SANDIP UNIVERSITY

Mechanical Engineering Department
School of Engineering & Technology
Academic Year 2023-24

Visit Report

Industrial Visit- Visit to Suzlon Wind Power Plant

1. **Event Title:** Industrial Visit Organized by Electrical and Electronics Engineering Department & Mechanical, SOET, Nashik at Suzlon Wind Power Plant,Sinner .
2. **Event Date:** 06th Sep 2023
3. **Event Conduction Duration:** Full Day
4. **Event Mode:** Field Visit
5. **Event Resource Person Details:**

6. **Name of Event Coordinator with contact details:**

Mr. Harshal Chaughule , Assistant Prof., EEED, SOET, Nashik.

Mr. Durgesh Borse, Assistant Prof., MED, SOET

7. **Event Outline & Outcome of the event:**

Generalities

Wind farm name: Sinnar
Country: India
County / Zone: Maharashtra

Details

Part #1:
City: Nashik
Commissioning:
1 turbine: Suzlon S82/1500 (power 1 500 kW, diameter 82 m)Total
nominal power: 1,500 kW
Operational Onshore
wind farm
Developer: AllGrow Ventures

Part #2:
City:
Nashik
Commiss
ioning:
6 turbines: Suzlon S95/2100 (power 2 100 kW, diameter 95 m)
Hub height:
Total nominal power: 12,600
kWOperational
Onshore
wind farm
Developer:
Mytrah
Operator:
Mytrah
Owner:
Source:
Localisation

Part #1:
Latitude: 19° 50' 37.1"
Longitude: 73° 59' 54.8"
Altitude: 948 m
Geodetic system:
WGS84Precise
localization: no

Part #2:
Latitude: 19° 50' 37.1"
Longitude: 73° 59' 54.8"
Altitude: 948 m
Geodetic system:
WGS84Precise
localization: no

Objective of Program:

The main objective of wind farms in the short term is to produce renewable energy power that homes and businesses can utilize. Wind farms can also help offset the use of fossil fuels, such as coal and natural gas, used to generate electricity.

Wind energy offers many advantages, which explains why it's one of the fastest-growing energy sources in the world. To further expand wind energy's capabilities and community benefits, researchers are working to addresstechnical and socio-economic challenges in support of a decarbonized electricity future.

Efficient extraction of wind energy is a complex, multidisciplinary process. This paper examines common objectives used in wind turbine optimization problems. The focus is not on the specific optimized designs, but rather on understanding when certain objectives and constraints are necessary, and what their limitations are. Maximizing annual energy production, or even using sequential aero/structural optimization, is shown to be significantly suboptimal compared to using integrated aero/structural metrics. Minimizing the ratio of turbine mass to annual energy production can be effective for fixed rotor diameter designs, as long as the tower mass is estimated carefully.For variable-diameter designs, the predicted optimal diameter may be misleading. This is because the mass of the tower is a large fraction of the total turbine mass, but the cost of the tower is a much smaller fraction of overall turbine costs. Minimizing the cost of energy is a much better metric, though high fidelity in the cost modeling is as important as high fidelity in the physics modeling. Furthermore, deterministic cost of energy minimization can be inadequate, given the stochastic nature of the wind and various uncertainties associated with physical processes and model choices. Optimization in the presence of uncertainty is necessary to create robust turbine designs.

Output of Program:

Wind is used to produce electricity by converting the kinetic energy of air in motion into electricity. In modern wind turbines, wind rotates the rotor blades, which convert kinetic energy into rotational energy.Wind power plants affect voltage levels and power flows in the networks. These effects can be beneficial to the system, especially when wind power plants are located near load centres, and certainly at low penetration levels.

Uses of wind energy generating electricitymilling grain pumping water powering cargo ships (via kites)reducing carbon footprint sailing. Wind surfing kitesurfing.

Wind energy is a source of renewable energy. It does not contaminate, it is inexhaustible and reduces the use of fossil fuels, which are the origin of greenhousegasses that cause global warming.

In addition, wind energy is a "native" energy, because it is available practically everywhere on the plant, which contributes to reducing energy imports and to creatingwealth and local employment.

For these reasons, producing electricity through wind energy and its efficientuse contributes to sustainable development.

- Renewable energy
- Inexhaustible
- Not pollutant
- Reduces the use of fossil fuels
- Reduces energy imports
- Creates wealth and local employment
- Contributes to sustainable development Wind power is the most ef

For these reasons, producing electricity through wind energy and its efficientuse contributes to sustainable development.

- Wind energy does not emit toxic substances or contaminants into the air, which can be very damaging to the environment and to human beings. Toxic substancescan acidify land and water ecosystems, and corrode buildings. Air contaminants can trigger heart disease, cancer and respiratory diseases like asthma.
- Wind energy does not generate waste or contaminate water—an extremely important factor

given the scarcity of water. Unlike fossil fuels and nuclear powerplants, wind energy has one of the lowest water-consumption footprints, which makes it a key for conserving hydrological resources.

Number Students Attended: 50

7. Event photos: