

EDITORIAL



The National Offshore Wind Energy Policy has recently led to lot of activity for development of Offshore wind sector. NIWE being the nodal agency for this development has

initiated offshore wind resource assessment off Gulf of Khambhat and another campaign will be started soon in the Tamil Nadu coast. At this stage, we need to have a clear roadmap for offshore development, which will help in arriving at a realistic target. Currently five potential zones have been identified off Gujarat coast and eight zones off Tamil Nadu coast. Offshore deployment in India can be considered in phases, initial deployment in the near shore areas of the potential zones with lower water depths and later away from the coast which will require higher investments on the structure and offshore grid infrastructure development. As the tariffs of on shore wind turbines are comparable to conventional generation today, any offshore commercial deployment would require economic incentives to bridge the gap between the levelised cost of production and the electricity tariffs. The MNRE has initiated discussions with stakeholders to understand the techno economic feasibility of offshore wind farms, which would provide a basis for the policy framework to be adopted for the sector.

European countries like Belgium and UK follow 'quota obligation' scheme for offshore wind energy similar to the 'Renewable Purchase Obligation'. Germany and Denmark follow a feed in tariff mechanism based on tendering with the burden of grid connection on the Transmission System operator. While subsidies have played a major role in this sector till date, many

European governments are now considering moving from the subsidy regime to the competitive bidding regime. The competitive bidding, improved economies of scale and better construction know how have supported cost reduction in offshore wind.

Forecasting is another area of continuous development by the NIWE team. A Centre of Excellence in Renewable Energy forecasting is being planned. The indigenous forecast model is a step in this direction and an MoU has been signed with ISRO SAC to facilitate this. Forecasting as a service is also being extended to Andhra Pradesh, Karnataka, Maharashtra and Rajasthan.

NIWE has also initiated a project on geotagging of wind turbines installed across the country. The vast asset base consisting of approx. 30000 wind turbines spread across the country will be geographically tagged and maintained in a centralised database system. The database will be used for repowering and forecasting studies. A mechanism for data collation in consultation with the major stakeholders is underway.

A project on evaluation of grid code compliance of 2 MW wind turbine was initiated during the year by the Certification team. NIWE is working on capacity building in this area as with large capacity additions to the grid, the RE sources will have to be tested and certified to meet the grid code requirements

We are committed on our objective of being a total solution provider to the sector. A clear roadmap for development by the Government involving all the stakeholders will help us meet to the 60 GW target!

Dr. Rajesh Katyal, Director General (AC)



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www.Twitter.com/niwe_chennai

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Wind Resource Assessment & Offshore

During the period of July to September 2017, 13 Wind Monitoring station has been commissioned in 2 States (6 in Chhattisgarh & 7 in Assam). Presently, 28 wind-monitoring stations are operational in 8 States under various wind monitoring projects funded by the Ministry of New and Renewable Energy (MNRE) as well as various entrepreneurs.

The following consultancy projects have been completed and reports have been submitted during this period.

- Verification of procedure of wind monitoring for 16 sites
- Wind Monitoring Study at 6 sites
- Site feasibility and Annual Energy estimation for 4 sites
- Wind Power Density Map at 50m AGL for 1 site
- Energy Yield Estimation for the proposed 625.9 MW wind farm projects
- Technical Due Diligence for the proposed 145 MW wind farm projects

WRA IN UNCOVERED/NEW AREAS 2016-17 (NE)

Installation & commissioning of WMS in the State of Meghalaya & Tripura is in progress.

RELOCATING 100M LEVEL MAST FOR VALIDATING WIND POWER FORECASTING

- Calibrated Sensors has been changed at 4 sites in Tamil Nadu.
- Site visit has been carried out at Tirunelveli for installation of 100m mast

GEO-TAGGING OF WIND TURBINES INSTALLED ACROSS THE COUNTRY

MNRE/NIWE has identified an estimated wind power potential of 302 GW at 100m agl, assuming a capacity utilization factor greater than 20%. As on September 2017, the wind turbine installed capacity in India stands at 32700 MW. These installations are mainly spread across the States of Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Gujarat, Rajasthan, Maharashtra, Madhya Pradesh and Kerala. India has a lot of untapped wind power potential, and a target to achieve 60 GW by 2022.

Tamil Nadu wind turbine details has been collated through forecasting project and same is being uploaded in NIWE's web portal.

Testing & Forecasting

TESTING (Large Turbine Testing)

- Type Testing of XYRON 1000 kW wind turbine at Richadewda, Ratlam District, Madhyapradesh of M/s. XYRON TECHNOLOGIES LTD. The measurements completed as per the signed agreement.

- An agreement has been signed between NIWE & M/s. Inox Wind Ltd. for Power Curve Measurements of INOX 2000 kW wind turbine with 113 meter rotor diameter at Ranipat Village, Muli Taluk, Surendranagar, Gujarat. The site instrumentation work is under progress.



Agreement signed between NIWE & INOX on 18.08.2017 for Power Curve Measurement of Inox 2000 kW WT

FORECASTING

- Establishment of real time generation data from GETCO is under progress.
- An Agreement has been signed between NIWE, IWPA & TANGEDCO / TANTRANSCO on 31st July 2017 for development & implementation of Wind Power Forecasting for the whole State of Tamil Nadu.
- An agreement has been signed between NIWE & VORTEX on 31st July 2017 for development & implementation of Wind Power Forecasting for the whole state of Tamil Nadu.



Agreement signed between NIWE & VORTEX

- The MOU / NDA signed between NIWE & RVPN on 12th September 2017 for initiating a Pilot Project on Wind Power Forecasting for the entire State of Rajasthan.

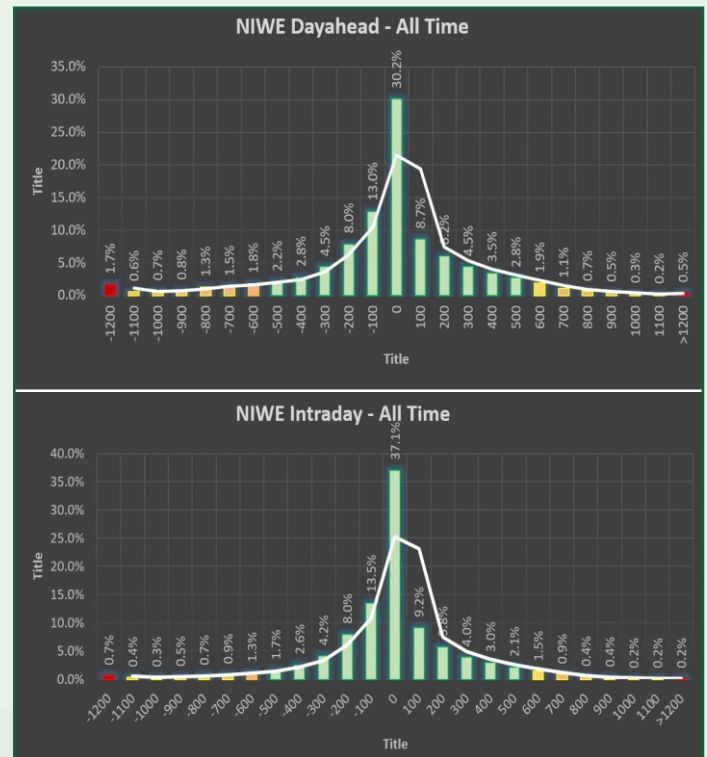


MOU / NDA signed between NIWE & RVPN

- MOU between MNRE & ISRO-SAC for Development of Wind Power Forecasting shall be signed during the end of September 2017.
- Letters of interest sent to SLDC's of Andhra Pradesh, Karnataka and Maharashtra on 19th September 2017 for wind power forecasting in the respective States.
- Meeting has been fixed with Madhya Pradesh Urja Vikas

Nigam. Ltd on 3rd October 2017 regarding discussion on Wind Power Forecasting for the entire state of Madhya Pradesh.

- Actual Data Report for the months of July & August 2017 has been sent to IWPA.
- The fine-tuning of NIWE indigenous forecast model is under progress.
- Error Analysis report for Vortex Dayahead and Intraday forecast value for each substation has been carried out.



- Forecasting error analysis has been done upto August 2017.

SMALL WIND TURBINE TESTING

- Type Testing of model Vaata Smart, Vertical Axis WT (5.5 kW) at Karungulam of M/s. Vaata Smart Ltd. Test Plan is completed. The customer yet to get the TNEB approval for grid connection.
- Type testing of SM2 (1 kW) at Wind Turbine Research Station, Kayathar, Tamil Nadu of M/s. Windstream Energy Technologies India Pvt. Ltd. The data quality check has been done.
- Type Testing of Nalwin 600 W at Wind Turbine Research Station, Kayathar, Tamil Nadu of M/s. Aparna Renewable Energy Sources Pvt. Ltd. The customer yet to install turbine controller at site. NIWE is awaiting a schedule for instrumentation from the customer.

NEW INFRA-STRUCTURE

Establishment of Centre of Excellence in Renewable Forecasting at NIWE.



Forecasting Laboratory at NIWE

Dr. Rajesh Katyal & Shri S.A. Mathew attended the meeting with TANGEDCO regarding improving the accuracy of the forecast on July 2017 at TANGEDCO office, Chennai.



Standards and Certification and Research & Development / Scientific & Technical Research

- Certification project viz., "Inspection for the Manufacturing Evaluation at a wind turbine tower production unit" is under progress.
- Certification project viz., "Evaluation of Grid Code Compliance of 12 MW wind turbines as per CEA Technical Standard" is under progress.
- Certification project viz., "Witnessing of Safety and Function test and Personnel Safety for a wind turbine model at the test site as a part of Type Certification" is under progress.
- Based on the agreement signed with M/s. RRB Energy Limited (RRBEL), carried out review / verification of various documentation for the project on 'Review / Verification of documentation in connection with renewal of Certificate of Pawan Shakthi – 600 kW wind



Issuing renewed Certificate to M/s. RRB Energy Ltd.

turbine model'. Based on the completion of review / verification, renewed Certificate has been issued to RRBEL.

- Interactions with officials of M/s. TUV Rheinland Industrie Service GmbH and M/s. TUV Rheinland (India) Private Ltd. in connection with Certification co-operation works are ongoing.
- Based on the request received, prototype application form has been sent for one wind turbine model in connection with installation of prototype wind turbines in India.
- Co-ordination with wind turbine manufacturers in connection with documentation to be submitted as per MNRE guidelines on prototype wind turbine models after issue of letter in connection with grid synchronization of prototype wind turbines are ongoing.
- Organized 20th Management Review (MR) meeting of Quality Management System as per ISO 9001:2008 at NIWE, Chennai.
- The continual improvement and maintaining the quality management system are ongoing.
- The continuous technical support is being provided to MNRE for their various queries related to Type Certification documentation in connection with Revised List of Models and Manufacturers of wind turbines.
- Co-ordination with Bureau of Indian Standards (BIS) in connection with standards related works are ongoing.

- Organized the Internal Review Committee meeting at NIWE Chennai under the Chairmanship of Dr. Rajesh Katyal, Director General (Additional Charge) to review the R&D proposals received from various organizations, academic & research institutions. The committee scrutinized the proposals and suggested modifications to the proposals. The committee also discussed on emerging research thrust areas in wind energy field and obtained information on the progress of on-going research projects.
- The Internal Committee shortlisted R&D project proposals based on objectives, methodology, deliverables and the estimated budget & duration. The shortlisted R&D project proposals were finally vetted by Project Monitoring Committee (PMC) experts constituted for this purpose.

- Organized the 25th R&D Council (RC) meeting at NIWE, Chennai on 09.09.2017, under the Chairmanship of Shri. SK Soonee, Advisor and former CEO, Power System Operation Corporation Ltd., POWERGRID.


25th R&D Council meeting held at NIWE, Chennai

Wind Turbine Research Station

- For the windy season 2017, all the wind turbines installed at WTRS, Kayathar (1 no 2000 kW KENERSYS, 1 no 2000 kW INOX, 1 no 600 kW SUZLON, 9 nos of 200 kW MICON with total capacity of 6,400 kW) were put in for un-interrupted operation, after successful completion of Operation & Maintenance works, and the power generated is fed into the Grid during the windy season 2017.
- After complete installation in all aspects of Grid integration of 75 kWp Solar PV Power with Existing 27 years old 200 kW Micon WEG @ WTRS, Kayathar Completed, using existing infrastructure like Land, Transformer, Transmission lines etc., hybrid power (wind and solar) was injected into the grid during the windy season 2017 and a mathematical modelling of the above hybrid system using the data collected has been completed.

Visitors

The following visits were coordinated and facilities of Small & Large Wind Turbine Testing, R&D and WRA showcased:

- Officials from ICF from New Delhi , FRAUNHOFER from Germany & TANGEDCO on 6th July 2017 and discussed implementation of Virtual Power Plant concept in India.
- 9 International delegates from Special International Training Course on “Wind Resource Assessment and Wind Farm Planning” on 14th July 2017.
- 110 Students and 6 staff from Savitha Engineering College, Chennai, Tamil Nadu on 17th July 2017.
- 36 Students and 2 staff from Tamil Nadu Agricultural University College, Coimbatore on 18th August 2016.
- 18 International delegates from 20th International Training Course on “Wind Turbine Technology and Applications” on 25th August 2017.



Information, Training and Customized Services

Special International Training Course

Successfully conducted the 17 days Special International Training Course on "Wind Resource Assessment and Wind Farm Planning" during 5th to 21st July 2017, sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC programmes. The course provided an invaluable platform for hands on practical training on Introduction to Wind Resource Assessment, Wind Resource Assessment techniques, Site Selection for Wind Monitoring Stations (WMS), Wind Resource Mapping, Installation, Instrumentation and Commissioning of WMS, Met Mast and Modern Measurement Techniques including measurement using remote sensing instruments (SODAR & LiDAR), Data Analytics and Processing, Software tools for Wind data Analysis, Design and Layout of Wind Farm, Forecasting and Wind Energy Production, Project Implementation and Operations & Maintenance aspects of Wind Farms in a focused manner. The course was attended by 10 participants from 6 countries (Afghanistan, Ethiopia, Ghana, Sri Lanka, Sudan and Vietnam).



Release of Course Material

As part of the training programme, the practical training was arranged with the visits to Wind Resource Assessment Analysis Lab, Instrumentation & Commissioning of WMS, Wind Analysis - Data collection, Validation and Processing and Reporting. The participants were taken to southern part of Tamil Nadu to visit Wind Turbine Test Station / Wind Turbine Research Station at Kayathar, where they got exposure on small and large wind turbine testing process

apart from visiting wind farms in and around Kanyakumari, where wind turbines are installed in large numbers like coconut trees.



Study visit at WTRS, Kayathar

The course structure and conduction of the training was highly appreciated by the participants. The participants were very much satisfied by the quality of lectures, practical sessions and hospitality of NIWE and India.

20th International Training Course

The 20th International Training Course on "Wind Turbine Technology and Applications" was successfully conducted during 16th August to 8th September 2017. This is a special training course for ITEC Countries sponsored by the Ministry of External Affairs (MEA), Government of India under ITEC programmes. The 24 days training course was attended by 18 participants from 10 countries (Afghanistan,



Dr Rajesh Katyal delivering the Inaugural Address

Azerbaijan, Ethiopia, Iran, Mauritius, Nepal, Tanzania, Uganda, Vietnam and Zimbabwe). The objectives of the course was to transfer the knowledge and special skills to the international participants, helping in building skilled human resource for advancement of wind energy in the participating countries and also to address all aspects of Wind Power starting from introduction to wind and its technology, wind resource assessment, installation, operation and maintenance aspects of wind farms along with financial analysis and also to provide an invaluable platform for exchange of professional and cultural experiences among diverse participants.

The practical training was arranged on Wind Resource Assessment, Instrumentation, Testing and R&D equipments apart from factory visit to M/s. ReGen PowerTech, TADA where they had the opportunity of listening from the industry experts who are actually in the process of making wind turbines. As part of the study visit, all the participants were taken to southern part of Tamil Nadu to visit Wind Turbine Test / Research Station located at Kayathar, where they got exposure on small and large wind turbine testing process apart from visiting wind farms in and around Kanyakumari.



Dr. Rajesh Katyal distributing the Course Certificate to the participant

Postponement of 22nd National Training Course to 12-16 March 2018

Due to administrative reasons, the 22nd National Training Course scheduled during 18th – 22nd September 2017 has been postponed to 12th to 16th March 2018 and necessary intimation had been made in NIWE Website and to the registered participants.

Students Internship / Project Work

Dr. P. Kanagavel, Additional Director, ITCS has been made

as Coordinator for the Students Internship, Projects and Apprenticeship activities at NIWE w.e.f. 28.04.2017 in addition to his existing port polios. Eight students from different colleges were allowed to do their internship during the period.

Students / College 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 July to September 2017, the following visits were coordinated;

- 13 course participants & 4 staff from VelTech Dr RR & Dr SR University, Chennai on 14th June 2017
- 51 students of I & II Year, UG from Prince Venkateswara Arts & Science College, Chennai on 25th July 2017
- 41 students from 6th, 7th & 8th standards of KC High, Cambridge International School, Chennai on 1st August 2017
- 70 students of IV year, EEE, UG from Panimalar Engineering College, Chennai on 1st August 2017
- 70 students of III year EEE, UG from Jeppiaar Engineering College, Chennai on 8th August 2017

Visitors

- 25 Course participants (Government Polytechnic teachers) National Institute of Technical Teachers Training and Research on 12th July 2017.
- 25 Course participants (Government Polytechnic teachers) National Institute of Technical Teachers Training and Research on 23rd August 2017.
- 13 Training programme participants from Ordinance Factories Institute of Learning, Chennai on 6th September 2017.
- 2 Officials from Cyient Ltd., Hyderabad on 8th September 2017.

Visit of Additional Secretary, MNRE

Shri. Praveen Kumar, IAS, Additional Secretary, MNRE visited NIWE on 1st September 2017 and addressed the NIWE staff.



Engineering Service Division

Solar 15 kW SPV Power Generation

The Power Generation of 15 kW SPV plant for the month of July to September 2017 is 1212 KWh and the Cumulative generation is 38.77 MWh.

Solar 30 kW SPV Power Generation:

The Power Generation of 30 kW SPV plant for the month of July to September 2017 is 5536 KWh and the Cumulative generation is 55.86 MWh.

Civil Works

The following civil construction works have been completed:

- Refurbishment of electrical circuit and distribution

box with MCB's & switches at UPS room.

- Provision of Sunshade arrangements for prevention of water leakage in ITCS & SRRA containers.
- Replacement of Tiles work at front side of DG's cabin.
- Fixing up of roof top sheet repair work at SRRA containers.
- Provision of water tank for new water pipe line connection to Guest House, securities and UK staff at the rear side of sub-station near 400 kVA generator.
- Purchase of storage cabinet cupboards for material store room.

Solar Radiation Resource Assessment

Project Activities

- Calibration of 6 pyranometers & 3 Pyrheliometers were carried out under SRRA project for Jabalpur, Rewa & Tezpur in the States of Madhya Pradesh & Assam.
- Calibration of 1 Pyrheliometer was carried out under commercial program.
- Project proposal on Vetting of DPR for 20 MW solar power plant for MOIL, Nagpur submitted on 29.06.2017.
- Delegates from GIZ, ICF and Fraunhofer IWES visited NIWE and WTRS, Kayathar during 05.07.2017-07.07.2017 in connection with implementation of the Virtual Power Plant concept.
- Technical Committee Meeting on SRRA was held on 18.07.2017 at MNRE, New Delhi.
- A meeting on Solar Forecasting and Virtual Power Plant held at MNRE, New Delhi on 18.07.2017 with GIZ and Overspeed GmbH officials.
- Project Proposal on Validation of electric components/design sent to M/s. Photon Energy Pvt. Ltd, Hyderabad.
- A preliminary visit to Ramakkalmedu, Idukki district,

Kerala was carried out on 31.07.2017 in connection with micro-siting programme along with ANERT and CDAC officials Trivandrum.

- A technical committee meeting on 08.08.2017 was organized for finalizing the Technical bid in respect to MEDA's consultancy program on SRRA at Chandrapur.
- Final report on consultancy project on Validation of DPR cum TEFR for 20 MW (AC) Solar Power Project at Rajgarh was submitted to MOIL Ltd. on 29.08.2017.
- Video conferencing carried out every Tuesday of each month with German officials on Solar Forecasting..

Fellowship

Mr. Tinotenda Zwavashe, Lecturer / Researcher, Harare Institute of Technology, Harare, Zimbabwe completed his fellowship as Research Trainee for a period of six months starting from 01.03.2017 - 24.08.2017 under the award of Fellowship 2016-17, NAM S&T under the topic "ON-GRID SOLAR PV SYSTEMS IN ZIMBABWE: A COMPREHENSIVE FEASIBILITY ANALYSIS AND ROADMAP PROPOSITIONS FOR A SUSTAINABLE FUTURE".

Invited lecture delivered / meeting attended by NIWE Official in external forums

Dr. Rajesh Katyal, Director General (AC) & Head, WRA & O

- Meeting with committee on Subordinate Legislation Rajya Sabha at New Delhi on 6th July 2017.
- Meeting on “Net Zero Building on all offices under MNRE”, chaired by Secretary MNRE, at MNRE, New Delhi on 7th July 2017.
- Technical Committee Meeting and Solar Power Forecasting at MNRE, New Delhi on 18th July 2017.
- Meeting with secretary MNRE on 3th August 2017.
- Meeting on “Consultative Committee of Members of Parliament for MNRE on implementation wind Energy program” at New Delhi on 4th August 2017.
- Meeting on “constitution of Technical Committee to access of Transmission system involved in off-shore wind projects” at MNRE, New Delhi on 6th August 2017.
- Meeting with Principal Secretary, Energy Department, Government of Rajasthan in connection with the pilot project on wind power forecasting for entire state of Rajasthan at Jaipur, Rajasthan on 17th August 2017.
- Meeting with “EXIM BANK C/o CUBAN EMBASSY officials at New Delhi on 24th August 2017.
- Attended the “Grid Integration conference” and to Co-chair forecasting session of SRRA at New Delhi on 7th September 2017.
- Meeting on Finance Committee at MNRE, New Delhi on 11th September 2017.
- Signed MoU for the pilot project on wind power forecasting for entire state of Rajasthan at Jaipur, Rajasthan on 12th September 2017.

Dr. G. Giridhar, Deputy Director General & Head, SRRA

- Meeting with RRVPN officials, Jaipur and MNRE officials, New Delhi on 17th & 18th August 2017.

A. Mohamed Hussain, Deputy Director General & Head, WTRS

- Delivered a lecture on “Over view of Testing/R&D/WRA facilities at WTRS/WTTS, Kayathar during visit of Delegates of 19th International Training Programme participants to WTRS, Kayathar on 14th July 2017.
- Delivered a lecture on “Over view of Testing/R&D/WRA facilities at WTRS/WTTS, Kayathar during visit of Delegates of 20th International Training Programme participants to WTRS, Kayathar on 25th August 2017.
- Delivered a lecture on "Challenges in Renewable Power Generation in India" at National conference conducted

by V.V.College Of Engineering, Tisayanvilai, EEE Dept, Tirunelveli Dist on 1st September 2017.

S.A. Mathew, Director & Head, Testing & Forecasting

- Meeting with MIT scholar regarding renewable energy integration challenges in terms of grid operations at IWPA office, Chennai on 5th July 2017.
- Attended the 16th edition of Green Power Conference & Exposition on Renewable Energy organized by Confederation of India Industry (CII) at ITC Grand Chola, Chennai on 25th & 26th July 2017.

A. Senthil Kumar, Director & Head, S&C and R&D / S&T and

S. Arulselvan, Assistant Engineer

- Attended the 25th R&D Council (RC) meeting held at NIWE, Chennai on 9th September 2017.
- Attended the fourth internal committee meeting for reviewing & evaluating R&D proposals at NIWE, Chennai on 24th July 2017.
- Attended 20th Management Review (MR) meeting of Quality Management System as per ISO 9001:2008 at NIWE, Chennai.

Dr. P. Kanagavel, Additional Director

- Delivered Guest lecture on "Wind Energy Technology and Applications" at the National Institute of Technical Teachers Training & Research (NITTTR) on 11th July 2017.
- Contributed for the short listing of Project Associates, NIWE meeting on 21st July 2017.
- Delivered Guest lecture on “Overview of Wind Energy and Motivational Aspect of Becoming an Engineer” at Vel Tech Dr. RR & Dr. SR Technical University on 16th July 2017.
- Stores & works Committee meeting of ICMAM Project Directorate, Ministry of Earth Sciences, NIOT Campus, Chennai on 31st July 2017.
- Inaugurated and delivered a lecture on “Wind Energy Technology and Applications” in the programme of Society of Electronics & Instrumentation Engineers & International Society of Automation (SOIND), organised by Easwari Engineering College, Ramapuram, Chennai on 27th July 2017.
- Attended the meetings of Board of Studies at Periyar University, Salem as External Expert Member on 28th July 2017 and 10th August 2017.



- Attended the Project Associates Interview committee meeting, NIWE as a member on 31st July 2017.
- Attended 11th International CALIBER International Convention on "Re-Envisioning Role of Libraries: Transforming Scholarly Communication" at Anna University, Chennai during 2nd to 4th August 2017.
- Delivered a lecture on "Wind Energy Technology and Applications" in the Two day Seminar and Workshop on 'Wind Energy Conversion System', organised by Department of EEE, Jeppiaar Engineering College, Chennai on 16th August 2017.
- Stores & works Committee meeting of ICMAM Project Directorate, Ministry of Earth Sciences, NIOT Campus, Chennai 16th August 2017.
- Delivered a lecture on "Wind Energy Technology and Applications" in the Short Course on Renewable Energy sources" at National Institute of Technical Teachers Training and Research on 22nd August 2017.
- Delivered a lecture on "Wind Turbine Technology and Applications" in the Two Days International Conference on "Recent Advances in Mechanical Engineering" organised by Kingston Engineering College, Vellore on 2nd September 2017.
- Delivered a lecture on "Wind Turbine Technology towards mitigating the Climate Change" in the Three Days Training programme on 'Renewable Sources of Energy including Solar Energy' organised by Indian Ordinance Factory Institute of Learning, Chennai on 7th September 2017.
- Attended the Fifth Meeting of the Governing Council and Second Annual General Meeting of 'Skill Council for Green Jobs(SCGJ)' as the Principal Representative of NIWE for SCGJ at India Habitat Centre, New Delhi on 15th September 2017.
- Delivered a lecture on "Renewable Energy System for Present Day" in the National Seminar on Solar PV Power Plant, the Need of the Day, organised by Department of ECE, SKR Engineering College, Chennai, sponsored by All India Council for Technical Education (AICTE), New Delhi, on 21st September 2017.
- Stores & works Committee meeting of ICMAM Project Directorate, Ministry of Earth Sciences, NIOT Campus, Chennai 22nd September 2017

A.G.Rangaraj, Deputy Director (Technical)

- Delivered a lecture on "Scheduling, Forecasting and Challenges for Upcoming Large Renewable Energy Era" organized by National Power Training Institute (NPTI) at IHC Centre, Delhi on 15th September 2017.
- Meeting with MIT scholar regarding renewable energy integration challenges in terms of grid operations at IWPA office, Chennai on 5th July 2017.

J. Bastin, Assistant Director (Technical)

- Delivered a lecture in the workshop on "The performance and potential of wind energy system in India" at IISc, Bangalore on 23rd August 2017.
- Delivered a presentation on "NIWE's Perspective" in the seventh annual conference on "Wind Power in India" at New Delhi on 29th August 2017.

B.Krishnan, Assistant Director (Technical)

Discussed with M/s. APGENCO officials for the 10 MW EPC tender clarification at Vijayawada on 12th September 2017.

S. Arulselvan, Assistant Engineer

- Attended the Committee meeting on '100% Net Zero Building of NIWE Chennai' held on 13th July 2017.

R.Sasikumar, Consultant

- Visited NCMWRF, Noida and POSOCO, New Delhi for discussion on Solar Forecasting project on 17th & 18th July 2017.

Additional Secretary, MNRE Meet

All Heads have participated in the meeting Chaired by Shri Praveen Kumar, IAS, Additional Secretary, MNRE during their visit in NIWE at NIWE, Chennai on 1st September 2017.

Publications

D. Lakshmanan, Dr. S. Rabiyaathul Basariya "Role and the Value of Creativity in the effectiveness of Advertising", International Journal of Research in Management, Vol.3, Issue 7, May 2017, ISSN 2249-5908.

D. Lakshmanan, Dr. S. Rabiyaathul Basariya "The Role of Social Media on enhancing Advertising Effectiveness", International Journal of Civil Engineering & Technology (IJCIET), Vol.8, Issue 9, Sep. 2017, ISSN 0976-6308.

Visits Abroad

S.A. Mathew invited to attend the India – Spain S&T Steering Committee Meeting at Madrid, Spain during 31st August to 2nd September 2017.

**The following NIWE staff delivered lecture(s) in the
20th International Training Course on “Wind Turbine Technology and Applications”
held during 16th August to 8th September 2017.**

S.No.	Topic	Speaker
1	Introduction and Status of Wind Energy Technology	Dr. P. Kanagavel
	Environmental Aspects of Wind Turbine Technology	
2	Overview of Wind Turbine Components	Shri. S. Arulselvan
	Control and Protection system in Wind Turbine	
3	Design Aspects of Wind Turbine	Shri. N. Rajkumar
	Wind Turbine Gear Box	
4	Wind Turbine Generators	Shri M. Anvar Ali
	Wind Power Evacuation	
5	The Aerodynamics Aspects of Wind Turbine	Shri. J.C. David Solomon
	Small Wind Turbine & Hybrid System	
6	Wind Turbine Tower and Foundation	Dr. Rajesh Katyal
	National Wind Monitoring Program (Onshore & Offshore)	
7	Wind Resource Assessment and Techniques	Shri. K. Boopathi
	Site selection for Wind Monitoring Stations	
	Wind Flow Modelling	
8	Wind Measurements and Instrumentation	Shri. B. Krishnan
9	Wind Data Collection, Processing Validation, Analysis and Reporting	Smt. G. Arivukkodi
10	Indian Government Policies and Schemes	Shri. A. Mohammed Hussain
11	Remote Sensing Instruments	Smt. M.C. Lavanya
	SCADA and Condition Monitoring in Wind Turbine	
12	Installation & Commissioning of Wind Turbine	Shri. T. Shankar Rao
13	Micrositing of Wind Farm Layout	Shri. J. Bastin
	Indian Wind Atlas : A case Study	
14	Grid Integration of Wind Turbine	Smt. Deepa Kurup
15	Operation and Maintenance Aspects of Wind Farms	Shri. S. Paramasivan
16	Forecasting of Wind and Energy Production	Shri. A.G. Rangaraj
17	Power Curve Measurements	Shri. Bhukya Ramdas
	Safety & Function Testing	
18	Instrumentation for Wind Turbine Testing	Shri. M. Saravanan
19	Economic Analysis of Wind Power Development	Shri. Joel Franklin Asaria
	Offshore Wind Energy	
20	Type Certification of Wind Turbine and Overview of Design Requirements as per IEC61400-1	Shri. A. Senthilkumar
21	Solar Radiation Resource Assessment	Shri. R. Karthik
22	Wind Turbine Testing & Measurements Techniques	Shri. S. A. Mathew

The following NIWE staff delivered lecture(s) in the Special International Training Course on “Wind Resource Assessment and Wind Farm Planning” held during 5th to 21st July 2017

S.No.	Topic	Speaker
1	Wind Energy Development and its status	Dr. P. Kanagavel
	Role of NIWE in Wind Energy Development and its Training Profile	
2	Overview of Wind Turbine Components	Shri. S. Arul Selvan
3	Basics of Wind Resource Assessment and Techniques	Shri. J. C. David Solomon
4	Guidelines for Wind Measurements	Smt. Deepa Kurup
5	Site selection for Wind Monitoring Stations	Shri. K. Boopathi
	Wind Flow Modelling	
6	Measurement & Instrumentation related to WRA	Shri. M. Saravanan & Shri. Bhukya Ramdas
7	Remote Sensing Instruments	Smt. M. C Lavanya
8	Wind Data Analysis - Data Collection, Processing Validation, Analysis and Reporting	Smt. G. Arivukkodi
9	Wind Atlas - An Overview	Shri. J. Bastin & Shri. B. Krishnan
10	Indian Government Policies and Schemes	Shri. A. Mohammed Hussain
11	Micrositing of Wind Farm Layout	Shri. N. Rajkumar
12	Forecasting of Wind and Energy Production	Shri. S. A. Mathew
13	Forecasting of Wind and Energy Production	Shri. A. G. Rangaraj
14	National Wind Monitoring Program (Onshore and Offshore)	Dr. Rajesh Katyal
15	Solar Radiation Resource Assessment	Shri. R. Karthik
16	Hybrid Systems	Shri. Joel Franklin Asaria

Training / Conferences / Seminars attended by NIWE Officials

Workshop

J. Bastin and **B. Krishnan** have attended workshop on Reliable Hub height measurements – An exclusive Vaisala at Courtyard Marriott, Chennai on 18th September 2017.

“Empower” demonstration

S.A. Mathew, M. Anvar Ali, A. G. Rangaraj, M. Saravanan, Bhukya Ramdas and S. Paramasivan attended the demonstration of Product “EmPower” by M/s. Konsberg Digital India, Energy Division at NIWE, Chennai on 20th July 2017.

WEB Portal Workshop

S. A. Mathew & A.G. Rangaraj attended the Workshop –cum- Meeting - WEB Portal on Weather Information and utilize its features for better grid operation for Southern Region organized by SRPC at Bengaluru on 12th July 2017.

Internal Audit

M. Anval Ali, M. Saravanan, Bhukya Ramdas & S. Paramasivan attended the Internal Audit for ISO 9001:2008 held on Testing & Forecasting at Chennai on 1st September, 2017 and on at WTTS, Kayathar 4th September, 2017.

S&C Unit

- Participated in the conference on “16th Edition of Green Power 2017 Conference & Exposition”

organized by Confederation of Indian Industry, Hyderabad held at ITC Grand Chola Chennai on 25th July 2017.

- Attended the one day training program on “Ethics and Values in Public Governance” delivered by Shri. K.S. Samarendra Nath, Director, Ministry of Steel & National Facilitator for Ethics & Values (approved by DOPT) held at NIWE, Chennai on 10th August 2017.
- Attended the Half day training program on GST organized by NIWE held at NIWE, Chennai on 2nd August 2017.
- Participated in the One day workshop on “Sexual harassment of women at workplace (Prevention, Prohibition and Redressal) ACT, 2013” delivered by Dr. H.S. Rana, Principal Director, Institute of Public Administration (IPA), Bangalore at NIWE, Chennai on 13th September 2017.

M.Anvar Ali, Director & Head, ESD

Attended one day training programme on “Ethics and values in public Governance” at NIWE, Chennai on 10th August 2017.

SRRA Unit

Training program on Solar Forecasting was conducted by representatives for Oldenburg University and Overspeed GmbH, Germany during 13th to 17th July 2017.

Award

- Dr. G. Giridhar received Dr. K.C.G. Verghese Excellence Award from the Hindustan Group of Institutions on 29th July 2017.
- Dr. P. Kanagavel, Additional Director, ITCS Unit has been bestowed with Excellence in Teaching Award 2017 by Madras Library Association (MALA) Awards 2017 on the occasion of 125th Birth Anniversary Celebration of Padmashree Dr. S.R. Ranganathan held at Indian Institute of Technology, Chennai on 12th August 2017. The award is in the form of a Certificate and a Medal.



Wind Data Analysis from First offshore Wind Monitoring Station at Gulf of Khambhat

Dr. Rajesh Katyal, Director General (Addl.Charge), National Institute of Wind Energy
Mrs. G. Arivukkodi, Assistant Engineer, WRA&O, National Institute of Wind Energy
Mr. S. D. Avinash Bhabu, Project Engineer, WRA&O, National Institute of Wind Energy

Introduction

Electricity demand in the country has been increasing and need for sustainable development has made us find sustainable sources of generating electricity. In the recent years, the offshore wind industry has grown beyond Europe to North America and East Asia, and the future of the sector looks promising. The total offshore installation across the world is 14,384 MW with UK leading with total installed capacity of 5156 MW followed by Germany and China at 4108MW and 1627 MW respectively. India is blessed with a coastline of 7600 km surrounded by water on three sides and has bright prospects of harnessing offshore wind energy. The Preliminary assessment along the Indian coastline through met mast measurements and satellite data assessment show reasonable potential. The potential at the demarcated zones needs to be validated by deploying wind monitoring stations.

NIWE along with the support of ESSO-NIOT has established LiDAR-based offshore wind measurement structure near Pipavav in Gulf of Khambhat, Gujarat Coast at one of the zones identified by FOWIND. The remote sensing instrument LiDAR (Light Detection and Ranging) has already been procured and most likely to be installed by the end of October 2017 owing to ban imposed for entering the sea

Meanwhile, an additional Wind Monitoring Station or Automatic Weather Station has been installed on the platform and the process of mounting LiDAR is underway and is expected to be completed by mid of October. Thereafter

measurements for a period of 2 years shall be carried out

The wind measurements were initiated by the Automatic Weather Station (AWS) / Wind Monitoring by April 2017 and the results of the analyzed data is presented in this article. The data is continuously pushed by the AWS/WMS by the GSM communication to NIWE, Chennai. Data has been regularly analyzed and results are encouraging. This will benefit the stakeholders for the development of offshore wind farmability in the country.

Site Description

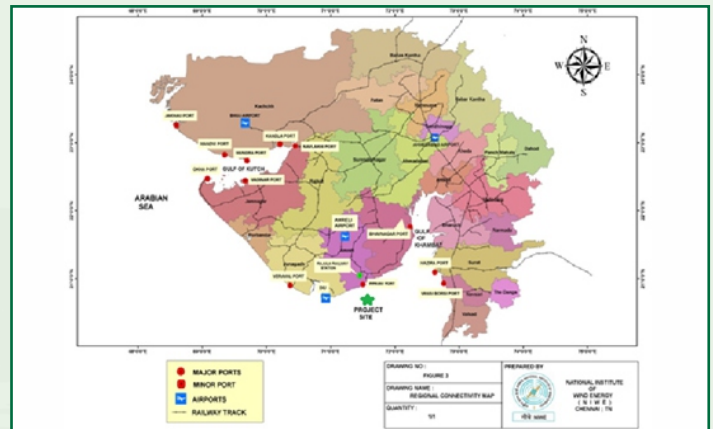


Figure 1) The LiDAR location



Figure 2) Distance to Structure from the shore

The offshore platform with automatic weather station at Gulf of Khambhat, 23 km south of Jaffrabad/Pipavav port is located at Latitude 20° 46' 37.7" N Longitude 71° 40' 09.9" E and the location map is given in Figure 1 & 2.

Instrumentation

The automatic weather station is equipped with first-class Anemometer and wind vane at a height of 18m (varies with wave height) above the sea level. Other environmental parameters such as Pressure, Temperature & Humidity are also being measured at 17m height. The wind sensors are mounted at the top of the rail to record data from the unobstructed flow. Other sensors are mounted at the bottom railings (1m below). The data logger is programmed to store 10 minute data averages, standard deviations, etc. from the anemometer, wind vane, temperature & humidity and a pressure sensor.



Figure-3 Structure for LiDAR

Wind data Collection & Analysis Figure Structure for LiDAR The Automatic Weather Station was commissioned at the site in the month of March 2017. The data is being transferred every day to the central server with the help of GSM services. The data measured at this site for the period from April 2017 to July 2017 was used for the analyses. Availability of data is 100% for the period of measurement. The data has been analyzed and details of the results in graphical form are presented here.

The month wise mean wind speed, wind power

density, percentage frequency distributions of wind speed at 18m level for the period from April 2017 to July 2017 have been given below. Time series plot of the wind speed data is shown in figure 3. The wind speed has reached a maximum of 18m/s during the month of June 2017 which looks to be encouraging.

The month wise average wind speeds and average wind power densities are shown in figure 4 & 5 respectively.

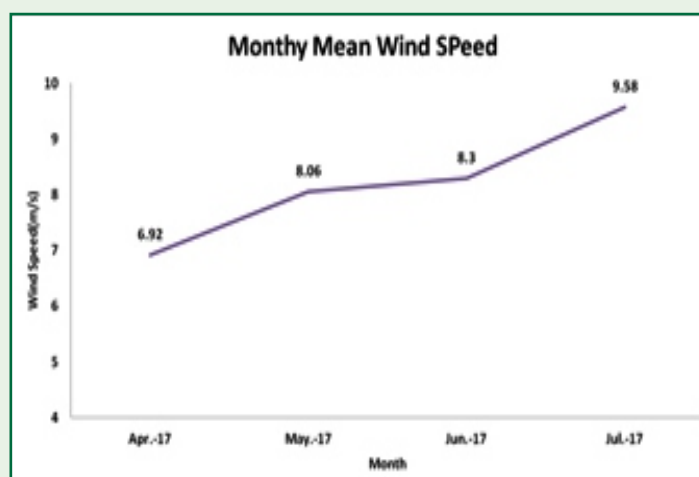


Figure-4 Monthly Average Wind Speed

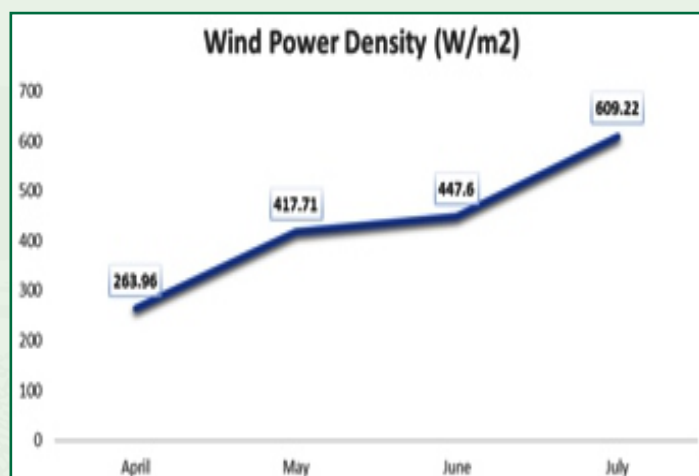


Figure-5 Monthly Average WPD

The diurnal profile of the wind speed is shown in Figure 4 and from the graph it is understood that, the wind speed at the shows peak during evening.

Wind speed more than 4m/s (which is normally the cut-in wind speed) is available 90% (for a

period of 2648 hours) during the period from April to July 2017.

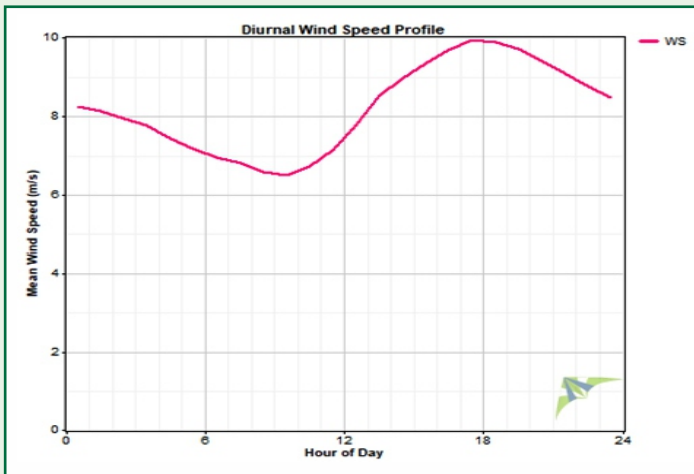


Figure-6 Diurnal profiles of Wind

Conclusion

The data from the first offshore wind monitoring station shows encouraging wind speeds and potential at Gulf of Khambhat of Gujarat for the measured period of 4 months. The LiDAR which is likely to be installed by the end of October 2017 expected to provide good insights at the hub heights of offshore wind turbines. NIWE is planning to initiate similar work in the Gulf of Mannar region of Tamil Nadu to evaluate the wind potential of the region. These initiatives will help India to make an entry in offshore wind farming in the near future.

Hindi Fortnight 2017

Hindi Fortnight 2017 was celebrated in NIWE during 28th August to 14th September 2017. Eleven Hindi program / competitions were conducted. Mr. Jawaahar Laal Sharma, Consultant (OL) read out the Hindi Day-2017 message of Mr. Rajanath Singh Ji, Honorable Union Minister of Home Affairs, Government of India which was delivered on 14th September, 2017. 163 participants took part in the competitions. Valedictory function was conducted on 14th September 2017, the prizes were distributed to the winners by Dr. Rajesh Katyal, Director General (i/c) and Group Head, WRA & O, NIWE.



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Published by :

NATIONAL INSTITUTE OF WIND ENERGY (NIWE)

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@nic.in URL : <http://niwe.res.in> [www.Facebook.com/niwechennai](https://www.facebook.com/niwechennai) [www.Twitter.com/niwe_chennai](https://www.twitter.com/niwe_chennai)

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