VAN Yojana for production 2G ethanol and other advanced biofuels including bolt on plants, Synthetic aviation Fuel (SAF), etc. using biomass and waste
- Biomass Aggregation Machinery (BAM)
- Direct Pipeline Infrastructure (DPI) for providing linkage to CBG plants with City gas distribution network

PM JI-VAN Yojana

4th Steering Committee of CHT for PM JI-VAN Yojana was held on 20th Mar'25. CHT was advised to float Request for Selection (RFS-V) to invite applications from Project Developers.

Accordingly, CHT floated the RFS-V for inviting the proposals for setting up commercial-scale and demonstration-scale advanced biofuel projects.

Direct Pipeline Infrastructure (DPI)

The scheme is to support and subsidize the construction cost of pipelines connecting CBG plants with existing CGD network. Total financial outlay is of ₹ 994.50 Cr for the period of FY 2024-25 to FY 2025-26.

CHT is designated as Project Management Agency (PMA) and CNA by MoPNG. Applications have been received from CGD entities and CBG producers through the dedicated portal of the scheme. The applications have been reviewed, and those fulfilling the criteria have been approved by the Project Approving Board (PAB).

Biomass Aggregation Machinery (BAM) Scheme

This scheme is providing financial assistance to Agri-residue based CBG producers for procurement of machineries for biomass aggregation. Maximum financial assistance of Rs. 9 crore can be provided per plant. CHT is designated as Project Management Agency (PMA) and CNA by MoPNG

Applications are invited on quarterly basis through the dedicated portal and portal was opened for new applications between 1st-30th January 2025 and 1st-30th April 2025.

Strategic Interventions for Green Hydrogen Transition (SIGHT)

The SIGHT-2B scheme targets a total capacity of **200 KTPA** of Green Hydrogen production. This crucial initiative is part of India's National Green Hydrogen Mission, which aims to significantly **boost domestic green hydrogen production and enhance its cost-competitiveness** against fossil fuels.

CHT has been appointed as the Scheme Implementing Agency and is responsible for end-to-end management, including guideline formulation, tender support to Oil Marketing Companies (OMCs), stakeholder coordination, project monitoring, performance assessment, timely incentive disbursement, and providing feedback to MoPNG.

Tender Phases:

- o **Tranche-I:** Tenders for **42 KTPA** have already been floated.
- o **Tranche-II:** The remaining **158 KTPA** will be launched

after Tranche-I's execution.

Financial Incentives (Valid for 3 years):

- o **Year 1:** ₹50/kg of Green Hydrogen produced and supplied.
- o **Year 2:** ₹40/kg during the second year.

- o **Year 3:** ₹30/kg during the third year.

First Major Award Under SIGHT-2B: In a significant development, the 10 KTPA capacity tender at IOCL, Panipat, was successfully awarded to L&T on June 26, 2025. Other tenders are also in advanced stages of being awarded.

3. Asset Reliability Management Program (ARMP)

Operational availability (OA) serves as a vital performance metric in refinery operations, with direct implications on production targets, profitability, and the ability to meet market demand. However, OA is often compromised due to unplanned shutdowns and prolonged turnaround duration. While the global benchmark for operational availability stands at 98%, PSU refineries currently OA levels between 95% and 97%.

Frequent unplanned and emergency shutdowns have increasingly disrupted refinery performance, leading to reduced availability and substantial financial and operational setbacks. In response, CHT has launched the Asset Reliability Management Program (ARMP) across PSU refineries. This initiative aims to promote learning, facilitate the exchange of best practices, and improve equipment reliability. The program focuses on the following objectives:

- Reviewing existing practices for compliance and effectiveness
- Sharing best practices among refineries

- Recommending mechanisms and measures to enhance reliability

To implement the program effectively, multidisciplinary expert committees—comprising specialists in rotary equipment, electrical systems, instrumentation, inspection, and operations—have been formed with representation from across Oil Marketing Companies (OMCs).

The ARMP review proved to be insightful for both the committee and the refinery team. This programme was implemented in following three refineries during March-April 2025:

(i) HPCL- Mumbai Refinery, (ii) BPCL- Bina Refinery and (iii) Numaligarh Refinery Ltd.

Refinery head of above refineries is appreciated the efforts of CHT and the expert members involved. A comprehensive report has been prepared and circulated, capturing best practices observed at refineries and offering recommendations for further improvements.

4. Furnace Efficiency Survey 2025

In order to improve energy efficiency and reduce energy consumption, CHT, in association with refineries, organizes Surveys every year in the areas of i) Furnace/ Boiler Efficiency and ii) Steam leak. These two areas are taken-up every alternate year. Survey in the area of Furnace / Boiler Efficiency

was conducted during January, 2023 and steam leak survey in all refineries conducted in January, 2024. Further Furnace Efficiency/Boiler survey for the year 2025 was conducted in February 2025

5. Committees on blending of DME into LPG

MoP&NG has constituted a High-Level Committee consisting of Director level officials from IOCL R&D, BIS, Ministry of Coal, PPAC, NITI Aayog, GAIL, EIL, ONGC and CHT regarding blending of DME into LPG.

The first meeting of the Committee to examine the technical standards for blending of DME in LPG was chaired by JS (M&OR) through VC on 6th March 2025. It was decided to form Sub-Committees under lead of BIS, IOC R&D, PESO & OISD, EIL and Coal India for various task as under:

S. No.	Sub-Committee Lead	Task
1	BIS	Details of various spec for DME and LPG blended with DME along with background note leading to formulation of BIS specifications.
2	IOC R&D	<ul style="list-style-type: none">• Properties of DME including compatibility with metals/ elastomers• Issues during storage, handling and transportation• Recommendations
3	PESO, OISD	<ul style="list-style-type: none">• Safety Considerations in DME Handling• International/ National Safety Standards• Assessment of the Existing Regulatory Framework for DME-LPG Blending• Recommendations
4	EIL	<ul style="list-style-type: none">• LPG Demand Scenario in India• Global Scenario of DME-LPG Blending• Assessment of existing LPG infrastructure for handling LPG-DME mixture.• Recommendations
5	Coal India	<ul style="list-style-type: none">• DME Production Technologies• Global Scenario of DME production• Pricing of DME• Commercial feasibility of blending DME <ul style="list-style-type: none">• Recommendations

CHT shall finalise the report after obtaining input from various sub-committees, based on which a stage-wise plan may be

drawn to implement DME blending in LPG.

6. Compendium on Indian PSU Refinery

A compendium on Indian PSU refinery was made to capture the basic information dispersed in different form. It offers a high-level overview of each refinery's configuration, key parameters, major process units and upcoming projects, including those in the petrochemical domain. It aims to present a coherent summary on this subject. The content has been curated from a variety of sources and from industry professionals. The compendium attempts to present a Bird's Eye view on Indian Refineries.

Key components:

- **Generic information of refinery sector:** Refiners present capacity, future capacity, product slate, crude carrier details, Single Point Mooring, Refinery wise area, manpower and brief description of the units were given.

- **Summary Table:** Here name plate capacity, NCI (Nelson Complexity Index), PII (Petroleum Intensity Index), Refinery performance were presented in a tabular manner.
- **Brief description:** In this section very concise but important details of history, expansion details with years were captured.
- **Details of process unit:** It is a tabular compilation of each refinery units with their capacity.
- **Crude & Storage facility:** It exhibit the pipeline details of crude receipt from its source. Storage details captured the tank details like capacity in TMT, no of tanks, density etc.

Expansion project & petrochemical units: This section covers the details of upcoming new projects and petrochemical details.

7. Workshop on Best Practices in AI-ML in Oil and Gas PSUs

Date: 4th April, 2025

Participation: The workshop was a hybrid event, with over 70 participants attending in person and more than 750 joining via live stream, reflecting the widespread interest and importance of the topics discussed.

CHT organized a comprehensive workshop on "Best

Practices in AI-ML in Oil and Gas PSUs", bringing together industry leaders and experts to discuss the advancements and applications of artificial intelligence and machine learning in the refining sector. The event saw participation from 10 PSU's Oil & Gas companies, each presenting insightful case studies on various aspects of refinery performance, data analytics, and innovative use cases in marketing.



The entire day was dedicated to exploring how AI and ML technologies can enhance operational efficiency, optimize processes, and drive strategic decision-making in the oil and gas industry.

Key highlights of the workshop included:

- Refinery Performance:** Several companies showcased their AI-driven solutions for improving refinery operations. These presentations highlighted how predictive maintenance, process optimization, and real-time monitoring can lead to significant cost savings and increased productivity.
- Data Tracking:** The importance of robust data tracking mechanisms was emphasized, with case studies demonstrating how AI and ML can be leveraged to ensure data accuracy, enhance data analytics capabilities, and provide actionable insights for better management of resources.
- Marketing Use Cases:** Innovative applications of AI in marketing were also discussed. Companies shared their experiences on how machine learning algorithms are being used to analyse market trends, predict customer behaviour, and tailor marketing strategies to maximize impact and ROI.

d) AI in Exploration:

ONGC is at the forefront of integrating AI into its exploration processes. AI is used for predictive maintenance, optimizing drilling operations, and reservoir management. By analysing vast amounts of data from sensors and other sources, AI provides real-time insights that help in making data-driven decisions, optimizing resource extraction, and ensuring environmental sustainability.

OIL has been leveraging AI to enhance its exploration activities. AI algorithms are used to analyse geological data, which helps in identifying potential oil reserves more accurately and efficiently. This reduces the time and cost associated with traditional exploration methods.

The workshop featured engaging open discussions led by subject matter experts, fostering an environment of knowledge sharing and collaboration. Participants had the opportunity to interact with the experts, ask questions, and gain deeper insights into the practical applications of AI and ML in their respective fields.

Overall, the workshop was a resounding success, providing valuable learning experiences and fostering a community of practice among professionals in the oil and gas sector.

8. Activity Committee Meet (ACM) on “Offshore Pipeline & SPM System”

Associate organizer: IOCL-SERPL, Pipeline Division

Date: 30-31 January 2025

Venue: Swosti Premium, Bhubaneswar

Total Participants: 70

Participating companies: BPCL, HPCL, MRPL, HPCL-Mittal Energy Limited, GAIL (India) Ltd., ONGC, Nayara Energy Ltd., Marine Solutionz, Petronet LNG Limited, Pipecare innovative solutions, Bharat Flow Analytics Pvt. Ltd., Marine Solutionz, Imodco Terminals SA, Vee Kay Vikram & Co. LLP, LIN SCAN Advanced Pipeline & Tank Services Pvt Ltd, etc.

Total No. of paper presented: 21 presentations and one panel discussion

Topics covered:

- Challenges to Solution - Maintenance Innovations at HMPL SPM
- Challenges in Shore pulling & laying of the Offshore Pipelines
- Offshore Ammonia Transfer Systems
- Dry Docking of SPM
- SPM Hose Life Enhancement and Best O&M Practices
- EIL capabilities in SPM systems and Sub Sea Pipelines
- Certification & classification, Life extension & Life cycle management of SPM
- Advanced Crack Detection using EMAT Technology
- Multi-beam Echo Sounder for Offshore Pipeline Inspection,

Benefits of PTX and New-Generation Petal C MBCs

- Ensuring operational continuity amidst challenges at Paradip Offshore
- A Non-Intrusive Enhanced Pressure Transient Technology for Wax and Debris Estimation in Oil and Gas Pipelines
- Handling of LS in PHBPL, Paradip after the increase in Russian LS import, etc.

Key Takeaways:

- The life of subsea hoses has increased ~4 times from 18 months to almost 6 years at SPM by slight change in design by HMEL.
- IOCL Paradip has implemented as follows: (a) Introducing “wire chain mandal shackle” arrangement in the pullback rope assembly after which there is zero incident of breakage of pull back ropes from tanker’s fairlead because of chaffing. (b) Introduced webbing sling at the end of the pickup chain of floating hose assembly which does not require diver to go inside the water and facilitate in quick hose connection.
- An enhanced Pressure Transient Technology Provides continuous monitoring of pressure, pipeline internal diameter, profile and accurately locates debris and stuck pigs.
- 48” SPM Crude Offloading line Intelligent pigging using tandem pig- Equipped with MFL technology to detect the presence and morphology of defects like external or internal metal loss due to IC or EC, cracks, dents, pitting, pinholes and thickness of pipeline.



9. Activity Committee Meet (ACM) on 'Best Procurement Practices

Associate organizer: BPCL

Date: 07th Feb 2025.

Venue Location: The Grand banquet, The Acres, Chembur, Mumbai.

Total Participants: 80

Participating companies: Senior executives from BPCL, IOCL, HPCL, GAIL, MRPL, NRL, HMEL, Nayara Energy, GeM, and Ernst & Young LLP shared insights on procurement challenges and strategies.

Topics Covered / Presentations & Panel Discussions:

- CPO-MR Team presented the functioning of CPO-Refineries.

- Four Focus Groups delivered findings on: (a) GeM (Government e-Marketplace) Procurement, (b) Foreign Procurement, (c) Inventory Management, (d) Digitization in procurement
- Special Sessions: (a) Interactive session with Joint Director, GeM, (b) Presentation by Ernst & Young LLP on best procurement practices, (c) Talk on government policies and regulations by Mr. Sanjay Agarwal, Advisor, Ministry of Finance.

Key Takeaways / Focus Group Observations & Recommendations:

(a) Foreign Procurement:

To streamline global sourcing, the process should replace failed domestic tenders with failed EOIs as the trigger for foreign procurement. Specific exemptions in GFR 161(iv) should be expanded to include licensor-mandated items like catalysts and specialty chemicals. International Competitive Bidding (ICB) may proceed up to price bid opening based on EOI outcomes, with award contingent on GTE approval. Further, accepting consolidated balance sheets from foreign bidders and exempting critical imports from land border restrictions are proposed.

(b) GeM Procurement:

A long-term revamp of the GeM platform is needed for full-cycle e-procurement, including rate contracts, system-based invoicing, and SAP integration. In the short term, a joint task force should address operational issues, define clear timelines, and implement pragmatic solutions. Collaborative efforts with CPSEs on testing, requirement documents, and configurable

systems will support platform adaptability.

(c) Inventory Optimization:

Optimizing inventory involves long-term OEM contracts, centralized pricing databases, and policies for surplus disposal. Vendor Managed Inventory (VMI) and shared platforms for non-moving inventory can improve utilization. Financial approvals should be simplified, and a framework for unsold assets post-MSTC auctions should be introduced.

(d) Digitization:

Digitization should integrate ERP with GeM and apply AI/RPA for procurement and inventory tasks. End-to-end vendor automation, AI-based forecasting, smart warehouses using IoT, and data-driven cost estimation models will improve transparency and efficiency. Green procurement and carbon tracking should support sustainability goals.



10. Apex Body Meet on Best Procurement Practices: Driving Self-Sufficiency in Oil & Gas Championing Efficiency and Domestic Vendor Empowerment

Associate organizer: HPCL-Mittal Energy Limited (H MEL)

Date: 16 April 2025

Venue: Hotel Holiday Inn, Mayur Vihar, New Delhi

Efficient procurement is vital for meeting energy demands and ensuring economic stability. Following successful initiatives like the meeting on "Best Procurement Practices" at MRPL and the Procurement Heads Meeting in Noida—chaired by ED-CHT, ED-BPCL (CPO-R), and GGM-Materials (MRPL), CHT established a Procurement Group to enhance procurement practices in India's oil and gas sector. The Procurement Group includes an Apex Body for strategic oversight and four Focused Sub-Groups with experts from leading PSUs (IOCL, BPCL, HPCL, MRPL, GAIL, and NRL). The meeting of the Apex body was aimed to

- Review recommendations from the Focused Sub-Groups.
- Establish actionable targets in key procurement areas.
- Promote collaboration to enhance efficiency and empower domestic vendors.

The event began with a warm welcome by K. Prabhakar Rao, VP, H MEL and Keynote address by Shri R. C. Agarwal (ED, CHT). Dr. Prashant (GGM, MRPL) emphasized significance of innovative procurement strategies. The Inaugural Address was delivered by Shri Prabh Das (MD & CEO, H MEL). Shri Harak Banthia (CFO, H MEL), and Smt. Anita Dam (ED, OIL) underscored the importance of self-reliance and operational

excellence. Ms. Shruti Gupta (DM, C&P, H MEL) delivered the Vote of Thanks.

Thereafter, the first technical session featured presentations by the four Focused Sub-Groups, addressing critical procurement themes:

- Digitization in Procurement: Highlighted the role of e-procurement platforms in enhancing transparency and streamlining supply chains.
- Foreign Procurement Challenges & Best Practices: Shared strategies to optimize global sourcing while reducing import dependency and mitigating risks.
- Inventory Management: Presented innovative techniques to minimize costs and improve inventory efficiency.
- GeM Implementation: Emphasized adopting the Government e-Marketplace (GeM) for transparent, cost-effective procurement.

The post-lunch session included a Special Talk by a BCG Consultant on "Key Trends in Procurement," offering insights into global best practices. An interactive discussion followed, where Apex Body members explored frameworks for structured, long-term procurement initiatives.

The event concluded with remarks by Shri L. Ravi (ED, CPO, BPCL-MR) and Shri A. K. Roy, who summarized key takeaways and reaffirmed the industry's commitment to procurement excellence and self-reliance.

Impact and Way Forward

The Apex Body Meet facilitated knowledge sharing, strengthened collaboration, and laid the groundwork for efficient, sustainable procurement practices. By prioritizing domestic vendor empowerment and leveraging digital tools, the

oil and gas sector is well-positioned to enhance operational efficiency and contribute to India’s energy security. The actionable targets and insights from this event will guide future strategies, advancing the industry toward greater self-sufficiency.

11. Status of GTE proposals submitted by PSUs during January to June 2025

PSU Name	Total Proposals Submitted	Processed & Recommended To MoPNG.	Processed & Returned To PSU	Withdrawn By PSU	With CHT, Under Processing
BPCL	13	7	1	5	0
CPCL	3	3	0	0	0
GAIL	1	1	0	0	0
HPCL	14	9	2	3	0
IOCL	18	16	0	2	0
MRPL	2	2	0	0	0
Grand Total	51	38	3	10	0

12. DPIIT (Department for promotion of Industries and Internal Trade) proposals regarding registration of bidders from a country sharing land border with India

During the period January – June, 2025, CHT sought from industries and provided recommendations for 14 numbers of

proposals (upstream, midstream/downstream industry) regarding registration of bidders from country sharing land border with India received from Flagship division of MoPNG.

गणतंत्र दिवस

26 जनवरी 2025 को सीएचटी कार्यालय में 76वें गणतंत्र दिवस समारोह का आयोजन किया गया। श्री अरुणाचलम के., निदेशक ने सीएचटी के अधिकारियों और सुरक्षा गार्डों की उपस्थिति में भारतीय तिरंगा फहराया। इस अवसर पर श्री अरुणाचलम के. जी ने गणतंत्र दिवस के इतिहास और आज के समय में भारत के संविधान के महत्व के बारे में बताया।

उन्होंने ऊर्जा के क्षेत्र में सीएचटी की प्रतिबद्धता को दोहराया। उन्होंने राष्ट्र की प्रगति के लिए हमारी सेवाओं को समर्पित करने का संकल्प दोहराया। श्री अरुणाचलम के., निदेशक, सीएचटी ने 76वें गणतंत्र दिवस के अवसर पर उपस्थित सभी अधिकारियों एवं कर्मचारियों को बधाई दी।





पेट्रोलियम एवं प्राकृतिक गैस मंत्रालय, भारत सरकार के दिशानिर्देशों के अनुपालन में, उच्च प्रौद्योगिकी केंद्र, ओआईडीबी भवन में 5 जून 2025 को विश्व पर्यावरण दिवस मनाया गया। 5 जून 2025 को विश्व पर्यावरण दिवस के अवसर पर श्री राजेश अग्रवाल, कार्यकारी निदेशक जी ने सीएचटी अधिकारियों को पौधे वितरित किए तथा विश्व पर्यावरण दिवस के प्रति जागरुकता फैलाने के लिए लोगों को पर्यावरण बचाने की जानकारी दी गई।

ग्यारहवें अंतर्राष्ट्रीय योग दिवस

भारत सरकार के तेल एवं प्राकृतिक गैस मंत्रालय के दिशा-निर्देशों के अनुरूप उच्च प्रौद्योगिकी केंद्र में दिनांक 21 जून 2025 को अंतर्राष्ट्रीय योग दिवस मनाया गया। इस अवसर पर कार्यालय के अधिकारी सुश्री अक्षिता गुप्ता (सहायक निदेशक-वित्त) व सुश्री ज्योति पांडे (सचिव) जी ने सभी अधिकारियों

एवं कर्मचारियों ने सीएचटी कार्यालय की बालकनी में ही योगाभ्यास कराया। जिस में अधिकारियों एवं कर्मचारियों ने विभिन्न प्रकार की योग क्रियाएं की जैसे कि अनुलोम-विलोम, आँखों के व्यायाम, सूर्य, नमस्कार ताड़ासन योग, वृक्षासन योग, सुखासन योग आदि। इनमें से कुछ क्रियाएँ कार्यालय में भी की जा सकती हैं तथा योग का लाभ उठाया जा सकता है।



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