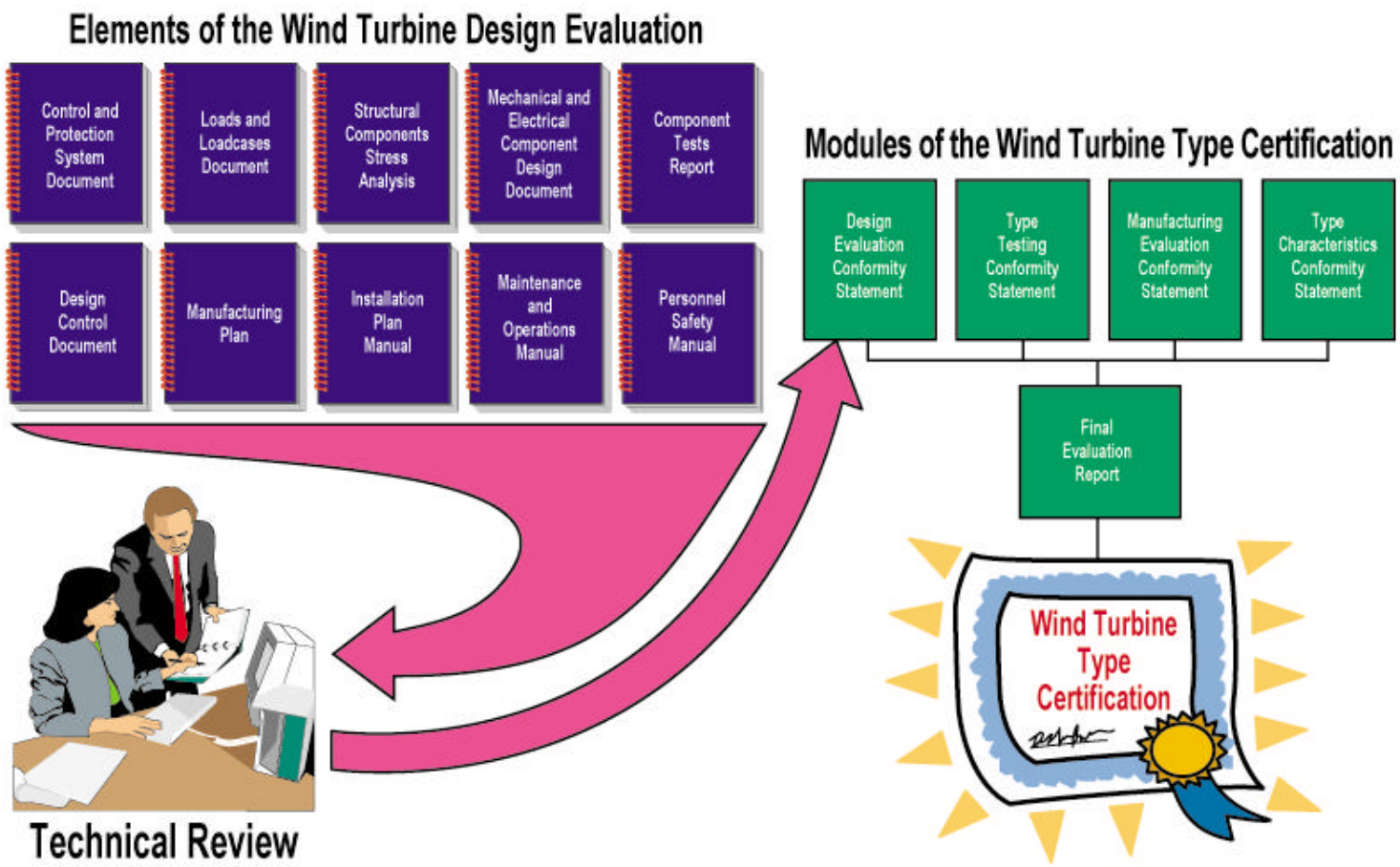
Wind Turbine Type Certification

at the

National Renewable Energy Laboratory

Hal Link

24 April 2000


Elements of the Wind Turbine Design Evaluation
Control and Protection System Document
Loads and Loadcases Document
Structural Components Stress Analysis
Mechanical and Electrical Component Design Document
Component Tests Report
Design Control Document
Manufacturing Plan
Installation Plan Manual
Maintenance and Operations Manual
Personnel Safety Manual
Technical Review
Modules of the Wind Turbine Type Certification
Design Evaluation Conformity Statement
Type Testing Conformity Statement
Manufacturing Evaluation Conformity Statement
Type Characteristics Conformity Statement
Final Evaluation Report
Wind Turbine Type Certification

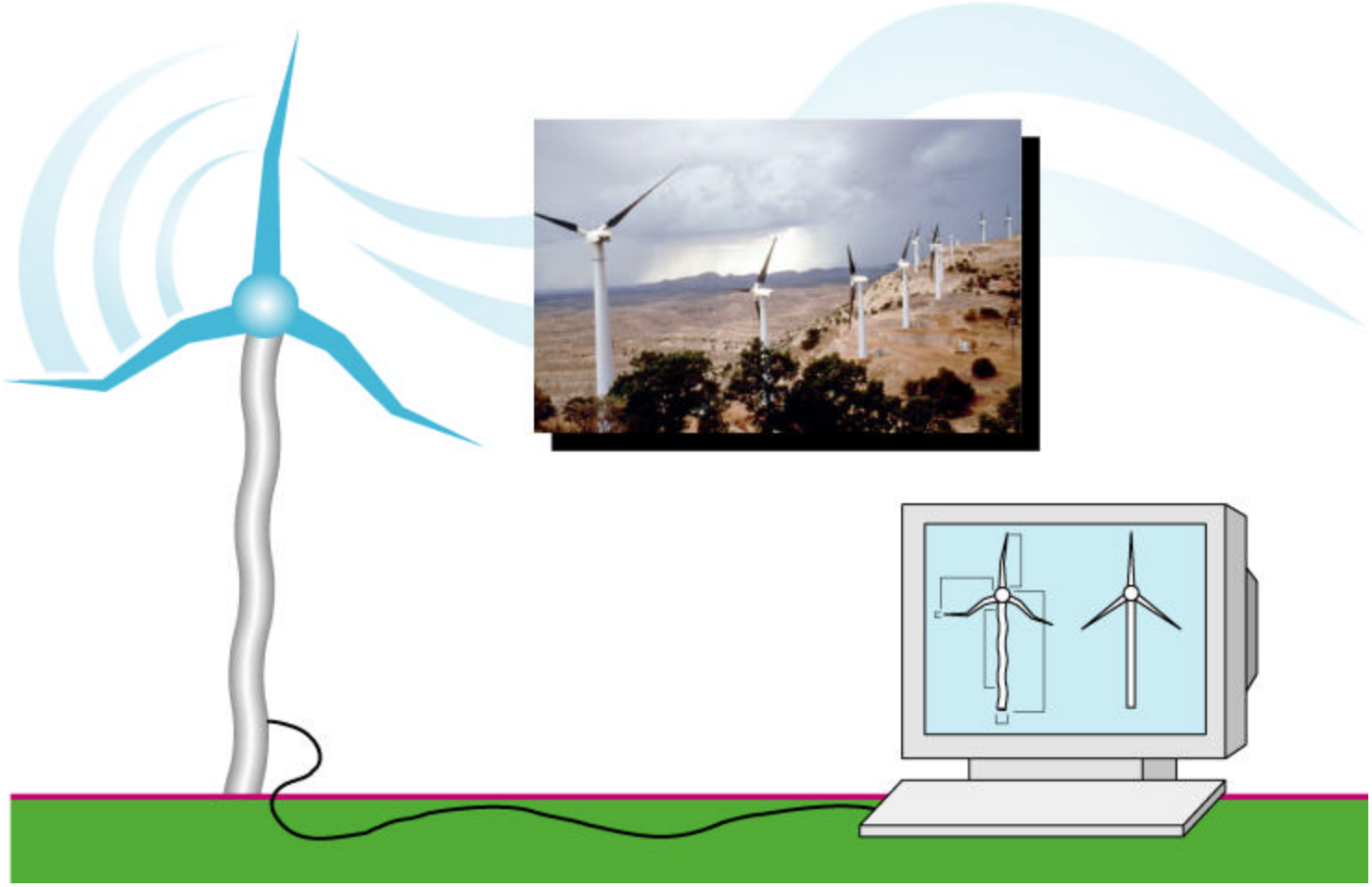
NREL TESTING CAPABILITIES

Test	NWTC Accredited	Needed for Certification	Conducted on
Safety and Function		Required	AIR403
Structural Loads	X	Required	Z-40FS, AOC15/50
Dynamic Characterization		Required	Z-750
Blade Static	X	Required	Z-40FS, Z-40A, Z-46, Z-48, Z-50, Z-50 (T-Bolt), AOC15/50
Duration		Required for small turbines only	AIR403
Acoustic Noise	X	Recommended	Z-48, Z-50VET, AOC15/50
Power Performance	X	Recommended	Z-40FS, Z-48, Z-50, AOC15/50, AIR403, AWT-27
Power Quality	X	Required	Z-48, Z-50
Blade Fatigue		Recommended	Z-750, AOC15/50
Dynamometer Test			Z-750
Full System Modal			Z-750, AWT-27
Component Modal			Z-750

Safety System Verification Test

02599905

Loads Test



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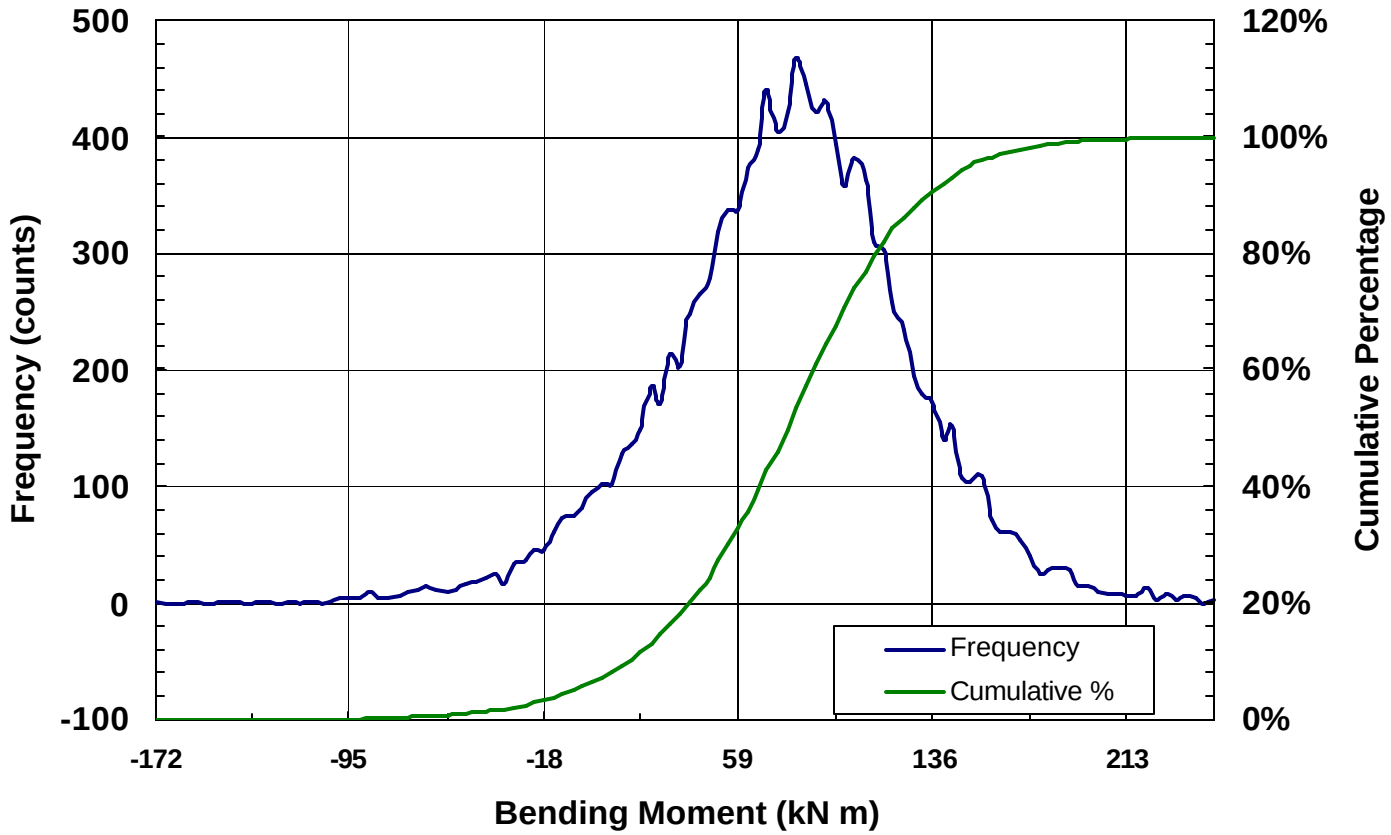
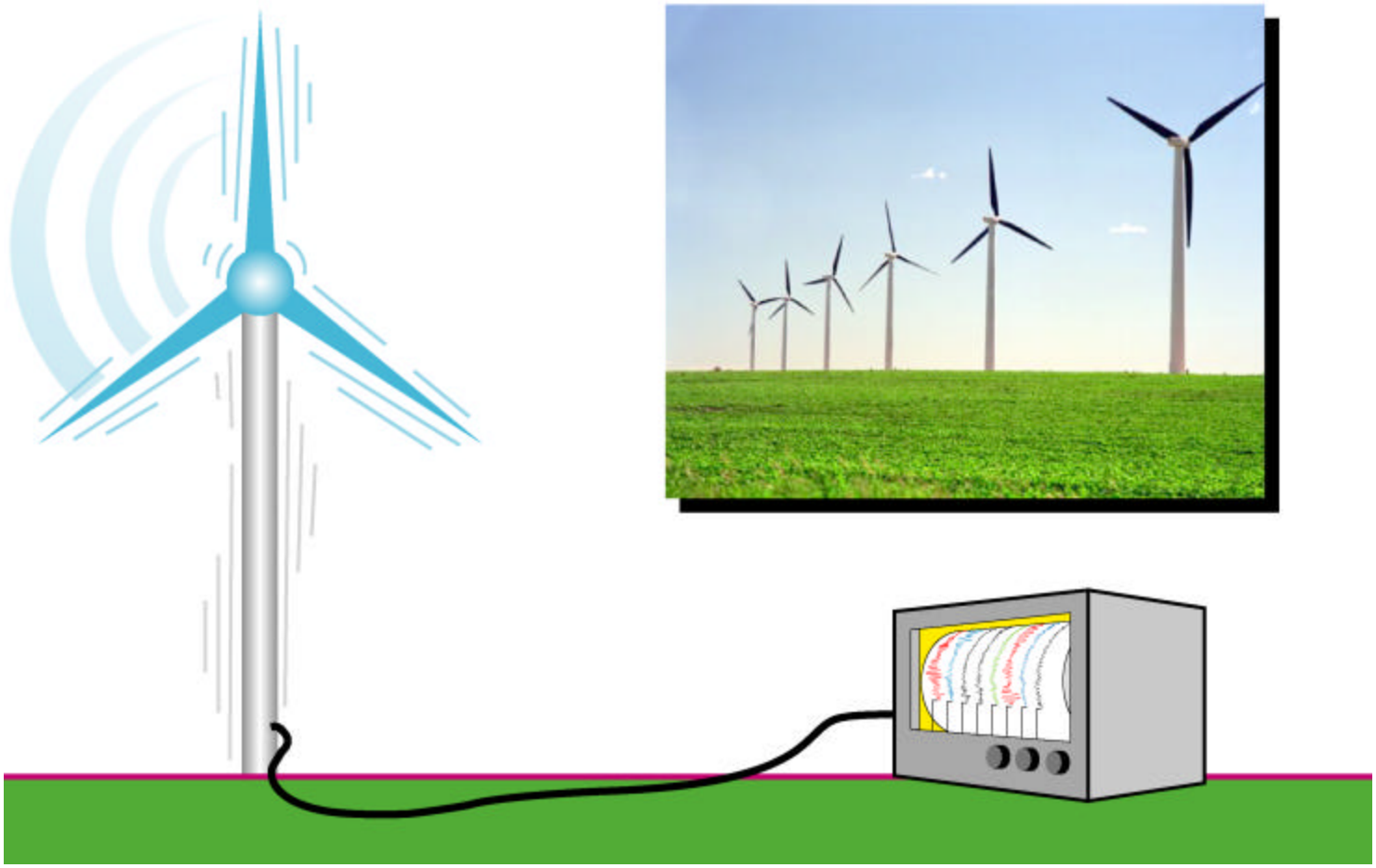
Structural Loads - Blade Bending Moments



Dynamic Characterization



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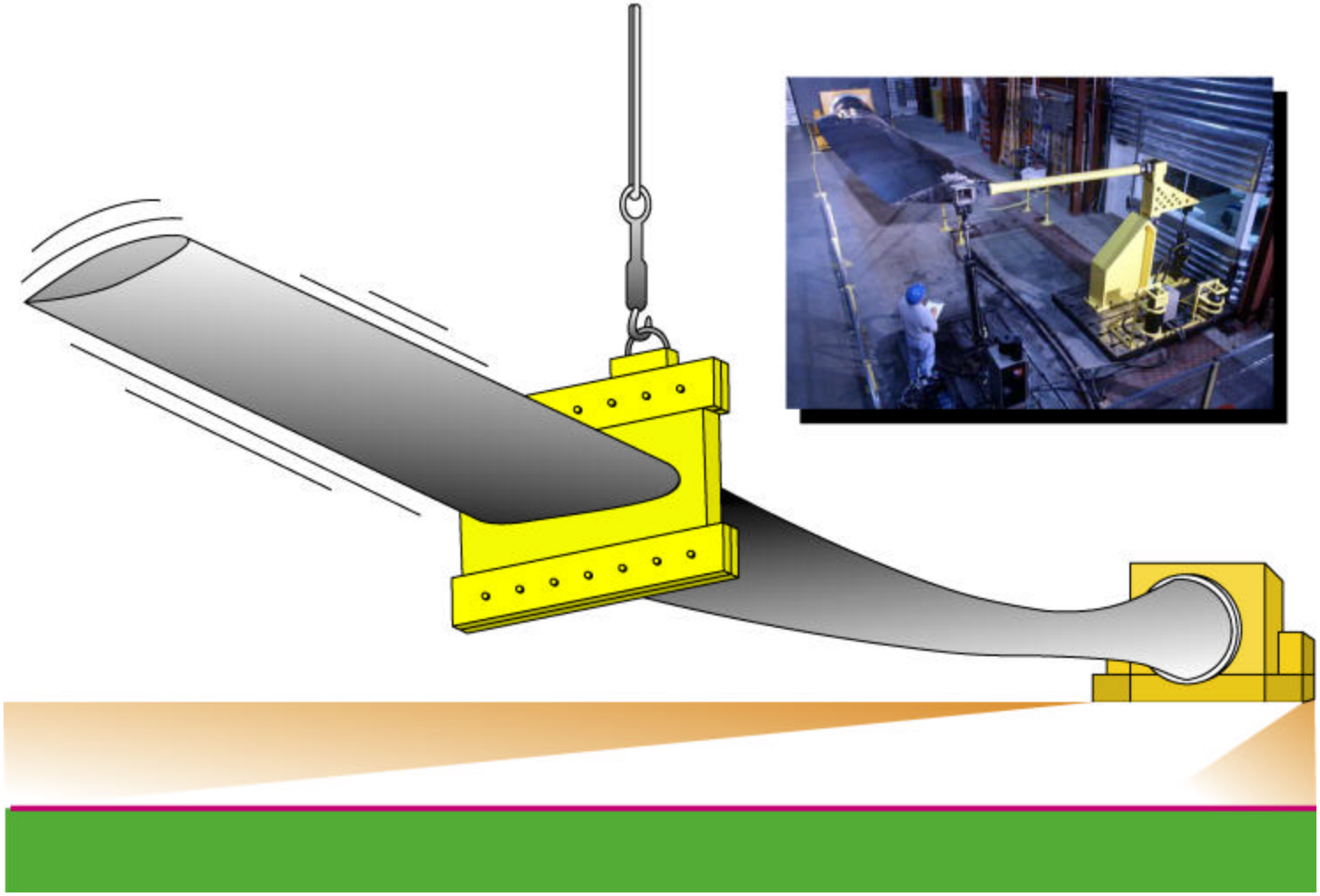
Blade Test



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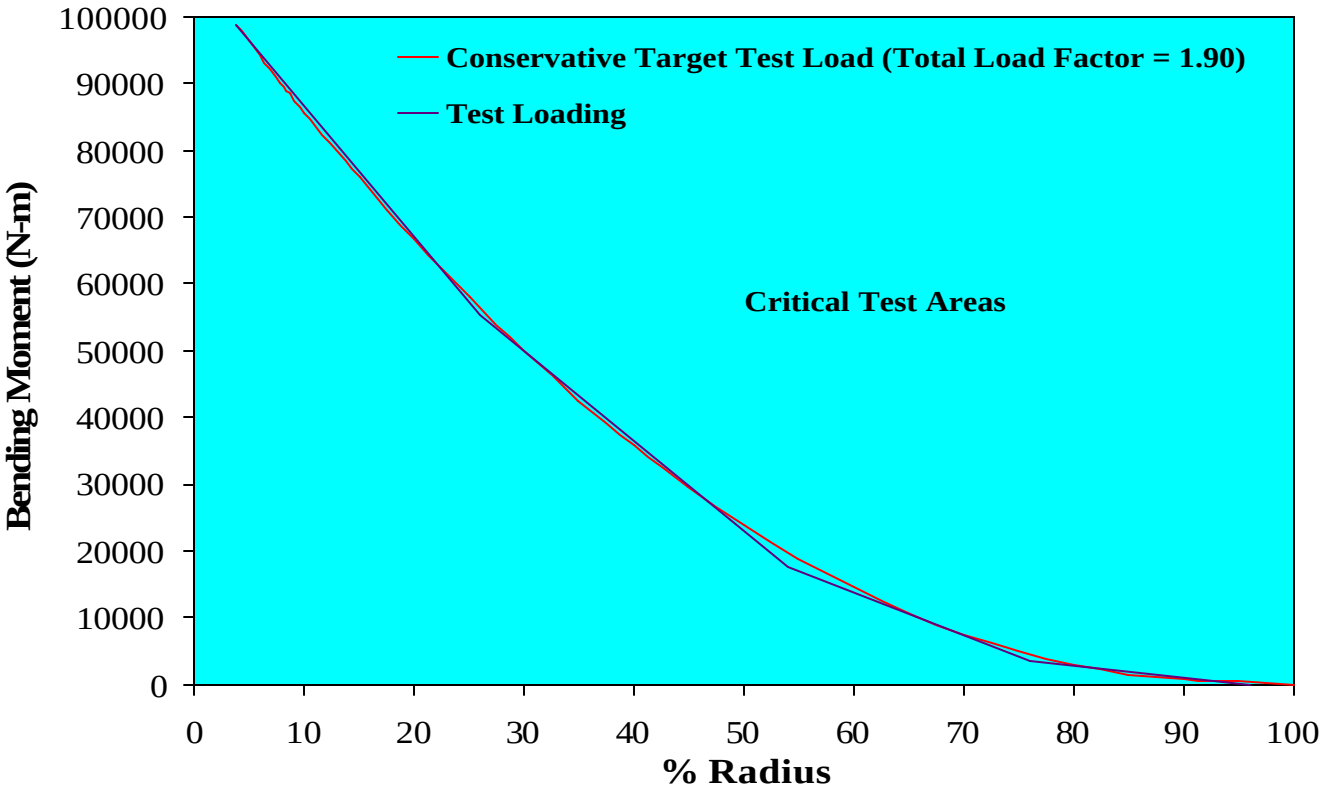
AOC 15/50 Static Target Loads and Test Loads



Duration Test

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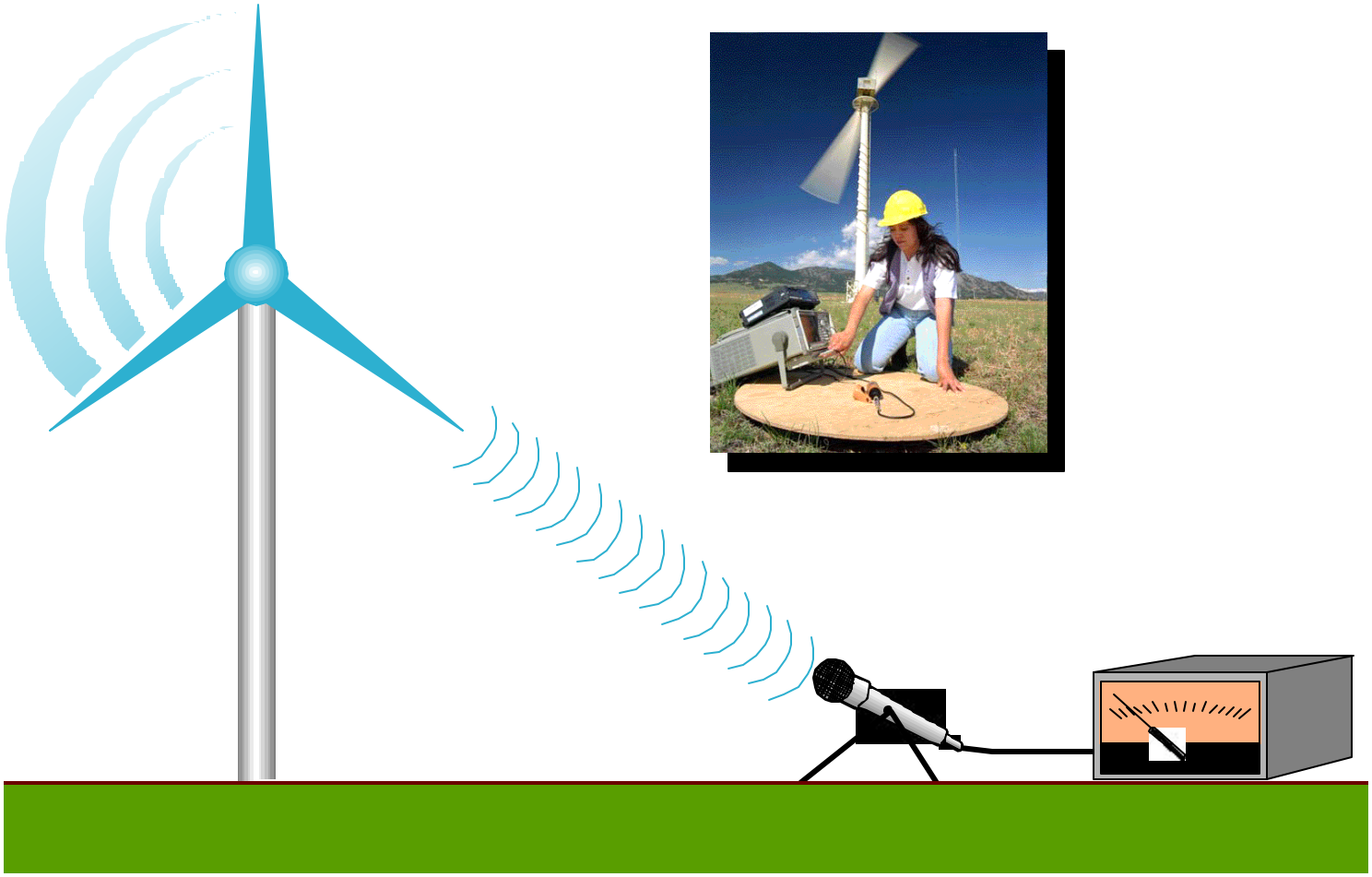
Acoustic Emission Test



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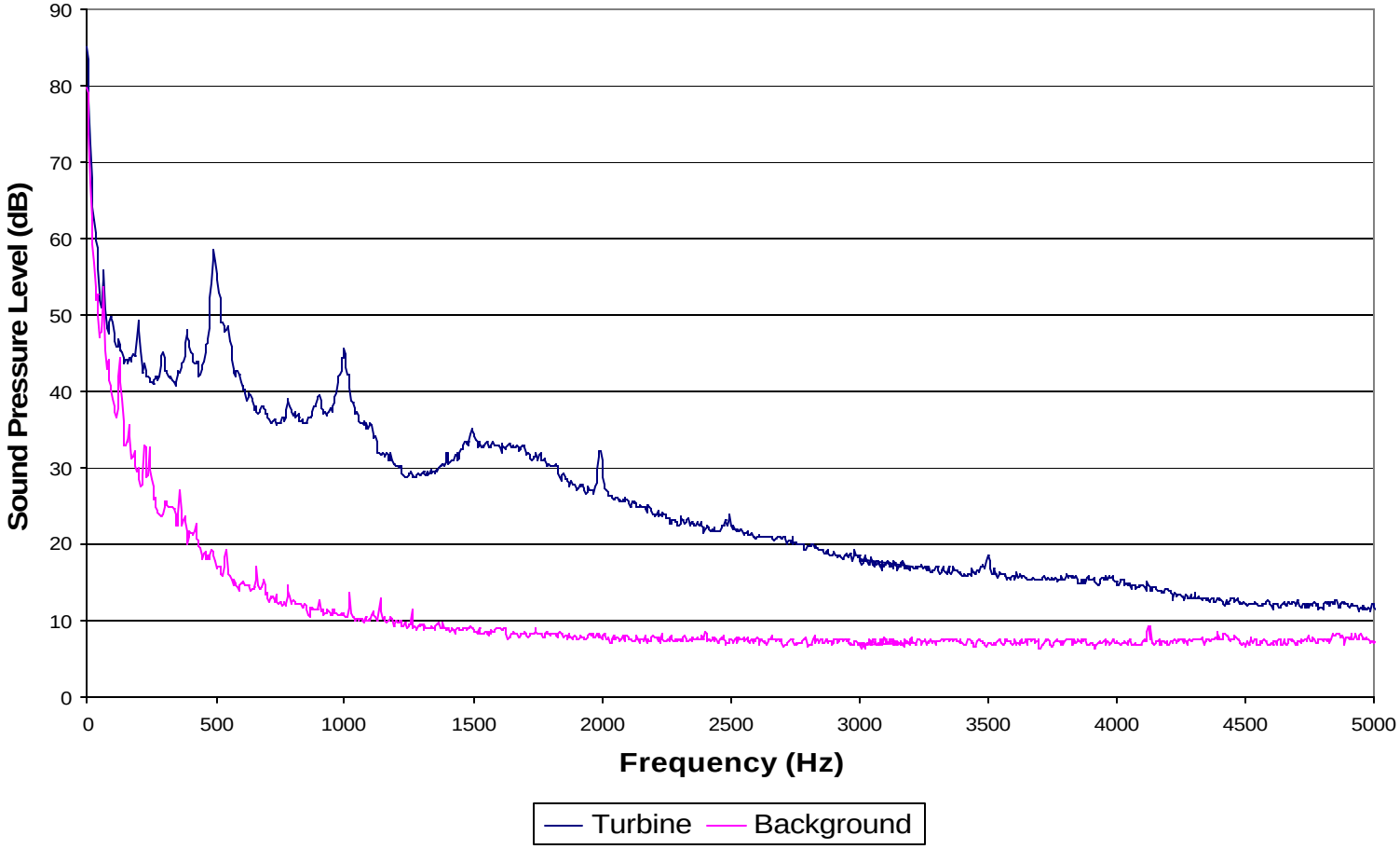
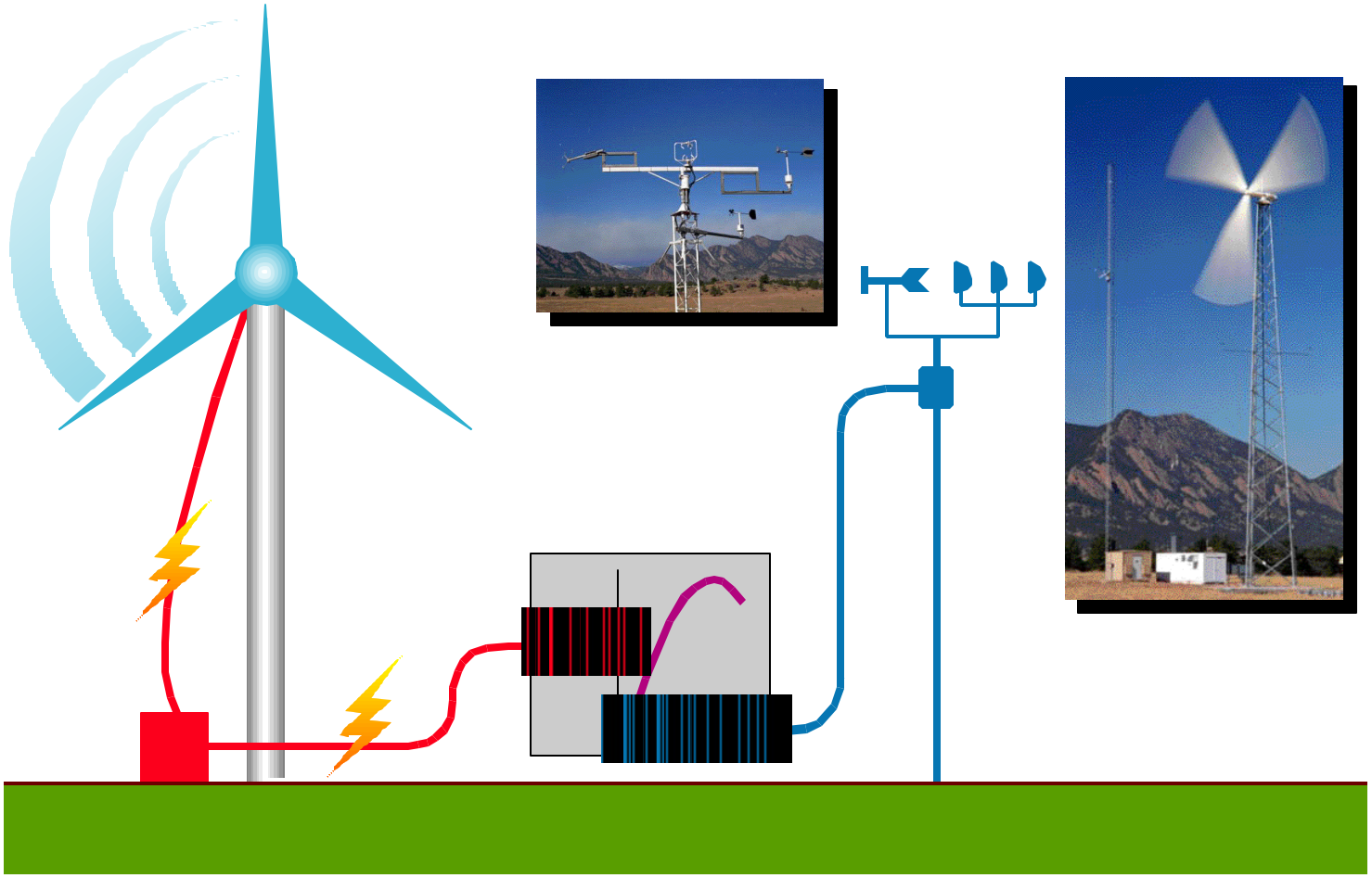
Acoustic Noise - Tonality



Power Performance Test



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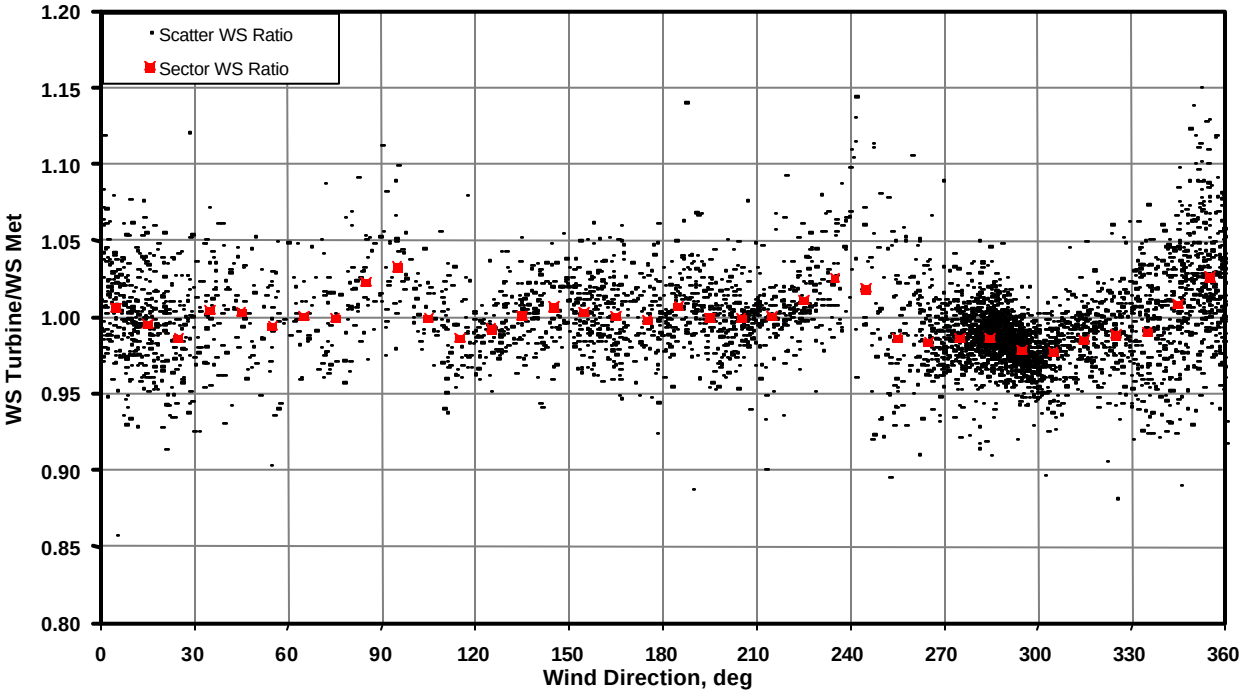
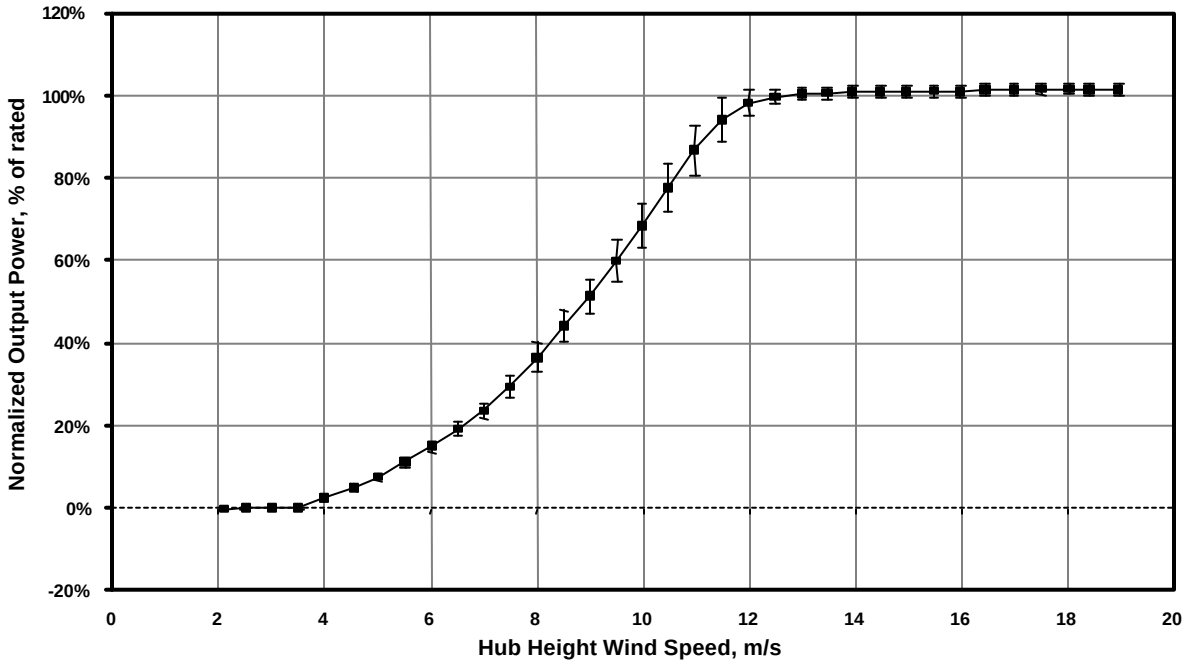
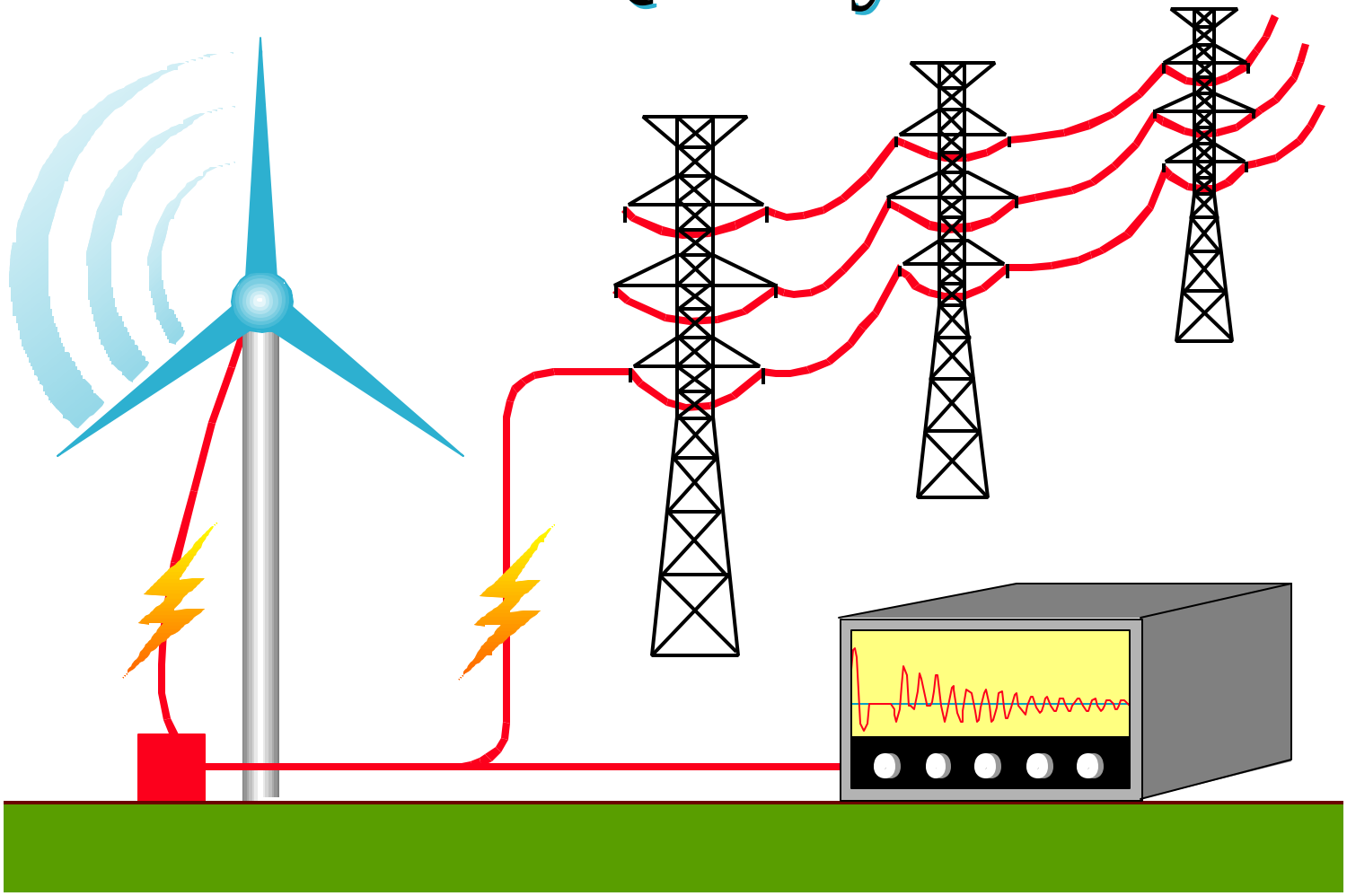
Site Calibration - Wind Speed Ratio vs Wind Direction



Power Performance - Power vs Wind Speed



Power Quality Test



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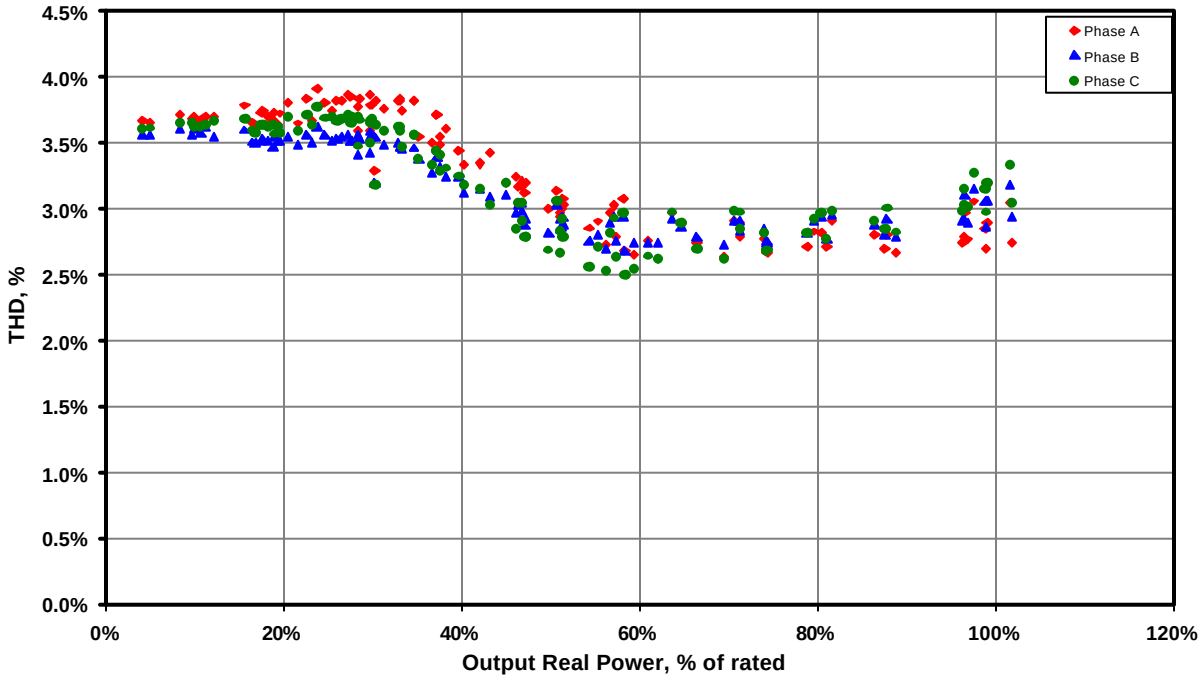
Power Quality - Harmonic Distortion