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EDITORIAL

The current advancements in technology, such as large wind turbines and better installation techniques, have contributed to improved efficiency thereby reducing costs. Globally countries have been implementing policies and incentives to hasten the growth of offshore wind energy. Many models have been utilized to fund large offshore wind projects.

In a move to expand the renewable energy footprint, the government has framed the Offshore Wind Energy Lease Rules, 2023. These new regulations are framed to streamline the process of leasing offshore wind project sites. Under the guidelines, Lease shall be valid for a period of three years for resource assessment and related study /survey activities. Further extendable for adequate reasons by additional two years in selective seabed areas. Post expiry of the period, the lessees are required to submit the data to the National Institute of Wind Energy.

On the Offshore Energy front, the installation and commissioning of LiDAR based wind monitoring station at two locations in VOC port, Tuticorin (4 to 5 km inside sea) has been completed. One year wind measurement campaign is likely to be completed by December 2024.

On the area of Wind Resource Assessment, several activities pertaining to IWSRA project have been executed like data collection and installation of WMS in the states of Madhya Pradesh and Andhra Pradesh. NIWE has also conducted site visits and inspections of SRRA stations, focusing specifically on the instruments used for measuring solar radiation and meteorological data at 14 locations across South India. NIWE has conducted meetings with developers to discuss and plan the implementation of the SCADA control system at pooling substations in Bhuj, Gujarat.

An agreement has been signed with one of the Indian OEMs for pre-evaluation of documentation in connection with type certification; initiated the 2 stage viz. evaluation process for one of the wind turbine model in connection with the type certification. Noise Measurements on 2.7 MW turbine as per latest IEC Standards has been done for one of the OEM. Further, NIWE continues to provided technical support to MNRE for implementation of RLMM process and to Bureau of Indian Standards in connection with the works related to standards.

With regard to skill development, NIWE during this quarter, has conducted 2 International training courses and trained 44 participants from 19 countries. Apart from training, NIWE has also coordinated the visit of 94 students to gain insights into Wind Energy. As part of the Vayumitra Skill Development Programme, ToP programmes are being conducted through training Partners.

The end of a quarter marks not just a conclusion but a new beginning to a new year. With optimism and anticipation, we embrace the challenges and opportunities that the next year holds. NIWE will always continue to strive for excellence and growth. **On behalf of NIWE, we wish you all a HAPPY & PROSPEROUS NEW YEAR 2024.**

Dr. Rajesh Katyal
Director General

Contents

Editorial Board

Offshore Wind Development

Met Ocean Measurement

NIWE has identified suitable locations for deploying the Offshore Lidar at VOC port (4 to 5 km inside sea) and Udangudi Thermal Coal jetty (8 to 9 km inside sea) which together with the measurements at sub-zone 1 will cover wind profile of the Gulf of Mannar region.

The Installation and commissioning of LiDAR based wind monitoring station at two locations in VOC port, Tuticorin (4 to 5 km inside sea) has been completed. One year wind measurement campaign will be completed by December 2024.

VOC PORT_1, Location: VTM Tower

VOC PORT_2, Location: Electrical Substation terrace near oil jetty

Wind Resource Assessment

Wind Resource Assessment

Integrated Wind Solar Resource Assessment (IWSRA)

The Integrated Wind Solar Resource Assessment project is a significant initiative aimed at advancing wind and solar resource planning to facilitate India's renewable energy objectives. Under this project, several activities have been executed and are as follows.

- Chip/data collection at Headpura, Madhya Pradesh, where comprehensive data on wind and solar resources was gathered to assess their potential for energy generation.
- Site selection was conducted at Bahadapalle, Ippapenta, and Ramayapatnam in Andhra Pradesh for the installation of Wind Monitoring Stations (WMS) for Phase II.

Chip/data collection at Headpura, MP

Site selection at Bahadapalle

Sound Detection and Ranging Instrument (SoDAR)

As part of our wind resource assessment efforts, we have conducted SoDAR (Sonic Detection and Ranging) rectification work at Kayathar. This involved trouble-shooting and resolving any issues with the SoDAR system to ensure accurate and reliable wind

SoDAR rectification work at Kayathar

data collection. Additionally, we have upgraded the software used in the SoDAR system, enhancing its capabilities for data processing and analysis.

SRRA

- The WRA Division has conducted thorough site visits and inspections of Solar Radiation Resource Assessment (SRRA) stations, focusing specifically on the instruments used for measuring solar radiation and meteorological data.
- The visit to the SRRA stations involved a meticulous examination of the solar radiation instruments, such as pyranometers, pyrheliometers, and sun trackers, ensuring their proper functioning. WRA Division also inspected the meteorological instruments, including sonic anemometers, temperature sensors, data loggers and solar panel, humidity sensors etc., to ensure accurate and reliable data collection. as detailed below:

नीवे NIWE Issue-79, October - December 2023 pavan Newsletter of NATIONAL INSTITUTE OF WIND ENERGY, Chennai

SRRA stations site survey and inspection

State	No. of WMS	Site name
Tamil Nadu	6	Vellore, Trichy, Erode, Tuticorin, Ramanad and Sivagangai.
Karnataka	2	Haveri and Chitradurga
Andhra Pradesh	3	Kadiri, Tirupati and Kadappa
Kerala	2	Alappuzha and Kannur
Puducherry	1	Puducherry

Research Activities

Maintenance and Repair Strategy for Wind Energy Development

- An abstract on "Damage assessment of wind turbine blade damage in Indian conditions" was submitted at the 5th International Symposium on "Leading Edge Erosion of Wind Turbine Blades."
- The research focuses on understanding the impact of Indian environmental factors on blade damage. Currently, non-destructive testing (NDT) is being conducted on a damaged blade to assess its structural integrity.
- The goal is to gather insights into the specific challenges posed by Indian conditions and develop effective strategies for mitigating and managing blade damage.

The wind farm SCADA control system at Bhuj, Gujarat

The wind farm SCADA (Supervisory Control and Data Acquisition) control system at Bhuj, Gujarat, has been a focus of our recent activities. We have conducted meetings with developers to discuss and plan the implementation of the SCADA control system at other pooling substations in Bhuj. These meetings aimed to ensure a smooth and efficient integration of the SCADA system, enabling centralised monitoring and control of the wind farm operations.

Data Analytics

Consultancy projects

At present, WRA Division is actively managing a total of 9 consultancy projects aimed at providing comprehensive support to various stakeholders within the wind industry. The range of activities encompasses a diverse set of tasks and expertise.

- **Energy Yield Estimation:** We utilise our in-depth knowledge and advanced tools to accurately assess the potential energy output of wind projects. This analysis is crucial for project planning, financial projections, and overall project viability.
- **Preparation of Tender documents and conducting Technical Bid evaluations:** We assist our clients in developing well-structured and comprehensive tender documents that effectively communicate



Site visit at Osmanabad, Maharashtra

project requirements. Additionally, we evaluate technical bids submitted by potential vendors, ensuring they meet the necessary criteria and align with project objectives.

- **Wind-Solar Hybrid projects:** By combining the strengths of both wind and solar energy, we help our clients explore the possibilities of hybrid power generation systems that maximise energy production and optimise resource utilisation.
- **Preparing Detailed Project Reports (DPR):** Provides comprehensive insights into project feasibility, financial aspects, technical specifications, and risk assessment.
- **Project Management Consultancy (PMC) services:** Project Management Consultancy (PMC) services ensure that wind turbine components meet required standards, verify manufacturing facilities, and monitor the installation process to ensure compliance and safety. Additionally, it supervise the commissioning process to evaluate performance and resolve any issues. By providing comprehensive project management support, PMC services contribute to the successful implementation of wind turbine project.
- **Verification procedure of wind monitoring stations:** The verification procedure of wind monitoring stations by private developers involves verification of the Wind Monitoring stations, equipment, calibration of instruments to ensure accuracy, continuous data collection of wind speed, direction, and other parameters like geographical locations etc.

Geotagging

Geotagging is a process that involves capturing GPS coordinates of wind turbine locations and assigning a unique ID to each turbine. In the case of a wind farm site with multiple turbines, this process is implemented to accurately map the precise location of each turbine.

RE Projects

2 MWp Ground Mounted Grid Connected Solar Power Plant at Indian Institute of Management (IIM), Trichy and 1 MW (AC) Ground Mounted Grid Connected Solar Power Plant at Madurai Kamaraj University (MKU), Madurai

- The 2 MWp ground-mounted grid-connected solar PV power plant at IIM, Trichy and 1 MW AC plant at Madurai Kamaraj University are being monitored through daily solar power generation data review and periodic site visits to inspect the solar arrays, inverters, transformers along with oversight of O&M activities like module cleaning, string checks, equipment tests as per the operational and maintenance agreements to validate proper maintenance and optimal performance of the solar assets for maximising clean power generation from the grid-connected plants.

Other Works

- Data availability reports were prepared for potential customers, explaining the wind and solar resource data available for sale at specific sites or regions. This supports the assessment of renewable energy projects.
- During industrial visits, division engineers showcased the lab facilities to students from various colleges and schools. The capabilities related to wind and solar resource mapping, forecasting, and equipment testing were explained and demonstrated.
- The division head and project assistant visited Osmanabad, Maharashtra, on 10th October 2023. The site visit was to collect ground truth data for micrositing and verification of the wind monitoring station (WMS).
- On-site factors like wind flow patterns, obstructions, land accessibility, and infrastructure logistics were assessed. Surrounding areas were surveyed to finalise an optimal location for wind turbine installation.

- The Division Head and Engineer from the National Institute of Wind Energy travelled to Deomali Hills, Odisha, on 12th October 2023, along with representatives from NHPC and NLC. The objective was to identify suitable locations for installing wind monitoring stations that would collect wind data to assess the viability of potential wind power projects in the region. The team surveyed several sites in and around Deomali based on factors like wind flow patterns, access roads, proximity to grid infrastructure, land availability etc. After evaluating multiple options, two locations were finalised for setting up 120-meter met masts with equipment to gather wind speed, direction and other parameters.

Site visit at Deomali, Odisha

- The Division Head and Engineer from the National Institute of Wind Energy travelled to Lakshadweep Islands from 20th to 30th November 2023. The purpose was to identify suitable locations for wind monitoring stations across various islands like Kavaratti, Andrott, and Minicoy. This was part of a project for the Solar Energy Corporation of India (SECI) to assess wind energy potential in Lakshadweep. The team surveyed a few inland sites on the Kavaratti islands.

Site visit at Kavaratti Island

Certification & Information Technology

- NIWE has signed an agreement with one of the Indian OEM'sfor Pre-evaluation of documentataion in connection with the Type Certification of one of their wind turbine model as per the scheme IS/IEC 61400-22 : 2010.
- NIWE has initiated the 2nd stage viz. evaluation process for 'SIVA U57' wind turbine model in connection with the Type Certification of M/s. Siva Windturbine India Private Limited as per the scheme IS/IEC 61400-22 : 2010.
- Non-Disclosure Agreement (NDA) has been signed between NIWE and one of the Gearbox Component Manufacturer to receive the design documents in connection with Type Certification.
- In compliance with the ISO/IEC 17065:2012 standard requirements and in the context of maintaining accreditation for PCB, NIWE conducted the Impartiality Committee meeting on 7th November 2023. The finalized minutes has been approved by the Competent Authority.

INFORMATION TECHNOLOGY

- Prepared tender documents for the procurement of new hardware, software, and AMC services.
- Continued to maintain the IT infrastructure to keep servers, storage, systems, and software up and running.
- Continued to provide IT support for users at NIWE and its stakeholders.
- Restructuring of LAN, CCTV infrastructure in NIWE is in Progress.

Web Portals

Design and development of the NIWE website in line with GIGW guidelines is in progress.

Other Work

New Hyper Converged Infrastructure (HCI) and IT Automation have been installed and Configured.

Testing, Standards and Regulation

TESTING

- Type Testing as per latest IEC Standards (IEC 61400-12-1:2017 & IEC 61400-13:2015) 3.0 MW Power Booster Mode 3.3 MW Rotor Blade Type SR71 (T-Bolt), Hub Height 100 m IEC WT Class IIIB wind turbine at Rajkot, Gujarat for one of the OEM have been recently completed. Test report for Power Performance measurements has been issued. Draft Test report for load measurements is prepared and finalization is in progress.
- Limited period Power Performance & Load Measurements as per latest IEC Standards (IEC 61400-12-1:2017 & IEC 61400-13:2015) for one of the wind turbine at Varapatti Village, Coimbatore, Tamil Nadu have been recently completed. Preparation of Test reports for Power Performance, Load Measurements are in progress.
- Conducted Acoustic Noise Measurements as per latest IEC Standards (IEC 61400-11:2018) on 2.3M130/ 2.7 MW turbine (HH 120m, RD 130m) at Tithawa, Gujarat for one of the OEM. The draft Test report for acoustic measurements is issued and finalization is in progress.

STANDARDS AND REGULATION

- Review / verification of documentation received for one wind turbine model in connection with installation of prototype wind turbines as per MNRE guidelines is ongoing.
- Review of documentation has been completed for 09 wind turbine models submitted by various wind turbine manufacturers for RLMM. Further, technical support has been provided to MNRE for implementation of Revised Lists of Models and Manufacturers of wind turbines (RLMM) process.
- Provided technical support to Bureau of Indian Standards (BIS) in connection with the works related to standards. Further, the works related to preparation of draft Indian standards / IEC standards & IECRE documents are under progress.
- The continual improvement and maintaining the quality management system are ongoing.

Skill Development and Training & Infrastructure Management

27th International Training Course

SDT division has successfully conducted the 27th International Training Course on "Wind Turbine Technology and Applications" during 04th to 20th October 2023, sponsored by Ministry of External Affairs (MEA), Government of India under ITEC programme. The course addressed all aspects of Wind Power starting from introduction to wind and its technology, wind resource assessment, installation and commissioning, operation and maintenance aspects of wind farms in a focused manner along with financial and policy aspects. 23 participants attended the

Shri. Dinesh Jagdale, Joint Secretary, MNRE delivering Inaugural Address

course from 13 ITEC countries, Cambodia, Eritrea, Ethiopia, Ghana, Kenya, Morocco, Mozambique, South Sudan, Sri Lanka, Tajikistan, Uganda, Uzbekistan and Vietnam.

The course was inaugurated by Shri. Dinesh Jagdale, Joint Secretary, MNRE in the presence of Dr. Prabir Kumar Das, Scientist, MNRE, Dr. Rajesh Katyal, Director General, NIWE, Dr. K. Boopathi, Director & Head, WRA, NIWE and Course Coordinator, Dr. P. Kanagavel, Director & Head, SDT & IM Division, NIWE.

During the 18 days course, 19 classroom lectures were scheduled apart from study visits to wind farm and wind Turbine manufacturing factory. The participants were taken for a factory visit to M/s. Siemens Gamesa Renewable Energy Pvt. Ltd., Mamandur. The participants were taken on a study visit to the southern part of Tamil Nadu to visit Wind Turbine Test Station at Kayathar, Transformers Workshop at Apollo Transformers & Filters Limited, Nagercoil, Operation and Maintenance of Wind Turbines at RS Windtech Engineering Limited, Nagercoil and Centralized Monitoring Station at Suzlon Global Services Limited, Thattaparai.

The valedictory function was conducted on 20th October 2023. Dr. Rajesh Katyal, Director General, NIWE distributed the course certificates to all the participants during the Valedictory Function.

Dr. Rajesh Katyal, Director General, NIWE distributing the Course Certificate

28th International Training Course

SDT division has successfully conducted the 28th International Training Course on "Wind Turbine Technology and Applications" during 29th November to 15th December 2023, sponsored by Ministry of External Affairs (MEA), Government of India under ITEC programme. 21 participants attended the course from 12 ITEC countries, Eritrea, Ethiopia, Fiji, Ghana, Kenya, Lesotho, Mozambique, Myanmar, Sri Lanka, Thailand, Turkmenistan and Uganda.

The course was inaugurated by Shri. S.A. Mathew, Director and Head, Certification and IT Division, NIWE in the presence of the Course Coordinator, Dr. P. Kanagavel, Director & Head, SDT Division, NIWE along with the participants of the training.

The course addressed all aspects of Wind Power starting from introduction to wind and its technology, wind resource assessment, installation and commissioning, operation and maintenance aspects of wind farms in a focused manner along with financial and policy aspects through 19 classroom lectures apart from study visits to wind turbine testing facility and wind turbine manufacturing factory.

As part of the course, Renewable Energy facilities available in NIWE campus, such as, Water Pumping Windmill, Vertical and Horizontal Axis Small Wind Turbines, Wind-Solar Hybrid System, Wind Turbine Nacelle Assembly facility, Metrological Mast, Biogas Plant and SRRA Station and Wind Energy Training Systems were shown to the participants.

The participants were taken to the 1) Training facilities of M/s. Vestas Wind Technology India Pvt. Ltd., Ammapettai, which provided valuable insights into the various components and its finer points in the installation and maintenance of wind turbine. 2) Study visit to CSIR-Structural Engineering Research Centre, Taramani where they were shown the wind engineering laboratory consisting of a state-of-the-art Boundary Layer Wind Tunnel (BLWT) facility and Advanced Seismic Testing and Research laboratory (ASTaR) was the state-of-the-art facility incorporating all major seismic technologies that involve critical seismic engineering issues. 3) Factory visit to M/s. Siemens Gamesa Renewable Energy Pvt. Ltd., Mamandur, where they had a chance of seeing the wind turbine nacelle assembling, and other connected equipment like hub and gear train with respect to wind turbine from the industry experts who are actually in the field.

The valedictory function was conducted on 15th December 2023. Shri. S.A. Mathew, Director and Head, Certification & IT, NIWE distributed the course certificates to all the participants. The participants were shared

their views and appreciated MEA, MNRE, NIWE and Government of India for conducting the course and also thanked the coordinator and NIWE staff.

S.A. Mathew distributing the Course Certificate

Vayumitra Skill Development Program (VSDP)

Ministry of New & Renewable Energy (MNRE), Government of India has assigned National Institute of Wind Energy (NIWE), Chennai as the nodal agency to implement, "Vayumitra Skill Development Program (VSDP)" in eight windy States and Kerala. The objective of the programme is to create skilled workforce for the Indian wind energy sector especially the trained manpower for the operation & maintenance of wind farms in the country as per the industry demand/needs so as to achieve the Government of India targets and other future targets.

Under VSDP, a total of 5010 participants are proposed to be trained through Training of Participants (ToP). The ToP training courses will be conducted through 22 identified institutions located close to the Wind Farms of windy States. To train the participants, NIWE will conduct Training of Trainers (ToT) programme and train 690 trainers who will train the participants.

Activities completed :

- 45 Nos. of TOP programme have been completed and 1350 trained participants and 3 batches are ongoing with 90 participants.
- 6 Nos. of TOT programme have been completed and trained 171 trainers.

Students & Training Participants Visit

To create awareness and to motivate towards research on wind energy, achieving the indigenization and also to create awareness about the activities and services of NIWE, schools and college students are encouraged to visit the campus.

During the period from October to December 2023, the following visits were coordinated.

S.No.	Name of Institution	No. of Students	No. of Staff	Visited on
1	Mohamed Sathak AJ College of Engineering, Egathur, Chennai	53	2	16-11-2023
2	International Participants - National Productivity Council, Chennai	21	1	14.12.2023
3	SRM Institute of Science and Technology, Kattankulathur	21	1	15.12.2023

Internship Programme

The "NIWE-Academic Associate Programme" (NIWE-AAP) aims to encourage students and provide an opportunity to choose renewable energy as their career option. To create awareness and interest in the field of renewable energy research among the young talented Sciences, Management and Engineering students NIWE invites applications from the eligible candidates for the "NIWE-Academic Associate Programme" (NIWE-AAP). The duration of the Internship is for two weeks to six months. NIWE-AAP will provide opportunities for the students/post studies students/ Lecturers/Professors to work with scientists/engineers on NIWE's projects.

The statistics for this quarter from October to December 2023 are given below:

1 No. of applications received : 16
2 No. of students admitted : 09
3 No. of students on pipe line : 07

During this quarter fifteen (15) Internship course completion certificates were issued. Presently, eleven (11) students are undergoing the said NIWE- Academic Associate Programme in various Divisions of NIWE.

UPCOMING TRAINING COURSES

NATIONAL TRAINING

25th National Training Course on "Wind Energy Technology"
from 21st to 23rd February 2024

INTERNATIONAL TRAINING

29th International Training Course on Wind Turbine Technology and Applications for ITEC Countries from 24th January to 9th February 2024

Detailed information available in NIWE website.

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An autonomous R&D Institution under the Ministry of New and Renewable Energy (MNRE), Government of India
Velachery - Tambaram Main Road, Pallikaranai, Chennai - 600 100.
Phone : +91-44-2246 3982, 2246 3983, 2246 3984 Fax : +91-44-2246 3980
E-mail : info@niwe.res.in URL : http://niwe.res.in www.Facebook.com/niwechennai www.Twitter.com/niwe_chennai

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