

ISSUE 01

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ARAI
Progress through Research

ARAI स्पंदन

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Dear Readers,

It gives me immense pleasure to introduce this inaugural edition of Spandan. The word Spandan is derived from Sanskrit, meaning “heartbeat” or “Pulse”. It signifies life, energy and rhythm, often symbolizing vitality or the essence of being. In the context of a magazine, Spandan implies the “heartbeat” of the organization, capturing and reflecting the pulse of activities, innovations and spirit within ARAI.

Over the years, ARAI has established itself as a cornerstone of innovation, making remarkable strides in the fields of research, development and technology that are shaping the future of the global automotive industry. Our journey has been one of continuous growth, where our contributions have not only enhanced the nation's capabilities but also positioned us as a significant player on the international map.

This magazine not only highlights the significant achievements, projects and research of our talent pool but also serves as a platform for exchanging ideas and collaboration among experts and engineers. As we continue to navigate the rapidly evolving landscape of mobility, sustainability and digital transformation, the insights shared in this publication will undoubtedly inspire and guide our journey ahead.

I extend my gratitude to all the contributors, whose dedication and creativity has enriched this issue, and to our readers, whose continued engagement fuels our collective progress. The team efforts have brought tremendous value to this publication, offering readers a wealth of knowledge and inspiration. Together, with renewed vigor and passion, we will continue to forge ahead, embracing every opportunity to shape the future of the automotive world.

Happy reading!

Dr. Reji Mathai
Director – ARAI

प्रिय पाठकों,

‘स्पंदन’ के इस उद्घाटन संस्करण को पेश करते हुए मुझे बहुत खुशी हो रही है। स्पंदन शब्द संस्कृत से लिया गया है, जिसका अर्थ है “दिल की धड़कन” या “पल्स”। यह जीवन, ऊर्जा और लय का प्रतीक है, जो अक्सर जीवन शक्ति या अस्तित्व के सार का प्रतीक होता है। एक पत्रिका के संदर्भ में, स्पंदन का तात्पर्य संगठन के “दिल की धड़कन” से है जो एआरएआई की आंतरिक गतिविधियों, नवाचारों और भावना की नब्ज टटोलता है और प्रतिबिंबित करता है।

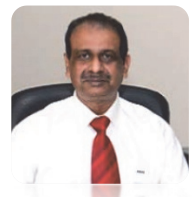
इन वर्षों में, एआरएआई ने खुद को नवाचार की आधारशिला के रूप में स्थापित किया है, जो अनुसंधान, विकास और प्रौद्योगिकी के क्षेत्र में उल्लेखनीय प्रगति कर रहा है जो वैश्विक मोटर वाहन उद्योग के भविष्य को आकार दे रहे हैं। हमारी यात्रा निरंतर विकास की रही है, जहाँ हमारे योगदान ने न केवल राष्ट्र की क्षमताओं को बढ़ाया है, बल्कि हमें अंतरराष्ट्रीय मानचित्र पर एक महत्वपूर्ण खिलाड़ी के रूप में भी स्थापित किया है।

यह पत्रिका न केवल हमारे प्रतिभा पूल की महत्वपूर्ण उपलब्धियों, परियोजनाओं और अनुसंधान पर प्रकाश डालती है बल्कि विशेषज्ञों और इंजीनियरों के बीच विचारों और सहयोग के आदान-प्रदान के लिए एक मंच के रूप में भी कार्य करती है। जैसा कि हम गतिशीलता, स्थिरता और डिजिटल परिवर्तन के तेजी से विकसित परिदृश्य को नेविगेट करना जारी रखते हैं, इस प्रकाशन में साझा की गई अंतर्दृष्टि निस्संदेह हमारी आगे की यात्रा को प्रेरित और मार्गदर्शन करेगी।

मैं उन सभी योगदानकर्ताओं के प्रति अपना आभार व्यक्त करता हूँ, जिनके समर्पण और रचनात्मकता ने इस मुद्दे को समृद्ध किया है, और हमारे पाठकों के लिए, जिनके निरंतर जुड़ाव से हमारी सामूहिक प्रगति को बढ़ावा मिलता है। टीम के प्रयासों ने इस प्रकाशन के लिए जबरदस्त मूल्य लाया है, पाठकों को ज्ञान और प्रेरणा का खजाना प्रदान किया है। साथ में, नए जोश और जुनून के साथ, हम ऑटोमोटिव दुनिया के भविष्य को आकार देने के हर अवसर को गले लगाते हुए आगे बढ़ना जारी रखेंगे।

पाठन का आनंद लें !

डॉ. रेजी मथाई
निदेशक - एआरएआई



प्रिय पाठक,

ए. आर. ए. आई. में नवाचार, सहयोग और ज्ञान-साझाकरण के सार को दर्शाने वाली हमारी गृह-पत्रिका ए. आर. ए. आई. स्पंदन के उद्घाटन अंक में आपका स्वागत है। यह संस्करण हमारे भविष्य को सँवारने वाली तकनीकी प्रगति से लेकर उपलब्धियों तक हमारी सिद्धि पर प्रकाश डालता है।

हम समर्पित कर्मचारियों को गौरवान्वित मंच प्रदान करते हैं, अभूतपूर्व प्रौद्योगिकियों पर अंतर्दृष्टि साझा करते हैं और उद्योग जगत के रुझानों पर अद्यतन सूचना प्रदान करते हैं। साथ ही, सकारात्मक सामाजिक प्रभाव डालने के लिए हमारी प्रतिबद्धताओं का प्रतीक सीएसआर पहलों को दर्शाते हैं।

आगे के पृष्ठों पर, आपको लेखों की एक समृद्ध चित्रावली मिलेगी जो हमारे काम के विभिन्न पहलुओं पर प्रकाश डालती है। आने वाले समय में, स्पंदन संवाद, ज्ञान-साझा करने और प्रेरणा के लिए एक मंच बना रहेगा। अपनी सामूहिक उपलब्धियों का उत्सव मनाते हुए, आइए, हम एक उज्ज्वल भविष्य की दिशा में नवाचार, सहयोग और नेतृत्व जारी रखें।

'स्पंदन' के माध्यम से, हमारा उद्देश्य संचार को बढ़ावा देना, उपलब्धियों का उत्सव मनाना और नवाचार को प्रेरित करना है, क्योंकि हम एक सार्थक भविष्य के लिए आशावित हैं।

डॉ. एस. एस. ठिप्से

वरिष्ठ उप निदेशक - ए.आर.ए.आई

संपादक-ए.आर.ए.आई. स्पंदन

Dear Readers,

Welcome to the inaugural issue of ARAI Spandan, our in-house magazine that captures the essence of innovation, collaboration, and knowledge-sharing at ARAI. This edition highlights our accomplishments, from technical advancements to milestones that shape our future.

We proudly spotlight our employees, share insights on groundbreaking technologies, and provide updates on industry trends. Additionally, we showcase our CSR initiatives, reflecting our commitment to making a positive societal impact.

In the upcoming pages, you will find a rich tapestry of articles that delve into various aspects of our work. As we continue to drive forward, Spandan will remain a vital space for dialogue, knowledge sharing, and inspiration. As we celebrate our collective achievements, let us continue to innovate, collaborate, and lead the way towards a brighter future.

Through Spandan, we aim to foster communication, celebrate achievements, and inspire innovation as we look towards a promising future.

Dr. S. S. Thipse

Sr. Deputy Director - ARAI

Editor – ARAI Spandan



Successful Completion of Portable Emission Measurement System (PEMS) Testing

ARAI proudly announces the successful completion of Portable Emission Measurement System (PEMS) testing for a leading Indian OEM's non-road machinery. This achievement demonstrates ARAI's commitment to both Indian and global emission standards, ensuring compliance with stringent environmental regulations.

Environmental Compliance: Helps manufacturers meet rigorous emission standards.

Sustainability: Contributes to a cleaner and more sustainable future.

Industry Support: ARAI is ready to extend testing and validation services to the industry, fostering innovation and compliance.



First Duty Exempted Vehicle for Testing and Validation

ARAI is proud to announce the import of the first duty-free vehicle for testing and validation under the Government of India's new basic custom duty exemption scheme. This milestone significantly advances automotive R&D in India, facilitating more efficient and cost-effective testing for vehicle manufacturers and research institutions.

Enhanced Testing Efficiency: Streamlines the testing process for manufacturers.

Accelerated Innovation: Easier access to advanced testing vehicles fosters innovation.

Improved Quality and Safety: Raises overall standards in the automotive sector.

Global Collaboration: Strengthens partnerships between international manufacturers and Indian research institutions.

Attracts Foreign Investment: Encourages technological advancements and job creation in the automotive field, positioning India as a global hub for automotive R&D.



FAME's Success in Transforming India's EV Landscape: From Vision to Reality

ARAI proudly participated in the seminar “**FAME's Success in Transforming India's EV Landscape: From Vision to Reality**” at Bharat Mandapam, New Delhi, on September 18, 2024, where it was recognized for its contributions to promoting electric vehicles (EVs) in India. The event featured Hon'ble Union Minister Shri HD Kumaraswamy, who addressed the importance of developing a robust EV ecosystem and the new PM E-DRIVE scheme.

Enhanced EV Ecosystem: Promotes collaboration among stakeholders to strengthen the EV infrastructure.

Government Support: Highlights ongoing government initiatives to improve testing facilities for R&D.

Commitment to Sustainability: ARAI aligns with India's Net Zero Emissions goal by 2070, enhancing its role in supporting the automotive industry.

Accelerated EV Adoption: The PM E-DRIVE scheme aims to boost electric vehicle mobility and charging infrastructure across the country, fostering growth in the automotive sector.

ARAI Honored by MHI for Pioneering Domestic Value Addition Assessment in Auto PLI Scheme

The ARAI has received recognition from the Ministry of Heavy Industries (MHI) for its significant contributions to the implementation of the Domestic Value Addition (DVA) assessment under the Automotive Production-Linked Incentive (PLI) scheme. This recognition underscores ARAI's commitment to fostering innovation and sustainability in the automotive sector, aligning with national goals for economic growth and development.



Technology Know-How for AC and DC Charging Stations

ARAI is excited to announce a significant milestone in its R&D efforts with the transfer of “**Technology Know-How**” for AC and DC charging stations to M/s Uniglobus Electricals and Electronics Pvt. Ltd. This collaboration aims to accelerate charger development, reduce reliance on imported technology, and empower Indian manufacturers to meet government localization requirements for FAME II incentives.

ARAI awards the first
PLI-AUTO Certificate to
TKAP in the category
of **Component
Champion**



First Auto PLI Certificate in N1 Category (4W-Goods)

ARAI has achieved a significant professional milestone by awarding the First Auto PLI certificate in the N1 Category (4W - Goods) to **M/s Tata Motors Ltd.** This recognition follows the stringent SOP outlined by the Automotive PLI scheme from the Ministry of Heavy Industries (MHI), showcasing ARAI's dedication to advancing automotive technology in India.



First Auto PLI Certificate in Category (Component Champion)

ARAI has awarded the first PLI-AUTO Certificate to **M/s Toyota Kirloskar Auto Parts (TKAP) Pvt Limited** in the category of ‘Component Champion’. This certificate recognizes their trans-axle designed for electrified vehicles, classified as an Advanced Automotive Technology Product in the Component Category.

Type Approval Certificate for CPCB IV+ Gas Genset Noise Compliance to KOEL

ARAI has awarded the Type Approval Certificate for CPCB IV+ gas genset noise compliance to **M/s. Kirloskar Oil Engines Limited.** This achievement underscores a commitment to pioneering innovation, promoting sustainability, and advancing environmental responsibility.



Homologation Certification to TI Clean Mobility for India's first Electric Agricultural Tractor

ARAI congratulates TI Clean Mobility (a Murugappa Group Company) on the successful Homologation Certification of India's first Electric Agricultural Tractor, branded as "Montra Electric." This achievement represents a significant milestone as the first electric vehicle in the agricultural tractor category to meet CMVR compliance.



Cummins India's Retrofit Emission Control Device (RECD)

Cummins India's Retrofit Emission Control Device (RECD) has received Type Approval Certification from ARAI, confirming its compliance with strict emission standards. This certification enhances the product's credibility as a clean air solution, as the RECD is designed to reduce particulate matter emissions by an impressive 70%, in accordance with the Central Pollution Control Board's Systems and Procedures Standards for CPCB-I and CPCB-II gensets (<800 KW).



Development Report on CPCB IV+ Compliant HCNG Engine

ARAI and IOCL successfully evaluated KOEL engine performance using Hydrogen Compressed Natural Gas (HCNG), achieving results that exceed CPCB IV+ emission limits, marking a significant step towards a carbon-neutral future. ARAI Director Dr. Reji Mathai presented the findings to KOEL leadership, including CEO Rahul Sahai and CTO Dr. Krishna, alongside IOCL representative Dr. Sauhard Singh and other senior officials. This achievement highlights the potential of hydrogen blending with natural gas, contributing to a sustainable power generation ecosystem, thanks to the dedicated efforts of professionals from ARAI, IOCL, and KOEL.



CMVR Compliance Certificate to M/s. Mahindra and Mahindra Ltd.

ARAI congratulated **Mahindra and Mahindra Ltd.** for achieving CMVR compliance for their flagship Category-N1 vehicle model, “VEERO 1.5XL SD V2.” Dr. Reji Mathai, Director ARAI, presented the compliance certificate to Dr. Venkat Srinivas, Senior Vice President of the Mahindra Group, in the presence of senior leadership from both organizations. **This compliance not only validates the vehicle's adherence to regulatory standards but also enhances its market credibility, ensuring it meets safety and environmental requirements, ultimately benefiting consumers and promoting cleaner transportation solutions.**



Type Approval Certificate for CPCB IV+ Gas Genset Noise Compliance to KOEL

ARAI awarded the CPCB IV+ Certificate to **M/S FORCE MTU POWER SYSTEMS PVT LIMITED** for their Series 1600 Genset Engine, noted for its advanced performance and efficiency in genset applications. The ceremony was attended by MAHENDIRAN D., CEO of Force MTU, and Dr. Reji Mathai, Director of ARAI, along with senior management from both organizations. **This certification represents a significant milestone in enhancing efficiency and promoting innovation in the power generation sector, ultimately contributing to cleaner and more sustainable energy solutions.**



Evaluation of CNG Genset Engine with HCNG Fuel

ARAI, in collaboration with a major government oil marketing company and a leading Genset OEM, has made significant progress in genset technology using a blend of hydrogen and natural gas (HCNG). Sponsored by Indian Oil Corporation Limited (IOCL), the project aims to enhance the current CNG genset engine for HCNG fuel use. **It will evaluate various HCNG blends (18%, 20%, and 30%) to assess their effects on engine performance and emissions.** The blend with the lowest emissions will be selected for further optimization to meet the latest CPCB IV+ emission standards, marking a step towards cleaner energy solutions.



Patents Granted during F Y 2023-24

Sr No	Patent Name	Inventors	Ref No	Date of Grant	Granted w.e.f.	Year	Dept
1	Hybrid Electric Two Wheeled Vehicle Transmission System	1. Dr. Sanjay Patil 2. K P Wani 3. Gopokrishnan N.S.	P-2518	29-12-2023	13-06-2017	2023	Academy
2	Diesel Control Strategy in Dual Fuel Engine	1. S B Sonawane 2. Late K P Kavthekar 3. Vinayak Sagare 4. S D Rairikar 5. Dr S S Thipse 6. N V Marathe	P-2311	10-11-2023	20-03-2018	2023	PTE
3	A Joint for Assembling a Vehicle Body	1. P A Nirmal 2. K S Patel 3. M A Patwardhan 4. R S Mahajan 5. Sudhir Jain 6. S C Dhamorikar	P-4859	01-12-2023	17-03-2021	2023	EDS
4	Bimetal Mixture Forging Process	1. M R Saraf 2. PK Ajith Babu	P-2414	01-01-2024	30-10-2016	2024	SDL/TG
5	Magnetic Suspension System for Two Wheeled Vehicles	1. K P Wani	P-2517	01-01-2024	3-10-2016	2024	Academy
6	A System for Navigating an Agricultural Vehicle	1. Rafiq Babu Agrewale 2. Amitabh Das 3. Yogesh Bhatshvar 4. K C Vora	P-4731	11-01-2024	23-04-2021	2024	Academy
7	A Bench Level System for Testing Electromagnetic Interference of Ignition Components of a Vehicle	1. Abhijit Mulay 2. A A Deshpande	P-3739	11-01-2024	22-08-2019	2024	AED
8	P1 configuration Hybrid -2-wheeler	1. Ashwin Subramanian 2. U S Karle 3. Garpati Sriyan 4. S R Ghugal 5. R S Shah	P-2649	25-01-2024	20-12-2018	2024	TG
9	A Hybrid Vehicle	1. Ashwin Subramanian	P-2648	15-02-024	29-07-2019	2024	TG
10	Deceleration Fuel Cut-Off for Gaseous Fuelled 2 And 3-Wheeler Vehicles for Improving Fuel Economy and Emissions Reduction.	1. S D Rairikar 2. Late K P Kavthekar 3. Dr. S S Thipse 4. S M Tembe 5. N B Dhande 6. Y R Jagdale 7. N V Marathe	P-2500	19-02-2024	19-02-2014	2024	PTE
11	A METHOD FOR THROTTLING HYBRID VEHICLES (Patent of addition)	1. Ashwin Subramanian 2. U S Karle 3. Garpati Sriyan 4. S R Ghugal 5. R S Shah	P-3403	20-02-2024	13-01-2020	2024	TG
12	A Method for controlling Diesel in Dual Fuel Engine	1. Shailesh Sonawane 2. Late K P Kavthekar 3. Vinayak Sagare 4. Sandeep Rairikar 5. Dr S S Thipse 6. Neelkanth Marathe 7. S J Vispute	P-2293	05-03-2024	28-03-2018	2024	PTE

Prominent Visitors



Dr. Renuka Mishra
Economic Advisor, MHI, Govt. of India



Mr. Sumit Kumar
Deputy Secretary, MHI, Govt. of India



Mr. Rajnesh Singh
Director, MHI, Govt. of India



Dr. Prashant Gargava
Director of the National Clean Air Program
at the Ministry of Environment, Forests,
and Climate Change



Shri. Vijay Mittal, Jt. Secretary, MHI



Shri. Deepak Singla
Addl. Metropolitan Commissioner, PMRDA



Shri. Mahmood Ahmed, AS, MoRTH



Shri S. D. Shibulal
Co-Founder and Ex-CEO, Infosys

Memorandum of Understanding (MoU) with Altair

ARAI has partnered with Altair, a global leader in computational intelligence, to drive innovation and sustainability within the automotive and heavy engineering sectors. This collaboration will leverage advanced digital twin technology, data-driven design, AI-powered engineering and knowledge-based solutions to enhance digital transformation and product development. By integrating Altair's cutting-edge simulation and data analytics tools into its consulting services, ARAI aims to explore new use cases in electrification, connectivity, and energy management domains.



Service Agreement with Danfoss

ARAI has partnered with Danfoss, a leading multinational corporation in hydraulic power solutions, to enhance NVH (Noise, Vibration, and Harshness) capabilities in India. This collaboration focuses on pioneering NVH assessment for hydraulic products in accordance with ISO standards.

Key Highlights:

State-of-the-Art Facility: The facility is designed to meet ISO 4412-1 and ISO 3744 standards, ensuring high accuracy and reliability in NVH assessments.

Capability Development: This initiative aims to develop advanced capabilities in NVH assessment, setting new benchmarks for engineering excellence in hydraulic systems within India.

Join us in this endeavor as we lead the way in enhancing NVH capabilities and standards in the automotive sector.



Bharat Heavy Electricals Limited (BHEL) visited ARAI

On July 2, 2024, Shri Jai Prakash Srivastava, Director (E, R&D) of Bharat Heavy Electricals Limited (BHEL), visited ARAI's test labs. During his visit, he engaged with Dr. Reji Mathai and ARAI's senior leadership team to discuss potential collaboration in areas such as EV charging stations, fuel cells, EV motors and controllers, hydrogen internal combustion engines (H₂-ICE), and other advanced engineering fields.



Delegation of Senior Executives from Kirloskar Oil Engines Limited (KOEL)

ARAI hosted a delegation from Kirloskar Oil Engines Limited (KOEL), led by Managing Director Ms. Gauri Kirloskar. The team interacted with Dr. Reji Mathai and ARAI's senior leadership, touring the institute's advanced laboratories to understand its research capabilities.

Following the tour, both parties engaged in discussions about potential collaborations in areas of mutual and national interest.



This partnership aims to drive innovation in the off-highway industry by identifying joint research projects and leveraging ARAI's expertise to support KOEL's technological advancements. Together, they seek to tackle critical challenges and develop more efficient and sustainable technologies in the sector.

Memorandum of Understanding (MoU) with Dept. of Fisheries

MoU between ARAI, the Department of Fisheries, Maharashtra, and ICAR-Central Institute of Fisheries Technology aims to advance alternative energy and fuel systems for fishing vessels. **Signed in the presence of Shri Sudhir Mungantiwar, Minister for Forests, Cultural Affairs, and Fisheries, this collaboration focuses on reducing the carbon footprint through the development of battery electric, solar-based, hydrogen fuel cell, and hybrid propulsion systems.**

This strategic partnership emphasizes green initiatives and aims to combat marine pollution for a sustainable future.

By implementing innovative propulsion technologies, the initiative seeks to enhance the efficiency and performance of fishing vessels while promoting environmentally friendly practices. The collaboration aspires to set new standards for sustainable fishing and inspire similar initiatives across other maritime sectors.



ARAI signs MoU with
Dept. Of Fisheries,

Conversion of Petrol Boat to LPG Bi-Fuel

ARAI, in collaboration with M/s Vanaz Engineers Ltd., has successfully converted a petrol boat to LPG bi-fuel, marking a significant step in marine sustainability. The performance of the converted boat was showcased at Sassoon Dockyard, Mumbai, on August 13, 2024, during an event organized by the Department of Fisheries. The event also featured ISRO's Transponder System aimed at enhancing marine vessel safety, with plans for 100,000 installations. Inaugurated by Dr. Patne, IAS, the event included key officials such as Dr. Fazeria, Dr. Pankaj Kumar, and Mr. Deore.

This initiative not only reduces pollution but also provides substantial cost savings for fishermen, promoting a sustainable future for marine mobility.



New Facilities at ARAI

ARAI has officially commenced full-fledged operations at its newly inaugurated facilities: the Advanced NVH Development Centre (ANDC), Advanced Acceleration Sled Lab, and Advanced Photometry & Optics Laboratory at its Chakan Facility.

The **Advanced NVH Development Centre** features a cutting-edge reverberation chamber with impact isolation and an anechoic chamber designed for comprehensive NVH development in Electric Vehicles (EVs) and their components.

Key Features:

- **NVH Development for EVs:** Focuses on optimizing noise, vibration, and harshness in electric vehicles.
- **Acoustic Properties Testing:** Evaluates sound transmission loss, sound absorption, and impact isolation.
- **Broader Applications:** Assists in noise assessment for medical, home, and industrial appliances, enhancing overall product quality and performance.

This facility is pivotal in advancing the acoustic performance of various products, ensuring a quieter and more comfortable user experience.



The **Advanced Acceleration Sled Lab** is India's first public facility dedicated to validating safety features in vehicles.

Key Features:

- **Safety Feature Validation:** Conducts restraint system tuning tests and NCAP tests, including knee mapping and whiplash assessments.
- **Diverse Testing Applications:** Capable of testing systems and subsystems in aerospace, defense, and space sectors.

This pioneering lab enhances vehicle safety standards and supports various industries in ensuring the reliability and effectiveness of their safety systems.



The **Advanced Photometry and Optics Laboratory**, previously operational at ARAI Kothrud for automotive lighting evaluation, has been relocated to HTC-Chakan.

Key Features:

- **Enhanced Equipment:** The lab now includes a Type C Goniometer, a 2m Integrating Sphere, and an Imaging Colorimeter.
- **General Lighting Evaluation:** Focuses on testing and evaluating general lighting components, ensuring compliance with performance standards.



This upgraded facility strengthens ARAI's capabilities in assessing lighting systems, contributing to improved safety and visibility in automotive and other applications.

As part of a skill development initiative, a state-of-the-art **EV-HEV Laboratory** has been established at ARAI Academy, Chakan, aimed at students and automotive professionals.

Key Features:

- **Advanced Equipment:** The laboratory is equipped with a battery cycler, two-wheeler EV trainer kit, and power electronics workbenches.
- **Research and Curriculum Support:** This initiative will promote research activities aligned with the curriculum developed under the New Education Policy.



The EV-HEV Laboratory is designed to enhance practical learning and skill development in electric and hybrid vehicle technologies, preparing participants for future challenges in the automotive industry.

Production Linked Incentive (PLI) Cell Inauguration

The establishment of the PLI Cell at ARAI underscores the organization's commitment to the government's Production Linked Incentive (PLI) scheme for the automotive sector. Launched in May 2023, the PLI Cell supports the MHI Initiatives of the Auto PLI Scheme, with full backing from all ARAI departments for technical assessments and support functions.

New office facilities have been set up on the ground floor of the A-Building at ARAI Kothrud, inaugurated by the Director of ARAI on January 29, 2024, with senior executives in attendance.



This initiative enhances ARAI's role in the automotive ecosystem and showcases its technical expertise and readiness to contribute to industry growth.

Upgradation Emission Measurement Test Cell (VTC-01) for WLTP Requirement

India is aligning its emission laws with the European Union and Japan by adopting the Worldwide Harmonized Light Vehicles Test Procedure (WLTP) for exhaust emissions, set to become mandatory by 2027. Some Indian manufacturers are already exporting WLTP-compliant vehicles to Europe.

To support this transition, vehicle manufacturers will start developing WLTP-compliant models two years before the regulations take effect. A fully-equipped testing facility is essential for testing export models, developing new vehicles, and certifying them for domestic and international markets.

ARAI has upgraded its emission testing lab with a new 150 kW 4x4 chassis dynamometer and advanced automation, capable of meeting WLTP standards. This facility is now operational for vehicle development, testing, and certification, and was inaugurated by the Director - ARAI.



Flex Fuel Emission Test Cell (VTC-02)



The Government of India is promoting the use of ethanol in gasoline and the development of Flex Fuel vehicles to reduce fossil fuel dependence and lower carbon emissions. In support of this initiative, the ARAI has established a state-of-the-art Flex Fuel Emission Test Cell (VTC-02), the only facility in India capable of testing emissions for all fuel blends, including up to 100% ethanol (E100) and 100% methanol (M100) for two, three, and four-wheeled vehicles. **This facility meets national and international standards and can conduct emission tests for domestic certification and export approval, as well as fuel consumption tests.**

It accommodates a wide range of fuels, including petrol, diesel, CNG, LPG, methanol blends, and biodiesel. The facility was inaugurated by the Director - ARAI.

Buzz, Squeak, and Rattle (BSR) Test Facility becomes operational at ARAI

ARAI has launched a state-of-the-art Buzz, Squeak, and Rattle (BSR) Test Facility to cater to the evolving needs of both traditional and electric vehicles. This facility is equipped to test various vehicle components, including seats, dashboards, infotainment systems, doors, steering systems, sunroofs, and HVAC controls. **With advanced equipment capable of simulating diverse conditions at a low background noise of 25 dBA and utilizing a 5 Degrees of Freedom (DOF) system, it can create various vibration patterns and achieve acceleration levels of up to 2.0 g rms, accommodating weights of up to 315 kg.**

Enhanced Product Quality: Enables accurate testing of automotive components, leading to improved quality and performance. **Real-World Simulation:** Allows for the simulation of complex scenarios and environmental conditions, helping engineers identify potential issues before production. **Subtle Detection:** The quiet room environment facilitates the detection and analysis of even the faintest vibrations and noises, providing critical insights for design refinement. **Streamlined Manufacturing Processes:** Supports manufacturers in enhancing their processes, ultimately leading to more reliable and durable vehicles.

Safety & Homologation Laboratory (SHL) web portal

ARAI has launched its Safety & Homologation Laboratory (SHL) web portal, designed to streamline certification and testing services for automotive component manufacturers. The user-friendly portal offers online tracking capabilities, ensuring efficient processing and transparency, which reflects ARAI's commitment to digitalization and customer satisfaction.



The SHL web portal serves as a centralized platform for manufacturers to submit certification requests, track progress, and access test reports. This digital transformation aims to reduce paperwork, minimize errors, and expedite the certification process, benefiting the entire automotive industry and enhancing overall efficiency and competitiveness.

Launch of ARAI's PLI – Auto Portal

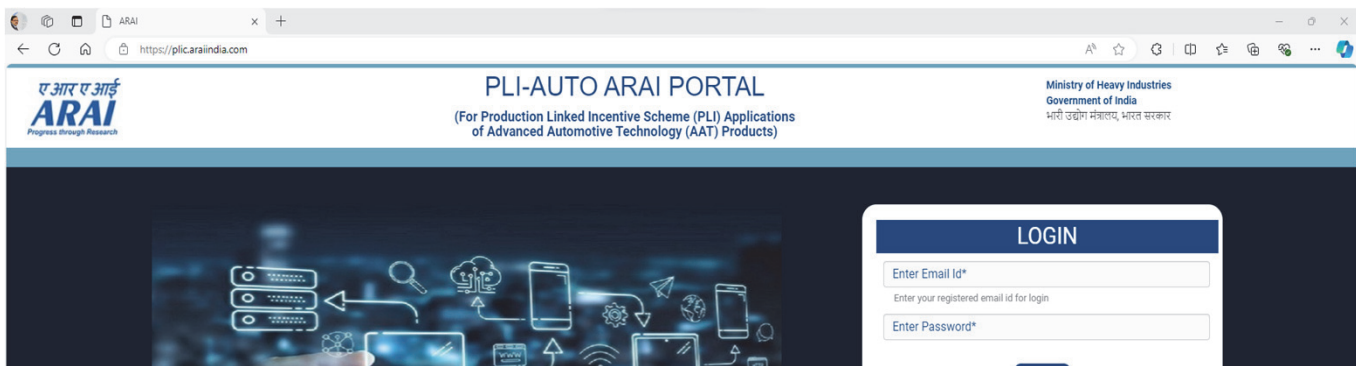
ARAI has launched the PLI – Auto Portal to facilitate Domestic Value Addition (DVA) certification for Advanced Automotive Technology (AAT) products under the Production Linked Incentive (PLI) Scheme. The portal features a user-friendly interface for application submission and document uploading, ensuring efficient processing, transparency, and online tracking with auto mail alerts for applicants.

New users can register and manage their applications, creating requests for DVA certification after uploading their applications on MHI's PLI – Auto Scheme Portal.



The intuitive design aligns with the latest MHI-SOP guidelines, simplifying the certification process, saving time, and reducing errors in submissions. This streamlined approach enhances the overall efficiency of the application process.

ARAI launched its own PLI – Auto Portal on 12th Jun 2024 by the hands of Director – ARAI



Launch of Technical Support Cell

ARAI's Technical Support Cell (TSC) is committed to assisting various market sectors, including EV start-ups, MSME component manufacturers, and the unorganized sector of bus, truck, and trailer body builders.

Key services offered by TSC include:

Comprehensive Customer Briefing: Initial consultations to understand client needs.

Testing/Validation Coordination: Connecting clients with relevant teams for testing and validation.

Homologation Support: Providing technical assistance based on the CMVR type approval process.

Test Schedule Coordination: Organizing test schedules and offering mock-up guidance.

Pre-Inspection and Gap Analysis: Conducting assessments of prototype vehicles.

TSC also connects clients with ARAI Technical Experts to address specific development requirements, ensuring clients are well-prepared and supported in the evolving mobility landscape.



ARAI inaugurated Camera-monitoring System (CMS) Facility

On National Innovation Day, ARAI inaugurated a Camera-Monitoring System (CMS) Facility within its Safety and Homologation Laboratory. This state-of-the-art facility is designed to test CMS in accordance with ISO 16505, ECE R46, and AIS 001/002 (Rev. 2) – 2023, as well as for developmental purposes. As the first of its kind in India, the facility is equipped with advanced in-house software and infrastructure, ensuring precise results for both components and vehicle-mounted CMS.



This innovation enhances vehicle safety and compliance, ultimately contributing to improved road safety standards in the automotive industry

Airbag Deployment Facility

ARAI has established a state-of-the-art Airbag Deployment Facility within its Passive Safety Laboratory for developmental testing. This advanced facility features four ignition channels for precise impact simulation, high-speed photography at 5000 frames per second from three angles, and the capacity to accommodate vehicles up to 5.3 meters long. It operates efficiently across a temperature range of -40° C to 110° C, ensuring reliable performance in extreme conditions. Manufacturers benefit from a controlled environment that allows for accurate testing of airbag systems, faster evaluation cycles, and reduced reliance on outdoor testing.



The facility enables comprehensive evaluation of airbag design and performance, ultimately enhancing product capabilities. This innovation plays a critical role in ensuring airbags function correctly, contributing to reduced injuries and fatalities on the road.

नशा मुक्त भारत अभियान

नशा मुक्त भारत अभियान भारत सरकार द्वारा मादक पदार्थों के सेवन को रोकने और नशा-मुक्त समाज को बढ़ावा देने के उद्देश्य से एक राष्ट्रव्यापी पहल है। यह अभियान नशीली दवाओं के उपयोग के खतरों के बारे में जागरूकता बढ़ाने, उपचार और पुनर्वास प्रदान करने और व्यसन के प्रभाव को कम करने के लिए सामुदायिक गतिविधियों का समर्थन करने पर केंद्रित है।

एआरएआई ने नशीली दवाओं के उपयोग के खिलाफ एक प्रतिज्ञा अभियान में कर्मचारियों और समुदाय के सदस्यों को शामिल करके, एक स्वस्थ जीवन शैली को बढ़ावा देकर इस पहल में सक्रिय रूप से भाग लिया। मादक पदार्थों के सेवन को रोकने और सामुदाय में सहनशीलता बढ़ाने के लिए अभियान के व्यापक आग्रहों में जागरूकता, उपचार और शैक्षिक कार्यक्रम शामिल हैं, हालांकि इसे हस्तक्षेप स्वीकार नहीं करने वाले व्यक्तियों या प्रदान किए जा रहे संसाधनों तक पहुंच की कमी वाले लोगों तक पहुंचने में चुनौतियों का सामना करना पड़ सकता है।

नशा मुक्त भारत अभियान पहल विशेष रूप से कमजोर आबादी जैसे युवाओं और हाशिए पर पड़े समुदायों में प्रारंभिक हस्तक्षेप और रोकथाम नीतियों पर जोर देती है। एआरएआई की भागीदारी कॉर्पोरेट सामाजिक जिम्मेदारी के प्रति अपनी प्रतिबद्धता को दर्शाती है और सामाजिक मुद्दों को हल करने में व्यवसायों की भूमिका पर प्रकाश डालती है। कर्मचारी और सामुदाय सदस्यों को सम्मिलित करते हुए एआरएआई एक ऐसे सहायक माहौल का निर्माण करता है जो लोगों को सकारात्मक जीवन शैली विकल्पों को अपनाने और नशीली दवाओं के उपयोग से दूर रहने को बढ़ावा देता है।

Blood Donation (July & August 2024)



Symposium on International Automotive Technology (SIAT 2024)

The Symposium on International Automotive Technology 2024 (SIAT 2024), held from January 23-25, 2024, at Pune International Exhibition & Convention Centre, was a landmark event organized by ARAI in collaboration with SAEINDIA and SAE International. The theme, **“Transformation Towards Progressive Mobility,”** focused on innovative solutions to evolving mobility challenges.

Key Highlights:

Inauguration: The event was inaugurated by Dr. Mahendra Nath Pandey, Hon’ble Minister of Heavy Industries, emphasizing the rapid growth of the Indian auto industry and the government's commitment to fuel efficiency, safety, and reduced carbon emissions.

Industry Insights: Dignitaries, including Dr. Hanif Qureshi and Dr. N. Sarvanan, highlighted India's emergence as an automotive powerhouse, with the sector contributing 7% to the GDP and significant growth potential.

New Facilities: The virtual inauguration of three advanced facilities (NVH Development Center, Accelerated Sled Lab, and Photometry Laboratory) showcased ARAI's commitment to enhancing automotive safety and technology.



Plenary Sessions and Presentations: The conference featured 3 plenary sessions and over 211 presentations, covering topics like E-mobility, ADAS, and sustainable technologies, providing valuable insights from global experts.

SIAT EXPO 2024: Concurrently held, the expo was the largest to date, featuring over 330 stalls and 216 exhibitors from various countries, including a special pavilion for Medium, Small, and Start-ups, promoting innovation and collaboration.

Student Engagement: A Student Poster Presentation Competition encouraged young talent to showcase their work in Safe, Sustainable, and Intelligent Mobility.

Awards and Recognition: The event concluded with awards for the best technical papers and stalls, recognizing excellence in the automotive field.

Networking Opportunities: SIAT 2024 facilitated connections among industry leaders, researchers, and students, fostering collaboration and knowledge sharing.

Innovation Promotion: The focus on advanced technologies and sustainable practices encourages the automotive sector to adopt innovative solutions for future mobility challenges.

Skill Development: The emphasis on training and skill development aligns with the government's vision for a skilled workforce in the growing automotive industry.

Overall, SIAT 2024 was a resounding success, attracting over 7,000 visitors and setting a new record, paving the way for the next edition in 2026.

e-mobility R&D Roadmap for India

On July 16, 2024, Professor Ajay Kumar Sood, Principal Scientific Adviser to the Government of India, launched the 'e-mobility R&D Roadmap for India' at Vigyan Bhawan Annexe, New Delhi. This comprehensive roadmap, developed through extensive analysis of the global automotive sector, identifies key technological requirements and categorizes research projects into four critical areas: Energy Storage Cells, EV Aggregates, Materials and Recycling, and Charging and Refueling.

Key Highlights:

Vision for Emission Reduction: Prof. Sood emphasized India's goal of achieving a 45% reduction in emission intensity by 2030 and energy independence by 2047, with a commitment to net-zero emissions by 2070.

Indigenous Development: The roadmap aims to promote the manufacturing of indigenous energy storage systems and the wider adoption of electric vehicles, essential for supporting charging infrastructure powered by renewable energy.

R&D Ecosystem: The event featured insights from key figures, including Dr. Parvinder Maini and Dr. Reji Mathai, highlighting the establishment of a strong R&D ecosystem in the automotive sector through the Consultative Group on e-Mobility (CGeM).

Global Leadership: The roadmap provides clear pathways for India to achieve global leadership in e-mobility by becoming self-reliant (Atmanirbhar) within the next five years.

Economic Growth: By fostering R&D and innovation, the initiative aims to enhance the automotive sector's contribution to India's GDP, driving sustainable economic growth.

Environmental Impact: The focus on electric vehicles and renewable energy aligns with national goals for reducing emissions and promoting sustainable practices in the automotive industry.

Overall, the 'e-mobility R&D Roadmap for India' represents a significant step towards a sustainable and self-reliant automotive future, positioning India as a key player in the global e-mobility landscape.



3rd Plenary Meeting of the Consultative Group on e-Mobility

The 3rd Plenary Meeting of the Consultative Group on e-Mobility, organized by the Office of the Principal Scientific Adviser to the Government of India, focused on developing a comprehensive R&D Roadmap for e-mobility. The meeting included a visit to the ARAI Centre of Excellence for E-Mobility, where participants gained valuable insights into the future of sustainable transportation.

Key Highlights:

Robust Roadmap Development: The meeting aimed to formulate a strong e-mobility R&D roadmap, identifying key priorities to enhance the e-mobility ecosystem.

Collaboration Focus: The roadmap emphasizes collaboration among industry leaders, research institutions, and government bodies to drive innovation and research.

Clear Deliverables: Specific deliverables were outlined to ensure tangible results, fostering advancements in e-mobility technologies.

Strengthened Ecosystem: The initiative aims to create a more robust e-mobility ecosystem, facilitating the adoption of electric vehicles and sustainable transportation solutions. **Innovation and Research:** By promoting cutting-edge research and collaboration, the roadmap will accelerate technological advancements in the e-mobility sector. **Sustainable Future:** The focus on e-mobility aligns with national goals for reducing emissions and promoting sustainable practices, contributing to a greener future for India.

Overall, the meeting marks a significant step towards establishing a comprehensive framework for e-mobility in India, positioning the country as a leader in sustainable transportation.



Circular Economy and Sustainable Cities

Dr. Atul Thakare, Manager of Business Development & Corporate Planning at ARAI, delivered an engaging talk on "Circular Economy and Sustainable Cities." He emphasized how circular economy principles can enhance urban sustainability, particularly through the promotion of electric vehicles (EVs) as a means to reduce carbon emissions and foster green transportation.

Key points from his talk included:

Resource Efficiency: The importance of using resources efficiently and designing durable, recyclable products.

Waste Reduction: Strategies for minimizing waste in urban environments.

Smart Mobility Solutions: The application of circular economy concepts to develop innovative smart mobility solutions that contribute to sustainable and efficient cities.



Dr. Thakare's insights highlighted the potential of adopting circular economy practices to create long-term environmental and economic benefits, paving the way for more sustainable urban living.

National Technology Day

ARAI hosted the esteemed Padma Vibhushan **Dr. Raghunath Mashelkar** for a special address on the future of Indian technology. **In his insightful talk, Dr. Mashelkar highlighted the vital roles of research, innovation, and education in advancing India's technological landscape.** He emphasized the concept of **"pole vaulting,"** advocating for exponential advancements rather than incremental improvements within the Indian tech ecosystem. His address provided a fresh perspective on fostering inclusive growth in technology.



Sustainability – Opportunity & Challenges

RE Sustainability Limited hosted a webinar titled "Sustainability - Opportunities & Challenges," featuring Shri Bobby Kuriem, Principal Advisor on Environmental Solutions. The session focused on the transition from a linear to a circular economy, emphasizing the importance of sustainable industrial growth and effective waste management.

Key Topics Covered:

Carbon Footprint Impact and Reduction Strategies:

Discussion on the significance of understanding and mitigating carbon emissions in industrial practices.

Effective Waste Management Practices: Insights into innovative waste management strategies that enhance resource efficiency and drive revenue through recycling and waste-to-energy solutions.

Role of the Circular Economy: Exploration of how adopting circular economy principles can minimize environmental impact and create strategic advantages as regulations tighten.



Enhanced Understanding: The program aimed to deepen employees' knowledge of sustainability, equipping them with practical strategies for effective waste management and carbon reduction.

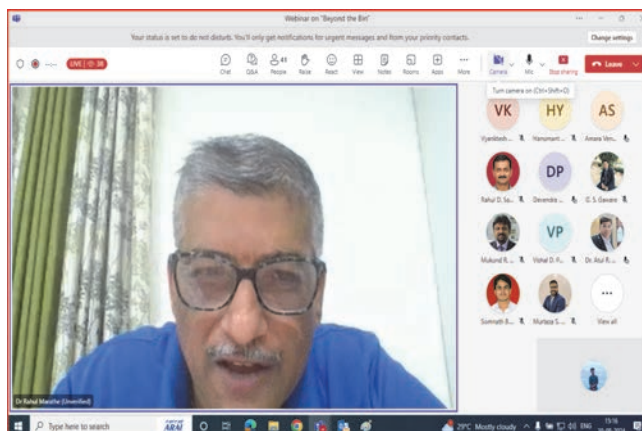
Strategic Advantage: By embracing circular economy principles, organizations can improve resource efficiency and capitalize on new revenue opportunities.

Collaboration and Innovation: The interactive format encouraged collaboration among employees, fostering a culture of innovation in sustainability practices.

Overall, the webinar served as a crucial platform for promoting sustainability awareness and equipping employees with the tools needed to navigate the challenges and opportunities in the transition to a circular economy.

"Beyond the Bin" Solid Waste Management using Insects

A special webinar featuring Dr. Rahul Marathe, an Entomologist specializing in sustainable solutions through insects, was held in celebration of Swachhata Pakhwada – 2024. **Dr. Marathe discussed the crucial role of insects in the environment and presented his innovative studies on using insects to decompose various types of waste. He shared a compelling case study demonstrating how these insects can effectively address waste management challenges in critical work environments such as factories, mines, and defense establishments.** The informative session was attended by over 50 participants, highlighting the growing interest in sustainable waste management solutions.



Secure by Design-Threat Modelling in Cybersecurity

The webinar "Secure by Design: Threat Modelling in Cybersecurity," part of the ARAI-Technovuus series, is held on September 20, 2024. **This introductory session focused on integrating security into every phase of the development lifecycle. Participants learned about the significance of threat modelling in identifying vulnerabilities before they can be exploited. Cybersecurity experts shared best practices and strategies for implementing secure design principles in software development, helping organizations protect sensitive data against emerging threats.** The session included a Q&A segment, allowing attendees to address specific queries and enhance their understanding of threat modelling techniques for their projects.



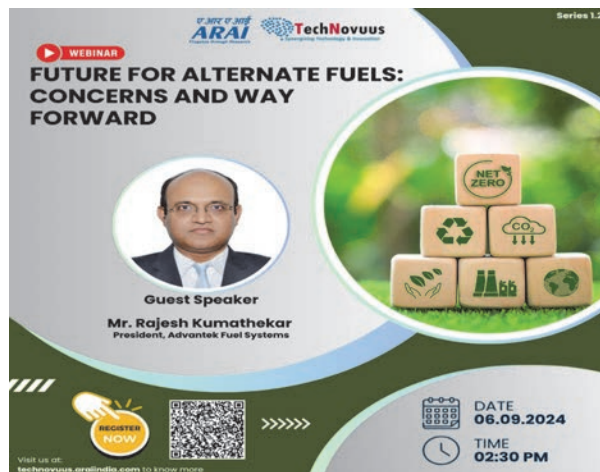
Clean Energy Horizon: Emerging trends in Alternative Fuels

Technovuus launched a 4-part webinar series on Clean Energy with the inaugural session titled "Clean Energy Horizon: Emerging Trends in Alternative Fuels." **This webinar addressed critical topics such as various alternative fuels, the regulatory landscape in India, market scenarios, and the potential of hydrogen as a fuel.** Attended by 120 participants nationwide, the session concluded with an engaging Q&A segment. This initiative underscores Technovuus's commitment to promoting clean energy solutions in India, reflecting the increasing interest and significance of alternative fuels and technologies in the country's energy future.



Future for Alternate Fuels: Concerns and Way Forward

The webinar “Future for Alternate Fuels: Concerns and Way Forward” focused on the crucial role of alternate fuels in achieving 'Net Zero' targets and bridging the gap to zero emissions. Conducted on September 6, 2024, as part of the Technovuus Clean Energy series, the session attracted 117 participants. It concluded with an interactive Q&A session where Mr. Rajesh addressed attendees' queries, emphasizing the importance of addressing concerns and exploring pathways for the future of alternate fuels.



Webinar on Fire, Life Safety and Rescue Operation

A refresher training webinar on fire, life safety, and rescue operations was conducted for ARAI employees, led by fire safety professional Mr. Nilesh Vasant Karmarkar, who has 25 years of experience. The session, attended by 110 employees from various ARAI sites, utilized video clips and real-life examples to teach fire prevention techniques. Following the webinar, a live demonstration of the fire hydrant system was held on April 16, 2024, with the security team operating the system, ensuring employees received hands-on training in fire safety.



Webinar on Requirement of Consent from Pollution Control Board

An interactive webinar on the requirements of the Pollution Control Board was conducted by Mr. R.D. Sawant and Mr. R.D. Chaudhari from ARAI. Key topics included obtaining Consent to Establish and Consent to Operate, major compliance issues, and the government's future initiatives for easing business processes. The session aimed to enhance employees' understanding of consent requirements and associated compliance to prevent project delays. Over 30 employees participated both in person and online.



Awareness Training on “5S” Implementation

An awareness training session on “5S” implementation was conducted by Shri P. P. Dambal to enhance the efficiency, effectiveness, and safety of the work environment. **The session covered the five components of 5S—Sort, Set in order, Shine, Standardize, and Sustain—along with their implementation and benefits.** Over 75 employees attended, engaging in discussions on applying 5S principles to their specific work areas. The training included practical examples and case studies from various industries, inspiring participants to envision improvements in their own environments.



Workshop with TIFAC on Technology Prioritization for the Transport Sector

ARAI Pune and TIFAC New Delhi held a crucial workshop on Technology Prioritization for the Transport Sector, where experts from various industries and research institutions discussed over 70 technologies aimed at sustainable and climate-resilient solutions for air, rail, road, and water mobility. **The event gathered more than 40 industry experts, marking a significant step towards the Viksit Bharat 2047 vision, which seeks to transform India into a developed nation by 2047.**



Workshop on Automotive Cyber Security

The workshop on Automotive Cyber Security, inaugurated by Dr. Reji Mathai, Director of ARAI, featured technical sessions by industry experts on Cyber Security Management System (CSMS) and Software Update Management System (SUMS). **Attended by over 150 delegates from OEMs, Tier 1 suppliers, and system providers, the event facilitated valuable networking and interactive Q&A sessions, addressing practical challenges in automotive cybersecurity.** As the industry evolves with greater connectivity and autonomy, such workshops are essential for keeping stakeholders informed about the latest developments and best practices, ultimately enhancing the industry's resilience against cybersecurity threats.



Regional Workshop and Round Table Discussion on Clean Air Project in India (CAP India)

In November 2019, the Swiss Agency for Development and Cooperation (SDC) launched the 'Clean Air Project in India (CAP India)' to support India's air quality improvement efforts over four and a half years. Led by The Energy and Resources Institute (TERI) and involving partners like EPFL, IIASA, IIT Kanpur, ARAI, and NEERI, the project aims to enhance public health and mitigate climate change. It aligns with the National Clean Air Program (NCAP) and complements initiatives from MoEF&CC and CPCB.



To disseminate findings, regional workshops were held in Pune and Lucknow, promoting cross-learning among stakeholders, including representatives from Smart City Cells, Pollution Control Boards, and Municipal Corporations. **ARAI and TERI hosted a workshop on August 8, 2024, focusing on scaling successful pilot projects in Uttar Pradesh and Maharashtra, which have the highest number of non-attainment cities in India. This initiative aims to drive broader implementation of effective air quality solutions across multiple regions.**

First Ever Global Autonomous BAJA Event hosted by ARAI

The 17th edition of BAJA SAEINDIA introduced innovative categories to address mobility industry challenges, themed "**Multiverse of Mobility.**" New categories aBAJA (autonomous) and hBAJA (hydrogen) joined the established mBAJA (IC Engine) and eBAJA (Electric) categories, reflecting ARAI's commitment to providing engineering students with a platform for learning and experimentation.

The Autonomous BAJA SAEINDIA 2024, held at ARAI, Pune, featured five teams from top engineering colleges competing over three days. Pre-event readiness checks ensured teams were prepared, including technical inspections and trial runs on dynamic event tracks. The event was inaugurated on September 30 at Ajeenkya DY Patil University, with key figures emphasizing the importance of bridging industry and academia.

On October 4, 2024, the competition commenced with five autonomous vehicles ready to tackle the challenges at ARAI.



It included static events like business presentations and design evaluations, allowing students to showcase their engineering skills and entrepreneurial mindset. **The event culminated in a grand inauguration ceremony attended by distinguished guests. Additionally, ARAI hosted the "Intellimobility" ideathon, where 100 teams participated, with the top 20 finalists presenting their ideas to industry experts.**

Conference on Lightweight Sustainable Manufacturing Solutions for Clean Energy

On October 17, 2024, ARAI Academy at FID Chakan hosted a dynamic conference on Lightweight Sustainable Manufacturing Solutions for Clean Energy Mobility. **Experts discussed key topics such as green energy vehicle opportunities, hydrogen fuel cell tank manufacturing, EV composites, sodium-ion battery advancements, and 3D molecular design simulations.** The event was inaugurated by **Shri SJR Kutty**, VP & Chief Sustainability Officer at TML, alongside **Dr. Reji Mathai**, Director of ARAI. An engaging session on Non-Ferrous Metals also took place, fostering future innovations and actionable insights.



Hydrogen - Emerging Technology Scenario for ICE Application

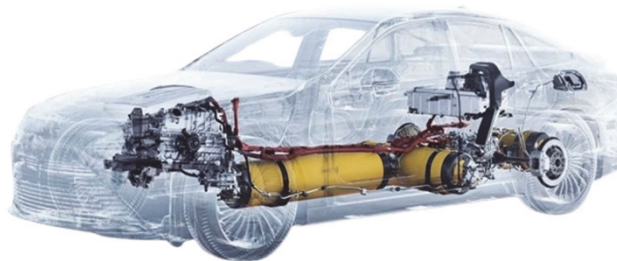
On November 27, 2024, ARAI hosted a seminar titled “**Hydrogen - Emerging Technology Scenario for ICE Application**” in Pune, addressing the growing demand for alternative fuels and the automotive industry's shift towards hydrogen as a decarbonizing solution.

Key Highlights:

Expert Insights: Esteemed speakers shared valuable knowledge on technology innovations, safety protocols, storage and handling of hydrogen, and the regulatory landscape surrounding its use in Internal Combustion Engine (ICE) applications.

This seminar mostly focused on below topics:

- Legislative Norms for Hydrogen ICE and Fuel Cell
- Hydrogen Roadmap for India and OEM Readiness for Hydrogen Technologies.
- Hydrogen Test Cell Facility Requirement and Safety Constraints
- Hydrogen Economy Worldwide
- Fuel System Components for Hydrogen ICE & Calibration Strategy for H2 Engine Development



Networking Opportunities: The seminar facilitated connections among professionals, fostering collaboration and innovation in the hydrogen technology space.

Overall, the seminar served as a crucial platform for advancing knowledge and discussions on hydrogen as a viable alternative fuel, positioning the automotive industry towards a more sustainable future.

Participation

**India Energy Storage Week 2024**

ARAI participated in the esteemed "India Energy Storage Week 2024," held at Yashobhoomi, New Delhi, from July 1st to 2nd to showcase ARAI's commitment to advancements in energy storage solutions.

**IESS Expo**

ARAI showcased its innovations at the IESS Expo held at CODISSIA Trade Fair Complex in Coimbatore on March 6, 2024. The exhibition focused on the impact of Automation and Smart Manufacturing on MSMEs, highlighting advancements that enhance the capabilities of the engineering community.

**Maharashtra MSME Defence Exhibition 2024**

ARAI participated in the esteemed Maharashtra MSME Defence Exhibition 2024, held at PIECC Moshi, Pune, from February 24th to 26th. The event provided a platform for ARAI to showcase its services and capabilities within the defence sector.

**CAEV Expo 2024**

ARAI took center stage as an exhibitor at CAEV Expo 2024, presenting cutting-edge automotive technologies and innovations poised to redefine the future of mobility. Visitors to the ARAI booth experienced an immersive showcase, gaining valuable insights into how ARAI is driving excellence and advancement within the automotive industry.

**Automotive Testing Expo Europe 2024**

ARAI participated in the Automotive Testing Expo Europe 2024, where it showcased significant advancements in automotive testing technologies and services. This event served as a vital platform for ARAI to present its research, foster collaborations with international entities, and engage in discussions on the latest trends in automotive safety, efficiency, and emissions testing.

**The Truck Trailer and Tyre Expo**

ARAI is proud to return as a Supporting Partner for the 8th edition of the Truck Trailer and Tyre Expo, taking place from August 29th to 31st, 2024, at Mahatma Mandir, Gandhinagar. This expo serves as a vital platform for connecting stakeholders in the Indian automobile sector, including manufacturers, suppliers, and OEMs, while facilitating international business communications. ARAI will be showcasing its expertise in homologation and regulation services at stall number B 17 C.

**International Conference on Green Hydrogen (ICGH) 2024**

ARAI was excited to participate in the 2nd International Conference on Green Hydrogen (ICGH) 2024, held from September 11-13 at Bharat Mandapam, New Delhi. ARAI showcased its expertise in engine and powertrain design, along with its projects in hydrogen and alternative fuel technology.

**Nexgen Mobility Show 2024**

ARAI served as a Knowledge Partner for the Confederation of Indian Industry Nexgen Mobility Show 2024, held in Pune from October 18th to 20th. During the event, Dr. Reji Mathai, Director - ARAI, highlighted the importance of developing technology tailored to India-specific mobility needs, focusing on achieving Net Zero Emission Targets and Vision Zero 2047.

75वां गणतंत्र दिवस 2024

26 जनवरी, 2024 को भारत ने अपना 75वां गणतंत्र दिवस मनाया, जो 1950 में भारत के संविधान के अंगीकरण का स्मरण कराता है और देश के गणतंत्र बनने को चिह्नित करता है। यह महत्वपूर्ण कार्यक्रम भारत की स्वतंत्रता के 75 वर्षों के उपलक्ष्य में एक बड़े उत्सव के रूप में मनाया गया। मुख्य समारोह एआरएआई कोथरुड में 'ए' बिल्डिंग के सामने आयोजित किया गया, जिसमें निदेशक, विभागाध्यक्ष और कर्मचारी उपस्थित रहे।



निदेशक-एआरएआई डॉ. रेजी मथाई ने राष्ट्रीय ध्वज फहराया और एआरएआई को संबोधित किया। चाकन केंद्र के कर्मचारियों के लिए कार्यक्रम का सीधा प्रसारण किया गया। साथ ही कर्मचारी अपने घरों से ऑनलाइन माध्यम से भी जुड़े।

डॉ. एन.एच. वालके, वरिष्ठ उपनिदेशक, एनवीएच एवं टीजीटीसी, और फैक्टरी प्रबंधक, एचटीसी एवं एफआईडी ने एआरएआई एचटीसी चाकन में राष्ट्रीय ध्वज फहराया।

श्रीमती एम.एस. जाम्भले, वरिष्ठ उपनिदेशक, विभागाध्यक्ष, एफएमसीई एवं विभागाध्यक्ष, एआरएआई अकादेमी ने एआरएआई एफआईडी चाकन में राष्ट्रीय ध्वज फहराया।



स्वतंत्रता दिवस समारोह

ऑटोमोटिव रिसर्च एसोसिएशन ऑफ इंडिया के स्वतंत्रता दिवस समारोह में आम तौर पर भारत की स्वतंत्रता का जश्न मनाने और कर्मचारियों और उनके परिवारों के बीच देशभक्ति की भावना को बढ़ावा देने के लिए विभिन्न गतिविधियाँ शामिल होती हैं। यह स्वतंत्रता दिवस, हमारे देश की प्रगति के लिए अपार गर्व, खुशी और साझा प्रतिबद्धता के साथ मनाया गया। हमारे समारोह हर साल संगठन में बढ़ते उत्साह को दर्शाते हैं, क्योंकि हम एकजुटता के साथ भारत की स्वतंत्रता और नवाचार की यात्रा का सम्मान व गौरवगान करते हैं।

एआरएआई के सभी कैम्पसों में औपचारिक ध्वजारोहण हुआ और राष्ट्रगान गाया गया।



सभी को स्वतंत्रता दिवस की हार्दिक शुभकामनाएँ !

विश्व हिंदी दिवस : 10 जनवरी, 2024

एआरएआई भारत सरकार की राजभाषा नीति के कार्यान्वयन के अंतर्गत हिंदी के प्रचार – प्रसार हेतु सक्रियता से प्रयासरत है। विश्व हिंदी दिवस 10 जनवरी, 2024 के अवसर पर एआरएआई में गोष्ठी का आयोजन किया गया जिसके लिए व्याख्यान हेतु पुणे, महाराष्ट्र की प्रसिद्ध भाषाविद् डॉ. अलका सुरेंद्र पोतदार का आमंत्रित किया गया। कार्यक्रम की अध्यक्षता श्री आनंद देशपांडे, वरिष्ठ उप निदेशक, एआरएआई ने की। आमंत्रित व्याख्याता डॉ. अलका सुरेंद्र पोतदार, भाषाविद् ने “वैश्विक परिप्रेक्ष्य में हिंदी भाषा का महत्व, चुनौतियाँ और हमारा दायित्व” विषय पर अपने विचार रखे और हिंदी की व्यापकता व व्यवहार्यता पर विस्तार से प्रकाश डाला।



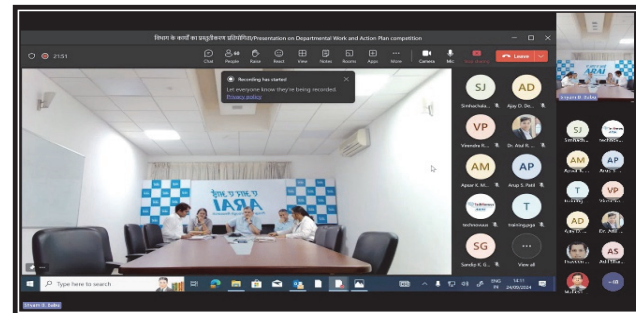
कार्यक्रम के बाद, आमंत्रित भाषाविद् डॉ. अलका सुरेंद्र पोतदार और डॉ. रेजी मथार्ई, निदेशक, एआरएआई की बैठक हुई। इस बैठक में एआरएआई में राजभाषा की गतिविधियों और स्थिति पर विस्तृत चर्चा हुई। डॉ. अलका सुरेंद्र पोतदार ने एआरएआई द्वारा संचालित राजभाषा की गतिविधियों की सराहना की।

हिंदी पखवाड़ा – 2024

राजभाषा हिंदी के प्रचार-प्रसार के लिए एआरएआई प्रति वर्ष हिंदी पखवाड़ा का आयोजन करता है। इस वर्ष भी हिंदी पखवाड़ा- 2024 का आयोजन एआरएआई में 14 सितंबर से 28 सितंबर, 2024 अवधि में उत्साह व जोश के साथ किया गया।

हिंदी पखवाड़ा- 2024 के अवसर पर निदेशक, एआरएआई, सभी विभागाध्यक्ष, राजभाषा कार्यान्वयन समिति के सभी सदस्य, मानव संसाधन प्रबंधन एवं प्रशासन के पदाधिकारियों ने सामूहिक रूप से “राजभाषा प्रतिज्ञा” ली और राजभाषा के प्रति अपने संकल्पों को दोहराया। पखवाड़ा अवधि में विविध प्रतियोगिताओं और एक तकनीती वार्ता का आयोजन किया जिनमें प्रतिभागियों की प्रतिभागिता बहुत ही उत्साहजनक रही।

निदेशक, एआरएआई, विभागाध्यक्षों, राजभाषा कार्यान्वयन समिति सदस्यों और मानव संसाधन प्रबंधन एवं प्रशासन के पदाधिकारियों द्वारा ‘राजभाषा प्रतिज्ञा’



विभागीय प्रस्तुती प्रतियोगिता की एक झलक

प्रतियोगिता गतिविधियाँ

1. हिंदी पखवाड़े का उद्घाटन 2. विडियो चित्रीकरण प्रतियोगिता (प्राकृतिक/ ऐतिहासिक/ सांस्कृतिक स्थल) 3. चित्र के आधार पर कहानी और रचनात्मक लेखन 4. हिंदी प्रश्नोत्तरी 5. शब्द खजाने की खोज प्रतियोगिता 6. हिंदी अनुवाद सह टंकण 7. विभागीय गतिविधि प्रस्तुतीकरण 8. घोष वाक्य/ ब्रीद वाक्य प्रतियोगिता 9. तकनीकी संगोष्ठी 10. हिंदी निबंध प्रतियोगिता और हिंदी कविता प्रतियोगिता

28 सितंबर, 2024 को हिंदी पखवाड़ा-2024 को समापन हुआ। सभी प्रतियोगिताओं के प्रतिभागियों / उत्तर-पुस्तिकाओं का मूल्यांकन कार्य पूर्ण होते ही परिणामों की घोषणा और किसी कार्यक्रम के माध्यम से विजेता प्रतिभागियों को प्रमाणपत्र प्रदान किया जायेगा और पुरस्कृत किया जायेगा।

एआरएआई में प्रोत्साहन योजना

हिंदी के प्रचार-प्रसार को बढ़ावा देने और कार्यालयीन कार्यों को अधिक से अधिक हिंदी में करने के लिए कर्मचारियों को प्रोत्साहन हेतु एआरएआई में 1 अक्टूबर, 2024 से प्रोत्साहन योजना लागू है। इस योजना में नियमित रूप से अधिकारी/कर्मचारी भाग लेते हैं। योजना के अंतर्गत प्रतिभागियों को प्रोत्साहन स्वरूप पुरस्कार राशि और प्रमाणपत्र प्रदान किए जाते हैं।

इस योजना के प्रति कर्मचारियों के उत्साह का परिणाम है कि कुछ विभाग 100 प्रतिशत हिंदी में कार्य करने के लिए अधिसूचित किए जाने के करीब हैं।

निदेशक महोदय स्वयं अपने संबोधनों में प्रतिभागियों को प्रोत्साहित करते हैं और अधिक से अधिक कार्मिकों को इस योजना से जुड़ने के लिए प्रेरित करते हैं।

जुलाई, 2024 में पुरस्कृत प्रोत्साहन योजना के प्रतिभागी अधिकारी/ कर्मचारी

क्र. सं.	प्रतिभागी का नाम	कार्मिक संख्या	पुरस्कार
1.	श्री श्रीनिवास देशमुख	1835	प्रथम
2.	श्री मिलिंद अनंत पलसे	977	द्वितीय
3.	श्री चारुदत्त शाम मुखेडकर	1623	तृतीय
4.	श्री किरण शंकर गायकवाड	1065	तृतीय
5.	श्री अमित व घाटे	1504	प्रोत्साहन
6.	श्री अखिलेश प्र. रत्नपारखी	1661	प्रोत्साहन
7.	श्री नितीन श. नलावडे	1664	प्रोत्साहन
8.	श्री संजय निकम	854	प्रोत्साहन
9.	श्रीमती स्मिता जोशी	715	प्रोत्साहन
10.	श्री सोहल गुजर	1270	प्रोत्साहन



प्रोत्साहन योजना के विजेताओं के साथ डॉ. रेजी मथाई निदेशक, एआरएआई और अन्य वरिष्ठ प्रबंधन अधिकारी

ARAI Sports Activity

ARAI has a rich culture of sports, actively engaging employees in various activities for decades. The management supports these initiatives, recognizing their importance for employee well-being. The ARAI Sports Committee organizes events across all locations, including Kothrud, HTC, and FID. Competitions in chess, volleyball, cricket, badminton, table tennis, and throw ball are arranged, with enthusiastic volunteer management. These events promote participation, foster a healthy competitive environment, and build team spirit among interdepartmental and intradepartmental teams, with activities scheduled for both men and women.

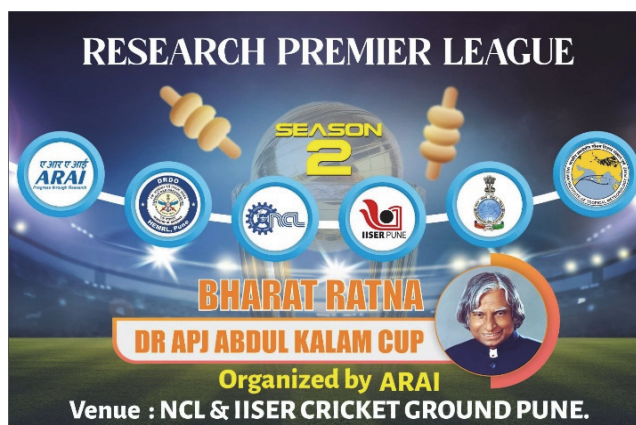
Inter Research Labs Sports Event

Pune is known for its educational institutions and vibrant sporting culture, particularly among its research institutes. ARAI collaborates with notable organizations like IISER Pune, NCL Pune, HEMRL-DRDO, ARDE-DRDO, and IITM Pune to organize inter-organizational cricket tournaments. These tournaments follow a round-robin format and are hosted by one of the participating institutions, fostering camaraderie and competition among diverse fields of science and technology.

In April-May 2024, ARAI successfully organized a sporting event, with heads of participating institutions expressing interest in continuing inter-institutional activities in cricket and other sports.

Dr. A P J Abdul Kalam Research Premier League Cup

The second edition of this tournament was inaugurated on April 6, 2024. Esteemed government research labs, including IMD, IISER, NCL, IITM, and HEMRL Pune, competed, promoting collaboration and innovation within the scientific community in Pune and beyond.



Inaugural session - Research Premier league 2024



Interdepartmental Sports Competition conducted this year:

ARAI Badminton Tournament 2024



ARAI Chess Tournament 2024



ARAI Volleyball Tournament 2024



ARAI Carrom Tournament 2024



ARAI Cricket Tournament 2024



ARAI is committed to enhancing employee well-being through the development of sports facilities at the ARAI Staff Quarters.

Gymnasium

The gym has been relocated to a larger space, attracting around 25 regular members, reflecting ARAI employees' strong interest in health and fitness. The facility will continue to be maintained and upgraded.



Cricket Practice Facility

A dedicated cricket pitch and practice ground have been established for the ARAI Cricket Club, allowing employees to improve their skills through regular practice sessions.

These initiatives are driven by management support and the enthusiasm of ARAI employees and volunteers. Participation from individuals and teams is encouraged to foster a vibrant sports culture. The ARAI sports committee plans to organize more events, promoting the Government of India's "FIT INDIA" initiative. All employees are invited to participate and contribute to the success of these activities.

National Safety Week 2024

National Safety Day is observed on March 4 each year to commemorate the Foundation Day of the National Safety Council, established by the Ministry of Labour, Government of India. The theme for 2024 is "Focus on Safety Leadership for ESG Excellence."

The 53rd National Safety Week was celebrated enthusiastically across all ARAI facilities, launched by Mr. N. B. Dhande, Sr. Dy. Director at ARAI-Kothrud. He emphasized the importance of collective efforts in improving occupational safety and reaffirmed ARAI's commitment to the health and safety of employees, service providers, and visitors.

The week commenced with a safety oath on March 4, 2024, followed by various activities such as webinars, safety quizzes, technical demonstrations, and mock drills to raise awareness about Occupational Health & Safety. ARAI is dedicated to fostering a strong culture of safety throughout its facilities.



International Women's Day

International Women's Day (IWD) is celebrated on March 8th each year to honor women's rights and achievements worldwide. The Automotive Research Association of India (ARAI) recognized this day to promote gender equality and empower women in the automotive industry, emphasizing the importance of female representation in engineering and technology.

On March 8, 2024, ARAI celebrated IWD with the theme **"Inspire and Inclusion."** All women employees were invited to participate in the festivities, which included a talk on "Well-being" and engaging activities with fun-filled games.

The event aimed to foster a sense of belonging and mutual respect within the organization, providing participants with opportunities to network, share experiences, and gain insights on work-life balance and personal growth.



World Environment Day

On World Environment Day 2024, ARAI embraced the theme of 'Land restoration, desertification, and drought resilience,' reaffirming our commitment to environmental stewardship and sustainability. We recognize the urgency to protect and restore our lands for future generations.

The day highlighted our collective responsibility to reduce carbon footprints, conserve natural resources, and promote renewable energy. We were honored to host Dr. Prashant Gargava, Director of the National Clean Air Program, who delivered an inspiring address and engaged in discussions with our team during his lab visits.



Key activities included:

- A special social media post focusing on land restoration, drought resilience, and conservation efforts.
- A talk on "Air Quality Management in India" by Dr. Gargava, emphasizing government initiatives.
- A training session on sustainability and waste management led by TUV trainers, covering topics like the circular economy and GHG emissions.
- Distribution of over 1500 saplings to employees, aligning with the WED 2024 theme.
- ARAI remains dedicated to nurturing our natural heritage for a resilient and sustainable future.

एआरएआई में हिंदी प्रशिक्षण

एआरएआई एक अनुसंधान संस्थान है और शिक्षण व प्रशिक्षण के महत्व पर बल देता है। अपने दायित्वों का निर्वहन करते हुए अपने कर्मचारियों की आवश्यकताओं को बखूबी समझता है और उनके व्यक्तित्व विकास के लिए नियमित प्रशिक्षण प्रदान करता है। राजभाषा नीति के कार्यान्वयन के क्रम में सभी अनुपालन सुनिश्चित करने हेतु अपने कर्मचारियों को हिंदी का कार्य साधक ज्ञान देने के उद्देश्य से वर्तमान में संस्थान में हिंदी प्रशिक्षण संचालित है। राजभाषा विभाग, पश्चिमी क्षेत्र का कार्यालय, नवी मुंबई के सहयोग से जुलाई-नवंबर, 2024 अवधि के लिए हिंदी प्रवीण और हिंदी प्राज्ञ के दो बैच एआरएआई परिसर में चल रहे हैं।



जुलाई – नवंबर, 2024 अवधि के हिंदी प्रशिक्षार्थी और हिंदी प्रशिक्षक श्री विनोद कुमार शर्मा

एआरएआई में योग दिवस समारोह

एआरएआई टीम ने अंतर्राष्ट्रीय योग दिवस मनाने के लिए एकजुट होकर सद्भाव और स्वास्थ्य के प्रति सामूहिक प्रतिबद्धता पर जोर दिया। एकता की भावना को आत्मसात करते हुए, उन्होंने दैनिक चुनौतियों के बीच संतुलन और शांति के अनुभव के साथ सामूहिक योग सत्रों में भाग लिया। इस उत्सव ने न केवल टीम का आपसी जुड़ाव मजबूत होगा, बल्कि सामूहिक सद्भाव और पुनःस्फूर्ति की भावना को बढ़ावा देने के साथ समग्र स्वास्थ्य के महत्व को भी रेखांकित किया।



National Fire Service Week

From April 14th to April 20th, 2024, ARAI is observing National Fire Service Week as directed by the Ministry of Home Affairs to raise public awareness and minimize fire-related losses. Recognizing the importance of fire safety, the Director of ARAI has encouraged enthusiastic participation among all stakeholders.

Key activities include:

- **April 14, 2024:** Display of banners at all sites to promote Fire Service Week and its theme.
- **April 15, 2024:** Launch event at ARAI's reception, featuring an introductory speech by the Director on the importance of fire safety, attended by employees both offline and online.
- **April 16, 2024:** A webinar on fire, life safety, and rescue operations conducted by Mr. Nilesh Vasant Karmarkar, along with a live demonstration of the fire hydrant system by the security team.
- **April 17, 2024:** A special inspection campaign on fire safety equipment and an evacuation drill executed by the safety officer, with checks conducted by the Maharashtra fire service agency.

These initiatives aim to enhance fire safety awareness and preparedness among ARAI employees and stakeholders.



National Road Safety Week

ARAI is actively participating as a stakeholder in the National Road Safety Month from January 15 to February 14, 2024, as designated by the Government of India. The initiative aims to raise awareness about road safety among citizens, drivers, and employees. Under the direction of Director ARAI, various activities were organized to promote responsible driving habits and adherence to traffic rules.



On February 9, 2024, ARAI conducted a public awareness drive near its Homologation & Technology Centre in Chakan, Pune, with support from the Mahalunge Police Station. Additionally, on February 13, road safety training was held for drivers, employees, and students in a hybrid format to ensure broad participation. Drivers demonstrating zero incidents and good driving practices were recognized with certificates.

Throughout Road Safety Month, ARAI emphasized the importance of creating a secure driving environment and reaffirmed its commitment to improving road safety through research and development initiatives.

स्वच्छता पखवाड़ा 2024

स्वच्छता पखवाड़ा "स्वच्छ भारत मिशन" का हिस्सा है, जो पूरे भारत में स्वच्छता और स्वच्छता को बढ़ावा देता है। 2024 की पहल एआरएआई के निदेशक श्री डॉ. रेजी मथाई द्वारा शुरू की गई, जिन्होंने कर्मचारियों को स्वच्छता की शपथ दिलाई और दैनिक गतिविधियों में स्वच्छता के महत्व पर जोर दिया। उन्होंने पखवाड़ा अवधि के बाद स्वच्छता प्रयासों में चल रही भागीदारी को प्रोत्साहित किया।

प्रमुख गतिविधियाँ:

शुभारंभ समारोह: निदेशक ने स्वच्छता को बढ़ावा देने में विभाग प्रमुखों की भूमिका पर प्रकाश डाला और सुधार के लिए कर्मचारियों से सुझाव आमंत्रित किए।



हाउसकीपिंग निरीक्षण: एक क्रॉस-फंक्शनल टीम (सीएफटी) ने पुराने वाहनों, इलेक्ट्रॉनिक कचरे और बगीचे के कचरे जैसे क्षेत्रों पर ध्यान केंद्रित करते हुए स्वच्छता और स्वच्छता का आकलन करने के लिए एक व्यापक निरीक्षण किया। उन्होंने सामग्रियों के पुनः उपयोग, पुनर्चक्रण और वैज्ञानिक निपटान पर मार्गदर्शन प्रदान किया।

श्रमदान गतिविधियाँ:

एआरएआई चाकन कैम्पस: अनुबंध और हाउसकीपिंग स्टाफ सहित कर्मचारियों ने बड़े पैमाने पर स्वच्छता अभियान में भाग लिया, सार्वजनिक क्षेत्रों में प्रयासों का विस्तार किया। कचरे को वैज्ञानिक रूप से एकत्र किया गया, अलग किया गया और निपटाया गया।

स्टाफ कार्टर: स्वच्छता गतिविधियों में सौंदर्यीकरण अभियान, सजावटी और औषधीय पौधे लगाना, और बागवानी कचरे को खाद बनाना शामिल था।

कुल मिलाकर, एआरएआई कर्मचारी सक्रिय रूप से स्वच्छता पहल में लगे हुए हैं, पूरे संगठन में स्वच्छता और स्थिरता की संस्कृति को बढ़ावा देते हैं।

Khandenavami Pooja Celebrations

Khandenavami, often celebrated as part of the Ayudha Puja festivities, holds significant cultural and spiritual importance in various regions of India. This festival is particularly dedicated to honouring tools, instruments, and vehicles that play a crucial role in daily life.

Significance of Khandenavami at ARAI

In ARAI, the Khandenavami pooja is a vibrant celebration that combines devotion, community spirit, and cultural heritage. It is a vibrant occasion that brings together various departments to showcase their creativity and cultural spirit through the art of Rangoli, which involves creating intricate designs on the ground using coloured powders, rice, or flower petals. Each department in ARAI takes pride in decorating their spaces with unique Rangoli designs, reflecting their identity and the festive spirit of the occasion. This celebration not only honours the tools and instruments of work but also strengthens the bonds among employees, making it a memorable occasion for all. Decorations are shown below:



ECL Department - Kothrud



HMR Department - Kothrud



AED Department - Kothrud



SDL Department - Kothrud



Calibration Department - Kothrud



Advanced Photometry and Optics Lab (APOL)



Digital Twin Lab (DTL)



Technology Group



Business Development and Corporate Planning (BDP)



Knowledge Centre

Bhorgiri Trek

The Bhorgiri trek, completed on July 13, 2024, stands as a testament to the spirit of collaboration and teamwork fostered among the members of the ARAI-HTC ECL laboratory. The participation of 14 employees in this monsoon trek not only demonstrates the organization's commitment to team building but also its adventurous spirit. The successful completion of this one-day trek underlines the importance of such activities in enhancing teamwork and camaraderie among colleagues.



A.S. TUVAR, I.H. SHAIKH, S.S. DIXIT, N.G. KADAM, R.R. AWARE, V.N. BHOSALE, R.A. NIMASE, A.S. SHIVALE, C.J. JATKAR, K.M. WAGHMARE, S.U. MALI, N. CHAUDHARI, V. JOSHI and R. MUGASE

13 जुलाई, 2024 को पूरा हुआ भोरगिरि ट्रेक, एआरएआई एचटीसी ईसीएल लैब के सदस्यों के बीच विकसित सहयोग और टीम वर्क की भावना का प्रमाण है। इस मानसून ट्रेक में 14 कर्मचारियों की भागीदारी न केवल टीम निर्माण की प्रतिबद्धता को उजागर करती है बल्कि संगठन की साहसिक भावना को भी दर्शाती है। इस एक दिवसीय ट्रेक का सफल समापन सहकर्मियों के बीच टीम वर्क और सौहार्द बढ़ाने में ऐसी गतिविधियों के महत्व को रेखांकित करता है। इन क्षणों को कैद करने वाली तस्वीरें "ए. आर. ए. आई. स्पंदन" की "कर्मचारी स्पॉटलाइट" श्रेणी में एक मूल्यवान अतिरिक्त हैं, जो दूसरों के लिए टीम-निर्माण अभ्यास में शामिल होने के लिए प्रेरणा के रूप में काम करती हैं।

**LogiQuids Mental Aptitude Olympiad**

LogiQuids, an IIT-IIM Alumni Venture, hosts the annual Mental Aptitude Olympiad to evaluate and enhance students' mental aptitude, logical reasoning, and problem-solving skills. The competition features uniquely crafted questions tailored to the students' capabilities.

This year, Master Shivansh Sachin Nigade, son of Mr. Sachin R. Nigade, Manager - EDS, achieved an impressive International Rank of 15 in Class 2 during the Final Stage of the 2023-24 Olympiad.



SteelChallenge-18 World Championship

Mr. Srinivasan Dhanaraj, Deputy Manager-TG (P. No. 1975), recently secured first place in the World Steel Association's SteelChallenge-18 World Championship held in London from April 9-11, 2024, becoming a World Champion in the Students' Category.

His achievement followed a victory in the regional (Asia-West) SteelChallenge Championship on November 29, 2023, where he was one of five finalists sponsored by the World Steel Association. As a Master's student at IIT Hyderabad, Mr. Srinivasan's win marks a historic milestone for India, being the first Indian to claim the title in this prestigious competition, which tests participants on the challenging simulation tasks of the steel-making process while meeting specific technical and carbon footprint requirements.



Mr. Srinivasan being felicitated by Mr. Leon Topalian, World Steel Chair and President & CEO, Nucor Corporation.

Heartiest congratulations to Mr. Srinivasan for making TG, ARAI and India proud.

Best Organizing Committee Member of BAJA SAEINDIA 2024

Mr. Ashish Rai, who began his career as a Trainee Engineer in the Homologation Management and Regulations Department at ARAI in 2018, was honored as the Best Organizing Committee Member of BAJA SAEINDIA 2024. He received the award from Sh. Gopalakrishnan VC, Director of Automotive and EV, Telangana, during the Valedictory Event at BVRIT, Narsapur, on March 9, 2024.



As the Joint Convener of the eBAJA event, Ashish shared the stage with esteemed industry leaders. Over the past nine years, he has been deeply involved in BAJA, participating for three years and serving in various organizing roles for six years, including Head of the Alumni Committee. This journey has significantly enhanced his technical and managerial skills while emphasizing the importance of building strong professional relationships.

Technical Visit of all ID engineers to Koyna Dam on 31st Aug 2024



Salient Features of Koyna Radial Gates:

No. of gates	6
Crest Level (K.R.L.)	2133.50 FT
Full Storage level	2158.50 FT
Discharge Capacity of each gate	225000 CUSECS
Year of installation	1965 to 1967
Weight of moving parts of each gate	49 MT
Weight of Total installation of each gate	62 MT
Sealing Material	Rubber
Total Sealing length	33600 MM
Hoist Capacity	

Salient Features of Koyna Hydro power plant:

Capacity of power plant	19 MW each
No of Turbine	02nos.

Road Not taken: Chikhaldara Hill Station!

Like every year, this year also our college friends planned for a Monsoon Trip. However, the location was the bone of contention. Most of the scenic locations in the western region of Maharashtra such as Mahabaleshwar, Ganaptipule, Alibaug, Bhandardara etc. were already explored in our previous trips. So, this time we decided to go with the east of Maharashtra and take the road not taken. And on the occasion of Friendship Day, a bunch of college friends embarked on the journey to explore Chikhaldara Hill Station also known as the Mahabaleshwar of Vidarbha.

Two of us took an overnight train to Badnera station and friends from Nagpur picked us up from Amravati. It was another two hours journey by road to Chikhaldara although the distance is only about 80 km. However, the road offered diverse landscapes and we immersed ourselves in the visual treats that each viewpoint alongside the road had to offer.

We had booked the MTDC resort at the Chikhaldara Hill Station that offered another scenic treat to our eyes. Nestled in the picturesque hills of Maharashtra, Chikhaldara offers a serene escape from city life with its lush green valleys, breathtaking viewpoints, and pleasant climate. At an altitude of 1118 m, it is the perfect destination for nature lovers, offering opportunities for trekking, wildlife exploration, and immersing oneself in the captivating beauty of nature. From the breathtaking sunset point to the enchanting monkey point, and from the stunning Mozari point to the captivating Devi point, each offers a unique and picturesque vista.

Home to the only coffee plantation in Maharashtra, the picturesque hill station of Chikhaldara is noted for its pristine waterfalls, serene lakes, lush green estates and a large variety of birds. Chikhaldara is an ideal site for adventure lovers and makes for a great camping and picnic spot.

Although we didn't visit but tourists can also visit the Chikhaldara Sanctuary, which is home to a number of animal species like leopards, sloth bears, sambars, barking deer, wild dogs, blue bulls, porcupines, langurs, wild boars and others. Another attraction is Melghat Tiger Project that hosts as many as 82 tigers, along with panthers, sloth bears, sambars, wild bears and wild dogs.

**Author - Dr. Atul R Thakare,
BDGP**



Emotional Intelligence & Spiritual Intelligence at ARAI workplace

(Creating right Spandan at ARAI workplace – for work-life balance and holistic success of ARAI family)

All of us know the famous story of a scholar person, (let's call him Mr.Sam) and an uneducated person, (let's call him Mr.John), travelling on a boat. Making the long story short, during this travel Mr.Sam asks many intelligent questions to boatman, Mr.John, which he was not able to answer. And hence, Mr. Sam was able to prove that, he is the most intelligent and knowledgeable fellow present in the boat. As the boat reached to the middle of a river, suddenly a storm hit the boat, all of the passenger jumped into the river, except this knowledgeable man, Mr.Sam, who was not having any knowledge of swimming. So Mr.John asked to Mr.Sam, "Do you know swimming?" And Mr. Sam replied "No". Eventually, in the end, all other passengers were able to save their own lives, except, the most intelligent fellow Mr.Sam. We may have different moral of this story, but one important learning can be, we should learn the skills which are of utmost important for our survival and ultimately resulting in holistic success in our life.



Figure 1 : Story of a scholar and poor boatman

In today's modern life style and facing daily obstacles of achieving targets, in the deep corner of our mind, a thought travels from one corner to other corner that, "I must be a successful person and whatever needs to do it, I will do it". In the process, knowingly or unknowingly we may have to pay a heavy price, in terms of health and peace of mind. As a result, to achieve these goals, we are making ourselves ready to do whatever it takes to be a successful person.

Success, holistic success and non-holistic success

Each one of us has our own definition of success. This definition is changing from time to time, mostly after a certain period in our lifetime (after every 5 to 10 years). This change may be caused because of different reasons. Some of them are listed, as below:

1. Major happening in life (good or bad experience).
2. Change in our certain type of belief.
3. Major influence of society, peer pressure, parents, siblings, etc.
4. Learning through books, films, social media, etc.
5. Self awareness
6. Social awareness

The next definition of success can be called as a non-holistic success .

Non-holistic success:

This type of success which is mostly related to achieving materialistic goals and short-term happiness. This type of goal can be harmful to our body, mind and soul. Some of the side effects of this type of non-holistic success can be listed as below:

1. Anxiety about maintaining success : We can worry about losing the winning streak and being set up to fail.
2. Envy from others : We may feel envy toward those who are successful.
3. Being judged as arrogant :We may be judged as an expressive winners but as arrogant and be less likely to befriend with others.
4. Inflated confidence: We may become overconfident in our ability to recreate what we see others succeed at.
5. Decreased empathy: We may become less empathetic and have less understanding of those who try and fail.
6. Plateauing: We may become complacent and stop putting in the effort to improve.
7. The Success Wound: We may mistake our success for our self-worth and abandon our true selves.
8. Limited by expectations : We may be placed into a new set of expectations and may not be considered to have the ability to expand our talents.

Holistic Success:

One thing is certain, for most of us, as we grow older, we generally shift from a narrow definition of success towards a more holistic success. The below figure 2 shows the holistic view towards success and wellness.

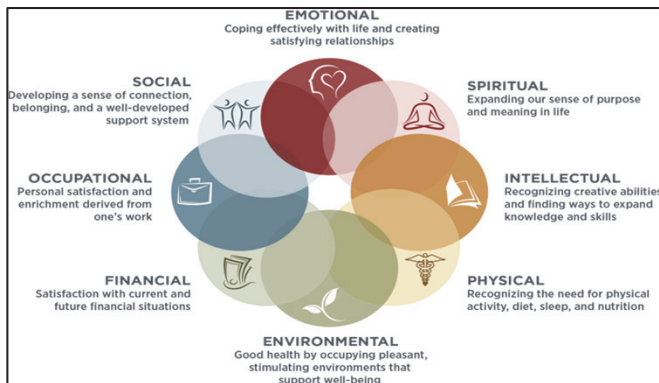


Figure 2 : The Eight Dimensions of Holistic Success and Wellness

SOURCE: SAMHSA, adapted from Swarbrick, M. (2006). A wellness approach. *Psychiatric Rehabilitation Journal*, 29(4), 311-314

For the industrial human workforce, the most popular theory, for understanding the relationship between success and motivation, is the Maslow's theory of motivation.

Maslow's theory of motivation:

Abraham Maslow's theory of motivation, also known as the hierarchy of needs, is a theory that explains how people are motivated to fulfill their needs in a hierarchical order as explained below :

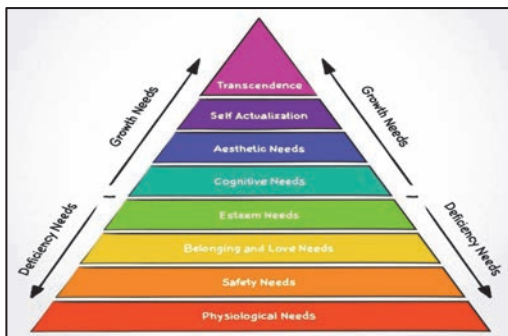


Figure 3 : Maslow's motivation model

(Changes to the original five-stage model are highlighted and include a seven-stage model and an eight-stage model; both developed during the 1960s and 1970s.)

A. Physiological needs. **B.** Safety needs. **C.** Love and belonging. **D.** Esteem. **E.** Self-actualization

Once we understood the philosophy of holistic success, wellness and the motivation behind it, now it is important to implement it in our life. But to do this more methodologically, we require scientifically proven tools and techniques. As an educated person, all of us want to use our thinking brain, which is one of the three parts of human brain, as shown in figure 4 below. We use our logical thinking and critical analysis before accepting a particular tool or technique to reach to ultimate aim of holistic success.

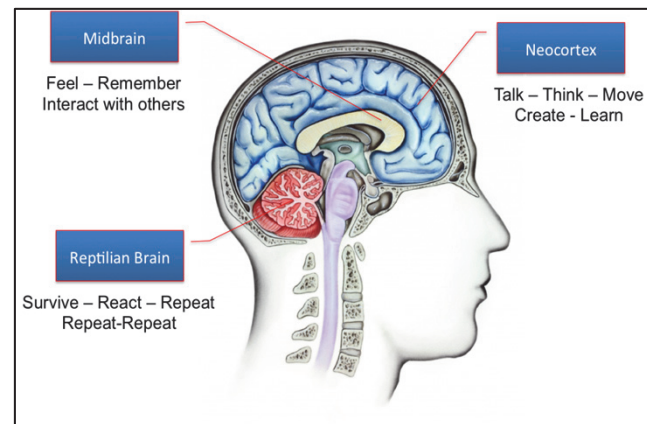


Figure 4 : Triune Brain Theory - Our 3 brains

Below are some of the popular techniques, which are scientifically proven and accepted all over the world:

1. Multiple Intelligence Tools and techniques
2. Emotional Intelligence
3. Spiritual Intelligence
4. Growth Mindset
5. Critical Thinking

For the holistic personality development, we have to particularly focus on three of the most important intelligence of a person. These are namely, Intelligent Quotient (IQ), Emotional Quotient (EQ) and Spiritual Quotient (SQ). To keep the article length shorter, I cannot dive into each of the above listed tools and explain all the types of tools and techniques. So I am currently focusing on only the most popular and most successful tools for today's world, two of them are as below :

A) Emotional Intelligence B) Spiritual Intelligence

There is very close correlation between IQ, EQ and SQ. This close relationship between IQ, EQ and SQ can be explained as shown in below figure 5

A) Emotional Intelligence B) Spiritual Intelligence

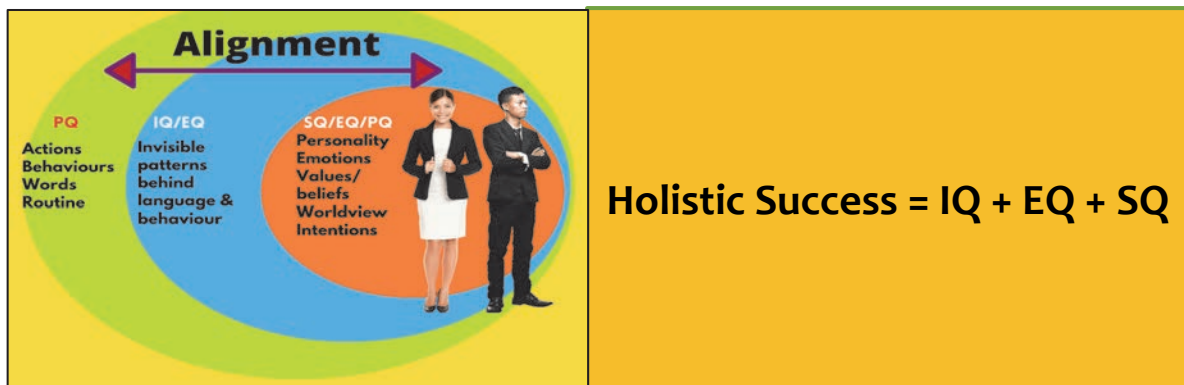


Figure 5 : Multiple intelligence whole person development

Relationship between IQ, EQ & SQ and formula of Holistic Success (Note: PQ is the Physical Quotient)

Now let's discuss in details about Emotional Intelligence (EI) and Spiritual Intelligence (SI).

A) Emotional Intelligence (EI) :

Emotional intelligence (EI) is the ability to recognize, understand, and manage your own emotions, as well as recognize and influence the emotions of others. It's a key factor in the workplace, helping people build relationships, communicate effectively, and resolve conflicts

	Recognition	Regulation
Personal Competence	Self-Awareness <ul style="list-style-type: none"> Self-confidence Awareness of your emotional state Recognising how your behaviour impacts others Paying attention to how others influence your emotional state 	Self-Management <ul style="list-style-type: none"> Keeping disruptive emotions and impulses in check Acting in congruence with your values Handling change flexibly Pursuing goals and opportunities despite obstacles and setbacks
Social Competence	Social Awareness <ul style="list-style-type: none"> Picking up on the mood in the room Caring what others are going through Hearing what the other person is "really" saying 	Relationship-Management <ul style="list-style-type: none"> Getting along with others Handling conflict effectively Clearly expressing ideas/information Using sensitivity to another person's feeling (empathy) to manage interactions successfully

Table 1 -Daniel Goleman's Model of Emotional Intelligence (Positive psychology, 2022). Daniel Goleman's Model of Emotional Intelligence (Positive psychology, 2022)

The benefits of emotional intelligence in the workplace. Why does emotional intelligence in the workplace matter? There have been many studies which have shown countless benefits of having EQ in the workplace but not only is it good for individuals, but also it's good for their organisations as well.

Some of the benefits of applying emotional intelligence include:

- People with high EQ earn more.
- High EQ boosts productivity.
- Higher EQ is associated with improved efficiency in the workplace
- EQ enhances cohesion in the workplace .
- EQ enhances trust.
- EQ enables people to manage their emotions effectively.
- EQ enhances impulse control.
- EQ makes a better workplace environment .
- High EQ is linked to higher job satisfaction .
- Higher EQ is negatively related to burn out .
- EQ boosts self awareness .

Examples of emotional intelligence in the workplace

What does an emotionally intelligent workforce look like? How do they really behave and what could you expect to have a team that is more emotionally intelligent? Here are some examples as shown in below table 2:

S.N.	EQ Skills	Improvements at workplace by the use of EQ skills
1	Improved listening skills	<ul style="list-style-type: none"> Don't interrupt people in meetings Provide considerate, constructive feedback Provide compassionate support when needed
2	Open and honest communications	<ul style="list-style-type: none"> Welcoming honest feedback from all personnel Providing the means to submit feedback without fear Nurturing an atmosphere in which people can speak up without fear of rebuke or criticism.
3	Able to cope with change	<ul style="list-style-type: none"> Not resistant to change Readily able to adapt and be flexible Finding positive aspects in challenging situations.
4	Freedom to be creative	<ul style="list-style-type: none"> Workplaces that facilitate and foster creativity tend to have higher EQ. They also experience the benefits of creative, 'outside the box' thinking.
5	Introduce stress relief into their day	<ul style="list-style-type: none"> Helps to build relationships with one another Better compassion

Table 2 –Improved skills because of higher Emotional Intelligence (Positive psychology, 2022)

Process for improving emotional intelligence in the work place

Many researchers believe - and have been able to show - that emotional intelligence can be learned. So it is possible to develop and boost EQ in the workplace. Primarily, EQ is an individual development but there are some concrete methods that can be used to train individuals as teams to be overall better with their EQ as listed below:

- Training courses and workshops
- Group activities
- Reflecting on one's emotions.
- Developing observation skills.
- Pause before acting.
- Consider 'Why' people behave as they do
- Learn from criticisms
- Practice EQ

B) Spiritual Intelligence (SI):

According to Stephen Covey, "Spiritual intelligence is the central and most fundamental of all the intelligence, because it becomes the source of guidance for the others." Spiritual quotient (SQ) is a measure of a person's spiritual intelligence, which is the ability to understand the meaning of life, connect with one's inner self, and navigate through existential challenges. It's considered to be as important as intelligence quotient (IQ) and emotional quotient (EQ). If we look at the layers in an organizational context, each of IQ, EQ and SQ can be compared based on the abilities person has depending of the use of that particular quotient. This is explained well in the below table which shows the comparison between IQ, EQ & SQ.

IQ Competencies	EQ Competencies	SQ Competencies
Receive information	Self-awareness	Reaching a higher level of self-awareness
Store information	Paying attention to emotions	Comprehending the meaning of life
Using information cognitively	Controlling emotions	Taking pleasure of life
Keeping in memory	Communicating effectively	Enjoying curiosity that comes with learning
Connecting old and new information	High level of concentration	Integrating with all forms of universe (nature affection)
	High degree of external motivation	Developing self-respect
	Developing leadership potential	Developing self-motivation
		Accepting the guidance of intuitions

Table 3 - comparison between IQ, EQ & SQ.

Comparison between Intelligent Quotient, Emotional Quotient and Spiritual Quotient :

Workplaces are getting challenging and competitive. There are targets and goals to achieve, enhance revenues, profits, capture market shares, complete projects on time and be ahead in the race. Amidst all this, there is also a constant desire to sprint through the career ladder and rush to the top. SQ provides the much-needed respite in this VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) world for a balanced understanding of what is happening around, what life is all about and helps in better decision making in all aspects. Taking a leaf from Maslow's Hierarchy of Needs, if we look at the layers in an organizational context, one attains a higher gratification in career, relationships and life with a high SQ. This is explained in below figure 6.

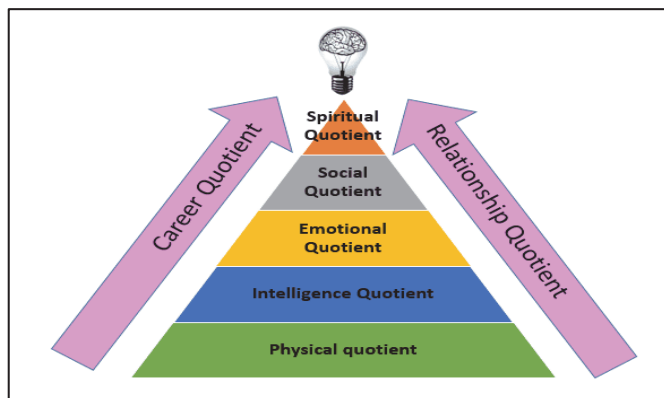


Figure 6: Maslow's Hierarchy of Needs

Benefits of Spiritual Intelligence at workplace:

Spiritual intelligence can have many benefits in the workplace, including:

- **Improved employee well-being** : Spiritual intelligence can lead to increased job satisfaction, reduced stress, and improved mental well-being.
- **Better teamwork** : Spiritual intelligence can foster a sense of unity and common purpose among team members, which can lead to better collaboration.
- **Enhanced leadership** : Spiritually intelligent leaders can create a culture of empathy, ethical decision-making, and a shared vision.
- **Increased productivity** : Mindfulness practices rooted in spiritual intelligence can lead to improved focus, creativity, and overall productivity.
- **Greater innovation** : Integrating spiritual principles into an organization can drive creative thinking and breakthrough innovation.
- **Positive social impact** : Social responsibility initiatives driven by spiritual intelligence can contribute to societal well-being.
- **Improved interpersonal relationships** : People with high spiritual intelligence are better able to understand and empathize with others, leading to stronger and more positive relationships.
- **Personal and professional growth** : Spiritual intelligence can help people identify and develop their strengths, overcome obstacles, and reach their full potential.
- **Better work-life balance** : Spiritual intelligence can help people balance work and their personal lives and families.

Summary:

Finally we can say that, to achieve better work-life balance, which is one of the main pillar of holistic success in life, we have to continuously work on developing our Emotional intelligence (EI) and Spiritual Intelligence (SI). The basic requirement to do this, is having the growth mindset instead of fixed mindset. The first step towards this goal is the unconditional acceptance of the belief of holistic success. This can be done without paying the cost of any mishap in terms of life style related deceases like, high or low blood pressure, diabetes, higher stress, anxiety and uncontrolled anger, etc .

Hope with this, I am able to share some useful information with all of you, as a small effort towards making our ARAI family as a more healthier and happier by correctly tuning the *Spandan* of our mind, body and soul.

References:

1. Z. A. Vural, Mjude Ker Dinçer, Nilay Başok, "Searching For Excellence in Educational Communication the Role of IQ EQ and SQ", February 2008, Bilig Journal of Social Sciences in Turkish World 45(45):147-164.
2. Miidom, Dumbor Frank , Onyah Innocent , Zebulon, T. Abule , "Spiritual Intelligence and organizational success : An emipirical research" , International Journal of Advanced Academic Research | ISSN: 2488-9849 Vol. 7, Issue 10 (October, 2021).
3. Elif Baykal, "Utilizing spiritual intelligence and workplace spirituality in creating collective awareness: the U-journey perspective", Front. Psychol., 30 May 2024, Sec. Consciousness Research Volume 15 – 2024, <https://doi.org/10.3389/fpsyg.2024.1359562>.
4. Amrendra Pandey, "Spirituality in the workplace and spiritual intelligence- A new paradigm for a more effective workforce in an organization", IOSR Journal of Business and Management (IOSR-JBM) e-ISSN: 2278-487X, p-ISSN: 2319-7668. Volume 16, Issue 10.Ver. III (Oct. 2014), PP 45-50.
5. <https://www.thomas.co/resources/type/hr-guides/complete-guide-emotional-intelligence-workplace>

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कविता (मराठी)

!!!...मला वाटलं...!!!

मला वाटलं शाळा झाली
आता मिटलंमला वाटलं शाळा झाली
आता मिटलंमला वाटलं कॉलेज झालं
आता मिटलंमला वाटलं नोकरी लागली
आता मिटलंमला वाटलं लग्न झालं
आता मिटलंमला वाटलं पोरं झाली
आता मिटलंमला वाटलं सुना आल्या
आता मिटलंमला वाटलं नातवंडं आली
आता मिटलंमला वाटलं नव्वदी पार झाली
आता मिटलंजेव्हा डोळे झाकले तेव्हा वाटलं
आता मात्र मिटलं...कवी - आशिष वळसे
एफमसीई डिपार्टमेंट

कविता (मराठी)

मी अज्ञानी

खूप शिकलो, खूप शिकलो
पण जगणेच नाही शिकलोखूप केलं, खूप केलं
पण काहीतरी राहून गेलंखूप पडलो, खूप पडलो
पण चुकण्यातुन नाही शिकलोखूप पाहिलं, खूप पाहिलं
पण हृदयांत पाहायचं राहून गेलंखूप धावलो, खूप धावलो
पण मोहापुढे न धावू शकलोखूप जिंकलं, खूप जिंकलं
पण स्वतःला जिंकणं नाही जमलंखूप शोधलं, खूप शोधलं
पण आकाशातलं ते नाही सापडलंकवी - किरण वाणी
ए आर ए आई अकादमी

कविता (मराठी)

‘ते’

यंत्राची खडखड,
हृदयाची धडधड
पोटाच्या खळगीसाठी,
माणसाची धडपडविकृत आकार,
वेगवेगळे विकार,
जीजासेपायी घडतात,
रोज नवे चमत्कारगरम श्वास,
कुबट वास
आपापल्या गरजेपोटी,
सोसतात ‘ते’ त्रासघामाची किंमत,
मालकाची रहमत
दोन घासांसाठी,
करावी लागते इथे मेहनत!कवी - योगेश वि ढगे
SDL, ARAI

कविता (मराठी)

आज सोसाट्याचा वारा
मन कातर कातर
हाकभर पलीकडे
सारे धूसर धूसर

आज सोसाट्याचा वारा
पाणी डोळ्यात मावेना
वर भरलेला मेघ
रिता रिता का होईना

आज सोसाट्याचा वारा
सय पिलाची का येते
त्याच्या इवल्या पंखांना
बळ मायेचे मी देते

कवी - श्रीमती विद्या पवार

डॉ. प्रशांत पवार
उप निदेशक - एसडीएल

कविता (मराठी)

ए आर ए आई वाहनांचं नवं चित्र

ऑटोमोटिव्ह जगताचं तंत्रज्ञान, नवा
प्रकाश द्यावा ।

इंधनाचा शोध घ्यावा, रस्ता खुला
व्हावा,
भारतात उठलेला, संशोधनाचा झेंडा,
ए आर ए आई ने बांधला, विज्ञानाचा
गगनखेळी झेंडा ।

इंजनाच्या गर्जना, यंत्राचा नाद,
गाड्यांच्या जगात येते नवी साधने
कितेकदा ।
प्रगतीच्या वाटेवर, शोधले नवीन तंत्र,
ए आर ए आई ने सजवलं, वाहनांचं
नवं चित्र

काळ बदलतोय, तंत्रज्ञान वाढतंय,
इथून पुढे जगात, नाव ठसठशीत
राहिलंय
खातरी आहे जगताला ए आर ए आई
च आसनार वाहनांचं नवं चित्र

भारतीय संशोधनाचा होतंय जागतिक
गौरव,
ए आर ए आई च्या कामगिरीला
सलाम, अमुचा
तंत्रज्ञानचा नवा प्रकाश द्यावा
जयघोष गरजावा, जयघोष गरजावा

कवी - वृंदा पी चक्रपाणि
नॉलेज सेंटर

Poem

Who am I ?

Who am I ?
Infinity or PI ?
Searching in me
Will give reply

Who am I ?
Body or soul
"Yama" will tell
A last reply

Who am I ?
Mind or Brain ?
"I" tell "Me"
When "Me" finds "I"

Who am I ?
God or devil ?
People will tell
Once I die

Who am I ?
Time or Sky ?
Will find it
as mind fly

Poet- Dr. Kiran P. Wani
DGM, ARAI Academy

TechNovuus : “Synergizing Technology and Innovation”

In an era when technical advancement is critical to tackling mobility concerns, Technovuus, a Technology Innovation Platform, stands out as a symbol of progress. TechNovuus, a Technology Innovation Platform by "The Automotive Research Association of India" (ARAI) under the aegis of the Ministry of Heavy Industries, Government of India, has quickly established itself as a worthy player in the innovation scene since its public debut in August 2020. The platform's development from its first announcement to its formal launch provides important context for understanding its strategy and the support of the government. Indigenous technology, innovation, and solution development are made possible by TechNovuus, an open platform for technology and innovation that acts as a collaborative ecosystem. In order to support the Government of India's Make in India and Aatmanirbhar Bharat initiatives, TechNovuus promotes the development of solutions for mobility-related difficulties while gradually expanding into other industries, such as defense, aerospace, telecommunications, railroads, etc.

The then-Honorable Minister of Heavy Industries and Public Enterprises, Shri Prakash Javadekar, virtually launched TechNovuus and five additional Technology Innovation Platforms on Friday, July 2, 2021. The Secretary of Heavy Industry, Shri Arun Goel, and the then-Minister of State for Heavy Industries and Public Enterprises, Shri Arjun Ram Meghwal, were also in attendance.

Currently Technovuus has



17285 Registrations



16 Challenges Posted



110 Experts



16 Challenges Completed/ Closed

The portal seeks to serve as the actual entryway for fostering the innovation ecosystem and young. Collaborative Technology Solution, Build Your Team, Expert Connect, Technology Wall, and Resource Sharing are the key components of this response-driven platform.

The success of the portal can be attributed in large part to its diverse strategy for interacting with different stakeholders. The foundation of TechNovuus's user interactions and new registrations is its engagement programs. It is typical practice to engage the general public through daily news updates, expert connect, webinars and seminars, design clinics and workshops, newsletters, blogs, mobility quizzes, challenges, tools connect, and live chat.

To hold them to a more lucid future, the youthful, creative minds of India require the proper platform and a beacon of hope. For an idea to develop into a healthy, innovative product, it has to be nourished and watered. TechNovuus has created focused programs for student involvement because it understands how important young brains are to fostering creativity.

The goal of TechNovuus's student engagements is to give them the proper tools at the right time and link them with the experts in the field so they may participate in the nation's vision of Atmanirbhar Bharat. Among the main programs are structured internship programs that last three to twelve months, the one-month Introduction to Industry (i2i) internships for first-year undergraduate engineering, scientific, and technology students.

While maintaining the competitive atmosphere, hackathons and student ideathons give students a good platform to work on their innovative ideas and test their viability. Some students even take advantage of this opportunity to network with industry experts and like-minded individuals, which may aid them later on in their product development and entrepreneurial endeavours.

An opportunity for prospective student researchers to showcase their work through posters is provided by the Student Poster Presentation Competitions (SPPC). We recently also conducted an ideathon INTELLIMOBILITY: “Driving Safe Mobility” on 5th and 6th of Oct, 2024.

Out of the 197 teams that registered, 87 ideas were submitted of which 21 teams were invited to the ARAI campus for the special innovation showcase during the first ever aBAJA which was hosted by ARAI and organized by SAEINDIA.



19 teams presented their ideas to a panel of industry experts of which 7 teams were mentored again and given a chance to present their modified ideas for a second time. Finally, 3 winners were declared. Gokul S of team RoadRanger from Kamaraj College of Engineering and Technology, Tamil Nadu was declared winner. His idea for the problem statement “Active Safety for 2-Wheeler with Advanced Rider Assistance System” was much appreciated by the evaluators.



TechNovuus has taken specific efforts for industry collaboration because it understands how crucial industry is to bringing innovation to market. TechNovuus's Industry Engagements aim to provide start-ups, MSMEs, and individual innovators in the mobility ecosystem with access to a variety of support mechanisms, such as financing, tools & resources, collaboration, mentoring, incubation, and technology up-leveling. In addition to the projects that were part of the UpTech program, TechNovuus has provided testing and patent help for a few more projects. TechNovuus has provided finance, technical assistance, and mentorship to seven start-ups through UpTech, enabling them to reach TRL 6–7. In addition to UpTech, TechNovuus constantly interacts with the industry through Grand Challenges and the ALTAIR Start-up Challenge 2021.



TechNovuus makes sure it reaches a broad and varied audience by attending expos, where TechNovuus can interact with enthusiasts and experts face-to-face while showcasing cutting-edge solutions created through the facilitation of the platform. These expos offer a fantastic setting for networking, increasing awareness, and keeping abreast of the most recent advancements and trends in the technology industry.

TechNovuus actively interacts with educational institutions through college engagement sessions in addition to expos. The purpose of these sessions is to establish connections among researchers, educators, and students in order to promote a collaborative and innovative culture. By engaging with the academic community, TechNovuus finds unique ideas and prospective talent that may be developed further, in addition to inspiring the future generation of engineers.

The significance of platforms such as TechNovuus cannot be emphasized as we look to the future. They are altering the entire terrain of innovation itself, not merely promoting technological advancement. Being part of TechNovuus is more than just a chance for students, innovators, entrepreneurs; it's a means of gaining access to the resources that will shape our future.

TechNovuus is a prime example of how collaborative innovation can be powerful in the digital era. As it develops and expands, we anticipate seeing more and more innovative technologies come out of its ecosystem, solidifying its position as a key participant in the mobility innovation scene through its numerous engagement initiatives for its diverse stakeholders, all of which are overseen and assisted by the Ministry of Heavy Industries, Government of India.

Author - Team – Technology Group

पर्यटन: एक मुक्त चिंतन (मराठी)

'केल्यानं देशातून' ही उक्ती सार्थ करण्यासाठी धावपळीच्या या आयुष्यक्रमात आपण वेळात वेळ काढून पर्यटन करण्याचा प्रयत्न करत असतो. आपल्या देशानं जागतिकीकरणाची कास धरल्यानंतर १९९० नंतरच्या गेल्या तीसेक वर्षांमध्ये पर्यटनाच्या दृष्टीनं खूपच सोयीसुविधा निर्माण झाल्या. दळणवळणाची पर्यायी साधनं विकसीत झाली. मध्यमवर्गाच्या हातात पर्यटनासारख्या पुर्वी अनावश्यक वाटणार्या गरजेसाठी थोडाफार पैसा उरायला लागला. विविध माध्यमांद्वारे आपल्या देशातल्या असंख्य सुंदर, भव्य, पुरातन वारसा जपणाऱ्या स्थळांची माहिती सामान्यांपर्यंत पोहोचाला लागली. येनकेनप्रकारेण तथाकथित मध्यमवर्ग आपली पर्यटनाची हौस सहजपणे भागवायला लागला. भारतातीलच नाही तर जगभरातली विलोभनीय स्थळे भारतीयांच्या किंबहुना विकसनशील देशांतल्या सामान्य माणसाला पहाण्यासाठी आपापल्या आवाक्यात यायला लागली. पुर्वी शालेय सहलींतच पहायला मिळणारी स्थळे, गड-किल्ले, धरणे, लेण्या, मंदीरे, संग्रहालये, समुद्रकिनारे आता कौटुंबिक, सामुहीक सहलींचीही आकर्षणे ठरू लागली. माणसाला जात्याच आवड असलेल्या मुशाफीरी वृत्तीला चांगलं खतपाणी मिळू लागलंय. आपल्या देशालाही पर्यटनातून, त्यानुषंगीक स्त्रोतातून हजारो कोटींचा महसूल मिळायला लागला. हॉटेलिंग, हॉस्पिटॅलिटी इ. उद्योग केव्हाच जुनी कात टाकून भरभराटीला पोचले आहेत.

पुर्वी केवळ तीर्थाटन करण्याच्या मर्यादीत उद्देशाने होणार्या देशाटनाचं स्वरूप गेल्या २-३ दशकांत आमूलाग्र बदलून गेलं आहे.

काळाच्या या पटलावर जगणार्या आपल्यासारख्या सर्वसामान्य नागरीकांना लहानमोठ्या सहली आयोजित करणं हे सहजसुलभ होत आहे याचं श्रेय आपल्या देशानं १९९०-९१ मध्ये स्वीकारलेल्या जागतिकीकरणाच्या, उदारीकरणाच्या धोरणाला निश्चितपणे दिलं पाहिजे असं या लिखाणाच्या सुरुवातीला थोड्या विस्तृतपणे सांगावसं वाटलं, म्हणून हे नमनाला घडाभर तेल.

आमच्या शिवतेज मंडळातल्या कार्यकर्त्यांची कदम दादाच्या पुढाकारानं झालेली शिवतीर्थ रायगडाची सहल ही जाणत्या वयातली पहिली सहल म्हणता येईल. ती त्या युवकवयात आम्ही मोठ्या कुतुहलानं तरीही सावधपणे आखलेली सहल होती. मला आठवतं आमचा एक मित्र विक्रम वीर भूगोलाच्या पुस्तकातल्या नकाशावर दोऱ्यानं अंतर मोजायचा आणि नकाशाच्या प्रमाणावरून किलोमीटर काढायचा.

आता आपण एका मिनिटातच जगातल्या कुठल्याही २ किंवा अधिक ठिकाणांमधलं अंतर GPS किंवा google map द्वारे काढू शकतो. ह्या अगदी टोकाच्या मापन पद्धती केवळ १०-१५ वर्षांच्या काळातील आहेत हे बघुन ७०-८० चं दशक अनुभवलेल्या माझ्यासारख्यांना केवळ थक्क व्हायला होतं.

पुर्वी केवळ बैलगाडी, एसटी बस आणि रेल्वे ह्याच किमान साधनांनी सामान्यांना घडणारा प्रवास आता हवाई मार्गे आणि क्रुझ मधूनही होत आहे. साधनांच्या कमतरतेमुळं पुर्वी होणारं पर्यटन मोठं आव्हानात्मक होतं त्यामानानं सुविधांच्या उपलब्धतेमुळं घडणारं सांप्रत काळातलं हे पर्यटन कितीतरी सुलभ झालेलं दिसतं. आपल्या देशातील रस्त्यांचा दर्जा सुधारायला लागल्यावर आता रस्त्यांवरूनही मोठ्या पल्ल्यांच्या सफरी आखणं शक्य होत आहे. हवाई मार्गही बऱ्याच जनांच्या बजेटमध्ये बसू लागला आहे. उच्च दर्जाच्या, पाहिजेल तशा रूपातल्या सायकलींचं उत्पादन वाढलं आहे. सायकलींचा उद्योग तुफान वेगात आहे. आरोग्य अबाधित राखण्यासाठी तर चालवतातच परंतु अगदी काश्मिर ते कन्याकुमारीपर्यंत वा कच्छ ते अरुणाचल पर्यंत सायकलवरून भ्रमंती करणारा मोठा समूह दिवसेंदिवस वाढतच चालला आहे. बुलेटचे मोठमोठे क्लबज एकावेळी पाचपाचशे जणांना घेऊन देशातनाला निघत आहेत. या विविध प्रकारे होणार्या भ्रमंती विविध उद्देशानं होऊ लागल्या आहेत. तरूण पीढीला वेगवेगळी आव्हानं स्वीकारून ती पुर्ण करण्याची आस असतेच. तिला या वेगवेगळ्या मोहिमांतून खतपाणी मिळू लागलंय.

प्रवासानं आपला प्रदेश कळतो, देश कळतो. वेगवेगळ्या स्वभाववैशिष्ट्यांची माणसं भेटतात. सांस्कृतिक वातावरणाचा, चालीरितींचा, खाद्यसंस्कृतीचा अंदाज येतो. आपल्या देशातल्या भौगोलिक विविधतेने नटलेले प्रांत, इतिहासाच्या खाणाखुणा अभिमानानं मिरवणारी शहरे, गावे पाहिली की आपण किती मोठ्या दैदिप्यमान वारशाचे प्रतिनिधी आहोत हे उमजून छाती भरून येते. इथली विविध वैशिष्ट्यांनी नटलेली कृषी परंपरा, खाण्यापिण्यातली वैविध्यता दुसऱ्या कुठंही एकत्रीतपणे अनुभवता येत नाही. जगातल्या कुठल्याही देशात आपल्याइतकी धान्यसंपदा, फळे, पिके, वृक्षसंपदा, प्राणीसंपदा, पक्षीसंपदा आढळत नाही. सहा ऋतुंचं चक्र, त्यानुसार घडणारे निसर्गातले बदल, खाण्यापिण्याची विविधता इतर कुठल्याही भूखंडावर आढळणारी नाही. इथे बर्फाच्छादित शिखरं आहेत, वाळवंट आहे, जंगलं आहेत, दर्याखोऱ्यांचे पर्वतीय प्रदेश आहेत, विस्तीर्ण शेती आहे.

जगाला हेवा वाटावा असे लांबचलांब समुद्रकिनारे आहेत, खाड्या आहेत. अंदमान निकोबार, लक्षद्वीप यांसारखी नवलाईची बेटं आहेत. इतकं हे वैभव व्यवस्थितपणे, नुसतं धावती भेट देऊनही पहायचं झालं तरी कित्येक जन्म लागतील. तरीही आपल्या आवाक्यातली, आपल्या भावविश्वात जपलेली, कथाकादंबऱ्यांतून मनातल्या कप्प्यांत वसतीला आलेली, मनाला भावलेली स्थळं प्रत्यक्ष पहाणं यासारखं सुख नाही असं आपल्या सार्यांनाच वाटतं. पुस्तकातून वाचलेला इतिहास, भूगोल वास्तवात कसा आहे हे आपल्या प्रदेशातून बाहेर पडून डोळसपणे अनुभवल्याशिवाय कसं कळणार? गिरनार किंवा इतर सहलीतून, प्रवासातून आपण आपल्या स्वतःचं अनुभवविश्व वाढवत स्वतःला अधिक समृद्ध करत जातो. गेल्या वर्षी गिरनारच्या पायऱ्या मध्यरात्रीत चढताना मनाने जो आल्हाद अनुभवला तो केवळ शब्दातीत. मला त्यावेळी सतत पौर्णिमेच्या रात्री रायगडावर केलेली भ्रमंती आठवत होती.

आपल्या मित्रमंडळींबरोबर, वर्षानुवर्षे एका आळीत राहणाऱ्या लहानमोठ्या सदस्यांबरोबरच्या सहलीत मिसळून माझ्यासारख्याला एका मोठ्या कुटुंबाबरोबरच राहण्याचा सुखदायी अनुभव येत असतो. एकमेकांची काळजी घेताना सौहार्द जपून स्नेहाची जपणूक करता येते हेच आपल्या ह्या सहलीतून मिळालेलं संचित आहे. प्रवासात नवे सदस्य असूनही बरीच वर्षे ओळख असल्यासारखं वाटलं. एकत्र राहण्यानं, जेवल्यानं, चालण्यानं मैत्र वाढीला लागतं हे समुहसहलीतून आपल्या सगळ्यांना पटतं. एकमेकांच्या बरोबरीनं प्रवासातली छोटीमोठी आव्हानं पार करायचं बळ येत असतं.

अनेक मित्रांची त्यांच्यातल्या एखाद्या अनोळखी हुनरीमुळं पुनर्ओळख होते. एकमेकांची काळजी घेण्याची वृत्ती अनुभवता येते. मित्रमंडळींबरोबर राहण्याची आस जाणवते. गिरनार चढताना रात्रीच्या वेळी पायऱ्या चढताना खांबावरच्या दिव्यांनी छायाप्रकाशित झालेली झाडे, छोटी मंदिरे, चहापानाच्या दुकानांतून पहाटेच्या वेळी ऐकू आलेली गाणी....६५-७५ च्या वयातही गिरनार पायी चढून मध्यरात्री गाणी म्हणत जाणाऱ्या ग्रामीण गुजरातमधल्या त्या मावश्या....मित्रांबरोबरच्या गप्पा....वाटेत मध्यरात्री झाडावर सुस्तपणे वावरणारा अजगर....त्याला थोड्या भितीमिश्रित कुतुहलानं न्याहाळताना गेलेला तो अर्धाएक तास....अंबाजी माता मंदिराजवळ भल्या पहाटे दादा आणि मला झेंड्याची फडफड एकताना लागलेली सुखद डुलकी.....समोर चंद्रप्रकाशात न्हाऊन निघालेला आसमंत.... त्या चंद्रप्रकाशात पहाटे दादाबरोबर असताना समोर दिसलेली गोरक्षनाथ व दत्तात्रेयांचं निवासस्थान असलेलं शिखर गिरनार...

आकाशातली हाताला लागतील अशा उंचीवर आलेली आणि स्पष्ट दिसणारी नक्षत्रं...गिरनारची चढण उतरण... नेमक्या सुर्योदयाला झालेलं गुरूपादुकांचं दर्शन.....

प्रसादालयातला तुपातील शिरा....चवदार ढोकळा...जुनागडचं ते जुनं रेल्वेस्टेशन.....तिथले रस्ते... वहिनींमंडळींनी करून आणलेले फराळ, लाडू...एकत्र घेतलेल्या कॉफ्या, चहा, जेवणं... मित्रांचं उत्सफूर्त नाचणं....सोमनाथ, नागेश्वर, द्वारकेचं एकत्र घेतलेलं दर्शन...एका मावशींनी सगळ्या यात्रेकरूंना उत्सफूर्तपणे दिलेली प्रसादरूपी मेजवानी...बेट द्वारकेला बोटीतून दिलेली भेट...सोमनाथच्या मंदिराजवळ असलेलं पुण्यश्लोक अहिल्याबाईंनी उभारलेलं नर्मदेश्वराचं मंदिर...तिथली अहिल्याबाईंची सात्विक भावानं पुरेपुर असलेली मुर्ती..ज्येष्ठांच्या स्वभावाची नवी ओळख.....

पर्यटनाच्या नवनव्या संकल्पना आताशा बहुतेकांच्या अंगवळणी पडू लागल्यात. कुणी एकांड्या शिलेदारासारखं 'एकला चलो रे' च्या धर्तीवर एकलपर्यटन करत असतात. कुणी धार्मिक कार्यासाठी यात्रा करतात. कुणी कुटुंबासोबत फिरता येणं शक्य असतील अशी स्थळं पहायला बाहेर पडताहेत. कुणी स्टडी टूरमधून अभ्यासासाठी फिरतात. पर्यटन कंपन्यांच्या विविध पॅकेज टूर, उद्देश टूर्स मधून कुणी फिरताहेत. आपल्या धार्मिक स्थळांचं तीर्थाटन करण्याचाही प्रचंड ओघ आपण अनुभवतोय. सध्या छोट्या गावांतूनही कितीतरी हौसी लोकं छोट्या मोठ्या सहली बिनधास्तपणे आयोजित करताना आपण पहातो आहोत. "आम्ही परवा हा गड केला....तो ट्रेक केला...हे पालथं घातलं...ते सर केलं" अशा गप्पा शेजारपाजारच्या घरांतून सतत कानावर पडू लागल्यात. यातून एक प्रकारच्या अहमहमिकाधारक वृत्तीनेही जन्म घ्यायला सुरूवात केली आहे. "आम्ही गेल्यावर्षी ना सिंगापूर केलं...आम्ही ना दुबईला शॉपिंगसाठी जाऊन आलो..."अशा संवादांतून पर्यटनाच्या निखळ आनंदापेक्षा आपली सांपत्तिक स्थितीच मिरवण्याची शिरजोरी वृत्ती वाढू लागली आहे. एक पॅशन म्हणून पर्यटन करणारी बहुसंख्य मंडळी आहेतच परंतु पर्यटन ही एक दिखाऊ फॅशन होऊ लागली आहे हेही तितकंच खरं.

सतत कुठेतरी प्रवास केल्याशिवाय मनाला चैनच मिळत नसणारी असंख्य माणसे तयार होऊ लागली आहेत. बँकेत भरपूर पैसा आहे म्हणून निर्हेतूकपणे फिरणाऱ्यांचीही संख्या वाढताना दिसत आहे. दारू पिण्याला प्रतिष्ठा मिळू लागल्यानं फक्त दारू पिण्यासाठीही गावाशहरांतल्या तरूण मुलांची कित्येक टोळकी सुंदर समुद्रकिनार्यांचे दारूखाने करताना दिसत आहेत.

लायकी नसताना अवेळी मिळणाऱ्या पैशांतून, मुजोर वृत्तीतून धनदांकांच्याची मुलं आपला शांत निसर्ग अशांत करत आहेत. वातावरण गढूळ करत आहेत. आपल्या महाराष्ट्रातील कोकणाचंच उदाहरण घेऊ या. निसर्गदिवतेनं मुक्तहस्ताने सुंदरतेची उधळण केलेलं हे केवळ नंदनवन! गेल्या पंचवीसेक वर्षांत अनियंत्रित अशा मुजोर पर्यटनामुळं या नंदनवनाचं रुपांतर एका विरूपात होत आहे. संपूर्ण कोकणपट्टीतल्या रायगड (अलिबाग) आणि रत्नागिरी ह्या दोन्हीही जिल्ह्यांचं पूर्वीचं ते सुंदर रूपडं हरवून गेलं आहे. पर्यटनामुळं वर्षानुवर्षे खिंतपत पडलेल्या कोकणी भूमिपुत्रांना रोजगार उपलब्ध झाला पण त्या बदल्यात आपल्या वाडवडिलांनी प्राणपणानं जपलेलं 'कोकण' मात्र त्यांच्या मुठीतून वाळूप्रमाणं निसटून चाललंय हे विदारक सत्य डोळ्यांआड करता येत नाही. आपल्या शासन व्यवस्थेनं कोकणचा कॅलिफोर्निया करण्याच्या नादात कोकणचा अल्कोहोलिया कधी केला हेच समजत नाही. कोकण त्याच्या विविध वैशिष्ट्यांनी ओळखलं जात होतं. तिथली कौलारू घरं, देवळं, उत्सव, जत्रा, भुताखेतांच्या कल्पना, बागा, वाड्या, तिथली तिरक्या आणि तितक्याच लाघवी स्वभावाची प्रेमळ, काटक, बाळबोधी माणसं ह्या सगळ्यांनी मिळून कोकण बनलाय. लोकमान्य टिळक, आगरकर, वासुदेव बळवंत, साने गुरूजी यांसारख्या नररत्नांची खाण असलेल्या कोकणाला किती सुंदरपणे पर्यटनासारख्या उद्देशानं घडवता येऊ शकेल.

काळाच्या सपाट्यात ह्याच वैशिष्ट्यांचं खरडून जाणं संवेदनाशील माणसाला प्रचंड वेदना देत चाललंय.

आपल्या समाजातल्या कित्येक श्रेत्रांत असंच होऊ राहिलंय. आपापल्या तालुक्यातल्या वीरांची ओळख आपल्या नव्या पीढीला करून देण्यासाठी आपली स्थानिक स्वराज्य संस्था किती प्रयत्न करते?

दिखाऊपणाच्या वृत्तीपायी निखळ आनंदा पासून मोठा समूह वंचित रहात आहे. या प्रदर्शनापायी अनावश्यक स्पर्धा वाढत आहे. निकोप वृत्ती कमी होऊ लागली आहे.

आपण विद्यार्थी दशेत असल्यापासून पुलंचं अपूर्वाई, पूर्वरंग ही प्रवासवर्णनं वाचत आलोय. आपल्या समृद्ध अशा साहित्यात प्रवासवर्णनाला मानाचं स्थान मिळालं आहे. गोनिदांची भ्रमणगाथा वाचताना नर्मदेची परिक्रमा घडत होती....त्यांची दुर्गभ्रमणगाथा आपल्या गडकोटांवर अपार प्रेम करायला शिकवते. 'पुर्णामायेची लेकरं' वाचताना वऱ्हाडी माणसं भेटताना नकळत सारा वऱ्हाड प्रांत डोळ्यांसमोर उभा राहतो.

'माणदेशी माणसं' वाचताना माणदेशातल्या जीवनरहाटीची, जगण्यासाठी आपला प्रदेश सोडणाऱ्या चिवट माणसांची मनात जागा तयार होते. मला वाटतं माणसांची वैशिष्ट्यं त्याच्या मातीतूनच तयार होतात. म्हणूनच आपापल्या विविध वैशिष्ट्यांनी नटलेले प्रांत त्यांच्या कुशीत वाढलेल्या माणसांमधून प्रसूत होताना दिसतात. सध्याच्या काळात मीना प्रभूची प्रवासवर्णनं कमालीची आनंददायी होत आहेत.

Epic, Traveller वा तत्सम बरीच चांगली चॅनल्स घरबसल्या सार्या जगातल्या कुठल्याही स्थळाचं दर्शन देत असतात. त्यांचा योग्य उपयोग करता पर्यटनाच्या तयारीसाठी खूप चांगला फायदा होत आहे.

एखाद्या शहराला, राज्याला वा देशाला भेट द्यायची असल्यास त्या शहराची, राज्याची वा देशाची किमान प्राथमिक ओळख करून घेणं अपेक्षित असतं. तिथलं सांस्कृतिक वातावरण, रहाणखाण्याच्या परंपरा, आहार संस्कृती, कलासंस्कृती, लोकसंगीत, तिथले शासक, ऐतिहासिक महत्वाच्या वास्तू, संग्रहालये, इतिहासाच्या पानांतून विखूरलेले त्या त्या प्रांतातले लढवय्ये राष्ट्रपुरुष, समाजसुधारक, तत्वज्ञ, लेखक, कवी, कलावंत यांसारख्या असंख्य गोष्टींचा ओझरता का होईना किमान आढावा घेणं खूप आवश्यक असतं. ते शहर वा तो प्रांत समजून घेताना हे संदर्भ मनात असले की पहात असलेल्या दृश्याला, वास्तूला, मंदीराला, तिथल्या आसमंताला एक वेगळं परिमाण मिळतं....नदीचं पाणी नुसतं पाणी न रहाता तीर्थ होतं....उत्कटतेनं ते अनुभवता येतं. मनात भूत आणि वर्तमानाची सांगड घातली जाते. एका अदृश्य धाग्यानं आपण तिथल्या घटकांशी जोडले जातो. रायगड वा आपल्या महाराष्ट्रातील कुठलाही गड पहाताना आपली ही अवस्था नेहमीच होत असते. आपल्यातल्या बऱ्याच जणांना हा अनुभव नक्कीच आला असणार वा येत असणार याबद्दल मनात शंका नाही.

कुठलंही शहर अनुभवताना पायी चालूनच अनुभवायला पाहिजे. धावते प्रवाशी बघितले की त्या शहराला वा गावालाच त्यांना आपलंसं करायला त्रास होत असावा असं प्रकर्षानं वाटतं. एखाद्या गावाची नस ही फुरसतीनंच चालत फिरत पकडता येते. आपण ही फुरसत घालवत चाललो आहोत ही खंत मनात सतत वसतीला असते. कालौघात प्रत्येक स्थळात बदल हा स्थायी आहे. तरीही पाश्चात्यांची जतन करण्याची वृत्ती, त्यांची रसिकता यांमुळं यूरोपीय राष्ट्रे आपापला प्राचीन, ऐतिहासिक वारसा पुढे येणाऱ्या मानवी पिढ्यांच्या हातात मोठ्या विश्वासानं सोपवताना दिसतात.

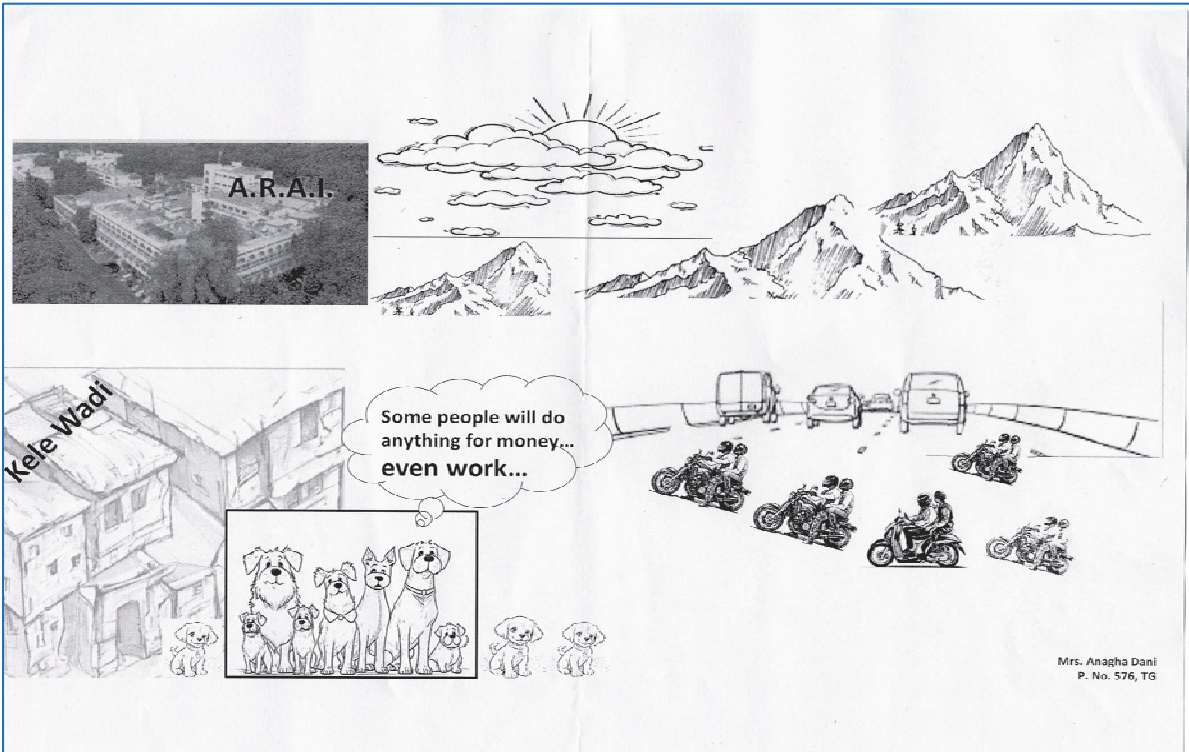
आपल्याकडं ही जतनक्षमता आजच्या प्रगतिशील वातावरणातही वाढताना दिसून येत नाही. शिक्षणाचा वापर केवळ ह्शारी वाढवायला, उदरनिर्वाहाचं साधन प्राप्त करण्यासाठीच होत आहे. त्यातून अधिक रसीक शिस्तप्रिय आणि शहाणपण लाभलेला समाज निर्माण होणं हे आजच्या घडीलाही स्वप्नवतच वाटतं. तरीही ज्या समाजाला पुर्वसुरीच्या योगदानाची, त्यांच्या सामर्थ्याची जाण आहे, इतिहासाचं विस्मरण झाल्यास उज्ज्वल भविष्यकाळ लाभणार नाही ह्याचं भान आहे अशा सगळ्या शहाण्या सुरत्या जनांनी पर्यटन अधिक डोळसपणे करायला हवं असं मला मनोमन वाटतं. आपल्यापासूनच सुरवात करायची म्हटलं तरी पुरंदरच्या आपल्या भूमीत कितीतरी ऐतिहासिक, पौराणिक महत्वाची स्थळं आहेत. सासवडला, कऱ्हेकाठाला कितीतरी सुंदर, शैलीदार मंदिरांची माला लाभली आहे. उत्साही तरूणांचे समूह ह्या मंदिरांची देखभाल, दुरूस्ती स्वयंप्रेरणेने करताना दिसत आहेत ही खूपच आश्वासक घटना आहे. आपली अभिमानस्थळे, वारसा स्थळे, पर्यावरणाचं भान ठेऊन अधिक स्वच्छ, सुंदर आणि सुखदायक करण्याची जबाबदारी त्या त्या स्थानिक समूहांनी घ्यायला सुरवात केली तर बघता बघता पुन्हा एकदा आपली मंदीरे, गडकिल्ले, वारसास्थळे येणाऱ्या भाविकांना, पर्यटकांना, भटकंतीत रमणाऱ्यांना विनासकोच दाखवू शकू.

"जन्मभूमी है हमारी" हे मोठ्या शानसे उच्चारण्यासाठी भारतवर्षातल्या बऱ्याच सुंदर ठिकाणांना अधिक डोळसपणे आपण भेटी द्यायला हव्यात. ही निसर्गांनं मोठ्या फुरसतीनं घडवलेली भूमी पहाण्यासाठी शरीराची साथही तितकीच महत्वाची. आपलं आरोग्य चांगलं ठेऊन, आपल्याबरोबर सगळ्यांच्या पर्यटनाच्या ईच्छा पूर्ण करण्याचा आपण प्रयत्न करूयात. त्याच जोडीला आपल्या जवळच्या स्थळांच्या संवर्धनात हातभार लावूयात. असं केलं तरच आपल्या येणाऱ्या पिढ्या जगाला मोठ्या अभिमानानं म्हणू शकतील....

"भारत हमको जानसे प्यारा है...
सबसे प्यारा गुलिस्ता हमारा है..."

माझ्याकडून झालेलं हे स्वैर लिखाण वेळ देऊन सहन करून वाचल्याबद्दल मनापासून धन्यवाद!

मोहन निवृत्ती बागडे
सासवड-पुणे



आलोचनात्मक सोच अपनायें और साइबर धोखाधड़ी से बचें !



'हैलो, मैं भारतीय सेना से मेजर अर्जुन बोल रहा है हूं। मैंने किराए के फ्लैट के लिए आपका विज्ञापन देखा है। क्या फ्लैट अभी भी उपलब्ध है?' कॉल के दूसरे छोर से व्यक्ति से पूछा।

'हां, फ्लैट उपलब्ध है।' मैंने पुष्टि की।

'मेरा तबादला पुणे हो गया है और अगले 10 दिनों में ड्यूटी ज्वाइन कर लूंगा। मेजर अर्जुन ने बताया, "मैं अपने परिवार के लिए किराए के लिए एक फ्लैट ढूंढ रहा हूं।"

'ठीक है। आपके परिवार में कितने सदस्य हैं?'

'चार, जिनमें मैं भी शामिल हूं।'

'कोई बात नहीं। आप फ्लैट देखने कब आ सकते हैं?' मैंने पूछा।

'दरअसल, मैं अभी हैदराबाद में हूं। अगर आप मुझे फ्लैट का वीडियो भेज सकते हैं तो मैं इसे अपनी पत्नी को दिखा सकता हूं और फ्लैट फाइनल कर सकता हूं।'

'अच्छा। मैं वीडियो भेजूंगा। तस्वीरें पहले से ही प्रॉपर्टी पोर्टल पर हैं।' मैंने उत्तर दिया।

'हां, मैंने तस्वीरें देखी हैं और मुझे वो पसंद आई।' लेकिन चूंकि मैं व्यक्तिगत रूप से संपत्ति का दौरा नहीं कर सकता, इसलिए मैंने वीडियो मांगा।'

'कोई बात नहीं, मैं तुरंत वीडियो भेज रहा हूं।'

'ठीक है। एक बार जब आप मुझे वीडियो भेज देंगे तो मैं आपको कॉल करूंगा।'

अगले दस मिनट में मुझे मेजर अर्जुन का फोन आया।

'मेरी पत्नी को फ्लैट पसंद आ गया है। और मैं इसे फाइनल करना चाहता हूं,' उन्होंने कहा।

मुझे अपने कानों पर विश्वास नहीं हो रहा था, क्योंकि कुछ ही मिनटों में मुझे अपने फ्लैट के लिए किरायेदार मिलने वाला था। COVID और Work From Home परिदृश्य के बाद, पुणे में संपत्ति बेचना और किराए पर लेना एक कठिन कार्य बन गया था।

'ठीक है। तो क्या आप आज मुझे टोकन देने जा रहे हैं?'

'हाँ। सच तो यह है कि मैं आज आपको पूरी जमा राशि भेज सकता हूँ।'

उनके इस बयान से मुझे राहत की सांस मिली।

'अच्छा। तो क्या मैं आपको अपने खाते का विवरण दे दूँ?'

'ठीक है। लेकिन मेरा नियोक्ता इसे आर्मी कार्ड के जरिए ट्रांसफर करेगा।'

'कोई बात नहीं। लेकिन उससे पहले, मैं परिवार के सभी सदस्यों के आधार कार्ड की प्रतियां लेना चाहूंगा,' मैंने समझाया।

'मैं इसे अभी फॉरवर्ड कर रहा हूँ। बस ऑनलाइन रहो।'

'ठीक है'

'इसके अलावा, मैं यूपीआई के माध्यम से पैसे भेजूंगा।'

'कोई विवाद नहीं। मेरा नंबर Google Pay पर है। आप इसे वहां स्थानांतरित कर सकते हैं।'

'क्या आप ऑनलाइन हैं? यदि आप अपना Google Pay खोल सकते हैं, तो मैं आर्मी कार्ड के माध्यम से लेनदेन कर सकता हूँ।'

मैंने एक पल सोचा और कहा, 'हां, मैं ऑनलाइन हूँ, आप रकम ट्रांसफर कर सकते हैं।'

'एक बार जब आप अपनी ओर से Google Pay पर आर्मी कार्ड पंजीकृत कर लेंगे तो मैं यह कर सकता हूँ।'

ये सुनकर मैं हैरान हो गया, इसलिए मैंने पूछा।

'क्या यह कोई नई व्यवस्था है? क्योंकि जहां तक मैं समझता हूं, भुगतान करने वाले व्यक्ति को बस राशि प्राप्तकर्ता के खाते या मोबाइल में ट्रांसफर करनी होती है।'

'हां, यह सामान्य खातों के साथ है, लेकिन सेना कार्ड के लिए, सिस्टम इस तरह से काम करता है।'

मैं आश्चर्य नहीं था लेकिन मैं जमा राशि प्राप्त करने के लिए मेजर अर्जुन के खाते को पंजीकृत करने के लिए सहमत हुआ।

इसलिए, मैंने अपना Google Pay खाता खोला और राशि के साथ उसका खाता नंबर डाला। हालांकि, पंजीकरण के अलावा केवल भुगतान करने का कोई विकल्प नहीं था।

'क्या हुआ? क्या आप पंजीकरण करने में सक्षम हैं?' मेजर अर्जुन ने दूसरी ओर से पूछा।

'नहीं। यह भुगतान करने के लिए कह रहा है।' मैंने उत्तर दिया।

'कोई बात नहीं, बस भुगतान पर क्लिक करें और अपना पिन दर्ज करें' उन्होंने आत्मविश्वास से निर्देश दिया।

'क्या? अगर मैं भुगतान के लिए अपना पिन डालूं तो यह मेरे खाते में कैसे जमा किया जाएगा?'

'कोई चिंता नहीं सर, यह आपके खाते में जमा कर दिया जाएगा। आपको बस विवरण में अपना नाम लिखना है और अपने खाते में जमा राशि का उल्लेख करना है।'

'मुझे खेद है, लेकिन मैं इस प्रक्रिया को आगे नहीं बढ़ा सकता। कृपया इसे मेरे खाते में भेजें' मैंने जोर देकर कहा।

उन्होंने बताया, 'मैं ऐसा नहीं कर पाऊंगा, क्योंकि यह एक आर्मी कार्ड है।'

'तो फिर रहने दो। मुझे बताएं कि आप इसे मेरे खाते में कब स्थानांतरित कर सकते हैं' मैंने दृढ़ता से उत्तर दिया।

'तो आप जमा राशि प्राप्त नहीं करना चाहते, है ना?' उसने मुझे पूछा।

'मुझे अपने फ्लैट के लिए एक किरायेदार चाहिए। लेकिन मैं जमा राशि प्राप्त करने के दांव में अपना पैसा नहीं खोना चाहता, बस इतना ही।' मैं अपनी बात पर अड़ा रहा।



'ठीक है। फिर दफा हो जाओ,' उसने अपना आपा खो दिया।

'क्या? आपने अभी अभी क्या कहा?

उन्होंने कहा, 'फोन रखो।'

'तो इसका मतलब है कि तुम धोखेबाज हो, ठीक है?'

'भाड़ में जाओ।' उसने कहा और कॉल काट दिया।

मेरे मन में विचारों की एक श्रृंखला चल पड़ी।

अगर मैंने मेजर अर्जुन- धोखेबाज पर विश्वास कर लिया होता तो क्या होता?

अगर मैंने तुरंत पैसे ट्रांसफर कर दिए होते तो क्या होता?

क्या होता अगर ...?

दरअसल, धोखेबाज ने मुझे फंसाने के लिए उस समय अधिकतम दबाव के साथ सही रणनीति अपनाई थी। लेकिन यह आलोचनात्मक सोचने की क्षमता ही थी जिसने मुझे उसके जाल में फंसने से बचा लिया।

मैं अपने सभी दोस्तों से आग्रह करता हूं कि जिसमें वित्तीय प्रतिबद्धता शामिल हो ऐसा कोई भी निर्णय लेने से पहले वे सभी पहलुओं पर विचार करें। आलोचनात्मक सोच अपनाने और साइबर धोखाधड़ी से बचें।

सतर्क रहें, सुरक्षित रहें!

डॉ. अतुल रा. ठाकरे, BDCP

योग- निरोगी आयुष्याची गुरुकिल्ली (मराठी)

आधुनिक जगात माणसाने केलेली प्रगती चकित करणारी आहे. एके काळी अशक्यप्राय वाटणाऱ्या अनेक गोष्टी आज प्रत्यक्षात उतरल्या आहेत. विज्ञानाने माणसाचं आयुष्य अनेक सुख सुविधांनी सुसज्ज केले आहे. जीवनाचा कायापालक या नव-नवीन संशोधनामुळे होत आहे.

परंतु, प्रदूषित हवा-पाणी हे सुद्धा याच विज्ञानामुळे जगात निर्माण झाले आहे हे मान्य करावे लागेल. शारीरिक कष्ट कमी झाल्याने तसेच तंत्रज्ञानाचा अतिवापर, यामुळे कदाचित जग जवळ आले, काम होण्यास लागणारा वेळ कमी झालाही असेल, पण मनुष्याचे शारीरिक आणि मानसिक आरोग्यही तेवढ्याच वेगाने ढासळत आहे हे सुद्धा तेवढेच सत्य आहे.

नवीन जीवनशैलीमुळे जडणाऱ्या व्याधी, निराशा, ताण-तणाव या आपल्या आयुष्याचा भाग बनत चालल्या आहेत. स्पर्धात्मक जगात, संपत्तीच्या आणि सतत काहीतरी मिळवण्याच्या लालसेने माणसाचं नैसर्गिक मन, भावना नष्ट होत चालल्या आहेत. डायबिटीस, कॅन्सर, ऍसिडिटी, उच्च-रक्तदाब, हृदयरोग इत्यादी मानसिक आणि शारीरिक रोग अति प्रमाणात वाढत चालले आहेत.

अर्थात, आधुनिकतेला झिडकाऊन आपण आपल्या पूर्वजांसारखे आयुष्य आता जगू शकणार नाही. यासाठी आधुनिकता आणि आपलं सुदृढ आरोग्य याचा योग्य मिलाप घडवून आणलाच पाहिजे. मानसिक आणि शारीरिक निरोगी आयुष्य जगणे हे प्रत्येकाचे पहिले ध्येय असले पाहिजे, कारण त्याशिवाय आपण खऱ्या अर्थाने या सर्व आधुनिकतेचा आणि जीवनचा परिपूर्ण आनंद घेऊ शकणार नाही. या सर्व समस्यांवर आजच्या आधुनिक जीवनशैलीतही 'योग' हा एकमेव आणि परिपूर्ण उपाय आहे. योग ही भारतीय संस्कृतीची जगाला मिळालेली एक असामान्य देणगी आहे. योग करण्याने फक्त मनुष्याचे शारीरिकच नव्हे तर मानसिक आरोग्य आणि क्षमताही उन्नत होते.

योग हा मानवाला जाणिवेच्या उच्च स्तर स्तरावर चढण्यास मदत करतो, तो मनुष्याचे सुप्त सामर्थ्य जागृत करतो. यामुळेच योगाला अत्यंत गहन पण प्रभावी 'भारतीय मानसशास्त्र' समजले जाते. आजच्या काळात मानसिक स्वस्थता, समतोल, शांतता, समाधान व आनंद मिळवण्यासाठी योगासनांचा, प्राणायामांचा, ध्यान-धारणेचा, एकाग्र चित्ताचा व कामविकारांपासून अलिप्त होण्यासाठी योगाचा मार्ग खूपच उपयोगी आहे असे आधुनिक वैद्यकशास्त्रही मान्य करीत आहे

या योगशास्त्राचे आद्य प्रचारक तसेच संशोधक म्हणून महर्षी पतंजली यांचे स्थान मोलाचे आहे. त्यांनी योगसूत्राची रचना विक्रमपूर्व दुसऱ्या शतकात किंवा ख्रिस्त पूर्व 147 पूर्वी केली असावी असा अंदाज आहे. तरीही आजच्या काळात त्या सूत्रांचे महत्त्व अधिक प्रभावतेने लागू पडत आहे.

"योगेन चित्तस्य पदेन वाचा मलं शरीरस्यचवैधकेन।

योऽपाकरोततम प्रवरम मुनिना पतंजली प्रांजकिराऽनतोऽस्मी ॥"

या श्लोकाचा अर्थ- "योगाने चित्ताची शुद्धी होते, तसेच वाणीच्या सुधारासाठी व्याकरण आणि शरीराच्या शुद्धीसाठी वैद्यकशास्त्र असे ज्या महान ऋषींनी प्रवर्तन केले आहे त्या पतंजली ऋषींना माझा हात जोडून, नतमस्तक होऊन नमस्कार असो"

'योग' या शब्दाची उत्पत्ती 'युज' या संस्कृत धातूपासून झाली आहे. 'युज' याचा अर्थ जोडणे, संबंध प्रस्थापित करणे असा होतो. माणसाने स्वतःच्या प्रयत्नाने पूर्णत्व प्राप्त करून घेणे, प्रत्यक्ष आचरणाने अनुभव घेणे आहे. या योगसूत्रांच्या 'साधना पद' विभागात 29 व्या श्लोकात, अष्टांग योगाचे प्रतिपादन केले आहे, ते असे:

"यम नियमासनप्राणायाम प्रत्याहार धारणाध्यान समाधयोष्ठावडागानि"

यम, नियम, आसन, प्राणायाम, प्रत्याहार, धारणा, ध्यान, समाधी ही योगाची आठ अंगे आहे, याविषयी आपण थोडक्यात समजून घेऊया

यम म्हणजे 'निग्रह' किंवा 'संयम', यात एकूण पाच यम आहेत. अहिंसा, सत्य, अस्तेय (चोरी न करणे), ब्रह्मचर्य आणि अपरिग्रह (उपभोगांचा त्याग).

नियम देखील पाच आहेत. शौच, संतोष, तप, स्वाध्याय आणि ईश्वरप्रणिधान. शरीर व मनाच्या शुद्धतेने ते सर्व परिस्थितीत चित्ताची प्रसन्नता ढळू न देता आनंदी राहणे, तपश्चर्या करणे व सर्व कर्मे ईश्वराला अर्पण करणे होय.

आसन - शरीराला स्थिरता व मनाला प्रसन्नता करून देणाऱ्या स्थितीला आसन म्हणतात. आसने केल्याने नाडीशुद्धी होते, स्वास्थ्य वृद्धिगत होते तसेच शरीर व मनाला स्फूर्ती प्राप्त होते.

प्राणायाम - प्राणावर म्हणजे आपल्या श्वासोच्छ्वासावर नियंत्रण. शरीरातील प्राणशक्तीला उद्दीपित करणे, संचारित करणे, नियमित करणे व संतुलित करणे असा प्राणायामाचा उद्देश आहे.

प्रत्याहार साधकाचे अचपळ मन व इंद्रिये स्थिर करण्यासाठी बाह्य विषयांचा परित्याग करणे याला प्रत्याहार म्हणतात. मनाचे मेंदूवरील नियंत्रण कमी करून सक्रिय, सृजनशीलता वाढवण्यासाठी याचा वापर केला जातो. धारणा, ध्यान आणि समाधी याद्वारे चित्तवृत्तीला केंद्रित करून, एकाग्र करून सात्विक गुणांचा विकास केला जातो. या त्रिपुटीला 'संयम' म्हणतात.

हठ योगामध्ये एकूण 84 वेगवेगळ्या प्रकारची आसने सांगितली आहेत, त्यातील 29 आसने प्रामुख्याने केली जातात. पद्मासन, वज्रासन, वक्रासन, मत्स्यासन, त्रिकोणासन, शलभासन, भुजंगासन, सर्वांगासन, मयुरासन, हलासन, सिंहासन, शवासन इत्यादी

चित्ताला शांत स्वस्थ व स्थिर बनवण्यासाठी प्राणाचे नियंत्रण व नियमन करणे आवश्यक असते. प्राणायाम याचा अर्थ श्वासोच्छवासाचे नियमन असा आहे. प्राणायाम तीन अवस्थातून केला जातो, नाकातून वायू आत घेऊन फुफ्फुसात भरणे याला 'पूरक' म्हणतात. वायू आत घेतल्यावर तो क्षणकाल तेथेच रोखून धरणे याला 'कुंभक' म्हणतात आणि वायू बाहेर सोडणे म्हणजे 'रेचक'. प्राणायामाचे प्रमुख नऊ प्रकार आहेत

अनुलोम-विलोम, सूर्यभेदन, उज्जाई, सित्कारी, शीतली, भस्त्रिका, मूर्च्छा, भ्रामरी आणि प्लाविनी

प्राणायामात उत्तम सिद्धी प्राप्त होण्यासाठी आसनांप्रमाणेच मुद्रा व बंध यांची आवश्यकता असते. एकंदर 108 मुद्रांची संख्या असली तरी प्रत्यक्ष 55 च प्रचारात आहेत. शारीरिक शुद्धीसाठी, षट्कर्म विधी सुद्धा योगामध्ये सुचवल्या गेल्या आहेत. धौती, बस्ती, नेती, त्राटक, नौली, कपालभाती ही कर्मे वापरून शरीर शुद्धी केली जाते.

योगासनांचे आसनांच्या प्रकारानुसार वर्गीकरण करता येते जसे की बैठी आसने, उताणे निजून करावयाची आसने, पालथे निजून करावयाची आसने, हातावर भार देऊन, गुडघ्यावर भार देऊन, पायावर भार देऊन आणि डोक्यावर भार देऊन करता येणारी आसने.

योगासने करण्यासाठी अत्यंत मर्यादित जागेची आणि कमी साधनांची गरज भासते, अधिकतम आहार अथवा खर्चाची फार जरूरी भासत नाही. योगासनांमुळे शरीर लवचिक बनते. शरीरात उत्साह निर्माण होतो, शक्ती वाढते. मनुष्याची कांती तेजस्वी बनते आणि आयुष्मानही वाढते. रुधिराभिसरण वाढल्यामुळे मोठ्या प्रमाणात रक्त शुद्ध होते. योगामुळे मानसिक शांती प्राप्त होते आणि त्यामुळे बुद्धीचा विकास होण्यास मदत मिळते. शरीरातील अंतर्गत ग्रंथी-अवयव यांचा व्यायाम झाल्याने संतुलित विकास होतो. योगासनांमुळे बद्धकोष्ठता, वायू-विकार, मधुमेह, ब्लडप्रेसर, हर्निया, डोकेदुखी इत्यादी रोग बरे होतात.

योगासने ही एक वैज्ञानिक प्रक्रिया आहे, त्याचा आपल्या शरीराच्या सर्व आंतरबाह्य भागांशी संबंध येतो. योग्य आणि जाणकार व्यक्तीच्या मार्गदर्शनाखाली योगाचा अभ्यास शिकून त्याचा नियमित सराव करावा.

अशा सर्वांग सुंदर परिपूर्ण व्यायाम प्रकाराची जोड जर आपण आपल्या जीवनात दिली, तर हे आयुष्य आणखीनच आनंदी आणि निरोगी व्हायला निश्चितच मदत होईल.

योगेश वि ढगे

SDL, ARAI

AED

आयुष्याचा एक, EMC स्कॅन हा घ्यावा म्हणतो,
अंगी असलेल्या षडरिपूचा, Graph आज पहावा म्हणतो.
DUT समोर Antenna हा, 'अद्वैताचा' रहावा म्हणतो,
चैतन्याचा supply हा LISN मार्फत घ्यावा म्हणतो.

Ohms law हा जवळून, पारखून निरखून घ्यावा म्हणतो,
क्रोधाच्या या Resistor भोवती, सुखाचा drop पहावा म्हणतो.
Oscilloscope चा prob हा, आत्म्याशी connect रहावा म्हणतो,
भावनांचे ते positive negative, Transient जाणून घ्यावे म्हणतो.

सुख दुःखाची vibration ही, अनुभवून थोडी घ्यावी म्हणतो,
माणुसकीच्या surface वरी free fall करून घ्यावा म्हणतो,
हिमालय हा HALT मधला एकदा तरी पहावा म्हणतो,
संकटांच्या वाटेवरी हसत चालत राहावं म्हणतो.

मत्सरेचा load dump आयुष्यातून व्हावा म्हणतो,
मायावादी surge deep शी, withstand उभं रहावं म्हणतो.
नैतिकतेचा lat long हा, हृदयात पकडून घ्यावा म्हणतो,
सुंदर आशा आयुष्याला सुंदर जगून पहावं म्हणतो

- शंभूराज चंद्रकांत पाटील

Automotive Electronics



भेट हेमलकसाची (मराठी)

हेमलकसाला जाण्याची खूप दिवसांपासून इच्छा होती पण योग येत नव्हता. माझ्या मुलाला एमबीबीएस गव्हर्मेन्ट मेडिकल कॉलेजमध्ये चंद्रपूर येथे एंडमिशन मिळाले आणि चंद्रपूरला जाण्याचा योग आला. एंडमिशन प्रोसेसची कामे झाल्यानंतर रात्री आम्ही हेमलकसाला जाण्याचा बेत आखला.

काही माहिती नसलेल्या दुर्गम नक्षलवादी भागात आम्ही पहिल्यांदाच जाणार होतो. पद्मश्री डॉक्टर प्रकाश आमटे यांच्या प्रकल्पाबद्दल आणि त्या दुर्गम नक्षलवादी लोकांबद्दल पुस्तकातून वाचले होते आणि लोकांकडून खूप एकले होते. पण एवढ्या जवळच आलो आहे तर चला हेमलकसाला भेट देऊया असा विचार करून स्थानिक लोकांकडून थोडीशी माहिती घेऊन आम्ही जाण्याचे ठरविले.

आम्ही सकाळी सात वाजता चंद्रपूरहून आमच्या गाडीने माझ्या कुटुंबासोबत निघालो. एटापल्ली मार्गे आम्ही हेमलकसाला चाललो होतो. हेमलकसा हे गाव गडचिरोली जिल्ह्यातील भामरागड तालुक्यातील अतिशय दुर्गम भाग. दोन्ही बाजूने घनदाट जंगल. मध्येच वळणावळणाचा एकेरी रस्ता. एकही गाडी पास होत नव्हती. कित्येक किलोमीटर अंतरावर गेलो तरी एकही गाव लागत नव्हते. एटापल्लीनंतरचा रस्ता कच्चा लागला. गाडीत आम्ही चौघे होतो. दोन्ही बाजूला घनदाट झाडी. रस्ता खूप खराब आणि खचलेला. अशातूनच कशीबशी वाट काढत झाडीतून बरेच अंतर कापले. रस्ता संपता संपत नव्हता आणि मोबाईललाही रेंज नव्हती. त्यावेळी मनात आले की आपण परत जावे की काय. मला त्यांना भेटण्याची खूप इच्छा असल्यामुळे शेवटी १८५ किलोमीटर अंतर कापत सहा तासाने हेमलकसाला दुपारी पोचलो. पण तिथे गेल्यानंतर भेटण्याची वेळ संपली होती मग तेथून जवळ असलेल्या भामरागडच्या त्रिवेणी संगमाला भेट दिली.

तेथील रम्य अशा इंद्रावती,पर्लकोटा आणि पामलूगौतमी या तीन नद्यांचा संगम पाहून मन अगदी प्रसन्न झाले. दुपारचे जेवण करून दोन वाजता आम्ही 'लोकबिरादरी प्रकल्प' असा फलक असलेल्या गेट मधून प्रवेश केला. तेथे डॉक्टर आमटे यांचे सहकारी मनोहर काकांसोबत संपूर्ण माहिती मिळाली. तेथील सुसज्ज रुग्णालय, शाळा, वसतिगृह, वन्यप्राणी अनाथालय पाहिलं. डॉक्टर प्रकाश आमटे आणि डॉ. मंदाकिनी आमटे यांना मिळालेले पुरस्कार, सन्मानपत्रे, त्यांच्या पुस्तिका यांचं भव्य दालन पाहून डोळे आणि मनही भारावून गेलं. त्यांनी प्राण्यांवर केलेले प्रेम त्यांच्या सानिध्यात राहिलेल्या अनेकांकडून एकले होते.

हे पाहून झाल्यानंतर आदिवासी लोकांचे देव, जंगली प्राण्यांचे मायबाप असणारे आदरणीय पद्मश्री डॉक्टर प्रकाश आमटे सर व डॉक्टर सौ. मंदाकिनी ताई यांच्याशी बोलण्याची संधी मिळाली. आम्ही एवढे सामान्य असूनही आमची आपलकीने चौकशी केली आणि तब्बल ३५ मिनिटे अगदी मनमोकळ्या गप्पा मारत त्यांच्या कार्याची माहिती दिली व आमच्याकडून ही माहिती घेतली. तुम्ही काय करता? तुमची मुले काय करताहेत? ह्या गोष्टी आस्थेवाईकपणे विचारल्या. बोलण्या चालण्यात साधेपणा, पांढरी खादीची चड्डी आणि बंडी या वेशात असणाऱ्या डॉ. प्रकाश आमटे सरांना आणि साध्या साडीतच असणाऱ्या डॉ.मंदाकिनी ताईची जीवनशैली पाहून कमालीचा आदरभाव वाटला.

त्यांचे हे कार्य पाहून असे वाटले की हिमालयाने पण नतमस्तक व्हावे. अशी माणसं, माणसं कसली देवदूतच! त्यांच्यात आम्हाला प्रत्यक्ष देव दिसला. त्यांच्या कार्याचा झेंडा असाच फडकत राहो. आपल्या सत्कर्माची आणि निष्काम सेवेची ज्योत अशीच तेवत राहावी ही विधात्याला प्रार्थना आणि या उभयतांना साष्टांग दंडवत. आम्हाला हेमलकसाला मोटारीने जाण्याचा प्रवास खूप खडतर वाटला पण ज्यांनी आपल्या जीवनाचा प्रवास खडतर करून संपूर्ण आयुष्य समाजकार्यात वाहून नेले त्यांच्या या अफाट कार्याला नमन. तृप्त मनाने आणि समाधानाने त्यांचा निरोप घेऊन परतीच्या प्रवासाला लागलो. जे अनुभवले, जे पाहिले, जे एकले ते विसरू शकत नाही. २७ ऑक्टोबर २०२४ हा दिवस आमच्या आयुष्यातील अविस्मरणीय असा मोलाचा दिवस ठरला.

महाराष्ट्राच्या सामाजिक जडणघडणीत मानवतेच्या मुल्यांची जपणूक करून आमटे परिवाराने उभारलेले हे प्रचंड कार्य आपल्या सगळ्यांना सतत प्रेरणा देणारे आहे. प्रत्येकाने एकदा तरी भेट देऊन या कार्याला मानवंदना दिली पाहिजे असे नक्की वाटते.

धन्यवाद!

संजय होनराव
एसडीएल



Welcome to the New Employees!

We are excited to welcome our new team members to the organization! We encourage you to embrace the opportunities ahead, collaborate with your colleagues, and immerse yourself in our vibrant company culture.



S.N.GUTTE
AED - DY. MGR.



S.S.KUBER
GCSL - MGR



S.S.MISHRA
HTC-PSL - DY. MGR.



SHYAM BABU
HRMA - DY. MGR.



S.M.MANKAR
HTC-SHL - EXE



A.S.JOSHI
VEL - ENGR.

Farewell to Retiring Employees

As we bid farewell to our esteemed retiring employees, we want to take a moment to express our heartfelt gratitude for your years of dedicated service and invaluable contributions to the organization. May your retirement be filled with joy, relaxation, and the pursuit of new adventures. Thank you for everything, and we wish you all the best in your future endeavors. You will always be a part of our family!



Mr. Shankar J. Hulawale,
Superintendent, Stores



Mr. Sanjay S. Natu,
Manager, Stores



Mr. Nitin B. Dhande, Sr. DD, BDCP



Mr. B S. Darak, General Manager,
HTC-PSL



Mrs. Seema S Das, DGM, KC
Mr. Santosh M Tembe, DGM, PLI Cell
Mr. M Sreenivasulu, DD, RCS
Mr. Sandeep E Medane, Sr. DD, ECL
Mr. Shashank H Nikam, DGM, SHL

वर्ग पहेली

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18				19			

बाएँ से दाएँ

1. साथ जीनेवाला, पुनर्जीवित करने वाला
4. औलाद, संतति, बाल बच्चे
5. छिद्र, बिल, दरार 6. संकीर्ण, विस्तार में कम
7. लकड़ी का एक प्रकार का तीर जो फेंकने पर फिर से वापस आ जाता है (अं.)
9. सौ हज़ार
12. युद्ध, लड़ाई
14. भारत के एक भूतपूर्व प्रधानमंत्री
15. एशिया का एक प्रसिद्ध देश
16. अविरल, ठोस
18. प्रार्थना
19. एड़ी के ऊपर निकलती हुई हड्डी की गांठ

ऊपर से नीचे

1. वह विधान या कानून, जिसके अनुसार किसी राष्ट्र या संस्था का संगठन संचालन तथा व्यवस्था होती है
2. आत्मा, प्राण, प्राणी
3. वधू द्वारा वर को पहनाई जानेवाली माला
4. वह स्थान जहाँ दो नदियाँ मिलें, मेल
6. खेमा, शामियाना
8. दुखी, शोकमग्न (उर्दू)
10. पोस्त का दाना
11. कद्र करने वाला (उर्दू)
13. श्मशान
17. नाखून

प्रिया कुमार (Priya Kumar)

वरिष्ठ हिंदी अनुवादक (Sr. Hindi Translator)

Testing of Artificial Legs as a part of Corporate Social Responsibility (CSR) Initiative

Viklang Punarvasan Kendra (VPK) approached the Structural Dynamics Lab of ARAI for comparative testing of two below-knee artificial leg samples designed as walking aids for amputees. ARAI agreed to conduct the tests as part of its corporate social responsibility (CSR) initiative.

The two samples differed in manufacturing processes and materials used for the 'L Socket,' which fits directly on the residual leg. Dynamic tests with a 125 kg load and ultimate strength tests were performed on both samples, and the results were compared.



On October 3, 2024, VPK representatives, including Chairman Shri Datta Chitale and Trustee Shri Vinay Khataavkar, visited ARAI to meet with Director Shri Reji Mathai and other key personnel. During the meeting, the test report was presented to the VPK team, who expressed their deep appreciation for the support provided by ARAI's Structural Dynamics Lab. The Director was also thanked for his commitment to this initiative.

Below are the photographs of the test set-ups and report handing over event.



Interview of Mr. Nitin B. Dhande, Sr. Deputy Director - ARAI

Background and Early Days

Can you share a bit about your background and what led you to join ARAI 30 years ago? What were your initial roles and responsibilities when you first started?

I earned my Diploma in Electronics & Radio Engineering in 1983 with distinction. After two years as a trainee at Advani Oerlikon Ltd., I joined ARAI in 1985 as a Technical Assistant in the Power Units Diesel department, focusing on engine design, testing, and development. My primary responsibility was managing engine test cell instrumentation, including setup, calibration, and maintenance.

Career Journey

How has your role evolved over the years at ARAI?

After overcoming initial challenges in my new role, I quickly became an essential member of project teams. Following my career plan, I completed my external graduation in 1989. As a Project Engineer, I gained valuable experience in advanced engine instrumentation, which was crucial for my career advancement at ARAI.

What are some of the most significant projects or initiatives you have been a part of?

As a key member of engine testing and development projects, I played a crucial role in engine diagnostics, particularly in high-speed data acquisition. In 1989, I received overseas training at AVL Austria in combustion photography and at B&K Denmark in noise instrumentation. This international exposure allowed me to learn and implement advanced testing practices in India, contributing to successful tractor and HCV engine development projects for leading OEMs. Additionally, presenting the outcomes of my abroad visits helped me enhance my presentation and public speaking skills.

What were some of the major milestones in your career here?

During my 39-year career at ARAI, I achieved several key milestones. Graduating after my initial struggles was my first significant accomplishment. I received my first merit increment, was nominated for my first overseas trip, and played a lead role in the successful completion of the DHI Cess project for establishing an advanced engine testing facility. Later, a First class Distinction Degree in Management Science in 2003 was quite helpful in developing the mindset with broad perspective of roles & responsibilities of corporate Management & Governance practices.

I also contributed to the foundation of the ARAI Cricket team and received "Man of the Match" awards. Later, as the second-in-charge at EDL, I gained extensive experience in engine R&D project management and techno-administrative responsibilities. Ultimately, I became the Head of BDCP & IMPC, leading the transformation of BDCP with new initiatives and professional marketing practices, culminating in a landmark achievement of 500 Crore O.I.

Can you describe a challenging moment you faced and how you overcame it? What is the secret of your long association with ARAI? What are the best practices you experienced here?

I faced challenging moments during pre-dispatch inspections of major equipment, which resulted in non-acceptance. My long association with ARAI stemmed from high job satisfaction, diverse exposure in technical and management domains, and recognition in sports and cultural activities. The friendly mentorship from seniors and the trust placed in me by all HoDs significantly boosted my confidence throughout my professional journey.

Memorable Experiences

What are some of your most memorable experiences during your time at ARAI?

Throughout my 39-year career, many colleagues and seniors, including various Directors, significantly impacted my journey. Notably, Mr. N V Marathe and S. Bhattacharya provided invaluable mentorship and guidance.

What important lessons have you learned during your tenure?

Trustworthy sincerity, hard work, and loyalty yield rewards. Prioritize the organization over individual interests, and at the middle management level, focus on developing business acumen followed by corporate governance skills.

Contributions and Achievements

What contributions or achievements are you most proud of in your 30 years at ARAI? How do you feel your work has impacted the organization and the industry as a whole?

Later in my career, I took on the challenging role of Head of BDCP, which required professionalism and versatility at the corporate level.

As a member of ARAI, I understood business development expectations and was fortunate to lead a dynamic team that transformed BDCP's image and enhanced ARAI's social media branding. I collaborated closely with the Director on capital budgeting and R&D projects, focusing on business sustainability across various departments. Key projects included enhancing Battery & EV test facilities, advanced NVH, and ADAS testing, which will significantly boost ARAI's future business. Additionally, I successfully managed national and international events for the Ministry and Industry, playing a vital role in securing key sponsored projects and business contracts.

Changes and Developments

How has ARAI changed and developed since you first joined? What advancements in technology or industry practices have you witnessed during your tenure?

ARAI has established itself as a trustworthy and responsible benchmark organization for industries, ministries, customers, and startups through its strong operational revenue and professional governance. As a leading nodal test agency and R&D institute, ARAI stands out among testing agencies. Its Academy plays a crucial role in skill development and building a skilled workforce. Key differentiators include highly competent personnel, strategic test facility expansions, a network of regional centers, global project exposure, and a robust social media presence, making ARAI the most tested and trusted development partner for industry and government.

Work Culture and Values

How would you describe the company's culture when you started, and how has it evolved? What core values do you believe are essential for success at ARAI?

Reliability, Transparency, Professionalism, Committed & well proven/established governance. Sincere, passionate and loyal working staff which love the organization is the real strength.

Closing Thoughts

Is there anything else you would like to share with our readers about your journey or experiences at ARAI?

ARAI must position itself as a key differentiator in advanced testing and R&D, leveraging its expertise. Achieving synergy through integrated multi-domain services is essential. Young engineers should focus on customer satisfaction and demonstrate professionalism, while automation and digitization will enhance efficiency. Middle management should cultivate business acumen and establish a centralized data center for analytics.

With its skilled workforce and visionary leadership, I am confident ARAI will reach new heights and become a significant international organization.

I extend my heartfelt appreciation to Dr. Madhav and Dr. Thipse for their insightful interview, and to Dr. Reji Mathai, Director for his leadership and support during my tenure at ARAI.

Best wishes to ARAI.

Mr. Nitin B. Dhande

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The Journey of the ARAI (1966-80)

1966

The Birth of
ARAI

In 1966, a significant milestone was achieved in the Indian automotive sector with the **establishment of the Automotive Research Association of India (ARAI)**. Formed as a non-commercial industrial research organization, ARAI was born out of a collaborative effort between the Government of India and leading automotive manufacturers. **Registered under the Societies Registration Act on December 10, 1966**, ARAI was founded by prominent figures in the automotive industry, including Seth Lalchand Hirachand, Mr. S. Moolgaonkar, and Mr. Keshub Mahindra, among others. These visionaries laid the groundwork for what would **become a pivotal institution in the growth of the Indian automotive landscape**.

1970

Laying the
Foundation

The journey of ARAI began with a clear vision: to ensure that vehicles on Indian roads were both efficient and safe. The organization started **as a testing agency**, focusing on the rigorous evaluation of automotive components and vehicles. **On December 18, 1976, Shri T.A. Pai, the Hon'ble Minister for Industry, laid the foundation stone for ARAI's UNDP Building**, marking a significant step in its development. The choice of Pune as the location for ARAI was strategic, given its status as one of India's largest automotive hubs.

1970s

Growth
and
Innovation

The 1970s proved to be a transformative decade for ARAI. The organization made **significant strides in research and development, emphasizing knowledge sharing within the automotive community**. One of the notable initiatives was the **launch of the "Automotive Abstracts," a magazine that provided insights into industry trends and ARAI's activities**. This publication was well-received, keeping stakeholders informed and engaged. During this decade, ARAI also developed two groundbreaking products: the **powered cycle rickshaw and the two-wheeler sidecar**. These innovations were the result of extensive research aimed at enhancing mobility for the common man. The powered cycle rickshaw, in particular, garnered appreciation during trial runs, showcasing ARAI's commitment to practical solutions for everyday transportation challenges.

1978

Branding
and
Recognition

In 1978, ARAI unveiled its first logo, symbolizing its identity and mission within the automotive sector. This branding effort was part of a broader strategy to establish ARAI as a recognized authority in automotive research and testing. The decade also saw the **establishment of critical facilities, including the Auto Electrical Lab and the Materials Lab**, which further enhanced ARAI's capabilities in component and engine testing.

1980

Continued
Expansion

By the end of the 1970s, ARAI had firmly established itself as a **leader in automotive research**. The organization had successfully **conducted a Diesel Engine Conference**, bringing together industry experts to discuss advancements and challenges in diesel technology. Additionally, the **establishment of the Chassis Dynamometer Lab marked a significant enhancement in ARAI's testing capabilities**, allowing for more comprehensive evaluations of vehicle performance.



Mr. B.S.V. Rao
Director - ARAI
1975 - 81

Mr. B.S.V. Rao served as the Director of the ARAI from 1975 to 1981, where he established foundational practices and governance. His leadership fostered strong relationships with industries and government bodies, promoting research and development initiatives that positioned ARAI as a credible testing and R&D institute. Rao's contributions set the stage for future growth and innovation, leaving a lasting legacy in the automotive sector.

The Journey of the ARAI Continues.....

ADAS



ARAI provides ADAS Verification & Validation (V&V) package for development and implementation of ADAS for India specific condition.



On road assessment.. infinite use cases

Real World Tests

Physical Certification Tests

Selected few standard tests

Audit and Assessment

Simulation based testing and validation
.... Driver in Loop (DIL)+HIL

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Director – ARAI

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