आज़ादी का अमृत महोत्सव

THE INSTITUTION OF CIVIL ENGINEERS INDIA ICE (I)

Ministry of Women and Child Development
Government of India

COMPENDIUM ON

75 WOMEN

ENGINEER JEWELS OF INDIA

THE INSTITUTION OF CIVIL ENGINEERS (INDIA)

COMPENDIUM ON

75 WOMEN

ENGINEER JEWELS OF INDIA

TO COMMEMORATE 75 YEARS OF INDIA'S INDEPENDENCE
"AZADI KA AMRIT MAHOTSAV"

Supported by

Ministry of Women and Child Development
Government of India

THE INSTITUTION OF CIVIL ENGINEERS
INDIA
ICE (I)

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मंत्री
महिला एवं बाल विकास
भारत सरकार
नई दिल्ली
Minister
Women & Child Development
Government of India
New Delhi

13th September, 2021

MESSAGE

During these difficult times when the entire world is coping with the Covid-19 pandemic, engineers play a significant role in rebuilding the country. The Occasion of Engineers day is celebrated on 15th September to commemorate the birth anniversary of the great Indian engineer, Bharat Ratna, Sir M. Visvesvaraya. On this day, we express our deepest gratitude towards the efforts and contributions of our engineers in nation-building. We salute our engineers for their continuous great ideas and innovations that have truly changed our lives.

I am delighted to know that the Institution of Civil Engineers (India) [ICE(I)] has dedicated the theme of this year's Engineers' Day to **"Infrastructure Development: Women Leading the Way"** in celebration of the accomplishments and contributions of women engineers. This, I believe will pave the way in raising awareness about the role of women in the engineering profession also motivating our girls to pursue the field more. This year, on Engineers' Day, I honour all those who are contributing to the cause of women empowerment and gender equality through the field of engineering.

Taking inspiration from the words of Hon'ble Prime Minister of India on the occasion of 75th Independence day as **"Azadi Ka Amrit Mahotsav"**, I am happy to launch this **"Compendium on 75 Women Engineer Jewels of India"** while saluting all the women engineers who have made India proud.

I compliment Dr S.L. Swamy, Chairman, ICE(I), and his team for such a thoughtful endeavour and extend them my best wishes for effectively continuing their inspirational work for women empowerment in the field of engineering for the years to come.

Jai Hind.

(Smriti Zubin Irani)

डॉ. मुंजपरा महेन्द्रभाई
Dr. Munjpara Mahendrabhai
(M.D. Medicine)

राज्य मंत्री
महिला एवं बाल विकास और आयुष
भारत सरकार
Minister of State for
Women & Child Development and AYUSH
Government of India

MESSAGE

Engineers Day 2021

Namaskaram to all /

As we approach the "Azadi Ka Amrit Mahotsav" I would like to congratulate all the delegates and the distinguished panelists from present today.

This year is special, also because we mark the historic milestone of 75th Anniversary of Independence Day. This Independence remains an abiding reminder of the heroism and immense sacrifice of Indian people. I am happy to note that our Hon'ble Woman & Child Development Minister has launched "Compendium on 75 Women Engineer Jewels of India" today.

I am sure it would provide inspiration to coordinate efforts on most pressing issues of global concern amongst the adhi sbaadhi. Today, we focus on taking India to new heights, to build a new India - an Atma-Nirbhar (self-reliant) India. India is making efforts to be self-reliant by re-orienting its terms of engagement. We look forward to close cooperation with ICE(I) as we make strides in our efforts.

I would like to thank Dr. S.L. Swamy, Chairman ICE(I) and his team for organizing this launching and conference "Infrastructure Development - Women Leading the Way"

Dr. Mahendrabhai Munjpara

Place: New Delhi
Date: 09/09/2021

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MESSAGE

Engineers Day 2021

Dr. S.L. Swamy
Chairman
The Institution of Civil Engineers (India)

The Asia Pacific is the fastest-growing region in the world and the Engineers play significant role as pillars of economic progress of any Nation. The same is reinforced in the UN Sustainable Development Goals.

It is appreciable that in 2015, the UN made “Gender Equality and Empowerment of all Women and Girls” one of its Sustainable Development Goals. Infrastructure is a prime mover and catalyst for each of the SDGs. The empowerment of women is the biggest measure of progress and social upliftment of any nation. India is a country where *'Nari Tu Narayani'* has been an integral part of the ethos and culture of this great country.

The myth that there is a gender imbalance when it comes to engineering, is gradually withering away and women engineers are equal partners in any discipline of engineering.

Taking inspiration from the words of Hon'ble Prime Minister, Govt. of India, to commemorate 75 years of India's Independence “Azadi Ka Amrit Mahotsav”, ICE(I) has dedicated Engineers Day 2021 celebration to the women engineers. It is an exciting time to be an engineer and female engineer are certainly in great demand. So women let's shape the world and engineer our future and discover prime employers offering exciting engineering opportunities to women.

On this occasion, ICE(I) with the support of Ministry of Women & Child Development, Govt. of India is bringing out a “Compendium on 75 Women Engineer Jewels of India” by saluting women engineers to celebrate Azadi Ka Amrit Mahotsav.

I am confident that this will inspire the younger generation to tap the highest potential and create value each day by strengthening their capacity for wisdom, courage, confidence, vitality and compassion to successfully meet the challenges of daily life and establish a state of unshakable happiness of this world, leaving a rich legacy to feel proud of.

"Jai Hind"

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महिला एवं बाल विकास मंत्रालय
शास्त्री भवन, नई दिल्ली–110 001
Government of India
Ministry of Women & Child Development

10th September, 2021

MESSAGE

I am glad to know that the Institution of Civil Engineers (India) [ICE(I)] is celebrating "Engineers Day" on 15th September, 2021 on the theme of "Infrastructure Development : Women Leading the Way" and is bringing out a "Compendium on 75 Women Engineer Jewels of India" that coincides with the celebrations of 75 years of India's Independence.

This compendium by the Institution of Civil Engineers (India) [ICE(I)] about 75 Women Engineers from different diverse fields of engineering would certainly inspire the young and aspiring girls and Women engineers of our country, to achieve even greater heights.

I complement ICE(I) for this initiative and hope that this compendium will spread knowledge about the lives and works of the exemplary women engineers to a wide audience and will be a useful reference for those, especially young girls, who want to join this exciting profession.

I wish ICE(I) great success.

(Indevar Pandey)

Shastri Bhawan, Dr. Rajendra Prasad Road, New Delhi-110 001
Website : http://www.wcd.nic.in

MESSAGE

Engineers Day 2021

Shri Prithipal Singh
Secretary General
The Institution of Civil Engineers (India)

We have entered the 75th year of our Independence and we stand tall as a young Nation on the foundation of our strong economy which has immense capabilities of growth. Nation does not signify brick and mortar alone, it is the human wealth which infuses life and vigour and also enabling us to reap dividends. The values imbibed by us from our ancestors are our treasure. When we glance through the canvas of values gender equality occupies a very prominent place on looking to the history of empowerment of women in our country.

The Health of a Society, it is often said, depends on the status of its women. Respect and regard for womanhood has been the distinguished characteristics of the Vedas. Women had free access to education and training, participation in religious ceremonies and functions. The Vedas speak of the feminine powers without which the masculine existence is not effective for work and formation.

History reveals that regime which had recognized the importance of women, mostly flourished. However, Women's march towards modernization has seen many upheavals. The saga of women from the Rig Vedic period to the modern world, presents a strange scenario. A clear contradiction is found between the outlook towards women in the ancient era and the modern society. Our march towards progress has not been democratic due to marginalization of women. Creating an environment through positive economic and social policies for the development of women and to enable them to realize their full potential.

During the last few years, lot has changed around us globally. The pandemic has impacted every sphere of human activity and most of us are still navigating through the challenges of the new normal. A lot to learn and look forward to with new spirit and passion.

In the celebration of 75th year of our Independence the launching of Compendium on 75 Women Engineer Jewels of India is just symbolic of the significant role the women are playing in every walk of life.

"Jai Hind"

MESSAGE

Engineers Day 2021

Ms. Maya Thakur
Director
The Institution of Civil Engineers (India)

All modern societies recognize that education and career are not only the right of a woman, but key factor that contributes to the economic and social development of a Nation. Women are often under-represented in the academic and professional fields of engineering, where as women represent a large untapped source of talent.

Few of the Indian Women Engineers have had contributed immensely yet much of their remarkable achievement and contributions to the development of the Engineering in India have neither been recognized largely nor given due attention. The story of Indian Women Engineers has been one of the struggles. ICE(I) is bringing out this "Compendium on 75 Women Engineer Jewels of India" spotlighting the road paved by some of the pioneering women engineers, who have today, cemented the path for future generation to fulfill their ambitions.

"Jai Hind"

Shakuntala A. Bhagat

First Woman Civil Engineer in India

Shakuntala A. Bhagat nee Joshi, (6 February 1933 – 14 October 2012), was the first woman Civil Engineer in India.

Bhagat was Assistant Professor of Civil Engineering and Head of the Heavy Structures Laboratory at the Indian Institute of Technology in Mumbai for much of the 1960s. In 1970, she and her husband founded their own firm, Bhagat Engineering; they also founded Quadricon, a bridge construction firm specializing in a patented prefabricated modular design. She worked on design and construction of hundreds of bridges around the world, including projects in the United States, Germany, and the United Kingdom. She worked on concrete research for the Cement and Concrete Association of London.

Bhagat was a member of the Indian Road Congress and a fellow of Indian Institute of Engineers. In 1972, the Bhagats received an award from the Invention Promotion Board for developing 'Unishear Connector'. In 1993, she was recognized as the "Woman Engineer of the Year"

The Business Insider included her name amongst "The 25 Most Powerful Women Engineers In Tech".

P.K. Thressia

First Female Chief Engineer

P.K. Thressia (12 March 1924 - 18 November 1981) was a Civil Engineer and became India's first female Chief Engineer. She was born in Kerala into a devout Syrian Catholic family. She attended the St. Mary's High School in Kattoor and through her father's encouragement went onto study Civil Engineering at the College of Engineering, Guindy (CEG), alongside fellow women engineers, Ayyalasomayajula Lalitha and Leelamma Koshie. After graduating in 1944, Thressia worked as Section Officer for the Public Works Commission of the Kingdom of Cochin, which was under the British rule and shortly after received a promotion to the Assistant Construction Engineer for the TB Sanatorium, Mulakunnathukavu. She became Executive Engineer in 1956 and moved to Ernakulam, where she worked for nine years. In 1966, she was promoted to Superintending Engineer of Kozhikode Roads and Buildings. In 1971, she was promoted to Chief Engineer of the state of Kerala.The literature named Roots and Wings, by Shantha Mohan, quoted her words 'an engineer's life is not as difficult as many women think.'

She retired in 1979, after working for the Kerala Public Works Department for 34 years and became a founding consultant for the firm Taj Engineers.

Leelamma (George) Koshie

First Women Civil Engineer Trios

Leelamma graduated from College of Engineering Guindy with a degree in Civil Engineering. At just 19, she became one of the first women engineer trios. After completing her engineering, she joined the Public Works Department and worked as a Junior Engineer. The Maharani of Travancore took a personal interest in Leelamma and promoted her achievements to the other women in the city & kingdom to inspire them. The Junior Queen sponsored Leelamma's higher education in England, where she pursued Town Planning. Leelamma returned to India in 1947 when India was moving towards independence from British rule, this, in turn, impacted her career. Later she moved to Trivandrum where she worked with PWD as an Assistant Chief Engineer and completed many projects successfully.

She was included in the BBC's list of '100 Inspiring and Influential Women' around the World for 2019.

Janaki Seshadri

First Woman Civil Engineering Student(IIT)

In 1966, she was IIT Madras's first female student in Civil Engineering.

Janaki Seshadri was one of the first women to join IIT-M's B.Tech programme. She picked Civil Engineering as her major; She was just one female in the batch of over 200 men. Her male classmates took a couple of days to get used to the "intruder" in their midst, but afterwards things improved, Janaki wrote in the student magazine Campus Times.

In a curriculum designed to keep students on their toes, workshop week would alternate with lecture week. The woman entered the machine shop in khaki coat, worn over half-sari, and picked up the tools of carpenters, welders, and fitters.The models she created that first week were far less impressive than the blisters and bruises on her hands. But her skills got better and prepared her for what lay ahead.

"Working in a plant is quite different from being a software engineer," she says.

Sunia Chib

First Woman Officer from Reasi

Sunia has made her family proud after she topped the merit list of Women Officers Technical Entry **(Civil Engineering)** of Indian Army in 2018. She joined the Indian Army on the Lieutenant rank. She is the first woman officer from Reasi, Jammu & Kashmir.

Sunia is the daughter of Retd. Subedar Jagdev Singh who is a veteran of Artiliary. She continues her legacy to serve in the Indian Army as her grandfather Late Th. Suram Singh Chib served in the JAK Rifles Regiment of Indian Army and then her father served as Subedar in the Artillery Regiment. She is now the third generation to wear Olive Green uniform and serve the motherland.

"The love for my country runs in the blood of my family. I took it as a challenge to wear the uniform which my forefathers have been wearing", Sunia said.

Sunia completed her schooling from Kendriya Vidyalaya No-1 Udhampur. After which she appeared for B.Tech.She completed her B.Tech in Civil Engineering from Rajasthan. During her graduation, she applied for SSCW(Tech)-21 course. She was called for SSB in Allahabad SSB Centre. She was selected in her first attempt and was ranked 1st in the merit list.

Prerna Shinkar

First Woman Executive Engineer

Prerna Shinkar is Pimpri-Chinchwad's first woman Executive Engineer.

Shinkar took up the challenge of getting into civil engineering, generally considered strenuous for women, all those years ago and worked her way up the ladder by playing key roles in many important civic works. Nearly 50 years after it came into existence, the Pimpri-Chinchwad Municipal Corporation (PCMC) had a woman as Executive Engineer as Prerna Pradeep Shinkar (51), a Civil Engineer with PCMC for 25 years.

After completing her Civil Engineering from SSVP college in Dhule, she worked with Pune's Wadia College for a couple of years and then joined PCMC as a Junior Engineer in 1996. Nearly 16 years later, she was promoted as Deputy Engineer and she bagged the coveted post of Executive Engineer. Getting the Defence Ministry permission for road work in Dighi was another big achievement. During her career so far, twice she was honoured as the meritorious employee of the civic body. “Civil engineering field requires a lot of energy and grit. It is a challenging field for women. It is not a desk job, you have to go right on the field to accomplish the job. I got an opportunity to work on the field and did not hesitate one bit to take up with the challenge”, she once said. From 1996 to 2021, She worked with different municipal Commissioners.

Chitra Swaroop

First Woman Engineer, UP PWD

Chitra Swaroop, the first woman Engineer-in-Chief of Uttar Pradesh Public Works Department, was also the first woman to head the PWD of any state in the country. Swaroop who was given the charge of Engineer-in-Chief (Development) and HoD, was Engineer-in-Chief (Rural Roads) for eight months in PWD.

In 1971, Chitra Swaroop joined B.Sc (Civil Engineering) course at Aligarh Muslim University after passing her higher secondary. Swaroop was the only girl in her class at AMU. In 1977, she joined as Assistant Engineer in the Irrigation Department of UP, where she worked in the bridge designing section. After working for three years in irrigation, she joined the PWD in 1980 as Assistant Engineer in the building designing section. Her first major project was the construction of a Sales Tax Office in Ghaziabad in 1980s.

Swaroop, in her three-decade career with PWD, has worked in Meerut, Agra and Gorakhpur zones. Her important projects were construction of Meerut-Bulandshahr, Meerut-Garh, and Meerut-Muzaffarnagar highways which were World Bank aided projects. More than 40 years—through classrooms and workplaces almost without any woman colleague—Swaroop has made history by becoming the first woman Engineer-in-Chief of the Uttar Pradesh Public Works Department at the age of 57.

Vaishali S. Hiwase

First Woman Commanding Officer (CO), RCC

Vaishali Sureshchandra Hiwase from Wardha was appointed as the first woman Commanding Officer (CO) by Border Road Organisation for a Road Construction Company (RCC) responsible for providing forward connectivity along the India-China border. Vaishali Hiwase, Executive Engineer (Civil) in BRO, also served in Kargil for years.

"With two air-maintained detachments located at 10,000 ft and above, the alignment of road is going through some formidable passes and treacherous terrain of hard rock with vertical cliffs," stated a press release once issued by BRO, while giving the description of the work ahead for the woman officer.

This humble beginning by BRO will usher in a new era of women empowerment that will see women officers taking over most arduous tasks, stated the BRO press release. "#History in making," tweeted BRO.

Aaina

First All India Woman Officer RCC

Aina is the first Women Officer of the Corps of Engineers of the Indian Army to command a RCC and is presently posted as OC 75 RCC at Pipalkoti in Chamoli district of Uttrakhand.

She is responsible for construction and maintenance of the strategic Joshimath-mana-Mana Pass Road. What makes her assignment even more interesting is that all the three Platoon commanders under her are also Women Officers. She is thus the Officer Commanding of the first All Women Officers RCC.

In addition, she has also actively taken part in various Combat Engineering related activities when she was posted with her unit in the forward Areas.

Archana Parmar

First Woman Chief Engineer in Himachal Pradesh

Archana Parmar opted for civil engineering when it was rare for women to take up engineering nearly four decades ago.She has come a long way through sheer dint of hard work in the field. Making inroads into yet another male bastion, Archana Parmar, 54, took charge as the first woman Chief Engineer of Himachal Pradesh in 2020. She joined the state public works department in 1988 after graduating from Punjab Engineering College, Chandigarh, She feels her new assignment as Chief Engineer, national highways, of the hill state as challenging. “I have a long experience in field postings but this assignment is certainly challenging. I'm proud to have got a bigger opportunity to serve my state,” she says.

She worked as the Executive Engineer of PWD, Solan division, from 2007-08 and was posted as the Superintending Engineer under the Pradhan Mantri Gramin Sadak Yojana in 2015. She also worked as AE and Xen, PWD design, in Palampur, Nurpur, Bilaspur, Solan and Shimla. Archana is In-charge of the state’s nine national highways with a total length of 1,250km.

Kanika Sharma

First Female Chief Engineer in the
Entire Energy Sector of Rajasthan

Ms. Kanika Sharma nee Agarwal is an Electrical Engineer from MNIT, Jaipur (erstwhile MREC) from the batch of 1983. Back then, she was one of the only two females in her year, and then went on to become one of the first females to join the Rajasthan State Electricity Board (now, Rajasthan Vidyut Prasaran Nigam) in 1984. Since then, her journey has been that of many firsts - First Female Executive Engineer, First Female Superintending Engineer and now, the first female Chief Engineer in the entire energy sector of Rajasthan. It's under her keen eye that the state has seen the design and construction of many grid substations and lines. Apart from many 400 kV substations, the only two 765 kV station projects have been executed under her supervision.

At present, Kanika is heading the Jaipur Zone of transmission and construction wing at RVPN. Her service of 37 and a half years has been full of varied experiences - with management of all kinds of tenders, the design wing, installation of computers during the transition of technology along with the project and planning division. She has also represented her field while on inspection of GIS based modules in Germany, which were later installed in the State. Along with that, she was also a part of the delegation which travelled to Japan to study the solar innovations of the country, and evaluate its scope in Rajasthan. She is an epitome of hard work and dedication at best.

Harpreet Kaur

First Woman Chief Engineer Commercial

Harpreet Kaur was among 7 technocrats promoted as Chief Engineers by the Punjab State Power Corporation Limited in 2018. With this, she becomes the third woman to attain the position of Chief Engineer in the state-run power entity. PSPCL has set an inspiring precedent by promoting a woman technocrat to the post of Chief Engineer.

Before promotion as the Chief Engineer, Commercial at Patiala, she had been serving as Deputy Chief Engineer, Punjab Bureau of Investment Promotion, Chandigarh. She is the first women appointed as the CE, Commercial.

Harpreet Kaur comes from a family of technocrats. She is a product of Punjab Engineering College.She had joined the erstwhile Punjab State Electricity Board (PSEB) in November 1985 before its trifurcation. She has also served as Executive Engineer, Technical at Mohali.

Rajyalakshmi Reddi

First Woman Telecommunications Engineer in India

Rajyalakshmi Reddi, the first woman Telecommunications Engineer in India and the oldest living woman engineer from the College of Engineering, Guindy (CEG)

CEG was the first engineering college in India to introduce Telecommunications Engineering. That was in 1945. Rajyalakshmi had joined the Electrical Engineering stream (also a first in India, in 1930) but when Telecommunications was introduced, the new course beckoned and she switched.

On graduation, she joined Indian Telephone Industries, Bangalore, but in November 1948 moved to All India Radio, Delhi, as a sound engineer in the control room. It was an opportunity to work on the technical aspects of recording personalities like Jawaharlal Nehru, Lata Mangeshkar (who demanded perfection), MS and Melville D'Mello among others.

Navneet Duggal
First Col.Woman Officer E & ME

She is presently posted as Officer Commanding 1053 Field Workshop at Srinagar under Project Beacon and is responsible for providing essential repair cover to BRO teams deployed for road construction in this vital sector.

She is amongst the first women officers of the Indian Army Corps of Electronics & Mechanical Engineerings to be conferred the rank of Colonel. She has represented India and the Army in Rifle Shooting in Military Games in Norway in the 50 Meters & 300 meters and won many medals and previously held a National Record in the 300 meters Rifle event.

Avani Chaturvedi

First Indian Woman Pilot to take a solo flight in a MiG-21

Flight Lieutenant Avani Chaturvedi (born 27 November 1993) is an Indian pilot and was declared as the first woman combat pilot along with two of her cohorts.

She Completed her B.Tech from Banasthali University, Rajasthan in 2014 where she joined that college's flying club which fascinated her to fly. She passed the AFCAT and further was recommended by AFSB.

Avani Chaturvedi was selected to train at Hyderabad Air Force Academy and completed the training at the age of 25. After completing one year of training there, Chaturvedi became a fighter pilot in June 2016. Chaturvedi completes Stage III training at Bidar in adjoining Karnataka next year,as was eligible to fly fighter jets like the Sukhoi Su-30MKI and Tejas. In 2018, Chaturvedi became the first Indian woman pilot to take a solo flight in a MiG-21. In 2018 Avani was promoted to the rank of Flight Lieutenant.

In 2018, she was honored with the doctorate degree from Banasthali Vidyapeeth. On 9 March 2020, Chaturvedi was awarded with Nari Shakti Puraskar by President Sh. Ram Nath Kovind.

Bhawana Kanth

First Female Fighter Pilots of India

Bhawana Kanth was declared as the first combat pilot along with two of her cohort, Mohana Singh, and Avani Chaturvedi. The trio was inducted into the Indian Air Force fighter squadron in June 2016. They were formally commissioned by the then Defence Minister. After the Government of India decided to open the fighter stream in India Air Force for women on an experimental basis, these three women were the first to be selected for the program.

She graduated as Bachelor of Engineering in Medical Electronics in 2014 and was recruited for IT giant Tata Consultancy Services.Kanth had always dreamt of flying planes. She took the Air Force Common Admission Test and was selected to be commissioned into the Air Force. As a part of her Stage 1 training, she joined the fighter stream.

In June 2016, Kanth underwent a six month long stage-II training on Kiran Intermediate Jet Trainers at Hakimpet Air Force Station in Hyderabad soon after which she got commissioned as Flying Officer at Combined Graduation Parade Spring Term at the Air Force Academy in Dundigal the same year.. Flying Officer Bhawana Kanth on 16 March 2018 takes the solo flight of Mig-21 'Bison'. She made the solo flight of Mig-21 from Ambala Air Force Station at around 1400 hours.

She was awarded with Nari Shakti Puraskar by President Sh. Ram Nath Kovind.

Mohana Singh Jitarwal

First Female Fighter Pilots of India

Mohana Singh Jitarwal is one of the first female fighter pilots of India. She was declared as the first female combat pilot along with two of her cohort, Bhawana Kanth, and Avani Chaturvedi. All three women pilots were inducted into the Indian Air Force fighter squadron in June 2016. They were formally commissioned by the then Defence Minister. After the government of India decided to open the fighter stream in India Air Force for women on an experimental basis, these three women were the first to be selected for the program.

Mohana Singh completed her BTech in Electronics & Communication from Global Institute of Management and Emerging Technologies, Amritsar, Punjab. On 9 March 2020, she was awarded with Nari Shakti Puraskar by President Ram Nath Kovind.

In June 2019, she became the first women fighter pilot of Indian Air Force to fly a Hawk Mk.132 advance jet trainer. She had completed more than 380 hours of incident free flying on Hawk Mk.132 with training in both Air-to-Air and Air-to-Ground fighting mode in 2019.

N. Valarmathi

First Abdul Kalam Awardee for Indigenously-Developed Radar Imaging Satellite.

N. Valarmathi is an Indian scientist and project director of RISAT-1, She is the first person to receive Abdul Kalam Award, instituted by Government of Tamil Nadu in honour of the former President Dr. Abdul Kalam in 2015. She was born in Ariyalur, Tamil Nadu and went to the Nirmala Girls Higher Secondary School. She graduated her Bachelor of Engineering from Government College of Technology, Coimbatore and Masters in Electronics and Communications from Anna University.

She has been working with the ISRO since 1984 and involved in many missions including Insat 2A, IRS IC, IRS ID, TES. She became Project Director of India's first indigenously-developed Radar Imaging Satellite RISAT-1, which was launched successfully on 2012. She is the second woman scientist of Indian Space Research Organisation (Isro) to head a project after Anuradha TK, project director of the GSAT-12 mission in 2011

Susmita Mohanty

First Space Entrepreneur in the World

She is Spaceship Designer, Serial Space Entrepreneur and a Climate Action advocate. She is well known for her research on space related topics. She co-founded India's first private space start-up, Earth2Orbit in 2009. She is the only Space Entrepreneur in the world to have started companies on three different continents in Asia, Europe and North America. Susmita is one of the few people to have visited both the Arctic and Antarctica.

She was born in Cuttack and was raised up in Ahmedabad. She was highly influenced to venture into space research by her father Nilamani Mohanty who was a former ISRO Scientist.

She completed her Bachelor's degree in Electrical Engineering from Gujarat University and Master's Degree in Industrial Design from the National Institute of Design in Ahmedabad. She also completed Masters in Space Studies from the International Space University in Strasbourg.

She co-founded Moonfront, an aerospace consulting firm based in San Francisco in 2001, which marked her entry into space entrepreneurship. She also co-founded Liquifer System Group (LSG), an aerospace architecture and design firm in Vienna, Austria in 2004. She also served as one of the prominent members of the American Institute of Aeronautics and Astronautics Aerospace Architecture for over a period of ten years while she was residing in California. In 2005, she was conferred with the International Achievement Award for promoting

international cooperation. She was included in the elite list of 25 Indians to Watch by the Financial Times magazine in 2012 and also featured on the front cover page of Fortune magazine in 2017.

She was nominated to the World Economic Forum's Global Future Council for Space Technologies for a period of three consecutive years from 2016 to 2019.She was included in the BBC's list of 100 inspiring and influential women from around the world for 2019.

Rita Rajkhowa

First Lady Electrical Engineering
Graduate of North East

She was born on 1st January 1949 at Guwahati. She is the first girl student to have joined Assam Engineering College, Guwahati and also in entire north east to pursue an Engineering Degree Course.

She has a Master Degree in Electrical Engineering from Delhi University and also has PGDCA from Institute of Advanced Studies in Science & Technology (IASST), Guwahati.

Mrs Rajkhowa has also served as Joint Director (Vocational Education) National Open School, Govt. of India, New Delhi on Deputation and retired as Principal of Govt Girls' Polytechnic, Guwahati, Assam after serving for six years.She is the founder President of Women Engineers' Forum of Assam (WEFA), an organization of women engineers set up specially for uplift of women and girl students and other meritorious but poor students. She is also the founder President of Geetashree Sangha, a Women's Non-Governmental Organization based in Guwahati, Assam. As the Chairperson of Muskan Welfare Society- A Rajbhavan based NGO, she has been taking active interest in the welfare of the physically challenged and weaker sections of the women & girls in particular .Mrs. Rajkhowa loves Indian Classical Dance, i.e. Bharat Natyam, Sattria Dance, Manipuri Nritya, Kathak and also folk dances like Assamese Bihu. She is also fond of musical instruments, i.e. Mendolin and Violin in particular. As for hobbies, she likes housekeeping, interior decoration, stitching, knitting, cooking and gardening. Among sports, she enjoys playing billiards, table tennis etc.

Harsharan Kaur Trehan

First woman Engineer-in-Chief
in the State Power Corporation

An alumnus of Delhi College of Engineering, Harsharan Kaur joined PSPCL (erstwhile PSEB) in 1987.Harsharan Kaur Trehan was appointed as the Engineer-in-Chief, Material Management Wing, Punjab State Power Corporation Limited (PSPCL). An alumnus of Delhi College of Engineering, Trehan had joined the PSPCL (erstwhile the PSEB) in 1987 as an Assistant Engineer.

Meera Sinha

First Female Serial Test Engineer

Meera Sinha joined Alstom in July 2018 as a graduate engineer trainee after completing her Bachelor's in Electrical Engineering from National Institute of Technology, Patna. She works at Alstom's electric locomotive manufacturing unit in Madhepura. Right from the beginning, she got a chance to work with different departments like Production and Sourcing, which helped her learn new things.

She currently works as a Serial Test Engineer in Testing and Commissioning Department.Working with a team of 40 people, Meera's responsibility is to encourage the team to ideate on improvements and track its implementation while documenting the product tests. She was the first woman to join the testing department. Post Covid 19 Alstom has started delivering electric locomotives to Indian Railways that are being deployed for commercial operations.

Anjali Joshi

First Women Broadband Facilitator

Anjali Joshi, Google's Vice President of Product Management, has over 10 years of experience in Google and she is fiercely known for being an engineer who can handle any kind of problems in the organization. She has worked on Google's cloud and infrastructure and has handled news and finance as well. As a leader for the product and engineering team, she's responsible for several products that also include search, image search, health search, maps, translation and localization.

Anjali Joshi completed her B.Tech. in Electrical Engineering from IIT Kanpur in 1981. Following it, she went to the USA and obtained her master's degree in Computer Engineering from the State University of New York and another master's in Engineering Management from Stanford University. In 1989, she joined AT&T Bell Laboratories and spent several years working in the areas of voice and high-speed data communications. She was a principal member of the technical staff and worked in different capacities including Signaling Network Technology/ Architecture Planner and Technical Program Manager handling ATM/ IP Network Implementation and Service Development for AT&T Interspan High Speed Services. In 1998, she joined Coved Communications Group Inc., the first service provider to offer a national DSL broadband service, as the Executive Vice President of Network Engineering.

Reshma Mathew

First Woman Chief Electrical Engineer, Goa

In 2018, Goa State Government appointed Reshma Mathew as the Chief Electrical Engineer. Mathew, who was Superintending Engineer with the State Electricity Department, is the first woman to hold the post.

Reshma the daughter of Suresh Kenkre from Benaulim was the first lady Junior Engineer in the electricity department and subsequently went on to be the first lady Assistant Engineer and Superintending Engineer from where she was appointed as the Chief Electrical Engineer making her the first lady CEE.

Monisha Ghosh

First Woman Chief Technology Officer
at the US Government's Powerful
Federal Communications Commission

Dr Monisha Ghosh is the Federal Communications Commission's first female Chief Technology Officer. The FCC regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and US territories.

Dr Ghosh has both conducted and overseen research into cutting-edge wireless issues in academia and industry.Her expertise is also broad, ranging from the internet of things, medical telemetry, and broadcast standards. .

Ghosh received her Ph.D in Electrical Engineering from the University of Southern California in 1991, and B.Tech from the Indian Institute of Technology, Kharagpur in 1986. She is a Fellow of the Institute of Electrical and Electronics Engineers. According to the FCC, Ghosh has been serving as a rotating Program Director at the National Science Foundation since September 2017 in the Computer and Network System Division within the Directorate of Computer and Information Science and Engineering.

Dr Ghosh has done outstanding work during her time at the National Science Foundation (NSF)."As a Program Director with the Division of Computer and Network Systems, she has contributed to programs supporting advanced wireless research including innovative uses for spectrum and wireless spectrum sharing.

Vinita Gupta

First Woman of Indian origin to take her Company Public in the US

She is an Indian-born American businesswoman. She is the Founder and Chairman of Digital Link Corporation (now Quick Eagle Networks). She is credited with being the first woman of Indian origin to take her company public in the United States. Gupta was born in 1949 in India and spent her early years in Delhi. In 1973 she earned a Bachelor's Degree in Electronics and Communications from the University of Roorkee (now Indian Institute of Technology Roorkee). In 1974 she came to the United States and earned an M.S. in Electrical Engineering from University of California, Los Angeles.

In her early career, Gupta worked as an engineer for GTE Lenkurt and later held engineering management positions at Bell Northern Research (now part of Nortel Networks). In May 1985 Gupta founded Digital Link Corporation, a company which engaged in the design, manufacture, marketing, and support of digital wide-area network access products for global networks.The company went public in 1994 and was later renamed as Quick Eagle Networks. Gupta still serves as Chairman, Chief Executive Officer and President. Gupta also serves as Chairman of Palo Alto Medical Foundation Research Institute. She also serves on the board of Indian School of Business (ISB), Hyderabad and Cancer Prevention Institute of California. Gupta holds two US Patents, one for a solid state relay issued in 1984 and another for a square root circuit issued in 1986.

For two consecutive years, Working Woman Magazine has named Digital Link one of the top 500 women-owned businesses in the United States. She was 1999 honoree at Asian Pacific Fund.

Rama NS

First Woman Engineers from Karnataka
who put Electronic City on the Global Map

Rama NS is one of Karnataka's first woman Engineer who traces 50 years of her career at corporates like ITI, Infosys and ELCITA. She dons multiple hats as a mentor, women's rights supporter, and teacher. Rama NS became one of the first women in Karnataka to graduate from an engineering college. After completing her electrical engineering course in 1970 with a gold medal, Rama joined Indian Telephone Industries.

In the last five decades, Rama, the adviser of Electronics City Industrial Township Area (ELCITA), a first-of-its-kind self-governed municipality in India, tread several paths, battled many stereotypes, took on challenges head-on in diverse fields to become the formidable leader she is today. Rama traces the different aspects of her career — her engineering college experiences, her path-breaking work with NEC and Infosys, or her initiatives against sexual harassment not with pride, but with a lot of empathy and understanding of the times she lived in, and how they are changing.

Believe in yourself- She believes though women have come a long way from when she first started 50 years ago, they still have to live up to expectations of handling both family and work efficiently.“I think a lot of women doubt that they can do it. Rama believes one has to go beyond one's comfort zones and keep learning on the job. She also says managing our ego is very important without compromising on self-respect. Also, networking is an essential tool to get ahead in one's career and life.

Anuradha T.K.

First Woman to Become a
Satellite Project Director at ISRO

Anuradha T.K is a retired Indian Scientist and Project Director of the Indian Space Research Organisation (ISRO), specialized communication satellites. She has worked on the launches of the satellites GSAT-12 and GSAT-10. She is the senior most female scientist at ISRO, having joined the space agency in 1982, and also the first woman to become a Satellite Project Director at ISRO.

She was born in Bangalore in 1960. She graduated with a Bachelor's Degree in electronics from the University Visvesvaraya College of Engineering in Bangalore. Unlike many of her classmates, she choose to stay in India to pursue her career.

Anuradha TK is a distinguished Scientist working as Director SATCOM, who was earlier Indian Geosat Programme Director at ISRO Satellite Centre. She works in the area of geo-synchronous satellites, which are crucial to telecom and data links. She has been a leading figure in several Indian space programs.

Anuradha's role was instrumental in developing and launching the ISRO communication satellite GSAT-12 satellite into space from the Satish Dhawan Space Centre on 15 July 2011. She supervised and headed the technical group of 20 engineer.

After working with the GSAT-12, Anuradha TK led the launch of the much bigger communication satellite GSAT-10 in September 2012.

As the Project Director, she also oversaw the launch of the GSAT-9,

GSAT-17 and GSAT-18 communication satellites. She has also served as Project Manager, Deputy Project Director and Associate Project Director for the Indian Remote Sensing and the Indian Regional Navigation Satellite System programs. Her specialty is satellite checkout systems which observe a satellite's performance once it is in space.

Muthayya Vanitha

Chandrayaan-2.
First Woman Project Director at ISRO

Muthayaa Vanitha was born on 2 August 1964, Chennai. She graduated from College of Engineering, Guindy.

Vanitha was promoted from Associate Director to Project Director for ISRO's Chandrayaan-2 lunar mission. She is the first woman to lead an interplanterary mission at the ISRO. Vanitha's responsibilities include ensuring complete oversight of the development and implementation of all systems and acting as a point of authority for the project. The launch successfully occurred on 22 July 2019. She is the first woman to lead an interplanetary mission at the ISRO. Muthayya Vanitha is an Indian electronics system engineer who has led projects on satellites at the Indian Space Research Organization. She was also the Project Director of the Chandrayaan-2 lunar mission of the ISRO.

Vanitha has worked at ISRO for over three decades. She joined the ISRO as a Junior Engineer working in various areas of hardware testing and development. She later succeeded to managerial positions, leading the Telemetry and Telecommand Divisions in the Digital Systems Group of ISRO Satellite Centre. She has also acted as Deputy Project Director for several satellites including Cartosat-1, Oceansat-2, and Megha-Tropiques, where she was responsible for data operations. Vanitha was also involved in the successful Mangalyaan mission to Mars in 2013.

Anioushka Lomas

First Woman Engineer for Fighter Aircraft

An electronic engineer by qualification, she grew up in Delhi to an engineer father and an anthropologist mother. A determined girl, Lomas knew she wanted to work with nothing less than fighter aircraft.

After she completed her training, she had to submit a form with top three preferences—She wrote Mirage, Mirage, Mirage in all three spaces," and Mirage 2000 is exactly what Lomas got.

Lomas keeps incredibly busy outside of her job: she has a combat para jumping patch; she's a Hindustani classical singer.

"A woman officer invests more dedication, hard work and follows a zero-error effort by being more situationally aware and cautious," states Lomas. "Women have a better capacity to handle emotions and work pressures and are more sensitive to the needs of their colleagues and subordinates, which helps build a good rapport."

J. Manjula

DRDO's First Woman Director-General

J. Manjula had been named the Defence Research and Development Organisation's First Woman Director-General, and took charge of the Electronics and Communication Engineer Systems cluster.

Until her elevation, Ms. Manjula, who is a DRDO Outstanding Scientist, was Director of the Defence Avionics Research Establishment, Bengaluru, since July 2014.

An alumna of Osmania University and a practising electronics and communications engineer, Ms. Manjula joined the DRDO in 1987 after a brief stint in Electronics Corporation of India Ltd. At the Defence Electronics Research Laboratory, Hyderabad, she worked in the area of integrated electronic warfare and is credited with developing fast signal acquisition receivers, high power RF systems, responsive jammers and controller software for various systems used by the military and the paramilitary.

Her specialisation includes configuration of communication and radar ESM and ECM systems. Ms. Manjula has been conferred the DRDO award for performance excellence, the Scientist of the Year award for 2011 and the India Today Woman Summit award for 2014.

Bipasha Hrangkhawal

First Woman Air Traffic Controller (ATC) of Tripura

Bipasha Hrangkhawal, a 26-year-old tribal girl from the remote Rangamura village in Khowai district has scripted history by becoming the first woman Air Traffic Controller (ATC) of Tripura. Bipasha Hrangkhawal is a graduate in electronics and telecommunication engineering from Mumbai University.

She began her career as an Assistant ATC in the Chhatrapati Shivaji International Airport, Mumbai, in 2017. But she was shifted to the MBB Airport after few months as she had to look after her ailing father.

After being persuaded by her father, she applied for the post. After clearing the interview, Bipasha underwent a six-month training.

“I feel proud that I am sitting in the ATC guiding aircraft. Working at the ATC is considered to be one of the most difficult jobs since we are constantly dealing with a number of flights carrying hundreds of passengers. One silly mistake can finish everything in seconds," she said.

Smita Khodke

First Lady Agricultural Engineer in Maharashtra

She has received the recognition as the "First Lady Agricultural Engineer in Maharashtra". Currently she is working as the Head of Department at Agriculture Process Engineering at College of Agricultural Engineering and Technology at Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. She developed 12 innovative and efficient food process technologies, and 5 machineries and equipments for small scale entrepreneurs and industries. Published more than 50 research articles, 5 book chapters, 2 books and more than 25 extension publications, Visiting speaker on many TV programs and Radio Talks.

Awards received :

1) Distinguish Services award (2013) for Professional Services in Agricultural Engineering - awarded by ISAE, New Delhi
2) Best Teacher Award (2012) - awarded by VNMKV, Parbhani
3) S.J.Hiran Award (2010) in recognition of development of innovative technologies in Soybean Food Processing - awarded by ISAE, New Delhi
4) Commendation Certificate (2005) - awarded by NAARM Hyderabad.

Rashmi Urdhwareshe

First Women Emissions Researcher

Rashmi Urdhwarde nee Ranade (born c.1959) is an Indian automotive engineer. She is the Director of the Automotive Research Association of India. In March 2020 she received the Nari Shakti Puraskar. In 1977 she opted to study Electrical Engineering at Visvesvaraya National Institute of Technology, Nagpur and then completed her post graduation from COEP in Automotive Engineering which was then an unusual and challenging choice of career for a woman in India.

Her areas of expertise are automotive safety, emissions and ambient air quality (AQM), E-mobility, sustainable transport, vehicle regulation, homologation, etc. She was an expert on total quality management and co-authored a book on the subject. She was keen on sport as a girl, learned to play the sitar and she was a champion at Bridge for her state. She was chosen to be the next director of the Automotive Research Association of India in 2014.In March 2020, her work in 2019, was recognised with the highest award for women in India.

The Nari Shakti Puraskar was given by the President of India Sh.Ram Nath Kovind recognising her work over 35 years work in automotive research and development.

Akanksha Kumari

First Woman Engineer for
Underground Coal Mines

As a new example of breaking the glass ceiling, Akanksha Kumari became the first ever female mining engineer in India who is working with the underground coal mines. An employee of the Central Coalfields Limited (CCL), Akanksha has secured the proud spot of the first ever woman to work in the underground mines of in all these years of Coal India's history.

Akanksha joined CCL at its Churi underground mines in the Jharkhand's North Karanpura area and her achievement was shared by the social media handle of the CCL, a subsidiary of Coal India. “A graduate of BIT Sindri, Ms Kumari broke the gender barriers by joining Churi UG mine, NK Area. She became the 1st women mining engineer in the history of CIL to work in underground mines," it said.

Annie Sinha Roy

India's First and only Woman Tunnel Engineer

Annie has played a monumental role in the Bengaluru Metro Project. Annie has helped develop the 4.8 km east-west underground track of Namma Bangalore – the country's first underground metro line in southern India – that will run from Cubbon Road to Vidhana Soudha.

Annie hails from a middle-class family in North Kolkata. She got a job to help her family's financial crunch which led to her joining Senbo, a contractor company with Delhi Metro in 2007.

It was in 2009 when she took up work with Chennai Metro, after which she flew to Doha in 2014 for six months. She started working with Bangalore Metro Rail Corporation (BMRC) in 2015 as assistant manager. In BMRC, Annie single-handedly steered Godavari - the tunnel-boring machine that recently finished carving out the underground track from Sampige Road to Majestic. She called it her tunnel because the moment she hopped on board, the machine got damaged. After that moment, Annie started spending eight hours in the tunnel every day. "Sometimes when people see me with the helmet and jacket and learn that I work for Namma Metro, they would only ask when the work will get over," added Annie. When asked what message she had for all the women out there, Annie said, "I want women to drive a tunnel boring machine. I want them to work in the tunnel."

Lila Firoz Poonawallala

First Indian woman to secure a Professional Degree in Mechanical Engineering

She was born on 16 September 1944 in Hyderabad in the Sindh region in British India as one of the five children in a Sindhi family. She lost her father when she was three years old and, during the partition of India, her family moved to India as refugees to settle in Pune. She is the first Indian woman to secure a professional degree in Mechanical Engineering and is a former chairperson of Alfa Laval India and TetraPak India. She was awarded the fourth highest civilian award of Padma Shri by the Government of India in 1989 and the Order of the Polar Star by Carl XVI Gustaf, the King of Sweden, in 2003.

She graduated in mechanical engineering with first class from the Government College of Engineering under the University of Pune in 1967.She worked as a trainee engineer, to the Indian division Alfa Laval, the Swedish multinational, where she worked in various positions to rise to hold the office of the Chairperson in a span of two decades, thus becoming one of the first woman CEOs in India.

During her career, she pursued management studies at the Indian Institute of Management, Ahmedabad, Harvard University and Stanford University. Under her management, Alfa Laval India operations grew from 500 million to 2.5 billion and eventually she took over the TetraPak operations in India as its Chief Executive Office, serving the companies till her retirement in 2001.

Shivangi

First Female Indian Naval Fighter Pilot

Shivangi was born on 15 March 1995 in Muzaffarpur district of Bihar. Shivangi hails from a humble agricultural background. During her childhood, she was captivated by the sight of seeing a politician using a helicopter to attend a political gathering in her native village, which inspired her to become a pilot.

She obtained a Bachelor of Technology degree in Mechanical engineering from Sikkim Manipal Institute of Technology. Shivangi further studied at the Malaviya National Institute of Technology in Jaipur.

Shivangi was inducted into the Indian Navy under the Short Service Commission (SSC)-Pilot entry scheme. In June 2018, she was commissioned into the Indian Navy. She undertook two successive six month courses; first the Naval Orientation Course at the Indian Naval Academy, and the second at Air Force Academy where she trained on the Pilatus PC 7 MkII aircraft. In the six months prior to December 2019, she learnt flying the Dornier aircraft at the Indian Naval Air Squadron 550. Sub Lt. Shivangi became the first female fighter pilot of the Indian Navy on 2 December 2019.

Shivangi Singh

First Woman Fighter Pilot to FLY Rafale

Flight Lieutenant Shivangi Singh is the first woman pilot in the Rafale squadron of the Indian Air Force (IAF). She underwent conversion training, a course pilots take to switch from flying one aircraft to the other, and got inducted into the Ambala-based 17 Squadron 'Golden Arrows.

Hailing from Varanasi in Uttar Pradesh, Shivangi Singh, who is one of IAF's 10 women fighter pilots, joined the air force in 2017. She has been flying the MiG-21 Bison aircraft and served at a fighter base in Rajasthan.

A graduate from Banaras Hindu University, where she was a part of the 7 UP Air Squadron in the National Cadet Corps (NCC), Singh was commissioned into the IAF in 2017 as part of the second batch of women fighter pilots.

Poonam Rawat

First Combat Assault Bridging Troop
Commander Corps of Engineers, Indian Army

Lt. Col Poonam Rawat is a third generation Army Officer, She graduated in Mechanical Engineering from Army Institute of Technology, Pune in the year 2001 and joined the Indian Army as a Assault Bridging Combat Engineer. Having excelled in Combat Engineering tasks in operations First combat assault Bridging troop commander , she diversified into the field of Infrastructure development. Poonam ushered the provisioning of optimized water supply and electricity solutions for Military Garrisons based on the SCADA System. She was instrumental in planning and execution of an efficient water harvesting and supply system for a Military Garrison in mountainous terrain.

The challenge of maintaining a Forward Air Base as the Garrison Engineer, was effectively met by the officer. She ensured that the runway remained adequately maintained and resurfaced, thereby facilitating unhindered flying operations for maintenance of forward military posts along the Line of Actual control. The officer has undergone the Special Short Staff Course and served in a Mountain Brigade in the Eastern theater as a Staff Officer. She has served in Desert and Mountainous terrain along the Western and Eastern borders and was posted in the Jammu & Kashmir theatre during the post Uri operations providing infrastructure and sustenance support to the troops deployed along the Line of Control. For her meritorious service she has also been awarded the Vich Chief of Army Staff Commendation.

Lt. Col Poonam having contributed towards combat as well as infrastructure development of the Armed Forces has now further diversified into the field of management. Presently she is undergoing a Management Course at MDI, Gurgaon.

Bibhusita Das

First Odia Woman Marine Engineer

She is first Odia woman to become a marine engineer. Das is the first woman from Odisha to serve as an officer on a shipping vessel. As the only woman in an otherwise all-male crew she has defied social pressure and set aside societal conventions to do so.

Bibhusita Das was born and brought up in Cuttack, Odisha. Her father Kurunakar Das is a retired Bharat Sanchar Nigam Limited (BSNL) employee. The youngest of four sisters, she credits her parents for their support and encouragement.

Das completed a four-year Bachelor of Technology (B. Tech.) at C. V. Raman College of Engineering, Bhubaneshwar, Odisha in 2007. She was the only one of the 7 girls in her engineering group to opt for on-board sailing. After working as a lecturer in Tirunelveli for six months, she was hired by the Shipping Corporation of India and opted for an on-board position.In 2012, she was promoted to third engineer at the Shipping Corporation of India In 2013, as the Marine Engineer of the cargo ship MV Biswamahal, Bibhusita Das was felicitated by the Port Trust, after the ship arrived in Paradip port en route from Australia.

Her work involves hard physical labor managing the ship's machinery. Voyages can last up to six months at a time. Her job has enabled her to travel to many countries including Australia, South Africa, Turkey, Britain, and Germany.

Suneeti Bala

First Woman Chief Engineer Onboard a Marine Vessel

In 2010, Suneeti Bala became the first woman chief engineer onboard a marine vessel. Bala is the managing trustee and co-founder of the International Women Seafarers Foundation (IWSF) that was launched in 2017. There is very little awareness among masses that women too can be seafarers: Suneeti Bala. She says while the percentage of woman seafarers is still very low in India and globally, fighting mindsets continues to be a challenge in the profession. An alumna of the Marine Engineering and Research Institute, she started her career as a junior engineer in 2002. Bala tells that shipping companies are yet to effectively address issues related to medical assistance, provision of sanitary napkins, maternity leave and sexual harassment.

Reshma Nilofer Naha

First Lady Marine Pilot of India

Reshma Nilofer Naha is an Indian maritime pilot who currently involves in steering ships from sea to Kolkata & Haldia port. She received Nari Shakti Puraskar Award in 2019 from the current Indian President Ram Nath Kovind. She joined the Kolkata Port Trust in 2011 as a trainee and became Hooghly River pilot in 2018. She holds a B.E in Marine Technology from Birla Institute of Technology, Ranchi.

One of the most common questions people ask Ms. Reshma Nilofer, the first Lady Marine Pilot in India, is how safe the sea is for women. “It is a common belief that one needs to know swimming and what not to be safe on the ocean”, she says. “However, the current safety regulations and the safety equipment available through dependable manufacturers have ensured that safety is no longer an issue.”

Reshma Nilofer Naha is an Indian maritime pilot who currently involves in steering ships from sea to Kolkata & Haldia port. She became the first Indian as well as one among world's very few female marine pilots after qualifying as a river pilot in 2018.

Sonali Banerjee

First Woman Maritime Officer

In 1999, Sonali passed out of MERI as India's first woman marine engineer, the only girl among 1500 cadets. Soon after, she was selected by Mobil Shipping Co for a gruelling six-month pre-sea course. This hands-on training took her to ports in Singapore, Sri Lanka, Thailand, Hong Kong, Fiji and Australia.

Having passed this crucial course, on August 26, 2001, Sonali made history when she boarded a Mobil Shipping Co. Vessel and officially became the first Indian woman to take charge of a ship's machine room. Sonali's trail blazing journey opened a new chapter in the history of India's maritime industry. The most remarkable fallout was the interest and enthusiasm it sparked for seafaring among girls across the country.

Radhika Menon

First Female Captain of the Indian Merchant Navy

Radhika Menon is India's first female Merchant Navy Captain. She is regarded as India's first female master mariner. Captain Radhika Menon got her first command in the year 2012, when she assumed the post of radio officer with Shipping Corporation of India Ltd. She made India proud by winning the top international bravery award by the International Maritime Organisation (IMO) for 'Exceptional Bravery at sea 2016'.

Her display of great determination and courage in rescuing seven fishermen from the sinking boat Durgamma made her a household name back then.

She was born and raised in Kodungallur of Kerala. She completed a radio course at the All India Marine College in Kochi and initially began her career as a radio officer at the Shipping Corporation of India.

Radhika also co-founded the International Women Seafarer's Foundation (IWSF) on 3 November 2017 along with fellow naval officers Suneeti Bala and Sharvani Mishra in Mumbai with the objective of motivating young women seafarers. On 29 September 2019, she was honored by the Indian government as she featured in Bharat Ki Laxmi hashtag campaign which was introduced by the Indian Prime Minister Sh. Narendra Modi to celebrate the achievements of the Indian women as a part of the Mann Ki Baat series.

Aditi Pant

First Woman participating in an Antarctic Expedition

The First Woman who made India proud by participating in an Antarctic Expedition,Aditi Pant is an Indian oceanographer. She was the first Indian woman to visit Antarctica, alongside geologist Sudipta Sengupta in 1983 as part of the Indian Antarctic Program. She has held prominent positions at institutions including the National Institute of Oceanography, National Chemical Laboratory, University of Pune, and Maharashtra Academy of Sciences.

Pant completed her B.Sc at University of Pune (also known as the University of Poona). She was inspired to take up oceanography as a profession when she came across the book The Open Sea by Alister Hardy from a family friend. Pant then went on to pursue a PhD in Physiology in Marine Algae at Westfield College London University. Her thesis dealt with the subject matter of the physiology of marine algae. She went on to earn a SERC award and a stipend for her investigations.

Between December 1983 and March 1984, Pant embarked on an expedition to one of the most untouched regions on earth, Antarctica. This was the third in a series of expeditions spearheaded by then Prime Minister Indira Gandhi. During the course of the mission, the team built Dakshin Gangotri, the first Indian scientific research base station of Antarctica (located 2,500 km from the South Pole). Pant also participated in the fifth expedition to the Antarctic in 1984, carrying out research in oceanography and geology.

Chandrani Prasad Verma

First Female Mining Engineer

Chandrani Prasad Verma, now a Senior Scientist at CSIR – Central Institute of Mining & Fuel Research [CSIR-CIMFR] became the first female mining engineer in India in the year 1999.

After finishing her schooling in 1992, Chandrani did a diploma course in Mining & Mine Surveying in 1995 from Govt. Then the Labour Ministry announced last month that an amendment had been effected in the Mines Act 1952 to allow women to work in underground coal mines and also work night shifts in opencast mines, many received the news with cheer. One of them was Chandrani Prasad Verma. Chandrani, who is now employed as principal scientist with the Central Institute of Mining and Fuel Research in Nagpur.

Chandrani got admission to a diploma programme in mining, with some difficulty. Later, for a B.Tech degree in mining, the doors of most colleges that had that programme, were firmly shut on her face. "I had to fight for my admission in the court, and this battle went on for a year," says Chandrani, who got admission as a 'special case'. Finding a job in the mining field was not easy — and that was expected. Finally, in 2001, she got a job at CSIR as a project fellow. Chandrani has a Ph.D. in rock mechanics and numerical modelling.

Sandhya Rasakatla

First Underground Mine Manager (Rajasthan)

Sandhya Rasakatla made history when she was appointed the first-ever woman underground mine manager by Hindustan Zinc, one of the largest producers of Zinc-Lead and Silver. She took over the role as Mine Manager in the company's Zawarmala Mine in Rajasthan.

It was a moment of pride for the 23-year-old to receive this honour at a young age, one she credits to the complete support of her family. As a child, Sandhya grew up in a mine area as her father was a mining engineer at the Singareni Coal Mines in Telangana.

“After completing my XIIth grade, she enrolled at the Kothagudem School of Mines. In 2018, she joined Hindustan Zinc Limited through campus placement. “At the time, there was no option to go underground, work as a foreman, or shift-in-charge. The amendments in 2019 changed all that, and soon I started visiting the underground mine to gain experience in production and utility,” she says.Posted at the Zawarmala Mine in Rajasthan, Sandhya was excited to be underground, though this was not the first time for her. She had often visited the underground mine at Singareni with her father and also during her studies.As an Underground Mine Manager, Sandhya's role encompassed regular visits to the underground mine in shifts, interact with workers and employees, and learning new technologies on the job.

Yogeshwari Rane

First Underground Mine Manager (Rajasthan)

Yogeshwari Rane, became the Head, Planning and Development at the Kayad Mine in Rajasthan – making it a double honour for women in unconventional and hitherto male-dominated roles.

As a young girl living in Goa, Yogeshwari Rani grew up around mines. Once she completed her XIIth grade, as luck would have it, a degree in mining engineering was introduced at the Goa Engineering College in association with Vedanta. She was one of the three girls who were placed in Vedanta after completing the course. Yogeshwari joined as a graduate engineer trainee and for three years worked in the open cast mines in Goa in different departments – planning, operations, control room in-charge, etc.When mining was banned in Goa, she was transferred to Hindustan Zinc and for the first time, left Goa to work in an underground mine. She moved to the Rampur Agucha Mines in Rajasthan and currently works at the Kayadi Mines in the state.

Sandhya Rasakatla and Yogeshwari Rane - the first Indian women to be appointed as managers in an underground mine at Hindustan Zinc. Both Sandhya and Yogeshwari received the Second Class Mines Manager and the First Class Mines Manager certificates to be able to literally go where no “Indian woman has ever gone before”- overseeing operations in an underground mine.

Sunita Mishra

First Lady Mining Engineering Faculty

Sunita Mishra, who joined the Department in February 2020 and is the first lady to join the Mining Engineering faculty at IIT Kharagpur and probably in the country as well. A Mechanical Engineer, Prof. Sunita Mishra is Assistant Professor in , Department of Mining Engineering, IIT Kharagpur. Prior to that, she was a Postdoctoral Fellow in SIMLab, CASA: Center for Advanced Structural Engineering at Norwegian University of Science and Technology (NTNU), Norway. She has completed her Ph.D. in the area of Rock Dynamics from the Department of Civil Engineering at the Indian Institute of Technology (IIT) Delhi where she worked on the project titled 'Characterization of high strain response of rocks and it's application in blast analysis of tunnels.'

Currently, her research interests are:

- Development of Novel Cutting Technology for Mining Machinery
- Experimental Rock Dynamics
- Study on the Fracture Progration in Rock
- Development of Dynamic Testing Equipment
- Pull Out Tests of Anchors in Concrete
- Blast Resistant Design of Underground Structures
- Split Hopkinson Pressure Bar Tests
- Rock Mechanics
- Finite Element Analysis
- Mechanized Tunneling Methods

Nivedha RM

First Lady Creater 'Waste into Wealth' Device called 'Trashbot'

Nivedha RM a Bengaluru Girl is turning 'Waste into Wealth' with device called 'Trashbot' to segregate garbage, five years ago.

It all started when Nivedha R M, a chemical engineering student decided to find a solution to a perennial problem faced by humanity – that of garbage. Today, after five years of hard work, what started out as a solo venture has now grown into an organisation of 60 people being funded by the World Bank and the Government of the United Kingdom. All thanks to Trashbot, the innovative new waste segregation device that can help solve the problem of waste management in India by segregating dry and wet waste.A bright chemical engineering student with several lucrative job offers from reputed companies, Nivedha chose to take the path less travelled and turned to innovation.

The basic prototype modelof trashbot won Rs 10lakh price money at Elevate 100, a flagship program by the Government of Karnataka that chooses 100 best start-ups and funds them.

The non-biodegradable waste segregated by trashbot is converted into sheets that resemble plywood but are 50% lesser the price. They are already made into furniture and are supplied to 3000 government schools in rural Karnataka.

Vartika Shukla

First woman CMD of Engineers India Limited

Vartika Shukla is the Chairman & Managing Director (CMD) of Engineers India Limited (EIL), a Navratna PSU under the administrative control of the Ministry of Petroleum & Natural Gas (MoPNG).

Vartika Shukla holds a bachelor's degree in Chemical Engineering from the Indian Institute of Technology (IIT), Kanpur and is certified with an Executive General Management Program from IIM (Lucknow). She has a pretty long association of about 32 years with EIL, which began in July 1988. She possesses more than 32 years of professional experience in chemical engineering. She has served in various positions at the organisation. She is a recipient of gold trophies at the 'SCOPE Excellence Awards' in the 'Outstanding Woman Manager in PSEs' category.

Sudha Murthy, (Kulkarni)

First Female Engineer, (TELCO)

Sudha Murthy is a Padma Shri awardee, an Engineer, teacher, author in Kannada, Marathi and English as well as a Social worker. She is also the Chairperson of the Infosys Foundation. She is married to the co-founder of Infosys, N. R. Narayana Murthy. Sudha Murthy became the first female engineer hired at India's largest auto manufacturer TATA Engineering and Locomotive Company (TELCO).

She joined the company as a Development Engineer in Pune and then worked in Mumbai & Jamshedpur as well. She had written a postcard to the company's Chairman complaining of the "men only" gender bias at TELCO. As a result, she was granted a special interview and hired immediately. She later joined Walchand Group of Industries at Pune as Senior Systems Analyst.

Renuka Khandelwal

Flipkart's First Woman Engineer

Renuka Khandelwal walked into an all-male engineering team in 2010. Flipkart's first woman engineer reflects on the excitement of startup life and that core Flipkart value of R.E.S.P.E.C.T.

When Renuka Khandelwal accepted an offer to join Flipkart in 2010, she had unwittingly walked into a boys' club. There were about 25 engineers in the Bangalore-based startup's high-energy engineering team, and all were men. Being Flipkart's first and only woman engineer did not rattle her, though. There were other concerns on her mind. It was a tough decision to join a startup. For my master's degree, I had specialized in data-mining and information extraction. Flipkart, being an e-commerce company, relied highly on that domain expertise when it came to building recommendation and personalization systems. I looked forward to building such a system and Flipkart gave me an opportunity to pursue my passion." Her previous stint had been with the Research and Development division at Siemens.

Renuka's primary work revolved around building recommendation and personalization systems. "Building this system from scratch was really exciting because before I started, I only had academic knowledge about this, not industry knowledge," she says. "It was challenging because it was my initiative to do this, and I was working for the first time on an industry product." Renuka Khandelwal reveled in doing work that had an immediate and measurable impact on the business. Flipkart's engineers wrote robust code and, although things tended to fly off the handle at times, it was mostly organized chaos — a lot like that oft-quoted Einstein quip about a cluttered 57

Sharvani Mishra

First Lady Engineer to Sail on an Indian Flag Vessel

Ms. Sharvani Mishra recounted her own experience during the time of engineering placements. Despite being one of the top five students in her batch, she and her fellow female classmate were never called to company interviews. On talking to their College Principal, they realized that all the companies that had arrived were not even ready to interview female candidates because they were sure they would not be good enough. The unwavering faith of her teachers, peers and her own confidence in her skills helped her through this. She later successfully sailed with The Great Eastern Shipping Co. Ltd. Her stellar performance encouraged shipping companies to start recruiting female candidates in the upcoming years.

Over time, the industry has gradually come to accept the presence and the value of women in the maritime field and is becoming open-minded about employing them. Students and teachers alike respect the competency of women and are ready to offer advice and help as necessary.

Kalpana Chawla

First Indian Woman Astronaut

Kalpana Chawla, the First Indian-born woman to fly in space. A fateful accident on February 1, 2003 when Space Shuttle Columbia perished upon entry to the earth's atmosphere lead to her death and six other astronauts. Let's take a look at some facts about this wonder woman whose achievements continue to inspire many. Early life- Kalpana Chawla was born on March 17, 1962, in Karnal, India. She was the first Indian-American astronaut and first Indian woman in space. She first flew on Space Shuttle Columbia in 1997, as a mission specialist and primary robotic arm operator.

Kalpana Chose Her Own Name-

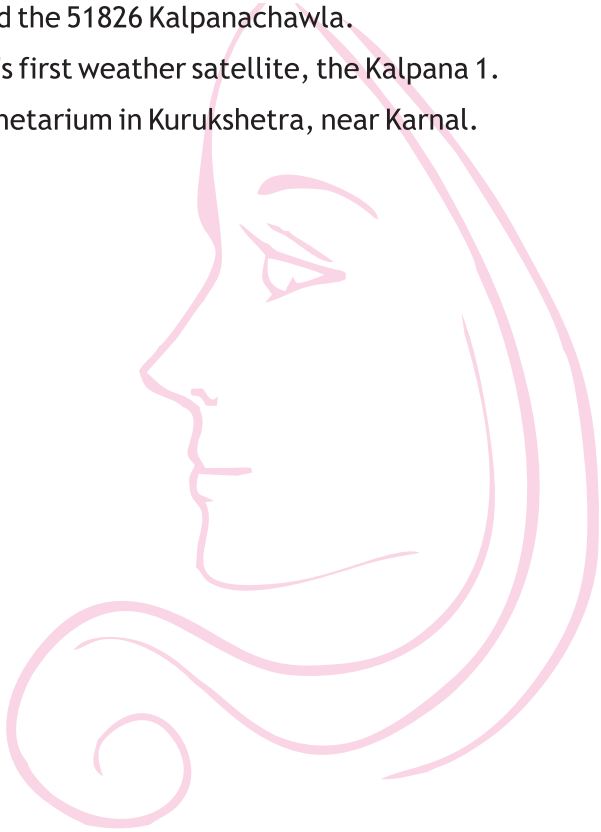
Apparently her parents never gave her a formal name but nicknamed her Montu. She picked her formal name at age three when she was brought to a nursery school by her aunt. The principal asked her name to which her aunt replied: "We have three names in our mind - Kalpana, Jyotsna and Sunaina." When the principal asked her to pick a name she chose Kalpana

She moved to US to become a NASA Scientist -

After completing her degree from Punjab Engineering College, she applied for Master of Science in University of Texas. After finishing the masters in 1984, to increase her prospects of becoming an astronaut at NASA, she enrolled for a Ph.D. In 1988, she completed her Ph.D. in aerospace engineering from the University of Colorado.

Few things named after Kalpana Chawla

- The 74th Street in Jackson Heights, Queens in New York City was renamed to 'Kalpana Chawla Street'.
- In her honour, the Haryana government set up a medical college and hospital in Karnal worth Rs 650 crore.
- There's a hill on Mars with her name.
- A Nasa Supercomputer is named after her.
- An asteroid that circles between the orbits of Mars and Jupiter called the 51826 Kalpanachawla.
- India's first weather satellite, the Kalpana 1.
- A planetarium in Kurukshetra, near Karnal.



Poonam Singh

First Woman Automobile Mechanic

The young lady does not cover her head with a veil as she heads out to work in a Maruti Suzuki dealership, doing a job only men are typically supposed to do. She has many firsts to her credit. Not only is she the first (claimed) female in the country to complete her automobile mechanic course followed by an apprenticeship from the government-run Industrial Training Institute (ITI), going on to win a President's Award for the same, but also the first female in the family to have a 'company' job. At a time when most career options have seen women grow to their potential, car garages are amongst a few places where women have put their foot in. Maruti Suzuki has initiated a program to accommodate women in rare professions like these.

Positioned as Supervisor, her job entails assessing every car that enters, ensuring it is serviced properly and handling client queries on delivery. She is passionate about her job and wants to learn more about vehicles and machinery. She is a part of the 2nd Maruti Suzuki supported batch which benefited from upgraded infrastructure and value added inputs aligning students like her, more strongly to industry needs. Trained on latest cars and systems, with practical experience, factory visits and a strengthened curriculum, the ITI is becoming a go-to place for many boys and girls from lesser privileged homes wanting a job in the auto industry.

P. V. Rajalakshmi

First Woman Tool and Die Engineer in Asia

P.V. Rajalaxmi, Asia's First Woman Tool and Die Engineer has carved a niche in the Manufacturing Sector.

Even in the 1970s, when technical education was difficult for women, NTTF provided an opportunity to Ms. P. V. Rajalakshmi to explore her passion for the technical domain. Combined with the right technical training from NTTF and continuous learning, she has achieved many milestones in her career.

Training in NTTF during 1978 was very strict, time bound and every action and minute was valued and validated including attitude and behavior. Tool making and related machining was done in a conventional method and hand skill was considered as a major ability. We had daily, weekly, monthly, quarterly and semester tests and evaluation where filtering the weaker students and termination was normal procedure. We were not allowed to use the regional language in the campus. This training will mould the trainees as strong and independent individuals for future life. The training system made me a person to think and attempt freely, brave enough to stand on what I believe. After successful completion of training, I was selected by NTTF tool room & Machine shop Bangalore, the most sophisticated facility, for design, manufacturing and quality control.

Aashritha V Olety

India's First Woman Flight Test Engineer

Aashritha V Olety, a native of Karnataka, has graduated as part of the 43rd Flight Test Course after completing a one-year course at the pilot school.

In her new role of a flight test engineer, she assess aircraft and airborne systems before they are inducted into the armed forces. She was part of the 43rd Flight Test Course and Systems Testing Establishment (ASTE). There are only about 275 graduates to ever clear this course ever since the course inception in 1973 and that she has become the first female officer in the history of IAF to ever clear this course after strenuous training'. Olety has done her engineering from MVJ College of Engineering in Bengaluru.

The armed forces of India have traditionally had women in their medical wing for decades, but it is only in the last decade or so, that women have started getting a place beyond the medical wing. The past six years has seen an increase of the headcount of women in armed forces. The rise is almost thrice the earlier number. This is a result of women getting more opportunities across board in the military.

Hina Jaiswal

First Indian Woman Flight Engineer of the Indian Air Force

Flight Lieutenant Hina Jaiswal became the first Indian Woman Flight Engineer of the Indian Air Force. Hina completed the six-month flight engineer course from the 112 Helicopter Unit attached to the Air Force Station in Yelahanka in Bengaluru.

Flight Lieutenant Hina Jaiswal from Chandigarh scripted history by becoming the first Indian Woman Flight Engineer to be inducted by the Indian Air Force. As Flight Engineer Hina is posted to operational helicopter units of the IAF. In the unit, she is routinely called to operate in demanding and stressful conditions, right from the icy heights of the Siachen Glacier to the seas of the Andamans.

Hina was commissioned in the engineering branch of the IAF, where she served as the Chief of firing team and battery commander in a frontline Surface to Air Missile squadron. During her course of Flight Engineer, which lasted for six months, wherein she was trained shoulder to shoulder with her male counterparts vigorously and displayed her unflinching commitment, dedication, and perseverance.In 2018, the Flight Engineer branch which was exclusively the domain of male air warriors was opened for women officers.

Harshini Kanhekar

First female fire fighter

Harshini Kanhekar rewrote the college's and Country's Fire Services history by becoming India's First Woman Fire Engineer. Initially, during her teenage years, she had signed for the National Cadet Corp Air Wing which ultimately led her to become a fire fighter.

Harshini Kanhekar is one of those women, who inspire us to chase our dreams and be fearless. It may seem like a simple job but it is not. It requires a lot of strength to hold the fire hose and save lives. She completed her Bachelors in Science from Lady Amritabai Daga College and she realized she wanted a change. She joined the National Cadet Corps during her college days and started taking part in various competitions. She dreamt of wearing the uniform and making sense of her life. After finishing her graduation, she joined the MBA course but she realized that it was not her calling. She wanted to wear a uniform and so, she took a chance and applied to the Fire engineering course. Harshini is the first woman to have got admission in National Fire Service College in Nagpur.

Riti Singh

First Woman Duo earned for operating Indian Navy warships

Sub Lieutenant (SLt) Riti Singh is one of the first two women, along with SLt Kumudini Tyagi, to have earned their wings for operating from Indian Navy warships. Riti comes from a family that has a history of serving in the armed forces for four generations.

She was born in Uttar Pradesh, where the family hails from. They moved to Hyderabad, Telengana in 2002. She holds a Bachelor of Technology in Computer Science. Riti completed the 22nd Short Service Commission Observer Course from Southern Naval Command, Kochi.

She was among a group of 17 officers, including four women officers, and three officers of the Indian Coast Guard, who were awarded "Wings" on graduating as "Observers" at a ceremony held at INS Garuda, Kochi. Rear Admiral Antony George, Chief Staff Officer (Training), presiding over the ceremony, highlighted it as a landmark occasion.

Her training includes Air Navigation, Flying Procedure, Air Warfare, Anti-Submarine Warfare. She is now training to operate a host of sensors onboard navy multi-role, or Utility Helicopters, including sonar consoles and Intelligence, Surveillance and Reconnaissance (ISR) payloads. She is likely to fly in the MH-60R Seahawk. Her deployments are expected to be on frontline Indian Navy warships including long duration missions.

Kumudini Tyagi

First Woman Duo earned for operating Indian Navy warships

Sub Lieutenant (SLt) Kumudini Tyagi is one of the first two women, along with SLt Riti Singh, to have earned their wings for operating from Indian Navy warships.Kumudini Tyagi was born in Ghaziabad, UP. The family hails from Kharkhoda, Meerut, but moved to Ghaziabad. Kumudini earned her Bachelor of Technology in Computer Science from ABES Engineering College while topping the college. She was passionate about joining the defence forces, and the tragic 2015 incident in which was martyred, impacted her deeply. She went on to be commissioned into the Navy in December 2018, even though she had a very lucrative alternate job offer. Her family describes her as a studious, but fit girl. Kumudini completed the 22nd Short Service Commission Observer Course from Southern Naval Command, Kochi.

On September 21, 2020, Kumudini was inducted as an Observer (Airborne Tactician) in the helicopter fleet of the Indian Navy. She was among a group of 17 officers, including four women officers, and three officers of the Indian Coast Guard, who were awarded "Wings" on graduating as "Observers" at a ceremony held at INS Garuda, Kochi. Rear Admiral Antony George, Chief Staff Officer (Training), presiding over the ceremony, highlighted it as a landmark occasion. Ajay Shankar Pandey, district magistrate of Ghaziabad, commented that the district of Ghaziabad plan a felicitation for her upon return form duty. Her family was unable to attend the historic occasion due to the COVID-19 situation.

Sanghamitra Bandyopadhyay

First Woman Director of the
Indian Statistical Institute

Sanghamitra Bandyopadhyay is an Indian computer scientist specializing in computational biology. A professor at the Indian Statistical Institute, Kolkata, she is a Shanti Swarup Bhatnagar Prize winner in Engineering Science for 2010 and an Infosys Prize 2017 laureate in the Engineering and Computer Science category.

Her research is mainly in the areas of evolutionary computation, pattern recognition, machine learning and bioinformatics. Since 1 August 2015, she has been the Director of the Indian Statistical Institute, and she oversees the functioning of all five centres of Indian Statistical Institute located at Kolkata, Bangalore, Delhi, Chennai, and Tezpur besides several other Statistical Quality Control & Operation Research Units spread across India. She is the First woman Director of the Indian Statistical Institute. She is on the Prime Ministers' Science, Technology and Innovation Advisory Council.

Sanghamitra Bandyopadhyay obtained a bachelor of science in physics from Presidency College, Kolkata before obtaining another bachelor's degree (of technology) in Computer Science in 1992 from Rajabazar Science College Campus of University of Calcutta. She then obtained a master's degree in computer science from the Indian Institute of Technology, Kharagpur before pursuing a Ph. D. at the Indian Statistical Institute, obtaining it in 1998.

Veena Sahajwalla

First Lady of Green Steel Manufacturing

Veena Sahajwalla FAA FTSE is an inventor and Professor of Materials Science in the Faculty of Science at UNSW Australia. She is the Director of the UNSW SM@RT Centre for Sustainable Materials Research and Technology and an Australian Research Council Laureate Fellow. Sahajwalla is known for her role as a councillor on the independent Australian and as a judge on the ABC television show The New Inventors. Sahajwalla also served as a commissioner on the now defunct Australian Climate Commission. She featured in a 2008 episode of ABC's science show called Catalyst.

Sahajwalla was born in Mumbai, India. Green Steel:- Veena Sahajwalla is well renowned for her contributions in building a waste-free economy. One of her most impactful projects was finding a cleaner alternative to using coal in the steel production industry. The process she created is named Polymer Injection Technology which is also known as Green Steel.

This Green Steel movement has earned Sahajwalla many awards and grants which have aided her in continuing environmental research. This Project has also earned her international recognition which landed her positions on multiple government organizations focusing on climate change. Her Green Steel process has also been listed as one of the "innovations that could change the way we manufacture" by the US Society for Manufacturing Engineers in 2012. This innovation also won Sahajwalla the Australian Innovation Challenge in the same year. Her innovation in green steel technology also has earned her the 2019 BHERT

(Business Higher Education Round Table) Award. Micro-factories- Veena Sahajwalla is also known for innovating micro-factories. She discovered that small scale factories that were comprised of one or more specialized machines were much more sustainable. Factories of this scale could be implemented in existing manufacturing businesses to recycle available waste. She launched her first micro-factory at the Sustainable Materials Research and Technology (SMaRT) Lab based at the University of New South Wales Kensington Campus in 2018. Her first micro-factory was focused on recycling e-waste from old technology. She found that technological waste housed many precious metals and rare earth minerals. This micro-factory salvaged gold, electrical conductors, and many other rare materials. After collecting these materials, she processed them through thermal techniques so that they could be recycled in new technology. Glass and Plastic used in electronics could also be melted down and used in industrial-grade ceramics and plastic filaments in 3D printing. This new concept revolutionized the recycling process for e-waste. Her contributions to this new e-waste recycling technology allowed her to continue to open new micro-factories targeted at recycling different materials.

Tessy Thomas

First Female Scientist Missile Woman of India

Known as the Missile Woman of India, Tessy Thomas is taking the eminence of Indian women scientists to new heights, literally. She is the Director-General of Aeronautical Systems and the former Project Director for Agni-IV missile at Defence Research and Development Organisation, becoming the first female scientist in India to head a missile project.

Growing up near the Thumba Rocket Launching Station, her fascination with rockets and missiles began when she was very young. She had a tough time completing her education because of the financial instability of her family but her mother's and her own perseverance and determination led her to become one of the most accomplished women in STEM and a highly respected engineer.

She received the Lal Bahadur Shastri National Award in 2012 for her contribution in making India self-reliant in the field of missile technology.

Minal Rohit

Satellite Communication Engineer

Minal Rohit is an Indian scientist and systems engineer with the Indian Space Research Organisation (ISRO). She helped send the Mangalyaan space probe to Mars.

After graduating from Nirma Institute of Technology, Rohit joined the ISRO. She became part of the team that launched MOM as a system integration engineer .Rohit started her career as a Satellite Communications engineer at Indian Space Research Organisation (ISRO) and went on to work for the Space Application Center.

She was one of 500 scientists and engineers who worked on the Mars Orbiter Mission. As Systems Engineer for the mission, she helped integrate and test the sensors that the orbiter was carrying. She abstained from taking any leaves for two years.

Sangeeta Bhatia

First Woman Researcher in Semiconductor Manufacturing to Impact Human Health

Sangeeta is a Howard Hughes Medical Institute Investigator and the John J. and Dorothy Wilson Professor at MIT's Institute for Medical Engineering & Science (IMES) and Electrical Engineering & Computer Science (EECS). She is also the Director of the Marble Center for Cancer Nanomedicine and a member of the Ludwig Center for Molecular Oncology – both part of the Koch Institute for Integrative Cancer Research at MIT. Additionally, she is an Affiliated Faculty member of the Harvard Stem Cell Institute, an Institute Member of the Broad Institute, a Biomedical Engineer at the Brigham & Women's Hospital, and a board member of both Brown University and Vertex Pharmaceuticals.

Trained as both a physician and engineer at Brown, MIT, Harvard, and MGH, Sangeeta leads a laboratory dedicated to leveraging miniaturization tools from the world of semiconductor manufacturing to impact human health. She has pioneered technologies for interfacing living cells with synthetic systems, enabling new applications in tissue regeneration, stem cell differentiation, medical diagnostics and drug delivery. She is currently applying her research to the Wyss Institute's 3D Organ Engineering initiative.Sangeeta earned her B.S. at Brown University, followed by an M.S. in Mechanical Engineering at MIT, a Ph.D. in Biomedical Engineering at the Harvard-MIT Division of Health Sciences and Technology, and an M.D. at Harvard Medical School. Prior to her current appointment at MIT, Sangeeta held a tenured position at UCSD, and has worked in industry at Pfizer, Genetics Institute, ICI Pharmaceuticals, and Organogenesis.

In 2003, she was named by the MIT Technology Review as one of the top 100 innovators in the world under the age of 35. She was also named a "Scientist to Watch" by The Scientist in 2006.She has received multiple awards and has been elected to the National Academy of Sciences, the National Academy of Engineering, the National Academy of Medicine, and the National Academy of Inventors.

Kiran Shekhawat

First martyred Indian Navy Woman Officer

Kiran Shekhawat (1 May 1988 – 24 March 2015) was the First Indian Navy woman officer to be martyred in the line of duty. On a flight as an observer with the Indian Navy, the woman Naval officer was martyred in a Dornier crash off the Goa coast on 24 March 2015.

Lt Kiran Shekhawat was born in Mumbai into a Rajput family. Commissioned on 5 July 2010, Lt Shekhawat joined the Indian Naval Air Squadron (INAS) 310 — a premier IW squadron nicknamed Cobras. In her five-year career, she was posted across various Naval stations and was transferred to Goa in 2015. Being an expert on intelligence warfare, she was recording the environment charts and various other parameters required for intelligence analysis during the ill-fated training sortie.

Lt Kiran Shekhawat's life was all about the Navy — her death too. She was born to a Navy officer and joined the Navy herself. She was extremely focused and a disciplined officer. Lt Shekhawat had a passion for flying and when not on duty, she loved dancing and listening to the music of Enrique Iglesias and Shania Twain. A big fan of author Nicholas Sparks, she read all his books or watched the movies based on them. Lt Shekhawat, an Observer, had taken part in the first all-women marching contingent of the Navy during the Republic Day parade of January 2015. Lieutenant Shekhawat's father retired from the Navy as Master Chief Petty Officer and is now running a charitable organization called, Lt Kiran Shekhawat Foundation in her honour.

Gunjan Saxena

First Women to Fly in a Combat Zone, Kargil WAR

Flight Lieutenant Gunjan Saxena is an Indian Air Force (IAF) officer and former helicopter pilot. She joined the IAF in 1994 and is a 1999 Kargil War veteran. She is the one of two women IAF officers to be part of the Kargil War, making her the second woman IAF officer after Srividya Rajan, her colleague, to go to war (also listed as "one of the First women to fly in a combat zone") flying Cheetah helicopters. One of her main roles during the Kargil War was to evacuate the wounded from Kargil, transport supplies and assist in surveillance. She would go on to be part of operations to evacuate over 900 troops, both injured and deceased, from Kargil. In 2004, after serving as a pilot for eight years, her career as a helicopter pilot ended; permanent commissions for women were not available during her time.

The 2020 Bollywood film Gunjan Saxena: The Kargil Girl is inspired by her life. Her Highly acclaimed bestselling autobiography titled “The Kargil Girl” was released along with the movie by Penguin Publishers, which she had co-written with author-duo Kiran Nirvan.

Almitra Patel

First Indian Woman Engineer to Graduate from MIT

Almitra Patel is an Indian environmental policy advocate and anti-pollution activist. Almitra's father was a businessman and her mother a civic activist, involved with an education society she had founded. Almitra's was surrounded by science from an early age, and along with her cousin was the first girl to study science at Barnes High School.

She finished her BSc in General Engineering and MS in Ceramics in three years, and in 1959 she became the first Indian woman engineer to graduate from MIT.Over the next three decades, she worked in the fields of Abrasives, Foundry-Refractories and Cement Tile industries.

From the 1970s Almitra was also involved in civic and environmental issues, including saving the Gir Lions, being a tree warden, saving Ulsoor Lake, solid waste management, and building low cost homes. Almitra went on to become active in environmental policy advocacy. She is currently engaged in solid waste management issues in various think tanks and government panels. In 1991, Almitra set out to find a solution for hygienic municipal solid waste management, and found that most of the 80 Indian cities she visited in 1994-1995 had nowhere to dump their waste except in the outskirts of the city or approach roads. Almitra Patel's landmark 1996 Public Interest Litigation in the Supreme Court against the open dumping of municipal solid waste was instrumental in the drafting of the Municipal Solid Waste Management Rule.

Sunita Williams

First in the World to run
Boston Marathon on the Space Station

Sunita L Williams was born at Euclid, Ohio to the family of Indian American Neuroanatomist. Her father hailed from Gujarat. She is the second woman of Indian origin to be selected for US Space Mission, after Late Kalpana Chawla, who died in Columbia Space Mission crash in 2003. She is also the second Slovenian heritage after Ronald M Sega to be included in US Space mission.

She is deeply attached to the Indian customs and culture; she took a copy of Bhagawad Gita, a small figure of 'Lord Ganesha' and a few samosas along with her in the space mission. She is first in the world to run Boston Marathon on the space station in 2007.

She graduated from Needham High School, Needham, Massachusetts, 1983. She did BS (Physical Sciences), US Naval Academy, 1987; MS (Engineering Management), Florida Institute of Technology, 1995; Sunita L William was commissioned as an Ensign in the United States Navy in May 1986. After six months, she was designated as Basic Diving Officer at the Naval Coastal System Command. She was designated as Naval Aviator, Naval Air Training Command in July 1987.

She had logged over 3000 flight hours in more than 30 different aircrafts. Sunita Williams began her Astronaut Candidate Training at the Johnson Space Centre in August, 1998. Her training included numerous scientific and technical briefing, instruction in shuttle and international space station systems, physiological training and ground school to prepare for T-38 flight training, as well as learning water and wilderness

survival techniques. After her training, she worked in Moscow with the Russian Space Agency on Russian contribution to the International Space Station (ISS) and with the first expedition crew to the ISS. She also worked with the Robotic branch on the ISS Robotic Arm and the follow on Special Purpose Dexterons Manipulator. As a NEEM O2 crew member, she lived underwater in the aquarius habit for nine days. Sunita Williams launched with the crew of STS-116 on 9th December 2006, docking with the Station on 11th December 2006. She served in various prestigious positions during her career in NASA, such as Deputy Chief of Astronaut Officer in 2008.

Ila Ghosh

First Woman Engineer in WB

Ila Ghose (née Majumdar) was a mechanical engineer and West Bengal's first woman engineer. She was the first female alumna of the Bengali Engineering College.

From a young age her interest in engineering was recognised. She was admitted to study at the Bengal Engineering College, where there was only one other woman in her cohort. Her fellow female student dropped out after one year, making her the first woman to graduate from the college. She graduated in 1951.

For her postgraduate training, she travelled to the United Kingdom to work for Glasgow-based company Barr and Stroud Once back in India, she worked in an ordnance factory in Dehra Dun, before taking up a lecturer's post at Delhi Polytechnic in 1955. After her marriage, she moved back to Calcutta where she became a lecturer at the Institute of Jute Technology, followed by being the Principal of the Women's Polytechnic on Gariahat Road. In 1985, she was approached by UNESCO to set up Mahila Polytechnic in Dhaka, Bangladesh.

In 1967, she attended the second International Conference of Women Engineers and Scientists held in Cambridge, United Kingdom.

Urmila Eulie Chowdhury

First Woman Indian Architect in Asia

Urmila Eulie Chowdhury was an Indian architect who worked during the mid-to-late 20th century. She worked in the fields of general architecture, landscape architecture and design, and was also a teacher and writer. She was a pioneer woman architect working in India. Some sources state that she was also the first female architect in Asia.After her education she worked in close collaboration with Le Corbusier in the planning design and construction of the city of Chandigarh.

She studied architecture at the University of Sydney, and at the Conservatory of Music of the Julian Ashborn School of Art, Sydney, and earned a degree in Ceramics in Englewood, New Jersey.

After working for a short time in United States, she returned to India in 1951 and became a member of a team headed by Le Corbusier for planning the design and construction of Chandigarh during 1951–63 and 1968–70; these assignments covered the Home Science College, the Women's Polytechnic and many residential complexes of the ministers. Her third assignment, from 1971 to 1976, was with the Chief Architect, who she worked with to complete the second stage of Chandigarh city planning. Government Home Science College, Sector 10, Chandigarh. Chowdhury's assignment during the period 1963-65 was as the Director of the School of Architecture of Delhi. During this period she also authored a book of memories of Le Corbusier titled “Those Were The Days”.

Sheila Sri Prakash

First Woman in India to have started and operated her own Architectural Practice

Sheila Sri Prakash is an architect and urban designer of Indian origin. She is the founder of Shilpa Architects and is the first woman in India to have started and operated her own architectural practice.

Kumari Sheila received an award from Rukmini Devi Arundale, 1965.She attended the Rosary Matriculation School in Chennai and attained a pre-university degree from Stella Maris College, Chennai. She enrolled in the Bachelors in Architecture from the Anna University School of Architecture and Planning in 1973, at a time when there was a strong bias against women entering the field and attended the Harvard Graduate School of Design's Executive Education Program.

ACKNOWLEDGEMENT

Taking inspiration from the words of Hon'ble Prime Minister, Govt. of India to commemorate 75 years of India's Independence and to enable Prime Minister Modi's vision of activating India 2.0, fuelled by the spirit of Atmanirbhar Bharat-Azadi ka Amrit Mahotsav is an embodiment of all that is progressive to India's socio-cultural, political and economic identity.

ICE(I) has developed "Compendium on 75 Women Engineer Jewels of India" to commemorate 75 years of India's Independence "Azadi Ka Amrit Mahotsav". This Mahotsav is dedicated to the people of India who have been instrumental in bringing India this far in its evolutionary journey, leading pride of India by saluting Women Engineers.

On behalf of ICE(I), we would like to thank the Ministry of Women & Child Development, Government of India, particularly the then Secretary Shri Ram Mohan Mishra, IAS and officials Shri Daya Shankar, Deputy Secretary and Shri Paras Sarwaiya, Under Secretary for supporting and helping to take ICE(I)'s vision to fruition.

Our sincere thanks to the true leaders whose critical insights and persistent support enabled us to develop this. We begin by acknowledging Dr. S.L. Swamy, Chairman, ICE(I), Mr. Prithipal Singh, Secretary General, ICE(I) and Ms. Maya Thakur, Director ICE(I), for their vision and direction in finalising the Compendium.

We would also like to extend our sincere thanks to the Editorial Team comprising of Dr. S.D. Sharma, Director (Acadmic)ICE(I) & Mr. Paras Dugar, CE, ICE(I) and the reference network team of ICE(I), comprising - Ms. Pooja Pun, Mr. Bimalendu Das, Mr. Deepak Sharma and Mr. Sachin for relevant assistance for sourcing the information of these Jewels from the public domain.

Lastly and most importantly, heartfelt thanks and gratitude to our stakeholders particularly the Women Engineers who trusted us with their stories and helped us bring them to life. Gratitude to all for this rewarding, insightful journey.

Prof. T.R. Piplani
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Disclaimer

Without prejudice this compendium does not reflect any kind of Ranking and is based on the compilation of information sourced from Public Domain; hence can re-verify from the original source before using. It is token of tribute to the Woman Engineer Jewels by the ICE(I) to commemorate the "Azadi Ka Amrit Mahotsav".

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