



# NDRF NEWSLETTER

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**DIRECTOR**  
**NATIONAL DESIGN AND RESEARCH FORUM**  
**The Institution of Engineers (India)**

No.3, Dr. B.R. Ambedkar Veedhi, BANGALORE-560001

Phone : 080 - 2226 4336

# **NDRF Training Program at Bharat Electronics Ltd on Advanced Robodynamics**

**7<sup>th</sup> to 10<sup>th</sup> Oct 2020**

**Time:  
9:00 am to 5:00 pm**

NDRF had organized 4 - Day training program at Bharat Electronics Ltd on “Advanced Robodynamics” during 7<sup>th</sup> 10<sup>th</sup> October 2020. Dr. Mylswamy Annadurai, Chairman NDRF-IEI, inaugurated the program and gave a talk on “ISRO’s Lander and Rover Autonomous Systems- Challenges”.

Speakers from DRDO, IISc, IIT-Madras, IIITDM-Kancheepuram, The University of Texas, Rio Grande Valley, USA, PSG Tech- Coimbatore, Manipal Institute of Technology-Manipal, VIT- Vellore, had delivered the talks. Participants from various units of BEL attended the training program.

## **Day 1 Topics:**

1. ISRO’s Lander and Rover Autonomous Systems-Challenges
2. Introduction to Robotics, Concepts and Fundamentals of Robotics
3. Direct and inverse kinematics, Velocity and static analysis, Dynamics, Trajectory planning and control
4. Introduction to wheeled mobile robots (WMR), Slip and its modeling, Dynamics, motion planning and control, Introduction to mobile robotics, Advanced features in mobile robotics
5. Automated vs Autonomous Systems- Fundamentals, Multi Agent Robotics Framework, Intelligent & Autonomous Weapon Systems

## **Day 2 Topics:**

1. Concept of Remotely Operated Vehicles (ROV) and its Applications
2. Adaptive Control Theory
3. Introduction to Autonomous systems, Motion planning & Co- ordination of autonomous vehicles, Guidance strategies for Autonomous Vehicles (Session-I)
4. Introduction to Autonomous systems, Motion planning & Co- ordination of autonomous vehicles, Guidance strategies for Autonomous Vehicles (Session-II)

## **Day 3 Topics:**

1. Collaborative Robots
2. Introduction, Concepts and Fundamentals of AI (Session I)
3. Introduction, Concepts and Fundamentals of AI (Session II)
4. Bio-Bots - Insect and Rat Cyborg for Search & Rescue

## **Day 4 Topics:**

1. Exoskeleton: Concepts, Challenges & Opportunities
2. Design & Development Approaches for Augmentative Exoskeleton
3. Test
4. Feedback & Valedictory Session-Intelligent Autonomous Systems

**E-certificates were issued to all the participants. Commendation certificates were issued to the speakers.**

# Webinar on “Satellite in Post Pandemic”



World Federation of Engineering Organizations  
Fédération Mondiale des Organisations d'Ingénieurs  
**WFEO-CIC**  
Committee on Information and Communication (CIC)  
Hosted by **The Institution of Engineers (India) Qatar Chapter**



## Satellite in the post Pandemic world

World Federation of Engineering Organizations - Committee on Information and Communication (WFEO-CIC) conducted the Technical Webinar on “**Satellite in Post Pandemic**” hosted by The Institution of Engineers (India), Qatar Chapter on 12<sup>th</sup> November 2020.

Dr. Narendra Singh FIE, President, The Institution of Engineers (India) was Chief Guest of the program. Dr. T.M Gunaraja, Chairman, WFEO-CIC and Immediate Past President, The Institution of Engineers (India) gave the Introduction for the program. Dr. Mylswamy Annadurai, Chairman, NDRF was the Keynote speaker of the program.

## NDRF-IEI Goa: Invited Talk on ‘Lessons Learnt and Challenges Faced during the Design and Development of Electronic Systems’



National Design and Research Forum (NDRF) in Association with The Institution of Engineers (India), Goa State center had organized an invited talk on ‘Lessons Learnt and Challenges Faced during the Design and Development of Electronic Systems’, delivered by Dr. Latha Christie Scientist-G & Associate Director Microwave Tube Research & Development Center DRDO, Ministry of Defence on 12<sup>th</sup> December 2020.

Er.Chandrashekar Prabhudessai, Chairman, IEI Goa State Centre presented the welcome address. Opening Remarks was given by Padmashri Dr. Mylswamy Annadurai, Former Project Director, Chandrayaan1 and Chairman, NDRF. Dr. V. Dillibabu, Scientist, DRDO & Director, NDRF briefed about NDRF and the event.

## BOG - MEETING -2020



Online Board of Governors meeting was conducted on 17<sup>th</sup> October 2020.

Dr. M Annadurai, Chairman, NDRF, chaired the meeting.

Dr. V. Dillibabu, made a detailed presentation on NDRF activities and had detailed discussion on the following indicative agenda:

1. Urgent points on Finance and Lock out of NDRF office
2. Approval of the Minutes of the previous BoG Meeting
3. Director’s Report –Activities of NDRF
4. Approval of Accounts of Receipts and Payments (1<sup>st</sup> Apr 20 to 30<sup>th</sup> Sep 20)
5. Approval of Audited Accounts (FY 2019-20) including Balance Sheet and Income & Expenditure accounts.
6. Approval for holding BoG meeting online and provision for extraordinary BOG meeting with relaxation in notice period

# ATC for Drone Control and Operations & Anti Drone Technologies

NDRF is pursuing research in the areas of evolving Air Traffic Control for Drones and Anti Drone technologies. An online meeting was organized on 26<sup>th</sup> Nov 2020 to discuss and finalize the way forward in the research pursuits pertaining to ATC for Drone Control and Operations & Anti Drone Technologies.

Dr.M.Annadurai, Chairman, NDRF, Lt. Gen. V. J. Sundaram, Advisor(Micro - Nano- Systems), NDRF, Dr.K Ramachandra, Former Director, NDRF and Dr V Dillibabu, Director, NDRF had participated in the technical discussions. Dr.Ramachandra had presented a briefing paper on the subject.

The following are the conclusions.

1. Bring out a "White Paper" on the Status of ATC System for Drones in other Countries.
2. Survey of Drone Operators and Agencies in Country and a Meeting of representatives to capture their views on Drone Administration
3. National Level Workshop on ATC-Administered Drone Operations and Control with IISc/IITs and Engineering Colleges such as Anna University and several Private industries and Start-Ups.
4. Pick-up from the Short-Term Objectives most critical project elements and develop Project Proposals along with Industries and Academic Institutions.
5. Seek funding from State Government agencies, KJA, DST ISRO, AR&DB and Niti-Ayog
6. Set up, on priority, a Meeting with BEL, Bangalore, for a "Dialogue" on their Perceptions and Plans for Anti-Drone Technologies and Complementary ATC System.

## Joint Research NDRF- IIITDM-NRCB : Extraction of fiber from Banana Trunk



**NDRF is pursuing the Research on the extraction fiber from banana trunks and developing value added products from the banana plant waste.** The research work has been initiated jointly with IIITDM, Kancheepuram and National Research Centre for Banana, ICAR, Trichy. M/s Gen Crest Industries, Mumbai is the industry partner of the project. **A project proposal had been submitted to Dept of Science and Technology for funding.**

Various technical and project meetings were organised between the partnering agencies from Oct to Dec 2020. The machinery for the extraction plant has been designed. The prototype of the machinery is under various stages of manufacturing.

## Inauguration of 'NDRF Online Mini Project Scheme' for Student Level Research



National Design and Research Forum, Bengaluru in association with IE (I) Kanpur Local Centre is offering an innovative 'Online Mini Project Scheme' for the benefit of engineering students.

Under the scheme student teams with innovative ideas, will be mentored by Technical advisors of NDRF, experts from IIT- Kanpur and IIITDM, Kancheepuram. The scheme shall provide a research exposure to the UG students of engineering. Multidisciplinary teams are encouraged under the scheme.

The scheme was inaugurated on 27<sup>th</sup> December 2020 by Padmashri Dr. Kota Harinarayana, Former Programme Director, Light Combat Aircraft. Padmashri. Dr. M. Annadurai, Chairman, NDRF, Prof.J Ramkumar, Chairman, IEI Kanpur Local Centre and Dr. V. Dillibabu, Director, NDRF had provided clarifications to the queries of participants. Padmashri Pfof. R M. Vasagam, Dr. K. Ramachandra, Faculty members of engineering institutions and students had attended the inaugural event.

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