Field Modifications & Retrofits
For Aging or Damaged Sites

Presented by:
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Things to be covered

• Why this is being addressed

• List of Common Damage

• Modifications & Repair Options

• Safety and Access Considerations

• Reduce long term costs with by simplifying remedial and ongoing maintenance efforts.
Why Address Modifications or Repairs

• Prevent future costly damage
• Repair or replace of parts
• Reduce field time and labor
• Increase Safety Factors
List of Common Damage

- **Human Vandalism**
  - Guns Shots
  - Theft
  - Graffiti
  - Rocks
  - Golf Balls

- **Animal & Rodent Damage**
  - Mice and rats eating through wires
  - Cows, Deer, and Bears – Rubbing/denting standpipes
  - Birds – Droppings, and nesting

- **Wild Fire Damage**
  - Melting of cables
  - Sensor damage
  - Standpipe Warping

- **Vehicular Damage**
  - Cars – running over – denting standpipes
  - Mowers – denting and punctures

- **Environmental Corrosive Damage**
  - Moisture/rust

- **Weather Related Damage**
  - Wind
  - Lightning
  - Flooding with debris
Can you provide additional Batteries so as the site can operate without solar?

Pros:
- If there is no solar panel it is less likely to be targeted for rocks, guns, and thieves
- Does not have to have good solar exposure
- One less component to fail

Cons:
- Battery replacements need to be planned with regular maintenance
Solar Panel Damage Prevention Ideas

If the site utilizes a cabinet, or gage house, consider mounting the solar panel on top facing the directly to the sky

Pros:
• If there is no solar panel visible, it is less likely to be targeted for rocks, guns, and thieves
• Can still keep batteries up

Cons:
• Requires good solar exposure
• Is more likely to have dust, sap, and other residue build up therefore requires more cleaning maintenance.
• May require a larger panel, because it is not positioned to maximize its charging potential
Solar Panel Damage Prevention Ideas

Add additional protective plexi glass cover or wire mask.

Pros:
• Good for the sites around schools or parks where kids are more present.
• Will protect against rocks, but not guns.

Cons:
• Can reduce the effectiveness of the panel
• Adds cost
• May require a larger panel to compensate for the loss of efficiency from the protective cover.
Bullet Hole & Standpipe Damage Fixes

For Bullet holes, many may just use silicone. This works, but should be inspected regularly, as it will eventually deteriorate.

Pros:
• Inexpensive
• Readily available and simple fix.

Cons:
• Only good for small holes
• Deteriorates over time
• May cause leak potentially damaging equipment
For a longer permanent fix, use a combination of a bolt, washers, and nylock nut, with silicone. Drill hole to size of bolt.

**Pros:**
- Inexpensive
- Long term seal

**Cons:**
- Takes more effort to complete
- Difficult to apply to lower section of Standpipe
Bullet Hole & Standpipe Damage Fixes

For large dents, where the transmitter can not be removed from the top, and depending where the dent is, a door could be installed at the location. If not perhaps a standpipe sleeve could be implemented.

**Pros:**
- Repairs the standpipe without total replacement.
- Allows for easy access to transmitter.

**Cons:**
- More Costs
- Requires a bit of planning and install time
Bullet Hole & Standpipe Damage Fixes

For dents or tears in the bottom of a standpipe, a mower guard could be installed.

Pros:
• Repairs the standpipe without total replacement.
• Prevents future mower accidents

Cons:
• More Costs
• Requires a bit of planning and install time
Prevention of Funnel Plugging from Birds

Add a roosting bracket to the mast below the funnel.

Pros:
• A roosting bracket is more natural for a bird to sit on
• Easy to implement, keeps most of the bird droppings out of the funnel

Cons:
• Adds cost
Prevention of Funnel Plugging from Birds

Add nixolite (bird spikes)

Pros:
• Discourages most birds from resting or nesting in the funnel
• Easy to implement, keeps most of the bird droppings out of the funnel

Cons:
• Adds cost
• Adds challenge to clean the funnel/screen. Use good leather gloves when working around them
• Could skew accuracy of rain bucket if spikes are not properly installed
Safety & Access

Installing doors

- Fall Risk Reduction
- Reduce the potential of back injury from lifting transmitter from bottom of standpipe
- Reduce the chance of dropping the transmitter back down the standpipe
- Reduce maintenance time
Mast Kits

• Fall Risk Reduction
• Allows technician to service any sensors and solar panel mounted on the mast without having to balance on the top of a ladder
• Reduces maintenance time
Safety & Access

Retrofit Standpipe Sleeves and Cabinets

When you need to replace a full standpipe because of age or damage, a standpipe sleeve is a good option. Requires a good solid base.

- Does not require to dig new hole
- Does not require concrete
- Can be installed in less than an hour
- Offers new features with door access, and mast drop down option.
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