

MARCH 2021



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NEWSLETTER & MAGAZINE

NITWARANGAL

ALUMNI ASSOCIATION



**DISTINGUISHED
ALUMNI AWARDS
2018, 2019 & 2020**

Leveraging the Alumni strength | Nurturing the students
Creating link with the Alma Mater | Staying connected with friends

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2021



FROM THE NEWSLETTER AND MAGAZINE SUBCOMMITTEE

The Newsletter and Magazine Subcommittee is glad to present and release the March 2021 issue.

We acknowledge the support and encouragement received for our previous issues. In continuation, this issue contains latest news from NITW, Distinguished Alumni Awards, Alumni Success Stories, Interesting articles written by our Alumni and a QUIZ to whack our brains.

We the Subcommittee members enjoyed putting this together and hope all our alumni members find this edition enthralling.

We request you to send your contributions, articles to the email nitwaa.newsletter@gmail.com within the limit of 2000 words. Please do ensure that there is no copyright infringement and also do mention your details (i) Degree (B.Tech, M.Tech, M.Sc. Etc.) (ii) Branch / Department (iii) Pass out Year

Though utmost care has been taken in publishing this newsletter, if there are any factual discrepancies they may be brought to the notice of the Subcommittee.

NITWAA Newsletter & Magazine Subcommittee

| Sr. No. | Name | Batch | At Present |
|---------|-----------------------------|-------------------------------|--|
| 1 | Dr. A Venu Vinod – Chairman | BT CHE 90, PhD CHE 06 | Professor, NIT Warangal |
| 2 | Sunil Simon - Convenor | BT ME 95 | Sr. Sales Manager, Oracle Ahmedabad |
| 3 | Dr. S. Shankar - Member | MT CE 06, PhD CE 12 | Asst. Professor, NIT Warangal |
| 4 | Arti Sengar - Member | BT ME 15 | Eco Designing Engineer, Alstom Bangalore |
| 5 | Sajal Kumar - Member | BT CHE 20 | Process Engineer, Dr. Reddy's Laboratories Hyderabad |

This newsletter has been designed with the support from Mr. Biju Philipose (BT | EE | 93), Vice President NITWAA. He is the Managing Director of Sepack India Private Limited, Kerala.


DISTINGUISHED ALUMNI

AWARDS
2018, 2019 & 2020


DAPAA – Distinguished Alumni Professional Achievement Award

DAPSA – Distinguished Alumni Public Service Award

DAVSA – Distinguished Alumni Volunteer Service Award

DYAPAA – Distinguished Young Alumni Professional Achievement Award

DYAPSA – Distinguished Young Alumni Public Service Award

DYAVSA – Distinguished Young Volunteer Service Award

DISTINGUISHED ALUMNI AWARDS 2018



ANANTHA REDDY CH.

BT | MET | 70
Chairman & MD,
Kartikaya Industries P. Ltd, Hyderabad
DAPAA



DWARAKANATH P

BT | ME | 78
CMD (Retd.), BEML Ltd.,
Bengaluru
DAPAA



BHASKAR M. GORTI

BT | EE | 88
President, Applications and
Analytics, NOKIA
DAPAA



SUBBA RAO MV

BT | MET | 84
CMD, Kudremukh Iron and Steel Co Ltd.
Bengaluru
DAPAA



DR. BHASKAR T

BT | MET | 90
Chief (Technology) TATA Steel
LongProducts Ltd., Jemshedpur
DAPAA



KC TIWARI

MT | CE | 77
Team Leader/ Road Safety Audit
Expert, Tanzania.
DAPAA



P S SUBRAMANYAM

BT | ME | 73
(Retd.) Program Director Light
Combat Aircraft, DRDL
DAPAA



P K RATH

BT | MET | 82
CMD Rashtriya Ispat
Nigam Limited (RINL), Visakhapatnam
DAPAA



SRINIVAS VEERAMASUNENI

BT | ME | 86 & MT | ME | 88
Senior Vice-president
Chief Technology Officer, USG
Corporation, Chicago USA
DAPAA



T. SATYANARAYANA REDDY

BE | CE | 68, MT | CE | 71, PhD | CE | 98
(Retd.) Director Grade Scientist,
Central Road Research Institute,
New Delhi
DAPAA



NARESH KUMAR DUBBUDU

BT | ME | 04
Managing Director,
Abhyaas Edu. Corp, Hyderabad
DAPAA



MURALI MOHAN GADE

BT | EE | 02
SCIENTIST 'F', D.R.D.L
Hyderabad
DAPAA

DISTINGUISHED ALUMNI AWARDS 2019



A. NARASIMHA RAO

BT | ME | 82
Freelance Consultant, GTD Trainer,
Career Mentor, Hyderabad
DAPAA



MAHENDRAN BALACHANDRAN

BT | ME | 86
General Partner, Accel,
USA
DAPAA



MALLIK TATIPAMULA

BT | ECE | 88
Chief Technology Officer,
Ericsson, USA
DAPAA



M.S. RAGHU CHANDRA DEV

BE | ME | 66
Chairman, Academic Council, Vidya
Bharathi Group of Institutions,
Cochin, Kerala, DAPAA



P. SESHUPASUMARTY

BE | ME | 84
Director, IIT, Dharwad
DAPAA



KRISHNA PRASAD T

BT | ME | 83
DGP, (Rtd) Hyderabad
DAPSA



D. RAMAJOGAIAH SHASTRY

BT | ME | 91
Poet and Lyricist, Telugu Film Industry,
Hyderabad
DAPSA



P. SRIVIDYA

BT | CE | 91
Principle Chief Commissioner
Income Tax, Karnataka and Goa
DAPSA



M D IMTIAZ

BT | CE | 86
Collector & District Magistrate,
Krishna District, Andhra Pradesh
DAPSA



G. MURALIDHAR

BT | ECE | 86
Chief Mentor, Akshara Livelihoods;
AP Community-Managed
Natural Farming
DAPSA



RAGHUVVEER

M.SC | PHY | 06
Manager, GSS Private Limited,
Hyderabad
DYAPSA

DISTINGUISHED ALUMNI AWARDS 2020



B. BALABHASKARA REDDY

BT | CE | 90, MT | CE | 93
Advisor and Head Portfolio, Results,
and Quality Control Unit, PARD,
Asian Development Bank, Philippines.
DAPAA



NAG PATIBANDLA

BT | MET | 83
Vice President,
Applied Materials
Santa Clara, CA, USA
DAPAA



PRK MURTHY

BT | CE | 82, MT | CE | 84
Director Projects, Metro Project
Mumbai
DAPAA



SREENIVAS RAO BARU

BT | ECE | 81
Operations, Industrialization and
Transformation Leader
USA
DAPAA



VENKAT PULLELA

BT | ECE | 90
Distinguished Engineer / Evangelist;
Broadcom, San Jose, USA
DAPAA



MADHAVA RAO YALAMANCHILI

BT | MET | 80
Head of Photomask
Etch Business group, USA
DAPAA



AARTHI SUBRAMANYAN

BT | CSE | 89
Group Chief Digital Officer,
Tata Sons Private Limited, Mumbai
DAPAA

16th Global EC MEETING

FEBRUARY 13-14, 2021 HYDERABAD



The 16th Global Executive Council meeting and the first EC meeting under the leadership of newly elected executive body 2020-22 happened at Hyderabad on Feb 13th & Feb 14th, 2021. It was a well attended event conducted in hybrid mode for the first time i.e. attendees had a choice of attending physical as well as online. Extensive arrangements were made for broadcasting the two day event across the globe and it was well received and appreciated by the esteemed members.

The agenda and the items of discussion were circulated well in advance. The event was arranged in the beautiful premises of The Country Club Resorts situated at Begumpet which is heart of the city of Pearls. Excellent arrangements were made by Hyderabad chapter who was the host of the event. The event was well attended by EC members from many chapters and also many alumni faculty from the campus .

The meeting started on the first day Feb 13th with President of the Hyderabad chapter Shri Y. Ram Mohan Rao welcoming the guests. Director of the institute Shri Prof. Dr. Ramana Rao who has joined online, in his inaugural speech has welcomed and congratulated the new team. He has also mentioned about the needs of the modern age alumni and wishes the team of new executive body will look into

addressing the needs of millennial alumni and students.

Dean IRAA, Shri Prof. Dr. Selvaraj has mentioned about the successful event of alumni donating the laptops to the needy students at the campus and has assured every step will be taken by the institute to serve the alumni wherever required.

In his President's address, Shri Alapati Prasad has mentioned about the priorities of the new team , present financial position of Nitwaa association, Nitwaa Foundation and also about the GTDTC and its revival.

Mr. Prasad has also informed the EC body that the association and the foundation are now 80G exempted by the tax authorities . He has also stressed the need to create a corpus fund for the association for taking up various activities of the association as we are purely depending on the interests from the existing fixed deposits.

Vice President of Nitwaa, Shri Biju Philipose in his address has discussed about the Alumni Convention Center (ACC)and the methods of raising funds from the Alumni.

Chairman of the Welfare and Benevolent Committee (WBC) and Secretary of Chennai Chapter has presented the new guidelines and process flow of the working model of the committee.





We had a special guest in the evening. Proud Alumni and Commissioner of Income Taxes Shri Patlavath Peerya has graced the occasion in the evening. He is the main helping hand and our dear alumni in helping resolving the long pending income tax related issues of Nitwaa. The EC body arranged a grand felicitation of Shri Peerya Ji on the beautiful evening. The first day of the meeting was concluded with a networking dinner and cocktail.

The second day of the event was started with a brain storming and deep dive into objectives and goals of Nitwaa 2.0 programme. There were presentations by various chapters on different topics of the programme . Shri Murali Gunji, secretary Nitwaa has explained the overall structure and goals of Nitwaa 2.0. programme .

Shri Seshu .M. , Secretary of Pune has presented the plan of action on entrepreneurship development and the role of international chapters in the overall alumni engagement.

Shri Ramakrishna.T., Secretary of Vizag Chapter has presented the detailed plans on improving Alumni Connects and Engagements.

Shri Dr. G.V.Rao, Secretary of Hyderabad Chapter has presented the ideas on Foundational Improvements that are needed in the areas of Website Rearchitecture, Secretariat, Compliance and financial auditing and also on welfare Activities.

Shri Ram Kumar . L. Secretary Bangalore Chapter has presented the detailed plans on focused group creations and their importance.

Shri Srinivas Atluri, President of America's chapter has presented the land scape of the alumni activities at Americas chapter.

Shri Arvind Sahay, Secretary of Middle East Chapter has discussed the need of improvements on the part of institute towards the alumni affairs.

This was followed by a presentation from Warangal Chapter on revival plans on GTDTC and the plan of action. This was a joint presentation from Shri Srinivas Chandragiri , Shri Prof. Venu Vinod .

Shri Prof. Anand Kishore , joint Secretary of Nitwaa has presented the plan of action for the establishment of central Secretariat at the campus .

Shri Srinidhi Anantraman, President of Bangalore Chapter has enlightened the audience with a detailed presentation on Alumni Convention Center (ACC) with a very well prepared visual walkthrough of the concept, to construct ACC in phased manner

There were detailed presentations on the chapter activities from Vizag, Hyderabad, Chennai and Warangal.

Director of the institute Shri Prof. Dr. Ramana Rao has graced the meeting with his physical presence on this day despite his busy schedule. The team had a group photo with the Director and the EC members.

The meeting was followed with very well organised and well attended New Year Celebrations of Hyderabad at Family World Resorts at Begumpet.



WELCOME

New Office bearers

CONGRATULATIONS & WELCOME ! NITWAA TEAM 2020-22



Prof. K. Anand Kishore
JOINT SECRETARY, NITWAA
PhD | CHE | 14
Professor, Dept of Chemical Engineering
NITW



Prof. G. V. S. Nageswara Rao
TREASURER, NITWAA
BT| MET | 88, MT | MET | 92, PhD | MET | 01
Professor, Dept of Metallurgical
& Materials Engineering
NITW

ACKNOWLEDGEMENTS ! NITWAA TEAM 2018-20



Prof. A Sarath Babu
JOINT SECRETARY, NITWAA
BT | CHE | 84, MT | CHE | 87
PhD | CHE | 16
Professor, Dept of Chemical Engineering
NITW



Prof. Deva Pratap
TREASURER, NITWAA
PhD | CE | 90
Professor, Dept of Civil Engineering
NITW



SIEMENS CENTRE OF EXCELLENCE

National Institute of Technology (NIT), Warangal, signed a Memorandum of Agreement (MoA) with Siemens Industry Software India Private Ltd and MTAB Technology Centre Private Ltd (MTC) in establishing a Centre of Excellence (CoE) on the campus. The CoE would focus on Industry 4.0 and Digital Manufacturing. This is a turnkey project approved by the MHRD, wherein Siemens and MTC will establish and operate 14 state-of-the-art labs for three years at an estimated cost of Rs 172 crore on the campus. The labs would train faculty, students, and industry personnel. The centre will also cater to the current and futuristic requirements of the industry. Prof. L. Krishnanand (PhD/ME/99), Professor, Department of Mechanical Engineering is the Chief Executive, Siemens Centre of Excellence.

DONATION OF LAPTOPS



2nd phase of laptop distribution was organized at NIT WARANGAL on 01 March 2021. Laptops were distributed to 50 students. Director Prof. NV Ramana Rao who spoke on the occasion thanked all the alumni who immediately responded to his appeal. He advised the laptop recipient students to make best use of the laptops and do well in their academic pursuits. NITWAA President Deans, Registrar and other institute officials graced the occasion.

In response to the Director's appeal for donation of laptops to poor students, the 1976-81 batch has donated 25 laptops to the Institute. Kudos to the batch!!



1st NITW Biotechnology Department Virtual Alumni Meet

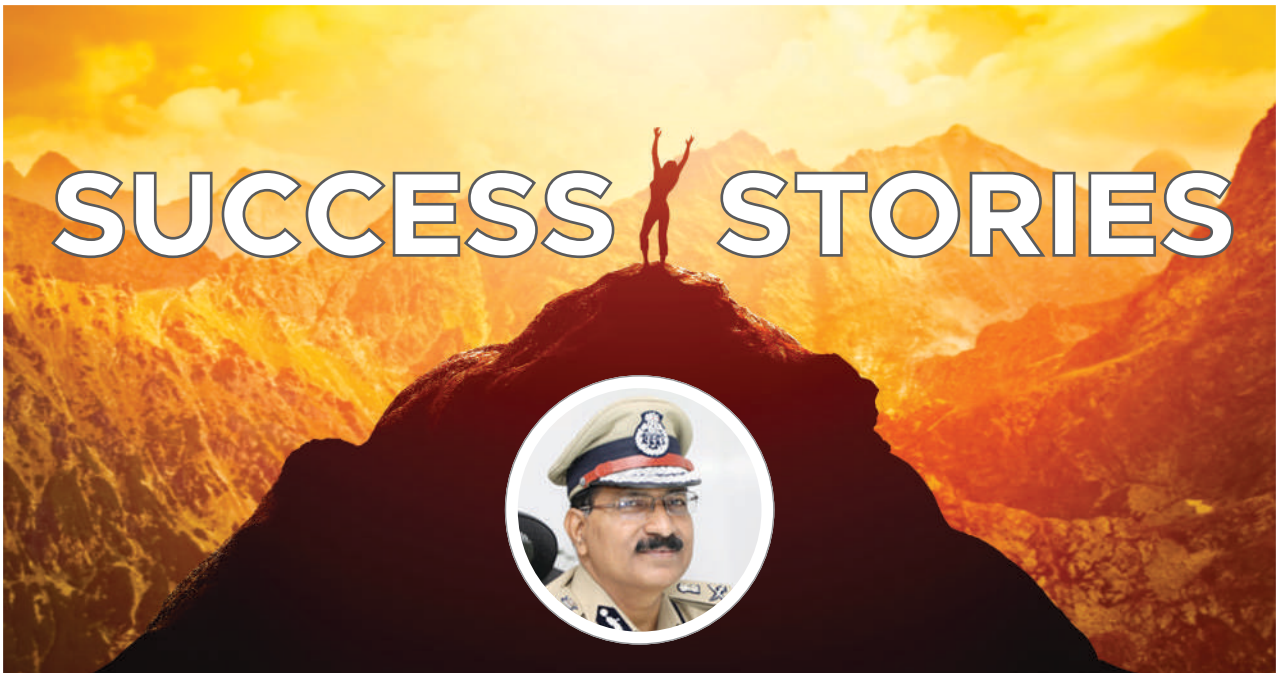
The other change happening in the Indian refining industry was the realization that to increase the refining margin, the bottom of the barrel which accounted for approximately 25% yield on crude also needs to be upgraded to distillate fuels. Upgradation of the bottom of the barrel was implemented across the refineries, existing as well as new, by installing Delayed Coking facilities.

With industrial activity picking up in the country, the environmental lobby also became active. The fuel specifications were in focus. The supreme court ruled that all vehicles in India have to meet Euro I or India 2000 norms by 1 June 1999 and Euro II in Delhi has to be implemented by April 2000. This led to a flurry of activities in the Indian refining sector. All the refineries had to install Diesel Hydro-desulphurization unit (DHDS) to reduce the sulphur content.

BioNITWork is a global community of Biotechnology students/alumni from the National Institute of Technology, Warangal (NITW), which facilitates interactive sessions and provides a platform for better networking opportunities. NITW Biotechnology Alumni Meet (BAM) was the first virtual alumni meet organized on 23rd and 24th January 2021 to connect alumni and current students. The Two-day meet covered the various research, finance, and management opportunities in Biotechnology, Entrepreneurship opportunities, IT/ Software India, and USA < Europe and Canada. The following is the link for the meeting:

<https://youtube.com/playlist?list=PLShEaMwNY1Chrl4nhWczWrfQ3MGeN9oye>





M Mahender Reddy

BT | CE | 84

Born on 3rd December, 1962. Shri M. Mahendar Reddy completed his Bachelor of Technology (B.Tech) in Civil Engineering from the then REC, Warangal, presently known as NIT, Warangal in the year 1984. Later, while pursuing M.Tech (Systems and Management) at IIT, Delhi, he was selected to Indian Police Service (IPS) in the year 1986 through Combined Civil Services Examination conducted by UPSC. Subsequently, while in Police Service, Shri Reddy obtained M.A (Public Personal Management) from Osmania University, Hyderabad.

Shri M. Mahendar Reddy joined Indian Police Service (IPS) in the year 1986 and served in the districts of Karimnagar, Guntur, Adilabad, Nizamabad, Kurnool and Hyderabad City in various capacities holding Managerial/Leadership positions in AP/Telangana Police Department. He has also served as a Faculty Member at SVP National Police Academy at Shivarampally, Hyderabad, a premier National Police Training Institution where officers of Indian Police Service from all over the country are trained.

Mr. Reddy went on study tours to USA and UK and acquainted himself with Police Systems in the respective countries.

Shri M.Mahendar Reddy served as Commissioner of Police, Cyberabad for about four years. He contributed for Technology improvements in Police Department while serving as IGP, Police Computer Services & Standardization. He was Chief of Grey Hounds, a Commando Organisation fighting Naxal violence before taking over as Chief of Intelligence Department, Government of Andhra Pradesh where he served for 5 years.

Shri M.Mahendar Reddy worked as Commissioner of Police, of Hyderabad City from 02.06.2014 to 12.11.2017. He has taken up several initiatives to transform Hyderabad City Police into a People Friendly Responsive Organisation using Technology innovations driving towards SMART Policing objective.

Shri M.Mahendar Reddy was later posted as DGP Telangana. He assumed charge as DGP on 12.11.2017.

Shri M.Mahendar Reddy has been awarded Indian Police Medal for Meritorious Services in the year 2002 and President Police Medal for Distinguished Services in the year 2010 in recognition of his Outstanding Services.

Shri Mahender Reddy was awarded Distinguished Alumni Award in 2016 by NIT Warangal



Dr. Lalit Goel

BT | EE | 83

Dr. Lalit Goel (born 1960) is a Professor and the Head of the Division of Power Engineering at the School of Electrical and Electronic Engineering (EEE), Nanyang Technological University (NTU). He is also concurrently the Dean of Admissions of the university and is a Fellow of the IEEE.

Dr. Goel is a native of New Delhi, India. He obtained his B.Tech degree in Electrical Engineering from the National Institute of Technology, Warangal, India in 1983. He worked as an engineer with Engineers India Ltd. between June 1983 and Dec 1988. Later on he completed his MSc and PhD degrees in Electrical Engineering from the University of Saskatchewan, Canada, in 1988 and 1991 respectively.

He joined the School of EEE at the Nanyang Technological University (NTU), Singapore, in 1991. He served as the Head of the Division of Power Engineering from July 2005 to August 2008. From July 2008 until June 2012 he served as the Dean of Admissions & Financial Aid. He served as Director, Undergraduate Education (Projects) in the President's Office, Nanyang Technological University, from Oct 2012 to Sept 2014.

He is currently appointed Director of the Office of Global Education and Mobility at NTU. He has received 18 teaching awards at NTU. Dr. Goel has chaired several IEEE conferences in Singapore. Dr Goel received the IEEE PES Singapore Chapter Outstanding Engineer Award in 2000, and the IEEE PES Outstanding Power Engineering Educator Award in 2009. Dr. Goel is the Editor for the International Journal of Electric Power Systems Research. Dr. Goel served as the IEEE Singapore Section Chair from January 2007 to December 2008, and as the Asia-Pacific Representative on the IEEE PES Governing Board from 2011 to 2016. His research interests are power system reliability, cost/benefit assessment, power markets and renewables.

Dr. Lalit Goel was conferred with the Distinguished Alumni Award in 2015, by NIT Warangal.

DEVELOPMENT OF INDIAN LIGHT COMBAT AIRCRAFT (TEJAS) CONTRIBUTION OF NITW ALUMNI , ADA

P.S. SUBRAMANYAM (BT | ME | 73) Distinguished Scientist, Dept of Def R&D; Former Program Director (LCA) & Director ADA. Dr. D SITARAMA RAJU (BT | EE | 73) Former Outstanding Scientist & Project Director ADA. Dr A. SUBHANANDA RAO (BT | ME | 73) Distinguished Scientist & Former Director General (AERO) DRDO

1. INTRODUCTION

On 3rd February 2021, during the Aero India 2021, the Hon'ble Defence Minister Shri Rajnath Singh handed over to HAL the documents related to the biggest defence production contract to supply 83 TEJAS MK1A aircraft to the IAF.

This article brings out the story of TEJAS aircraft and how Indian scientists and engineers have accomplished the design, development, manufacturing, and induction of this aircraft. The article highlights the outstanding contributions made by NITW Alumni. Some of them were in the highest positions taking crucial decisions for the program.

The government wanted the LCA program to develop advanced technologies including manufacturing technologies, establish the test facilities, develop the economical maintenance and operational facilities, nurture the private industry to be partners and involve the academic institutions.



2. STRATEGIES TO OVERCOME CHALLENGES

The government created a new organization, Aeronautical Development Agency (ADA) to execute this program harnessing all the technical capabilities in the country by forming National teams and sharing facilities available in the country. ADA is an autonomous society steered by its General Body consisting of cabinet ministers, secretaries to the ministry of defence, chiefs of armed forces and experts in science and technologies.

Foreign exchange limitations in the early nineties forced the program to optimally utilize the participation of foreign industries in Design and development consultancies, procuring equipment and materials, and sharing the design and developmental facilities.

US sanctions after nuclear weapons testing at Pokhran

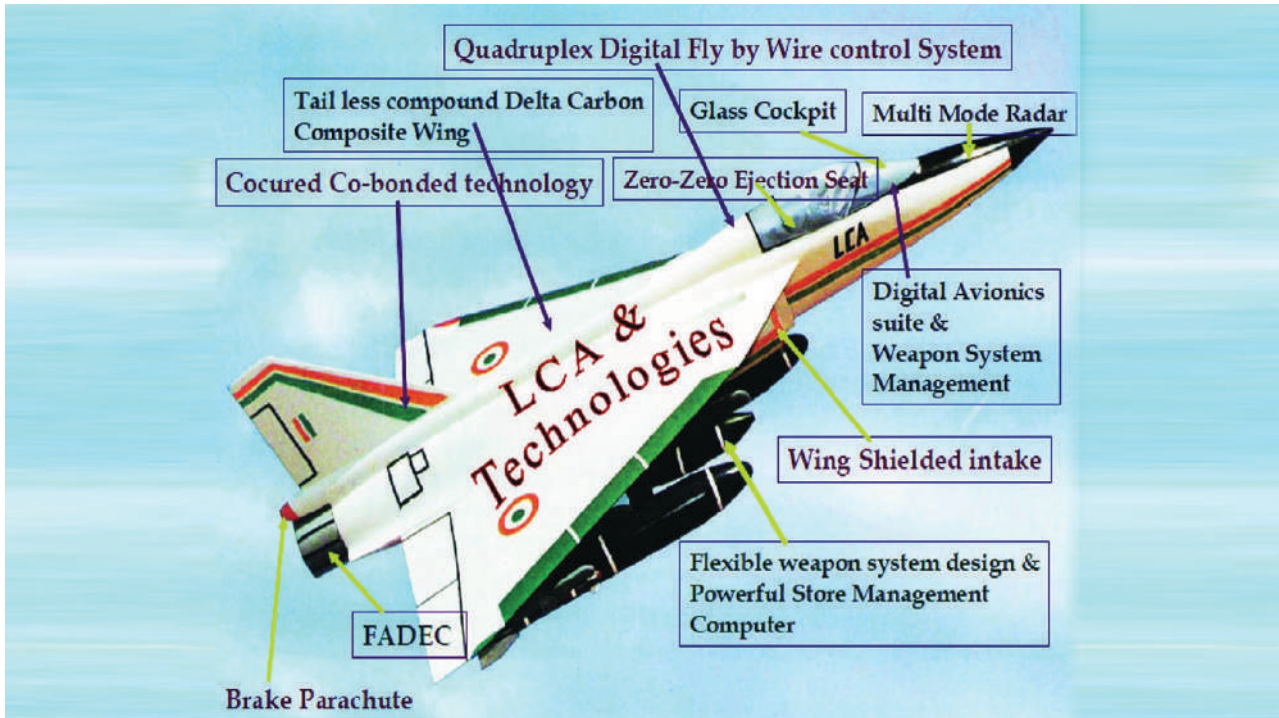
had severely impacted the participation of foreign industries. Several indigenous developments were initiated to overcome the dependency on foreign industries, and they were completed. This has resulted in greater self-reliance.

The author, **Shri PS SUBRAMANYAM (BT | ME | 73)** has been associated with ADA and LCA program since 1986 in various capacities including the head of the program, PGD from Sept 2005 to June 2015.

Dr. D SITARAMA RAJU (BT | EE | 73) was associated with the program in the capacity of Project Director ADA. **Dr A SUBHANANDA RAO (BT | ME | 73)** also was associated with the program in the capacity of DG(AERO) of DRDO Ministry of Defence, under whose leadership DRDO labs have contributed to the program.

3. DESIGN AND DEVELOPMENT

The requirements from the air force were very demanding to meet their future operational roles of air defence and ground attack. This resulted in strong demand for four-plus generation fighter aircraft technologies. There was a strong debate on adopting easier 3rd generation technologies versus difficult four-plus generation technologies. A bold decision was taken to adopt four-plus generation technologies which demanded more time, cost, and effort. Carefully selected collaboration with foreign aircraft industries based on cost and diplomatic relations. Design challenges and strategies:



A) AERODYNAMIC CONFIGURATION DESIGN

This is the most challenging aspect of design. The design must perfectly balance the requirements of stealth, aerodynamic performances (lift, drag, manoeuvrability Etc.), pilot comfort, stability and control, engine integration, internal fuel tanks, space for internal equipment etc. Multi-disciplinary optimization is done with proper weighting factors for the conflicting requirements. The design resulted in a compound delta wing, without horizontal tail and boat tail at the rear fuselage, supersonic air intake etc.

B) STRUCTURAL DESIGN

This design was a challenge to balance the requirements of weight optimization, stealth properties of materials, time and cost optimizing of manufacturing and assembly, ease of maintainability in terms of accessibility to equipment, internal equipment location preferences etc. The design of carbon fibre composite structures for wings, fuselage and control surfaces is an achievement.

C) ENGINE SELECTION

Engine thrust requirement over the flight envelope to meet the aerodynamic performance. Engine geometry to fit into the aircraft configuration. Engine with a high thrust to weight ratio. The engine was chosen from General Electric USA.

D) FLIGHT CONTROL SYSTEM

To meet the requirements of reliability, flying qualities and aerodynamic agility LCA is intentionally designed to be unstable. To control the agile aircraft, it was decided to design state of art "quadruplex digital fly by wire flight control system". The hardware architecture consists of the quadruplex digital computer, air data sensors for static and dynamic pressure sensing, inertial sensors for angular rates and accelerations, electrohydraulic servo actuators for control surface movements. The aircraft flight is thus made to depend on computer control without any

manual back up. The most challenging task was to design flight control laws for safety, reliability, and best handling qualities. Other challenging tasks are to develop and test the software integrated with hardware, in real-time hardware in a loop simulation facility known as IRON BIRD to ensure bug-free operation of the total systems. Established the flight simulators, test systems, actuators development etc. The pilots have rated the handling qualities of the aircraft extremely pleasant. India is one of the very few countries which mastered this technology.

Dr. D SITA RAMA RAJU (BT | EE | 73) after working for 12 years in ISRO joined ADA in 1987 and served till 2017. He made outstanding contributions to this development in various capacities. He retired in 2013, as an outstanding scientist/ Technology Director responsible for all activities of integrated flight control systems of LCA.

E) AVIONICS SYSTEMS

The avionics systems of a fighter aircraft consist of mission computers, cockpit displays, navigational systems, communication systems and radars with associated antennae, controllers of electromechanical systems using embedded computers and electronic warfare Etc. About thirty computer-based systems are connected on high-speed data buses.

Shri M. PANDURANGA REDDY (BT | EE | 73) after 10 years of experience at HAL joined ADA and has made excellent contributions during his twenty years in evolving the architecture of avionics system, especially the pilot vehicle interface.

Dr NARAYANA MURTHY (BT | ECE | 85) Distinguished Scientist and director RCI, DRDO made significant contributions during the initial stages of LCA avionics development.

Shri K RAMAIAH (BT | ME | 73) retired as Sr. DGM in BEL, Bangalore has contributed to the manufacturing of avionic equipment.

F) WEAPONS AND EXTERNAL STORES SYSTEMS

LCA has the capabilities to carry the Gun, unguided bombs, laser-guided bombs, laser designation POD, close combat missiles, beyond visual range missiles like ASTRA, fuel carrying drop tan.

G) ELECTROMECHANICAL SYSTEMS

The electrical power generating and distribution system systems: The electrical power is generated from the engine. AC/DC power is distributed to all the equipment. Battery power backup is provided. Extremely high reliability is achieved by providing redundancy of equipment and distribution paths.

Hydraulic power generating system: Hydraulic power is generated by pumps drawing the power from the engine. High-pressure circuits of 280 bar and 210 bar are used.

Some equipment is tested at CMTI Bengaluru, where **Shri Y BALARAMAIAH (BT | ME | 73)**, Former Scientist'F',CMTI, made a significant contribution

H). ENVIRONMENTAL CONTROL SYSTEM

The environmental control system bleeds the compressed air from the compressor of the gas turbine engine and expands it for cooling. A water separator is used to control the humidity before it goes to the cockpit. The cool air is used to cool the electronic equipment, hydraulic fluid and to pressurize the fuel tanks for feeding the fuel to the engine.

I) FUEL SYSTEM

The fuel is carried in the fuselage tanks, wing tanks and external drop tanks. The tanks are pressurized using the air bled from the compressor of the engine.

J) LANDING GEAR

The landing gear is a TRICYCLE type with two rear wheels and a front wheel. The front wheel has a nose wheel steering system. The entire landing gear is retractable into the fuselage.

K) BRAKE MANAGEMENT SYSTEM

A computer-controlled and hydraulically operated brake system with high-temperature carbon disc pads is designed for effective brake management. **Smt ROHINI DEVI (BT | CHE | 73)**, Former outstanding scientist, ASL, DRDO contributed to the development of carbon disc pads. Very few countries in the world have this capability.

L) PILOT COCKPIT AND LIFE SUPPORT SYSTEMS

The cockpit is equipped with electronic displays, mechanical switches, engine throttle control, joystick for flight control and rudder control pedals. The cockpit is equipped with an Ejection seat and canopy ejection system for emergencies. The pilot is provided with anti G suit and an oxygen supply system for high altitude flying.

4. MANUFACTURING AND AIRCRAFT INTEGRATION :

The manufacturing of parts, sub-assemblies and equipment were done at several MSMEs in addition to HAL which was a big challenge. Manufacturing of major sub-assemblies, final assembly, Equipping the aircraft with pipes, cables, equipment, and aircraft testing is done at HAL. Quality assurance and quality control procedures for the manufacturing and assembly was the challenge.

Shri SNG KRISHNA RAO, (BT I ME I 73) Former DGM, HAL, has made a significant contribution in integration activities of Aircraft.

5. FLIGHT TESTING OF LCA

Formation of the NATIONAL FLIGHT TEST CENTER), a national team was formed drawing experts from IAF, HAL, DRDO, NAL and ADA was a management innovation. Major achievements of NFTC are the Design of flight test instrumentation for the onboard and ground segment. Also, the Design of flight tests, conducting flight testing, flight data analysis and reporting to the designers. The entire flight testing so far has been without any incident, a great achievement for a development program.

6. AIRCRAFT TESTING, CERTIFICATION AND OPERATIONAL CLEARANCES

The centre for military airworthiness& certification (CEMILAC), Directorate general of aeronautical quality assurance (DGAQA) and IAF have worked together to evolve the procedures to obtain the OPERATIONAL CLEARANCES for the LCA Tejas.

Shri S A VANESWARN, (BT I EE I 73) Former Scientist 'E', ADA with expertise in quality assurance processes at DRDL Hyderabad, Joined the QUALITY ASSURANCE GROUP of LCA program in the initial phase and contributed to the formulations of quality assurance procedures.

7. PRODUCTIONIZATION

Based on the satisfactory performance of the aircraft the IAF has placed an order for 20 aircraft in the IOC configuration and twenty in FOC. HAL has set up the production line with special tools, jigs, fixtures and established a reliable supply chain, quality control and quality assurance norms. HAL has also developed special ground support equipment and test equipment for manufacturing.

8. INDUCTION TO SQUADRONS AND SETTING UP OF THE OPERATIONS AND MAINTENANCE FACILITIES

The Indian air force has inducted the aircraft and established the two squadrons at SULUR near Coimbatore. This involved the design and development of flight training simulators, ground handling equipment for operations, maintenance equipment for squadrons & depots and maintenance training simulators.

DR. T. RAJA RAO (BT I EE I 73) CMD, VISION LABS, Hyderabad had developed maintenance training simulators.

9. FUTURE VARIANTS

LCA TEJAS MK1A VARIANT This is an upgrade of TEJAS mk1 with Enhanced capabilities. Recently the Indian government has placed an order for the Production order.

ADVANCED MEDIUM COMBAT AIRCRAFT (AMCA)

The success of the LCA TEJAS program in achieving four-plus generation technologies has enabled the nation to pursue the development of FIVE PLUS GENERATION FIGHTER AIRCRAFT. ADA has

Progressed the development activities of AMCA. The Preliminary design is completed, and the detailed design is progressing.

LCA NAVY

The naval variant takes off at a short distance from the aircraft carrier and touches down on the deck of the aircraft carrier, engages the arrestor gear wire with the arrestor hook, to halt the aircraft in a short distance.

The LCA naval variant performed takeoff and landing on INS VIKRAMADHITYA.

The INDIAN NAVY is now supporting a new Twin-Engine Deck Based Fighter development.



First from the left Mr PS Subrahmanyam, 6th Dr A. Subhananda Rao, 7th Dr D Sita Rama Raju

10. TANGIBLE AND INTANGIBLE BENEFITS

Design capabilities, enabling technologies and facilities for testing at government and private institutions. Expertise in carbon Composite structures technology, quadruplex digital fly by wire flight control systems, Digital avionic system and computer-controlled electromechanical systems. Nurturing of private industry to manufacture parts and equipment and sub-assemblies of fighter aircraft.

11. CONCLUSION

The success of the LCA-Tejas program, the confidence reposed on the indigenously developed aircraft by IAF and the Government of India are demonstrated by the procurement order on HAL for 83 LCA-Tejas aircraft for Rs 48,000/ crores. As stated by the defence minister of the Government of India, LCA Tejas will be the backbone of the defence of our country. In this great journey of the nation, NITW alumni played a very vital role.

NITWA ALUMNI CONTRIBUTED FOR DESIGN, DEVELOPMENT, CERTIFICATION & PRODUCTION OF TEJAS



PS Subrahmanyam
(BT | ME | 73)
Distinguished Scientist & Former Program Director (LCA) and Director ADA



Dr. Sitarama Raju
(BT | EE | 73)
Former Outstanding Scientist & Project Director, ADA



Dr. A Subhananda Rao
(BT | ME | 73)
Distinguished Scientist & Former Director General (Aero), DRDO



M Panduranga Reddy
(BT | EE | 73)
Former Scientist 'G', ADA



Ms Rohini Devi
(BT | CHE | 73)
Former Outstanding Scientist, ASL, DRDO



SNG Krishna Rao
(BT | ME | 73)
Former DGM, HAL



Narayana Murty
(BT | ECE | 85)
Distinguished Scientist & Director, RCI, DRDO



Dr. T Raja Rao
(BT | EE | 73)
CMD, VISIONLABS group



Y Balaramaiah
(BT | ME | 73)
Former Scientist 'F', CMTI, Bangalore



K Ramaiah
(BT | ME | 73)
Former Sr DGM, BEL, Bangalore



SA Vaneswaran
(BT | EE | 73)
Former Scientist 'E', ADA



Indrani Krishnan

(BT | CHE | 91)

Chief General Manager, Engineers India Limited, New Delhi

Bringing Refining Industry in India to maturity



Introduction

The Refining Industry in India was established in the year 1901 with the setting up of Digboi refinery in the remote North-Eastern corner of India with a meager capacity of 0.5 MMTPA. Spurred on by the dream of making India an industrialized and energy independent country, the refining capacity was raised to 13 MMTPA by the year 1965. But the technology dependence on foreign players continued to be absolute. Since then, the Indian refining industry has travelled a long way and today as we stand in the third decade of the 21st century, the total refining capacity of all the public sector and Joint ventures refineries put together stands at 250 MMTPA with 23 operating refineries.

Indian Refining Sector–Period 1900-1970

When India became independent in 1947 there was only one operating refinery in the country of 0.5 MMTPA crude processing capacity set up by Burmah Oil Company Limited in 1901 at Digboi. The Refinery

was designed to process indigenous Assam crude. Subsequently, in 1950s, the private oil companies operating in India like Caltex Oil Limited, Burmah Shell Oil company and Exxon Corporation set up refineries at Vizag and Mumbai. The first refinery post independence was set up by Exxon Corporation in 1954 at Mumbai. Following year Burmah Oil company commissioned the Mumbai refinery and then in 1957, Caltex started the Vizag refinery.

The first public sector refinery was set up by Indian Oil Corporation at Guwahati with Romanian assistance. This was followed by the commissioning of the Barauni refinery in 1964 and Gujarat Refinery in 1966. Both these refineries were set up with Russian and Romanian assistance.

In 1966, Government of India in association with Phillips corporation of USA set up the Cochin Refineries Limited with an initial capacity of 0.5 MMTPA. Subsequently in 1969 the Madras Refinery Limited at Manali was

commissioned in association with Amoco and NIOC of Iran.

These early refineries were typically Hydroskimming refineries with basic configuration consisting of primary processing units i.e., Crude and Vacuum distillation units. Only in few cases like the Burmah Shell refinery at Bombay, secondary processing unit like Fluid Catalytic Cracking unit was part of the configuration. Subsequently in 1969, the Esso refinery in Bombay installed the lube block for production of Lube Oil basestocks. The Madras refinery which was set up in 1969 also had Lube and the Wax block in addition to the fuels block to produce distillate fuels, lube base stocks as well as paraffin waxes.

Era of consolidation 1970 – 1990

After independence, the government of India adopted the policy of planned economic development in the country. The Planning commission was set up in the year 1950 to promote all round development by utilizing natural and human resources. The economic thinkers of the country believed that Public sector enterprises can meet the vision of national industrialization policy.

The major consideration for the setting up of PSUs was to accelerate the growth of core sectors of the economy; to serve the needs of strategically important sectors, and to generate employment and income.

With the economic progress picking up in the country, the growth in oil consumption increased drastically. Between 1950 and 1955, the growth rate was 7.7% whereas this increased to ~10% in the next five years between 1955 and 1960.

During the Chinese war of 1962 and subsequently during the war with Pakistan in 1965 and 1971, it was felt that government control on the availability of fuel for strategic control is essential.

Therefore in the backdrop of all these developments, Government of India decided to nationalise the private oil companies and merge them to form bigger entities so that they can collectively contribute to the economic progress and provide strategic fuel security to the nation. The Esso Oil refinery in Bombay was nationalized in 1974 to form Hindustan Petroleum Corporation Limited (HPCL). The Caltex refinery in Visakh was nationalized in 1978 and merged with HPCL. The Burmah Shell Refinery in Bombay was nationalized in 1976 to form Bharat Petroleum Corporation Limited.

During this period several new refineries were set up like, Haldia refinery in 1976, Bongaigaon refinery in 1981 and Mathura refinery in 1982. With the demand of petroleum products rising at a steady rate, it was decided to augment the capacity of the existing refineries. Several revamps were undertaken in the Refineries. In most of these revamps, the mother unit of the refinery i.e the crude and vacuum distillation unit

(CDU / VDU) was revamped or a new grassroots CDU / VDU was installed.

With the economic and industrial growth in the country picking up, the demand for petroleum products also increased. Since the refineries could not meet the demand internally, petroleum products had to be imported leading to depletion in foreign exchange reserve. The growing need made the Indian refiners relook into the refinery configuration and it was felt that there is no option other than installing the secondary processing facilities to enhance the distillates yield per barrel of crude processed. Therefore Fluid catalytic process unit (FCCU) was set up in Gujarat refinery in 1982, Cochin refinery in 1985, Madras refinery in 1986, Vizag refinery in 1986 and BPCL Bombay refinery in 1986. The FCCU which is also known as the workhorse of the refinery drastically increased the refinery margin since the distillate yield of the refinery increased considerably.

As the infrastructure development picked up in India, the demand for bitumen increased. This led to the setting up of Deasphalting unit in Haldia and Chennai.

Refineries of the Nineties

As India entered into the last decade of the 20th century, there was a paradigm shift in the refining industry. Year 1990 – 1991 saw a major change in the economic policies of the country. The license raj was abolished and with that, a number of **private players entered the refining business**. There was a flurry of activities including companies venturing into transplant of old refineries from US and Europe to India.

However among the private players only Reliance and Essar have been successful in setting up their refineries on the west coast of India. The highlight of these refineries was their **scale as well as complexity**. Till that time, the single train CDU capacities even after revamp did not cross 6.0 MMTPA, but in both these refineries, the CDU capacity (single train) was 15.0 MMTPA and 9.0 MMTPA respectively.

PSU Oil Companies also carried out a number of studies to set up refineries in various parts of India. Major Oil companies from across the world were interested to partner in the projects. Thus the Bharat Oman refinery at Bina, Panipat refinery, Mangalore refinery and Numaligarh refinery were conceived. Similarly new technology like Hydrocracking was introduced to increase the diesel production. The first hydrocracking unit was set up at Gujarat refinery in 1993.

With rapid growth in domestic demand of fuels, refining industry in the country witnessed significant capacity addition through brown field capacity expansion as well as through implementation of grass root refineries.

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The other change happening in the Indian refining industry was the realization that to increase the refining margin, the bottom of the barrel which accounted for approximately 25% yield on crude also needs to be upgraded to distillate fuels. **Upgradation of the bottom of the barrel** was implemented across the refineries, existing as well as new, by installing Delayed Coking facilities

With industrial activity picking up in the country, the environmental lobby also became active. The **fuel specifications were in focus**. The supreme court ruled that all vehicles in India have to meet Euro I or India 2000 norms by 1 June 1999 and Euro II in Delhi has to be implemented by April 2000. This led to a flurry of activities in the Indian refining sector. All the refineries had to install Diesel Hydro-desulphurization unit (DHDS) to reduce the sulphur content.

Indian Refining sector of the new Millennium

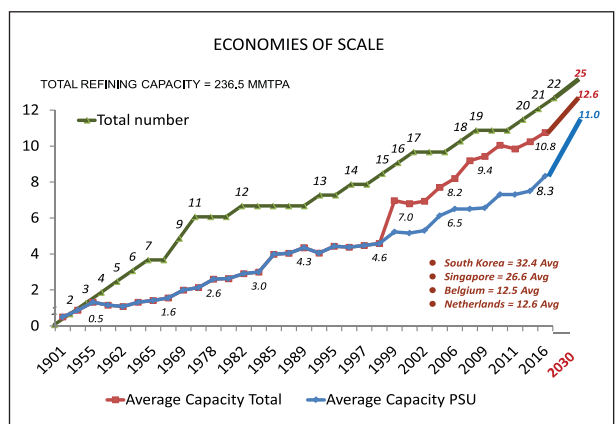
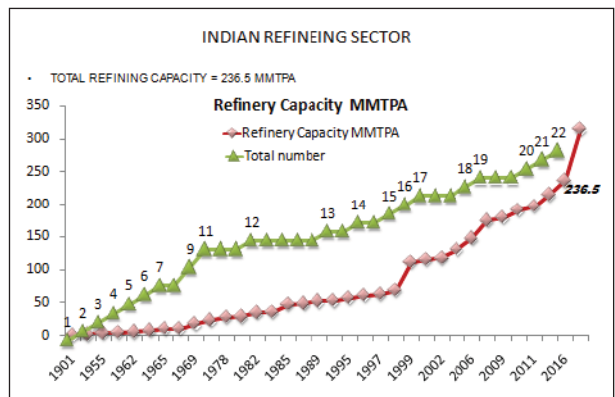
As India entered the new millennium, the major areas which came under focus in the refining sector were maximizing the returns from investment and existing assets, increasing the energy efficiency and executing and implementing the projects within schedule. New terminology like Nelson index and Solomon norms were buzzing in the corridors of the refineries. The terms **“economy of scale”** and **“integrated complex”** were slowly assimilated. The burning example of economy of scale was the Reliance complex where the second 30 MMTPA refinery was being conceptualized. This prompted the public sector units to started thinking **“big”**.

IOCL’s integrated complex in Panipat is a testimony to this effect.

In the year 2006, the Panipat refinery expansion project was implemented where along with a 6.0 MMTPA CDU / VDU, a Hydrocracker for secondary processing and a Delayed coker for bottom upgradation were installed. Subsequently, an Aromatic complex producing Paraxylene and PTA was implemented in Panipat and finally the Naphtha Cracker plant along with downstream ethylene and propylene derivative units were installed making a truly integrated refinery cum aromatics cum petrochemical complex.

The HPCL - Mittal (H MEL) joint venture refinery in Bhatinda was another milestone in the refining sector. This 9.0 MMTPA refinery was set up by HPCL & Mittal Energy Limited in a record time. The refinery configuration had a Petro FCC and a Polypropylene unit to enhance the refinery economics. The Petro FCC at H MEL, Bhatinda is the country’s first high severity unit designed for very high propylene yield.

The next two graphs depicts the historical journey of Indian refineries and how the capacity of the refineries has increased over time.



The testimony of the Indian refinery gaining maturity is the fast pace at which the Fuel specifications have improved in the country. From introduction of Euro 1 fuel specifications in the year 2000 to implementation of BS-VI (equiv. to Euro VI norms) in year 2020, we have come a long way. Euro VI specs are the latest fuel specs and very few countries in the world are in a state of readiness to adopt it. India has implemented the changes required to meet the new specifications which are more environment friendly & will go a long way in abetting pollution.

Refineries of the future

Indian economy is growing at a rate higher than 7.0 %. With growth of economic activity, there is a resultant increase in the demand of petroleum and petrochemical products. Air transport is on the rise. The Indian Power sector is also growing at a very fast rate. Cleaner renewable sources of energy are gaining importance. Electric vehicles are likely to increase at a fast pace in the coming years. This is expected to slow down the growth rate of petroleum products demand globally. Rather than distillates, petrochemical products will gain importance.

These are challenges for the refiners. The current refinery configurations will require change so as to be competitive in the evolving market. Refiners are gearing up to meet the challenges. The configuration of the refineries is being remodeled by shifting the-

distillate to petrochemicals. Indian refinery has come along way and in the future which is projected to be vibrant; it will raise and meet the challenges.

Ms. Indrani Krishnan

She stood third in her class.

Currently Chief General Manager, Engineers India Limited, a premier Engineering and Consultancy organization operating out of its head office at New Delhi, India. Indrani has over 30 years experience in Process design and has to her credit designed major refinery and down stream processing units in India and abroad. She has been associated with the conceptualization and design of mega flagship refineries in India and abroad, examples being the HMEI refinery in Bhatinda, HPCL refinery in Mumbai, Mathura Refinery revamp, Panipat Refinery, and the world's largest Dangote refinery being built in Nigeria.

Ms. Indrani is married to CP Krishnan (BT | CHE | 91).



GLOBAL TECHNOLOGY DEVELOPMENT AND TRAINING CENTRE (GTDTTC)

NITWAA took over the erstwhile Punnami Guest House on a 29-year lease from NITW, and executed the renovation and refurbishment of premises as NITWAA Global Technology Development and Training Centre (GTDTTC). Couple of Training programs were conducted in the premises. Furnished class-rooms were given to TASK (Telangana Academy for Skill and Knowledge) on lease. A total of 20 rooms (10 rooms on each floor) were renovated and have been under active operation. Shri Chandragiri Sreenivas (BT | CE | 91) Warangal Chapter President and Prof. A. Venu Vinod (BT | CHE | 90, PhD | CHE | 06), Secretary Warangal Chapter have been nominated as Chairman and Advisor GTDTTC respectively. Training programs for students and professionals are proposed to be conducted in association with NIT Warangal. NITWAA with its alumni base of over 33,000 professionals having rich experience in diverse areas has tremendous scope to offer training programs. Interested alumni are welcome to contact the Chairman (sreenchandrageri@gmail.com) or Advisor (avvnitw@yahoo.in).



1. When was the foundation stone laid for REC Warangal?
2. Who laid the foundation stone for RECW?
3. On what date REC Warangal was renamed as NIT Warangal?
4. Who was the Principal when RECW converted to NITW?
5. What were the branches of engineering RECW started with?
6. The youngest engineering department at NITW.
7. Name the Russian computer given to RECW in the early 1980s.
8. Who was the chief guest at the diamond jubilee celebration?
9. Name the famous alumnus who worked with CBI & investigated high profile cases.
10. Name the Sanskrit phrase at NITW emblem.
11. Name the principal/director who served for the longest period
12. Name the electrical alumnus who was an MP.

UNIQUE ALUMNUS WITH 4 DEGREES FROM NITW



Prof. N. Subrahmanyam

BTECH Electrical Engineering-1973-1978
 MTECH Power Systems Engg-1978-1980
 MTECH Computer Science Cross migration program-1990-1993
 PhD in Electrical Engg- -1998
 Currently Professor at Department of Electrical Engineering, NIT Warangal



FROM FAMILY



Dr. G. V. S. Nageswara Rao

BT | MET | 88, MT | MET | 92, PhD | MET | 01
 Professor (HAG), Department of Metallurgical & Materials Engineering,
 NIT Warangal
 Treasurer NITWAA



Dr. G. Venkateswara Rao

BT | MET | 94, MT | MET | 05
 Deputy General Manager (Mineral Processing), NMDC Limited,
 Uppal Road, HYDERABAD
 Secretary, NITWAA Hyderabad Chapter



Ms. G. Saibhavani D/o Dr. G. V. S. Nageswara Rao

BT | BIOT | 16
 PhD scholar



The NITWAA Cultural Sub-Committee under the aegis of NIT Warangal Alumni Association organised a Musical Evening, Online event (virtual mode) on 31st January 2021 time 17:00 Hrs to 20:00 Hrs (IST).

The chairman of the NITWAA Cultural Sub-Committee Mr P. Ramaprasad (BT I CHE I 83) opened the program with his remarks and invited Chief Guest and Chief Patron of NITWAA, Prof. N V Ramanarao to light the lamp.

Mr NasySankagiri (BT I ME I 86) part of the organising committee invited President NITWAA Mr Alapati Prasad (BT I CE I 78) to address the evening. This was followed by the address of Prof. CSRK Prasad (BT I CE I 85) and Prof. Selvaraj, Dean of Internal Relations and Alumni Association.

As the evening progressed, the Chief Guest and Chief Patron of NITWAA, Prof. N. V. Ramanarao shared his thoughts. This was followed by a presentation by Mr PVRS Kishore (BT I ECE I 78), Chairman of Alumni Career Guidance, Capacity Building & Mentoring Sub-Committee of NITWAA.

Mrs J Kedareswari wife of Mr P. P. Sastry (BT I EE I 78) from Hyderabad anchored the programme which was a resounding success and many of the alumni members and their families could listen to their favourite songs and appreciated the format of the musical evening.

The performances included Devotional songs, Instrumental (Mouth Organ, Guitar), Songs in Old is Gold Category, Songs in Old & New category and also Mix language category.

Mr Shankar Shivaratri, Convenor of NITWAA Cultural Sub-Committee proposed the Vote of Thanks.

We offer our thanks to the NITWAA Cultural Sub-Committee consisting of Mr P. Ramaprasad (BT/CHE/83), Mr Shankar Shivaratri (BT I MET I 94), Mr K S Prasad (BT I CE I 79), Mr Dilip Kumar Sahoo (BT I CE I 91) and Mr NasySankagiri (BT I ME I 86).

You Tube link :<https://www.youtube.com/watch?v=acf7U57MtJA>

MATRIMONIAL

Arti Sengar (BT I ME I 15)
 Ecodesign Engineer at Alstom, Bangalore
 Contact: 7842745684

OBITUARY



Late Chhabinath Singh
BT | ME | 79
Coal India Limited , Hazaribagh, Jharkhand
Left us on 27-07-2020



Late B. Madhu Mohan
BT | CE | 91
Lecturer, Government Polytechnic,
Nizamabad
Left us on 15-09-2020



Late Gurbachan Singh
BT | ME | 67
Retd Brigadier, Haryana
Left us on 14-01-2021



Late Sunil Kumar Datta
BT | EE | 74
Ex-GM Central Coal Fields Ltd.
Left us on 22-01-2021



Late K Sreenivasan
BT | EE | 67
Left us on 13-02-2021

ANSWERS TO



1. 10 October 1959
2. Late Pandit Jawaharlal Nehru
3. 10 September 2002
4. Prof V Vasudeva Rao (MT | EE | 69)
5. Civil, Electrical, Mechanical
6. Biotechnology
7. EC1045
8. Vice President of India, Shri M Venkaiah Naidu
9. Shri V V Lakshminarayana (BT | ME | 86)
10. **कर्मण्ये हि संसिद्धिः** Karmanaiva hi samsiddhim
11. Prof K Koteswara Rao
12. Shri Kavuri Samba Siva Rao (BT | EE | 64)

25/3/50

The Principal, Incharge, Members of the Faculty and Students of
The Regional Engineering College, Warangal

request the pleasure of your company on the occasion of

The First College Day

at 4.30 p. m on Wednesday the 2nd March 1950

at the Government Polytechnic, Motwada, Warangal

Shri. Damodararam Sanjivayya

Chief Minister, Government of Andhra Pradesh,

has kindly consented to deliver the address and give away the prizes

Shri. D. S. Reddi

Chairman, Board of Governors of the Regional Engineering College and Vice-Chancellor,
Osmania University, Hyderabad.

has kindly consented to provide.

P. T. O.

The Chairman and the Members of the Board of Governors,
Regional Engineering College, Warangal.

Cordially invite you on the occasion of

Laying the Foundation Stone & Inauguration of
the Regional Engineering College, Warangal.

by

Shri Jawaharlal Nehru

Prime Minister of India

at 11.30 a. m on Saturday, the 10th October, 1959

at the Engineering College Site

(next to Futuna Colony near Kasipet Rly. Station)

Prof. Humayun Kabir

Minister for Scientific Research and Cultural Affairs, Govt. of India,

provides.

PROGRAMME OVERLEAF