

Power Performance Analysis

Day 1: Inputs, SCADA Data & Availability Analysis

1. **Introduction to Wind Farm Data Analysis**
 - Overview of Wind Farm Operations
 - Importance of Data-Driven Decision Making
2. **Input Data & Assessment Overview**
 - Monthly Reports: Wind Farm Exploitation & Availability
 - Maintenance Reports & Pre-constructive Assessments
3. **SCADA Data Basics**
 - Key Variables in SCADA Data
 - Filtering and Processing SCADA Data
 - Total Counters vs. Average Counters
4. **Availability Analysis**
 - Time-Based Availability
 - Energy-Based Availability

Day 2: Power Curves, Performance & Losses

1. **WTG Performance & Power Curves**
 - Introduction to WTG Performance Indicators
 - Nacelle Power Curve Analysis
 - WTG and Wind Farm Power Curves
 2. **Data Filtering for Accurate Analysis**
 - Techniques for Effective Data Filtering
 - Identifying Outliers and Noise Reduction
 3. **Operational & Energy Losses**
 - Internal Wake and External Wake Effects (Blockage Effect)
 - Types of Energy Losses: Operational, Availability, WTG Performance
 - Methods for Loss Quantification
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Day 3: Predictive Methodology, Uncertainty & Risk Management

1. Predictive Methodology for Proactive Actions

- Developing a Predictive Maintenance Strategy
- Using Historical Data for Forecasting

2. Uncertainty Assessment

- Identifying Sources of Uncertainty
- Impact of Measurement Devices on Data Accuracy

3. Risk & Reliability Management

- Assessing Risks in Wind Farm Operations
- Reducing Operational and Energy Losses

4. Best Practices & Reporting

- Monthly Analysis Techniques
- Reporting and Visualization of Key Metrics