Wind Monitoring Tower Installation

Alaska Energy Authority
Alternative Energy and Energy Efficiency

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Presentation developed by Mia Devine
Meteorological Tower

- (Met tower)
- 100-feet tall
- Guyed tower
- Tilt-up tower
Met Tower Kit

- Tower sections
- Grounding rods
- Anemometers
- Vane
- Temperature sensor
- Data Logger
The Equipment

- NRG Symphonie data logger
- MMC data chip
- SCM chip
- Desiccant pack
- Sampled every 2 seconds
- Averaged every 10 minutes
Slope & Offset

- Transfer function converts electric signal into m/s or degree value
- Anemometer: use default slope & offset for NRG#40
- Vane: Must specify the offset!
Site Selection

- Local knowledge
- Wind-shaped vegetation
- Snow-swept areas
General Installation Steps

• Clear the site and measure anchor points
• Layout tower uphill and downwind

Anchor Layout and Dimensions
General Installation Steps

• Select Anchor Type:
  – Screw-in
  – Duckbill/ arrowhead with drive rod
  – Rock anchor
General Installation Steps

• Install the anchors
General Installation Steps

• Lay out main tower:
  - 10’ and 5’ sections
  - attachments
  - base plate

• Paint tower sections
General Installation Steps

• Align the base plate with the anchors
• Level the base plate
• Secure the base plate with rebar
General Installation Steps

• Horizontally assemble
  - bolt in tower section
  - slip on guy wire collars
    (red tag determines level)
  - elevate on tires/ blocks
General Installation Steps

• Assemble the gin pole
  - safety cable
  - safety ropes
General Installation Steps

• Lay out guy wires
  – Red tag has the lifting eye
  – Be careful not to mix up wires
Laying Out Guy Wires

Rear anchor guy wires
Side anchor guy wires
Gin Pole lifting eyes
General Installation Steps

- Wire sensors
- Mount the booms with hose clamps
- Wrap sensor wires down the tower & tape
General Installation Steps

• Connect the winch
  - 12 volt battery
Other Winch Options
General Installation Steps

• Support and raise gin pole
General Installation Steps

• Final arrangement of booms and sensors
  - Don’t stand under the tower or guy wires!
General Installation Steps

- Erect tower while controlling side guy wires
  - positioning of people during the lift
  - 4 levels of guy wires
General Installation Steps

- Hold tower back when nearly vertical
General Installation Steps

- Move gin pole wires from winch anchor to rear/downhill anchor
General Installation Steps

- Straighten tower by adjusting guy wire tension
General Installation Steps

- Attach, wire, and configure data logger
- Program the vane offset
General Installation Steps

• Clean-up and final check of site
Summary

Photos Courtesy of Doug Vaught (V3 Energy, LLC), Rebecca Garrett, Hannah Willard, Mia Devine, and Zach Adam

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For more information and wind data:
www.akenergyauthority.org/programwind.html