Azadi ka Amrit Mahotsav

to commemorate 75 years of progressive Independent India

REPORT OF THE FOURTEENTH EVENT

"Webinar on Forecasting of Renewable Energy Production"

NIWE with the support of MNRE has scheduled sixteen events to commemorate 75 years of progressive Independent India (Azadi Ka Amrit Mahotsav).

The fourteenth event, **"Webinar on Forecasting of Renewable Energy Production"** was successfully conducted on 23rd June 2023.

The announcement about the event carrying the instructions was hosted in NIWE website and circulated through Social Media pages along with the Flyer given below.

The event was conducted online, enabling large number of participants to take part in the Webinar.

REGISTRATION

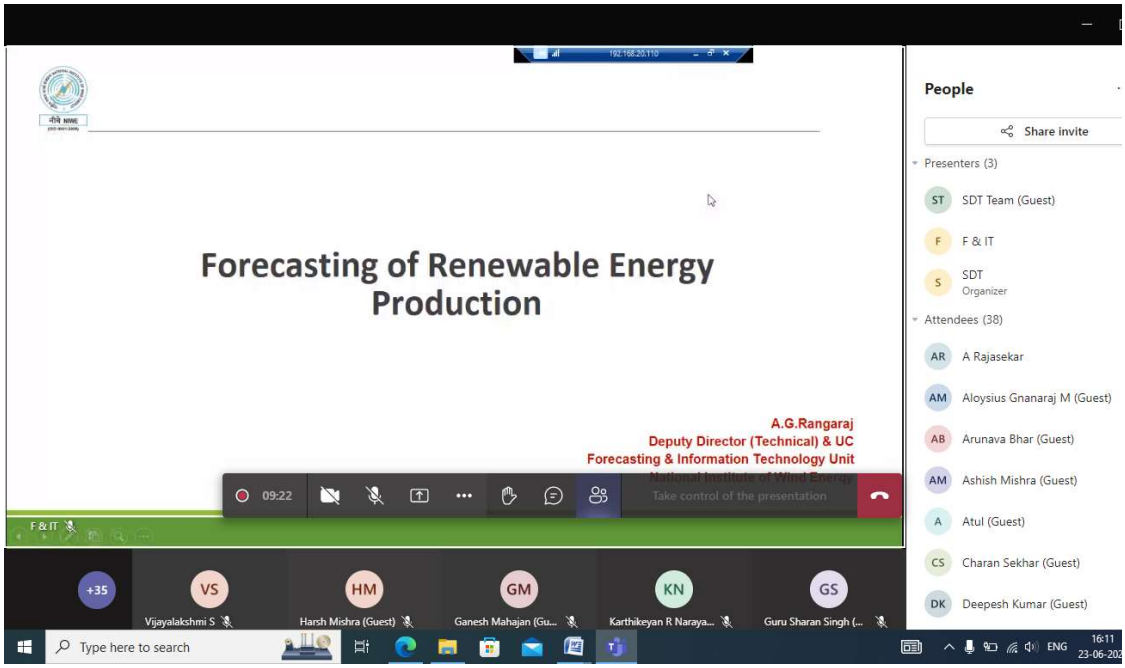
After the announcement, 75 candidates registered and 51 participants have attended the event.

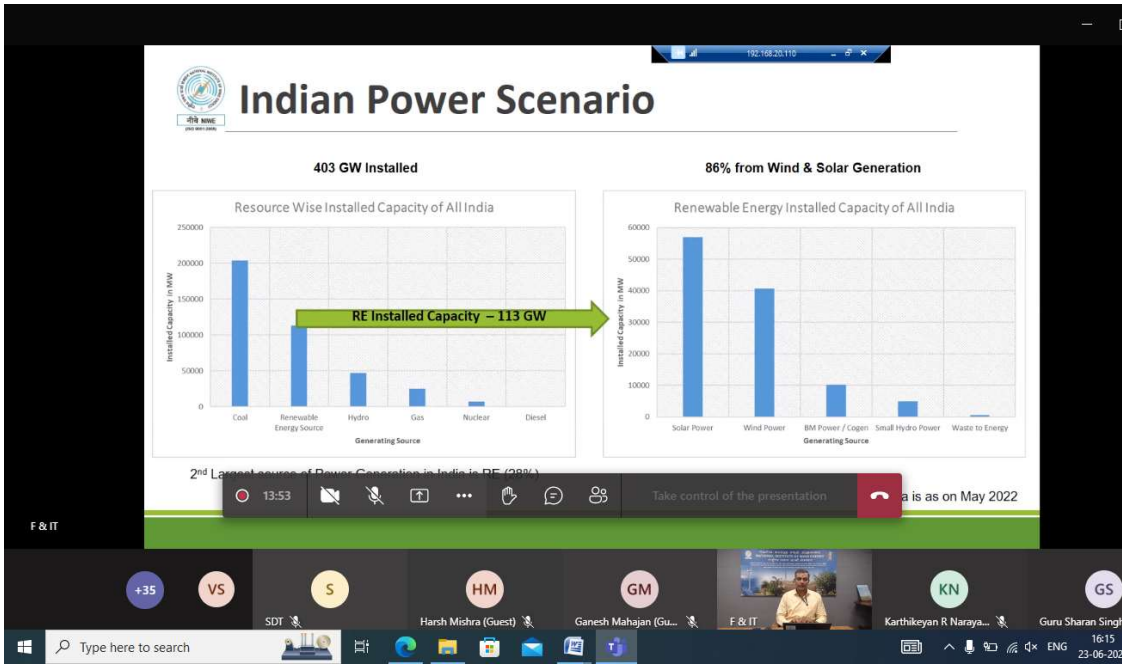
PROGRAMME SCHEDULE

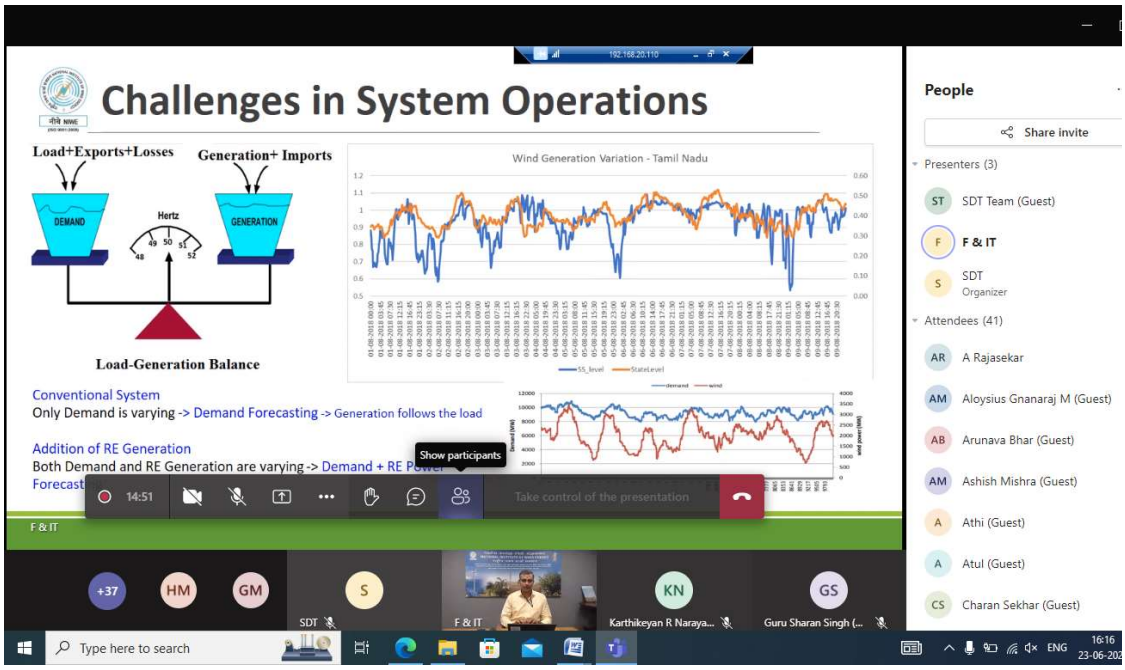
Date	Time	Webinar Topic	Speaker
23rd June 2023	**4.00 - 5.00 pm IST**	**Forecasting of Renewable Energy Production**	**Shri. A.G. RANGARAJ** Deputy Director (Technical) & Unit Chief, Forecasting & Information Technology, NIWE

The speaker gave a detailed presentation on Forecasting of Renewable Energy Production and all the doubts and queries raised by the participants were clearly explained and clarified by the speaker. The participants were very much satisfied with the presentation and had reciprocated the same by appreciating and thanking the speaker. In addition, they expressed their thanks to NIWE / MNRE for hosting this webinar under the event of Azadi ka Amrit Mahotsav.

Gallery of the 14th Event






Challenges in System Operations
Load+Exports+Losses
Generation+ Imports
DEMAND
Hertz
GENERATION
Load-Generation Balance
Wind Generation Variation - Tamil Nadu
Conventional System
Only Demand is varying -> Demand Forecasting -> Generation follows the load
Addition of RE Generation
Both Demand and RE Generation are varying -> Demand + RE P
Forecast
Show participants
14:51
Take control of the presentation
F & IT
People
Share invite
Presenters (3)
SDT Team (Guest)
F & IT
SDT
Organizer
Attendees (41)
A Rajasekar
Aloysius Gnanaraj M (Guest)
Arunava Bhar (Guest)
Ashish Mishra (Guest)
Athi (Guest)
Atul (Guest)
Charan Sekhar (Guest)
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Guru Sharan Singh (...
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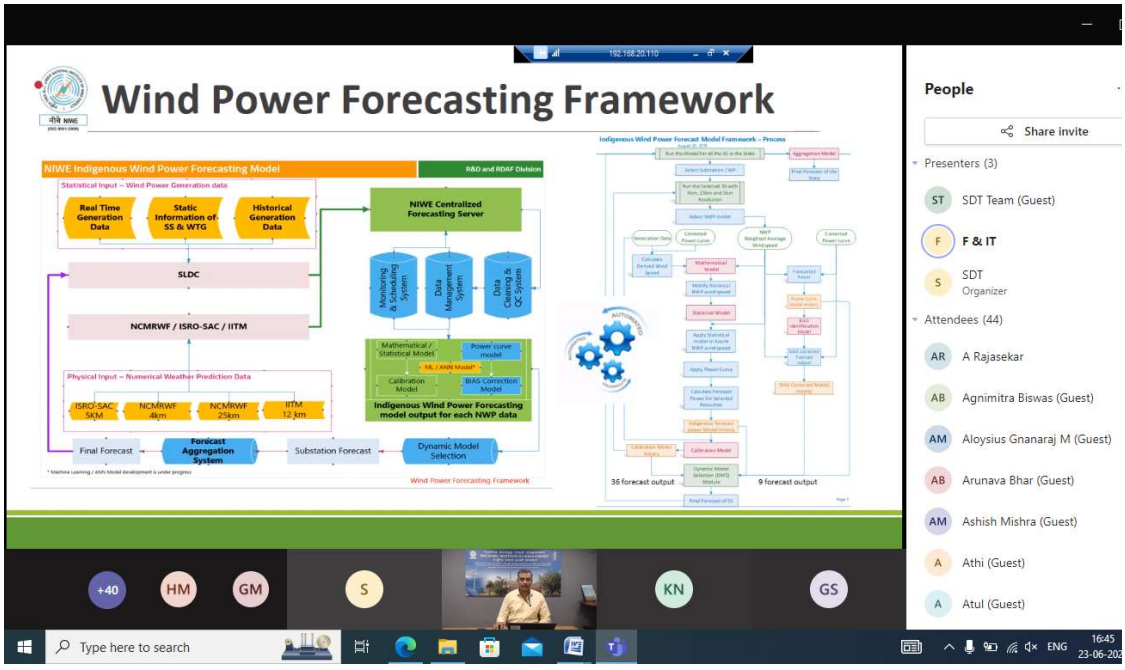
Wind Power Forecasting Framework
NIWE Indigenous Wind Power Forecasting Model
R&D and RDAF Division
Statistical Input – Wind Power Generation data
Real Time Generation Data
Static Information of SS & WTG
Historical Generation Data
NIWE Centralized Forecasting Server
SLDC
NCMRWF / ISRO-SAC / IITM
Physical Input – Numerical Weather Prediction Data
ISRO-SAC 5KM
NCMRWF 4km
NCMRWF 25km
IITM 12 km
Monitoring & Scheduling System
Data Management System
Data Cleansing & QC System
Mathematical / Statistical Model
Power curve model
ML / ANN Model*
Calibration Model
BIAS Correction Model
Indigenous Wind Power Forecasting model output for each NWP data
Final Forecast
Forecast Aggregation System
Substation Forecast
Dynamic Model Selection
Wind Power Forecasting Framework
36 forecast output
9 forecast output
People
Share invite
Presenters (3)
SDT Team (Guest)
F & IT
SDT
Organizer
Attendees (44)
A Rajasekar
Agnimitra Biswas (Guest)
Aloysius Gnanaraj M (Guest)
Arunava Bhar (Guest)
Ashish Mishra (Guest)
Athi (Guest)
Atul (Guest)
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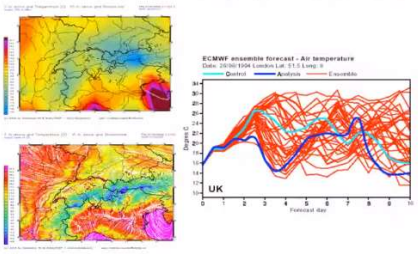
Uncertainties in Numerical Weather Prediction

Initial Condition Errors	Model Errors
Observational Data coverage Spatial Density Temporal Frequency	Numerical Approximations Horizontal Resolution Vertical Resolution Time Integration method
Errors in the Data Instrument Error Representativeness Error	Boundary Conditions Horizontal Vertical
Errors in Quality Control	Terrain
Errors in Data Assimilation	Physical Process
Missing Variables	Parameterization
Error due to Post processing of Information Forecast fields are interpolated, smoothed and manipulated.	

Small Errors in defining Initial condition leads to big impact

Ensembling – Multi-model, High resolution model



People

Share invite

Presenters (3)

- SDT Team (Guest)
- F & IT
- SDT Organizer

Attendees (44)

- A Rajasekar
- Agnimitra Biswas (Guest)
- Aloysius Gnanaraj M (Guest)
- Arunava Bhar (Guest)
- Ashish Mishra (Guest)
- Athi (Guest)
- Atul (Guest)

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Conclusion

- Grid operators primarily require the forecast system for solving various key challenges in scheduling, system control and dispatch.
- The various process involved in wind power forecasting using both statistical & physical model chain has been discussed in detail.
- It was seen that combination of NWP models is improving the forecasting accuracy of individual plants and aggregation.
- Data Analytics technique can be adapted in the Satellite Images based Intraday forecasting system to detect cloud movements for every 30mins.
- Automated system shall be implemented in order to capture, process and store the various input data set

01:12:59 Take control of the presentation

People

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Presenters (3)

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- F & IT
- SDT Organizer

Attendees (46)

- A Rajasekar
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- Arunava Bhar (Guest)
- Ashish Mishra (Guest)
- Athi (Guest)
- Atul (Guest)

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