

Tips 'N' Tricks

Care and Feeding of the FM Transmitter Site

(Grounding, Cooling, Security, Maintenance, etc.)



Agenda

Overview

- ✓ Grounding
 - What's different from AM?

- ✓ Security
 - Adding visibility
 - IT Security

- ✓ Maintenance
 - Sometimes it is easier to stop the fire from starting
 - Spending a little to save a lot
 - Older equipment



Jeff Welton, CBRE
Regional Sales Manager
Central U.S.



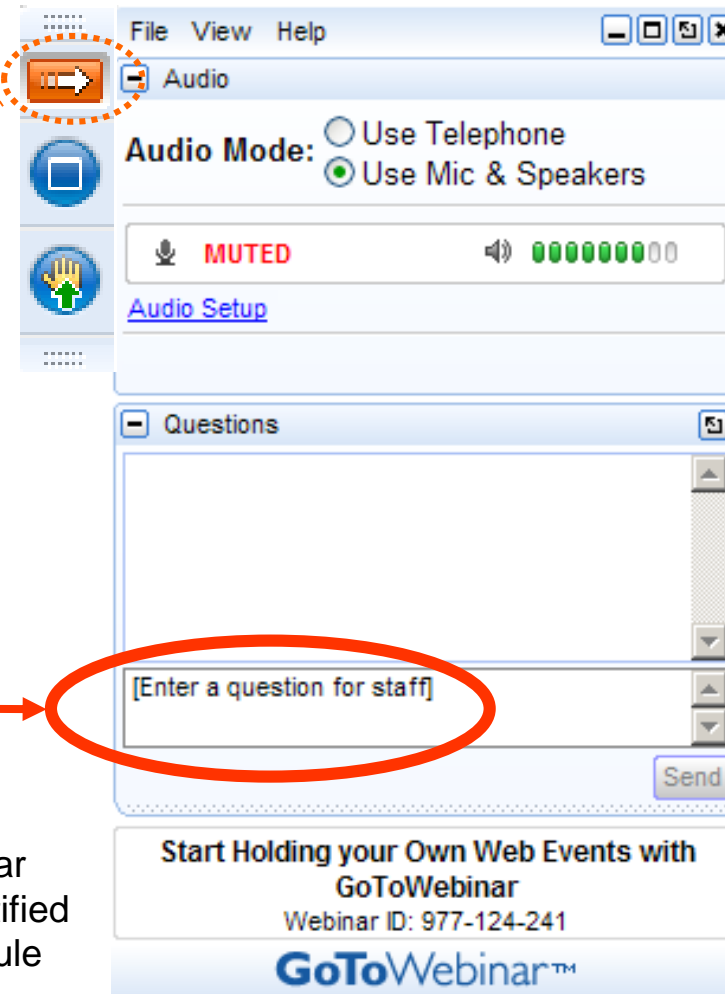
Chris Tarr, CSRE, AMD, DRB, CBNE
Director of Technical Operations
Entercom Wisconsin

making digital broadcasting work

Your questions please?

(if you don't see the control panel, click on the orange arrow icon to expand it)

Please enter your questions in the text box of the webinar control panel (remember to press send)



Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.

Grounding

- Single Point
- Bonded connections
- Short, straight runs
- Surge Protector
- Use ferrite



Single Point

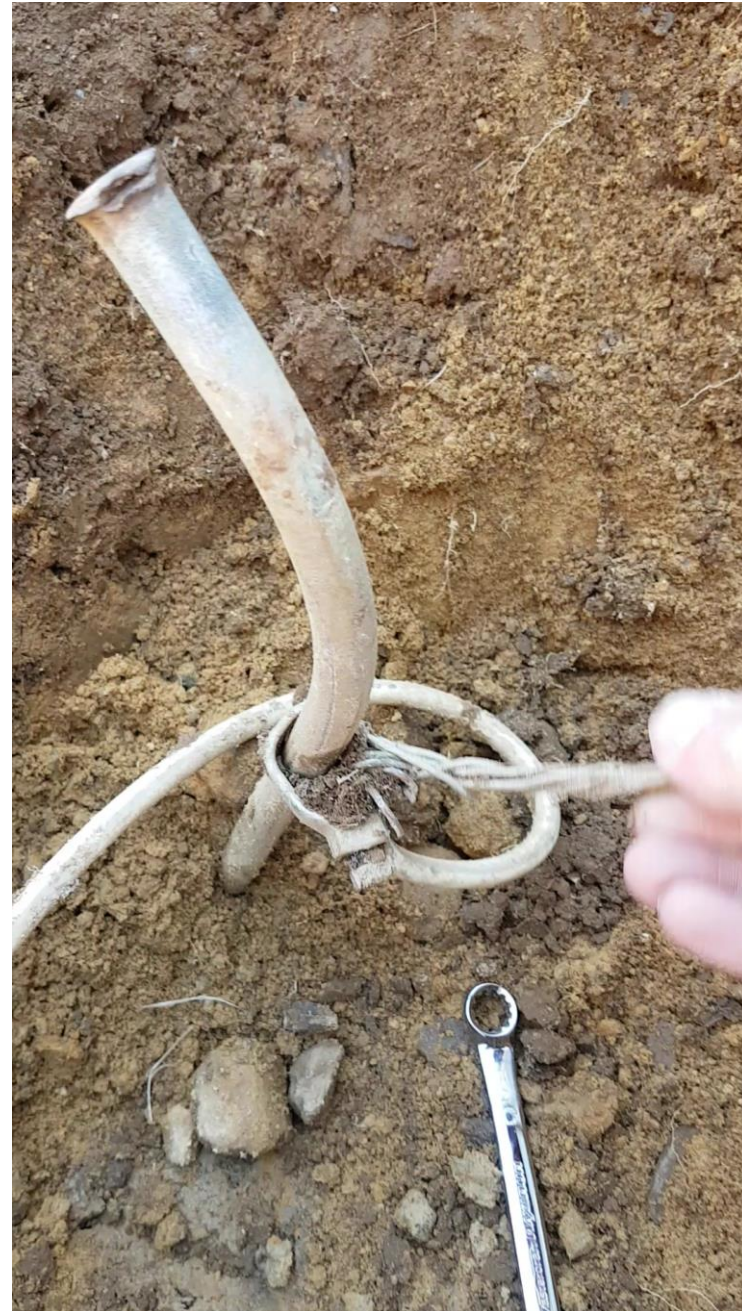
Bulkhead ground for coax cables

- Best done where cables enter building
- Connected to station reference ground
- Keep ground leads as short as possible



Bonding

Make certain your ground is
REALLY a ground!



Surge Protector

AC Power line protectors are a must – and they **MUST** be connected to your station reference ground.

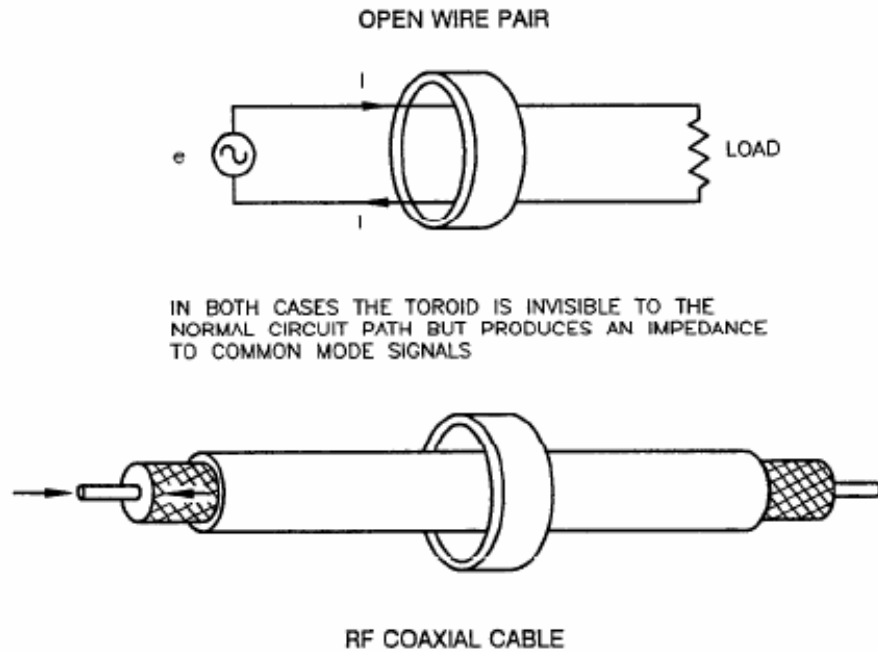


Ferrites

- On the coax near the transmitter
- On STL antenna cables
- On audio cables near their termination point only twisted pair, shielded cables should be used
- On the AC to the transmitter - all AC phases and AC ground go through the same ferrite
- On the remote control cables
- On AC cables to any external equipment
- On any network cables



Ferrites



Ferrites are good for reducing common mode signals

- Lightning surges
- Induced RF (especially at co-located AM and FM sites)
- Power line and power supply noise

Figure F-4 Use of Toroids to Impede Common Mode Signals

Ground Loops

Clean up excess wiring

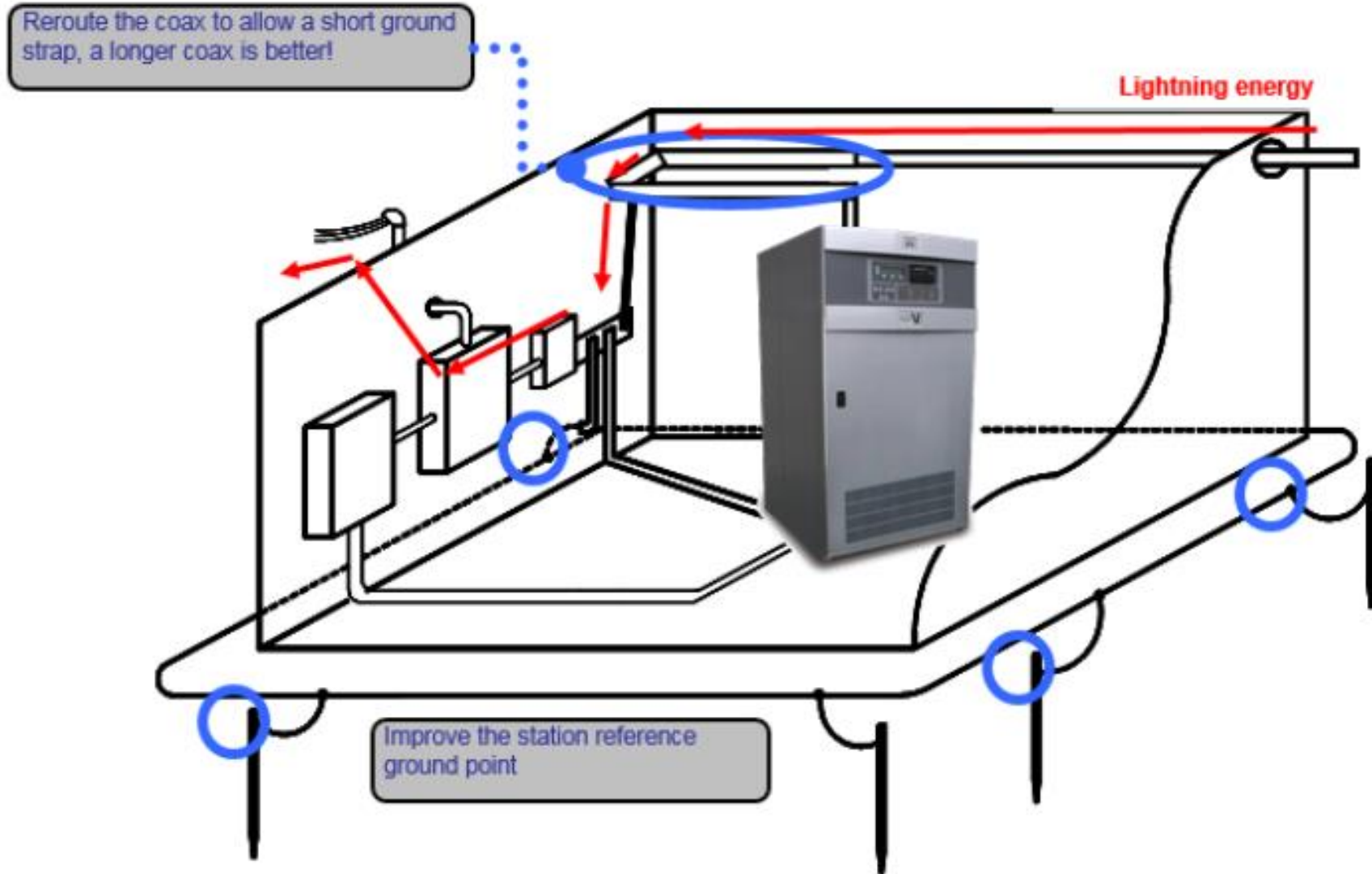
- previous installs
- broken connections that were replaced

Keep ground connections to a minimum

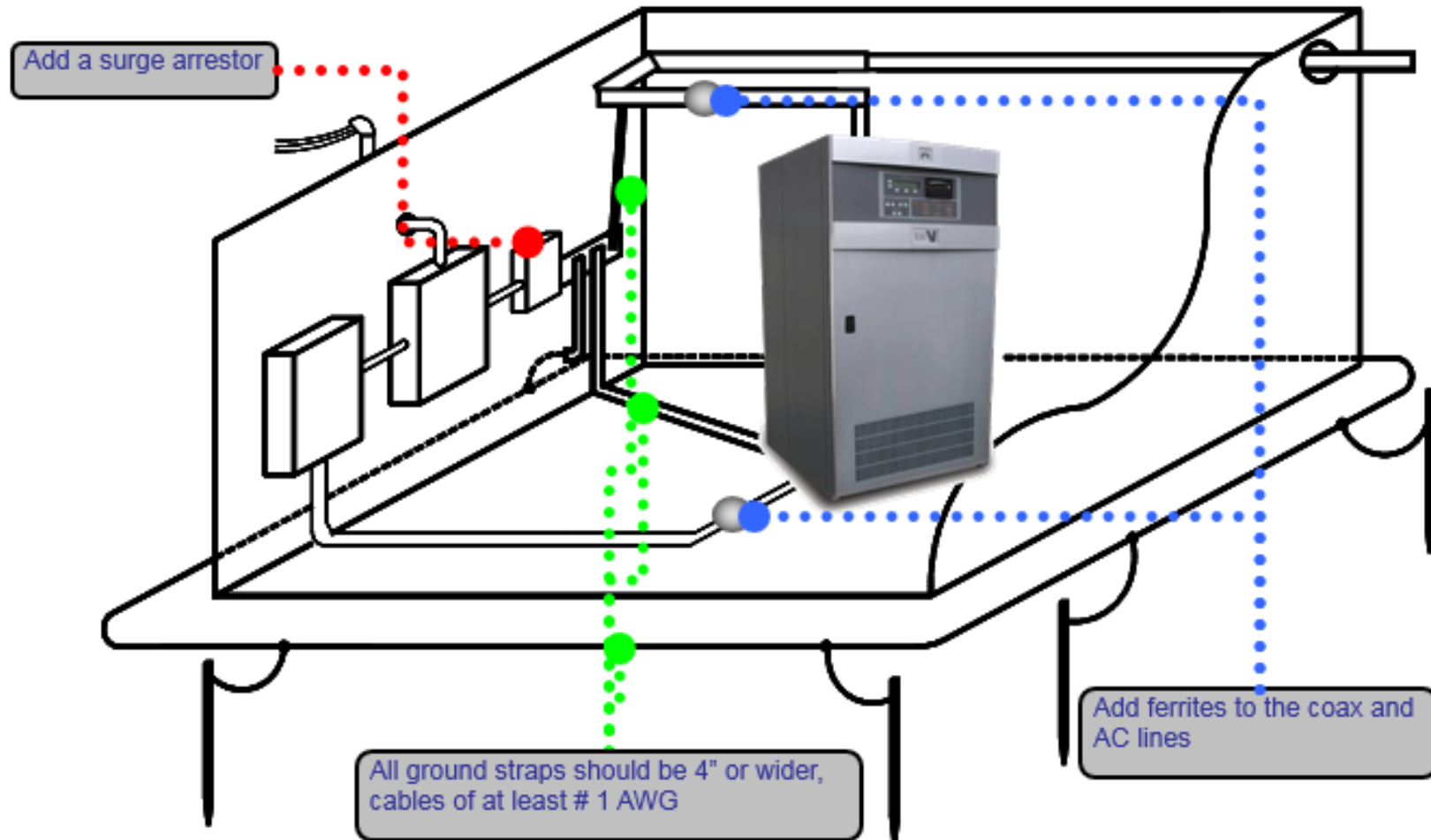
- one per piece of equipment



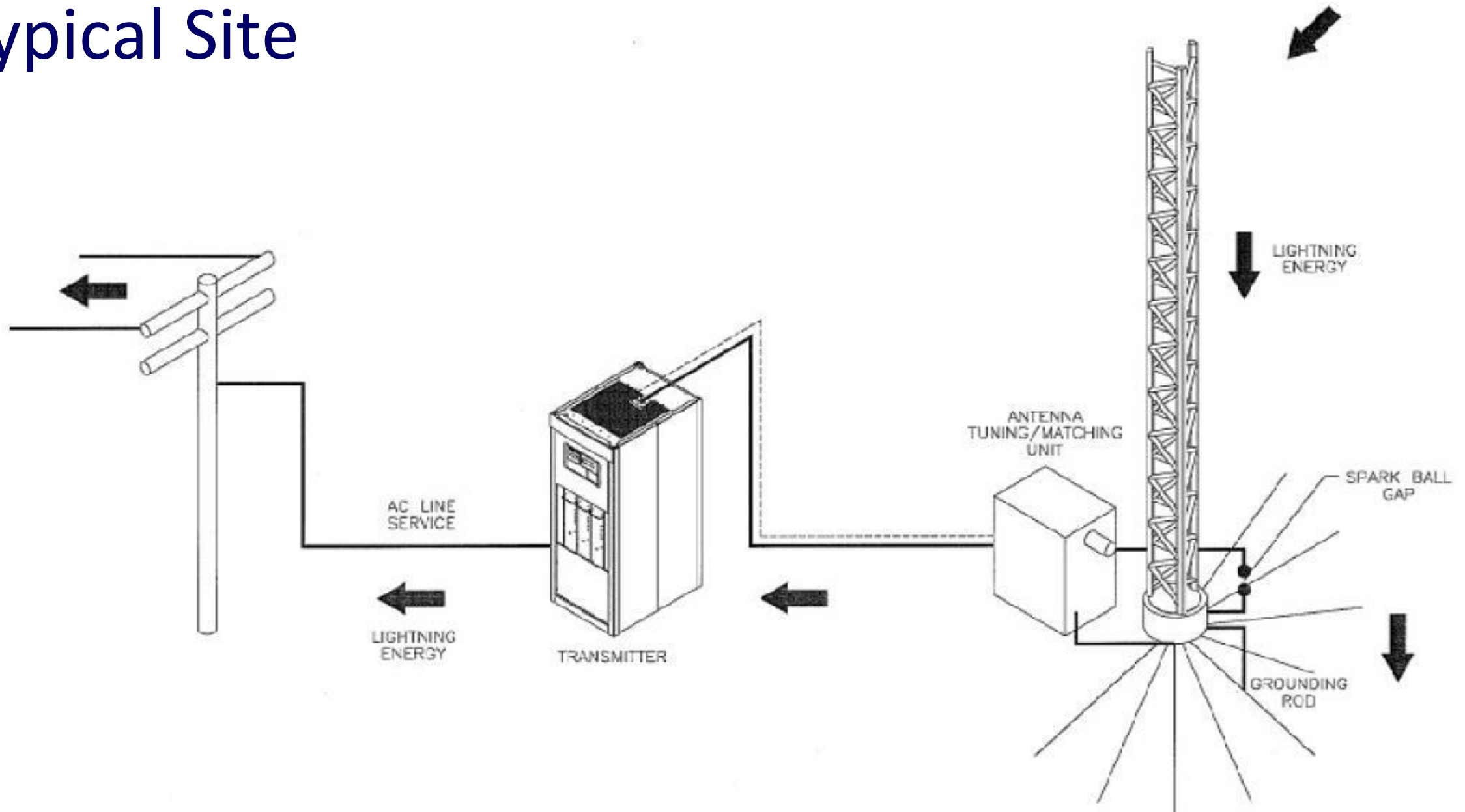
Improving Layout



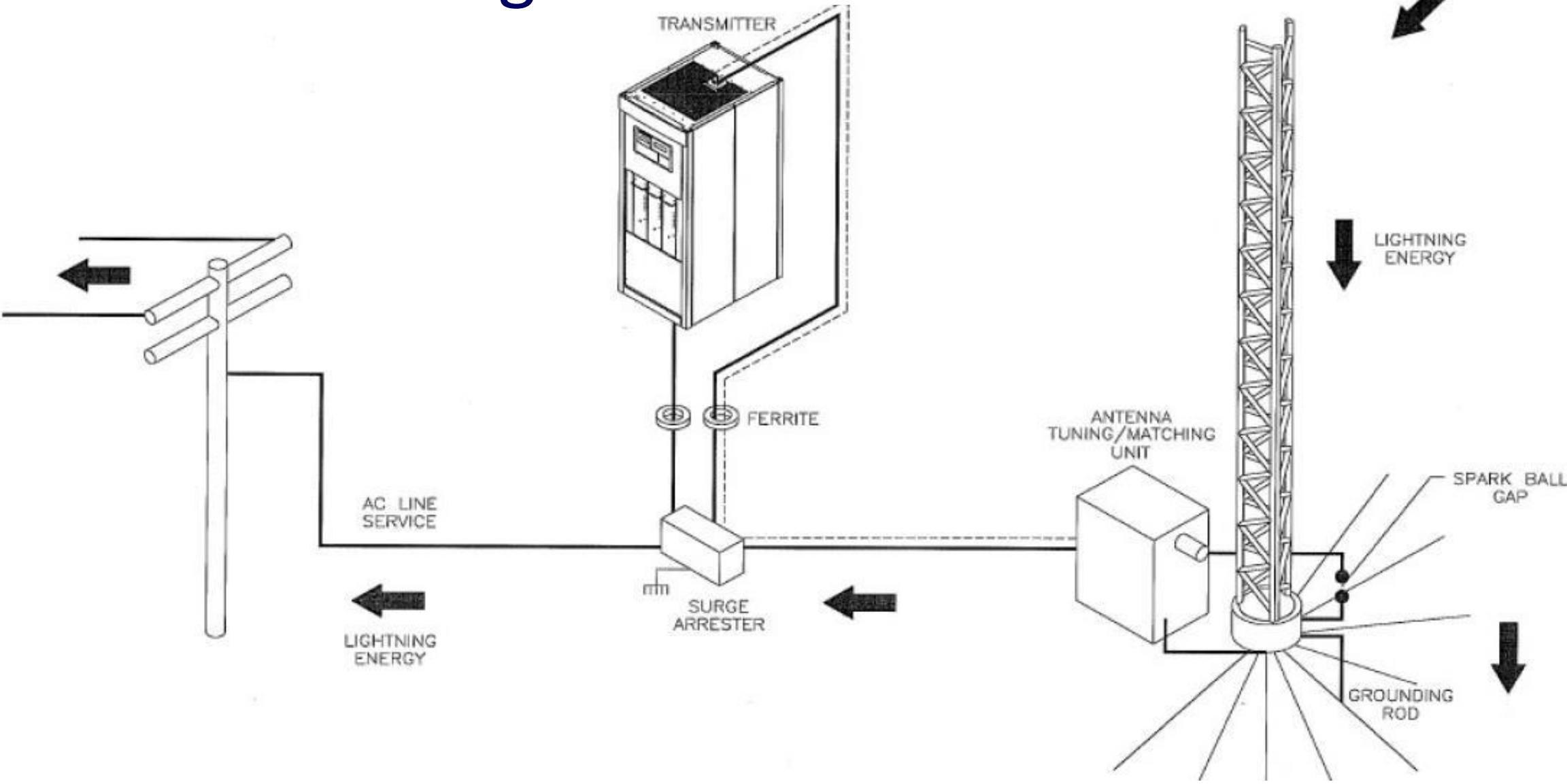
Improving Layout



Typical Site



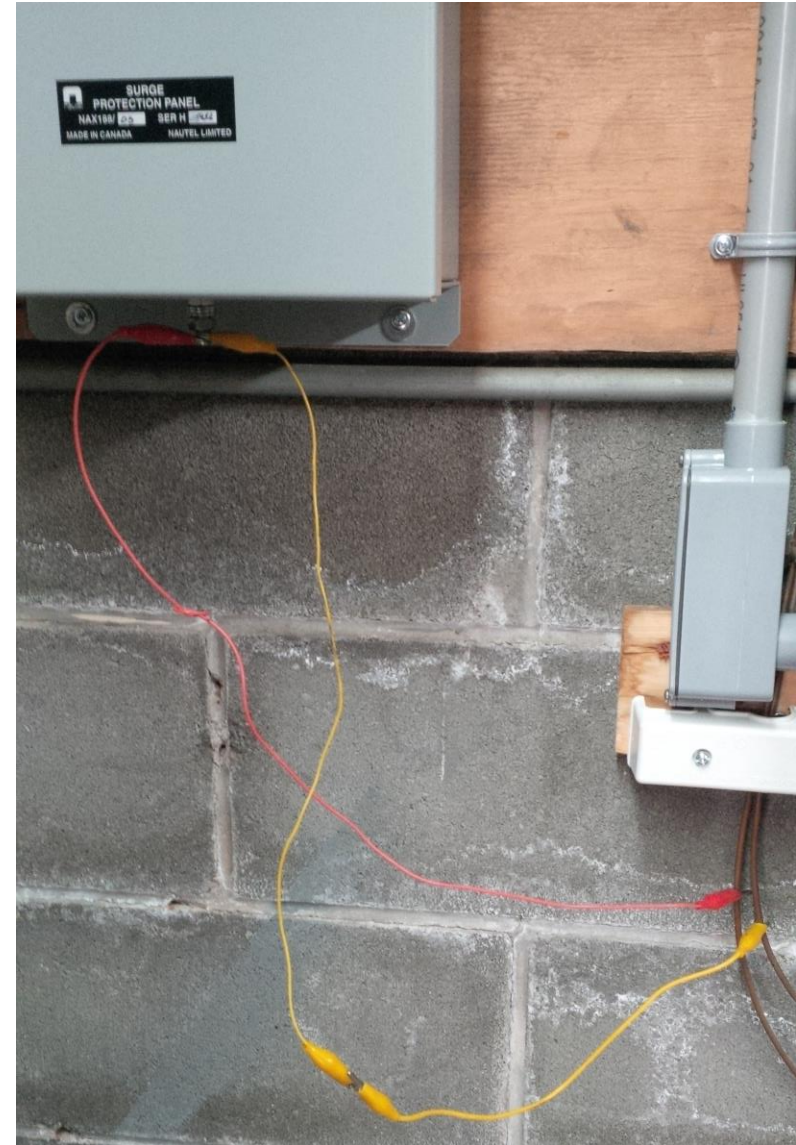
Installation of Surge Protector



Good Engineering Practices



Photo credits: Rod Thannum, Northwestern Media



Maintenance

- Air Filters / Air Conditioning Systems
- Hardware – power supplies
- Air Handling – belts and blowers
- Ground System - integrity
- Housekeeping – clean up!
- Older gear (GlassFETs!)
- Air Conditioners
- Generators



Air Filters

Air Filters should be changed on a schedule, based on site conditions.

Metal mesh filters can be washed – make sure they are dry before reinstalling!



Hardware

- Compression connections (as AC entry points and circuit breakers) can loosen over time, as wires compress.
- Filter connections and grounds should also be checked (fan/blower vibration and heating/cooling cycles can also cause these to loosen)

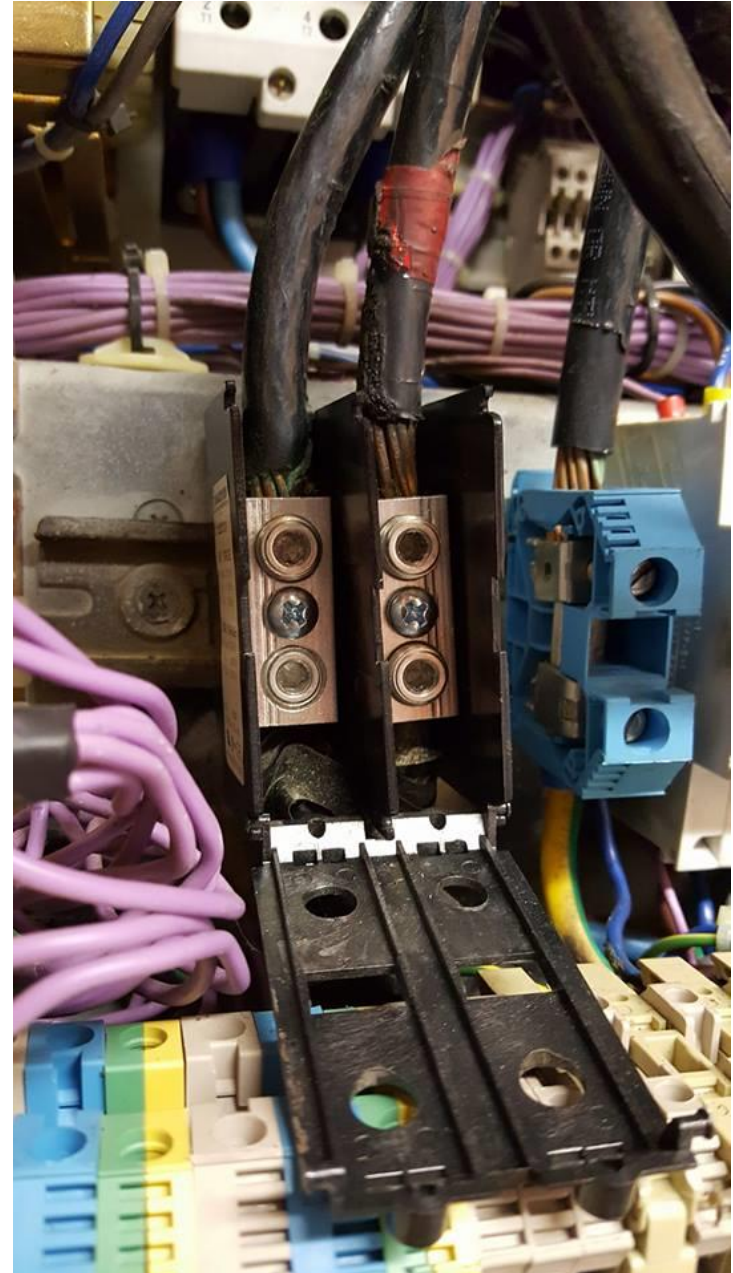


Periodic Safety Checks

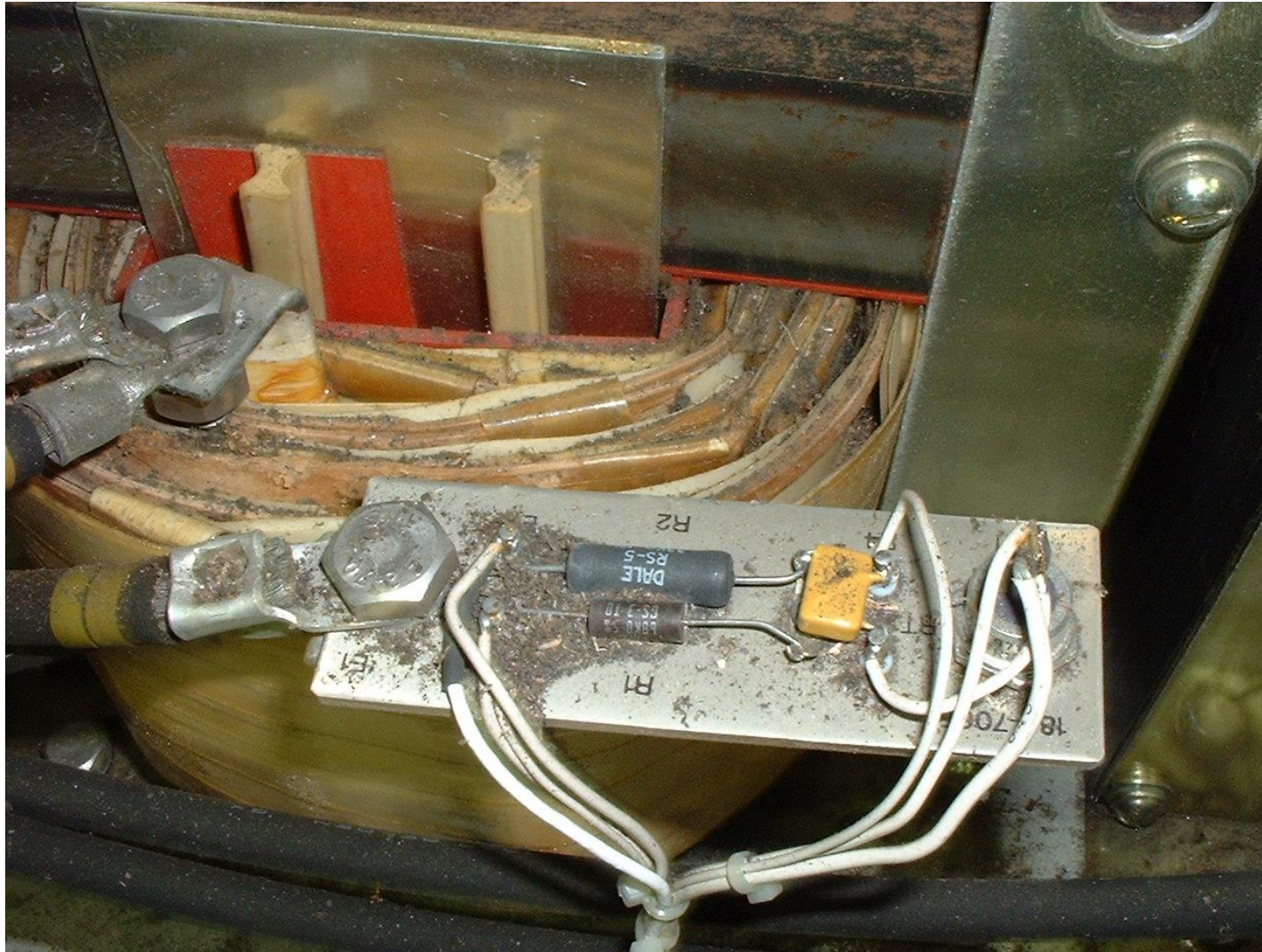


Hardware

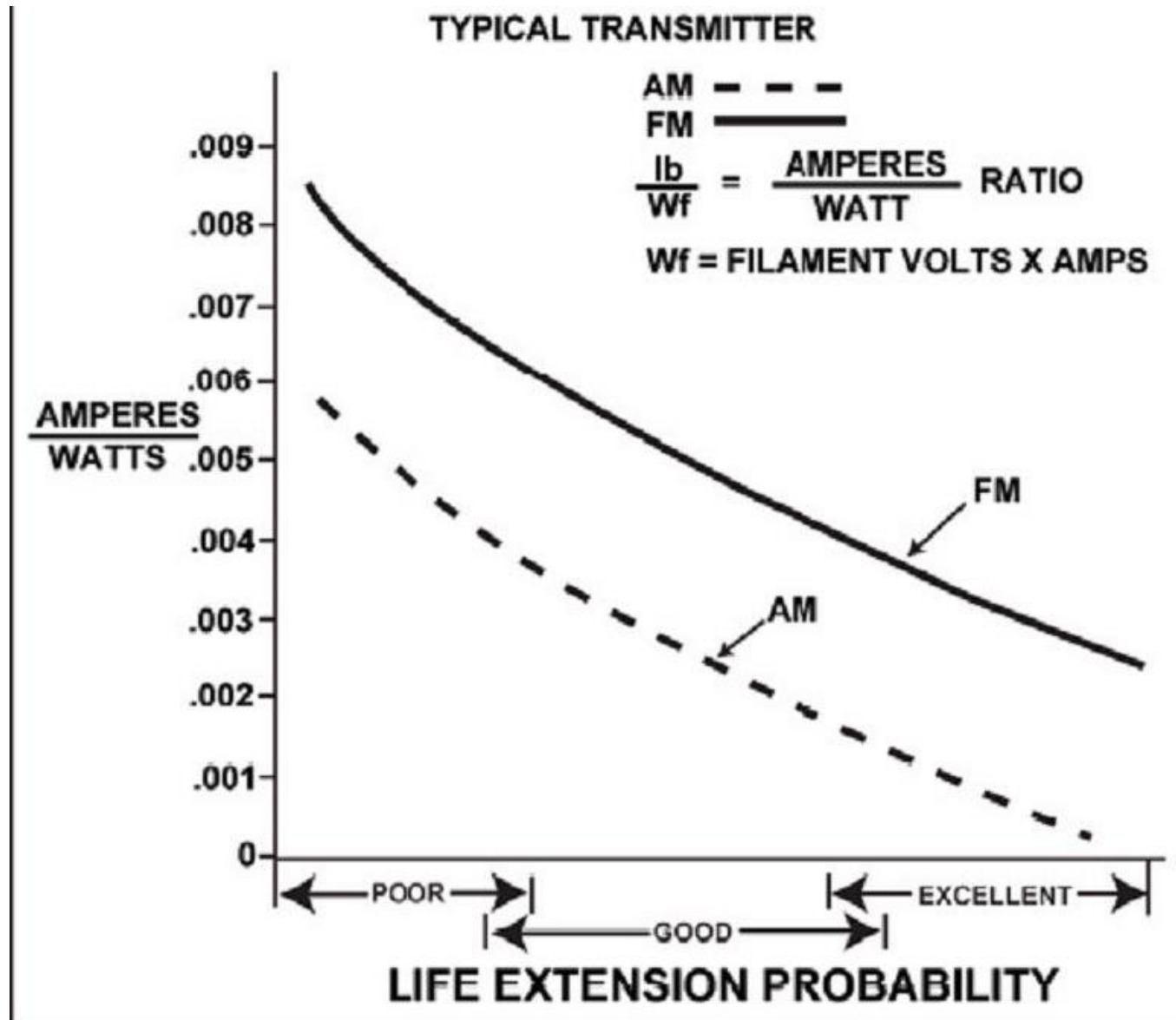
- Compression connections must be checked periodically



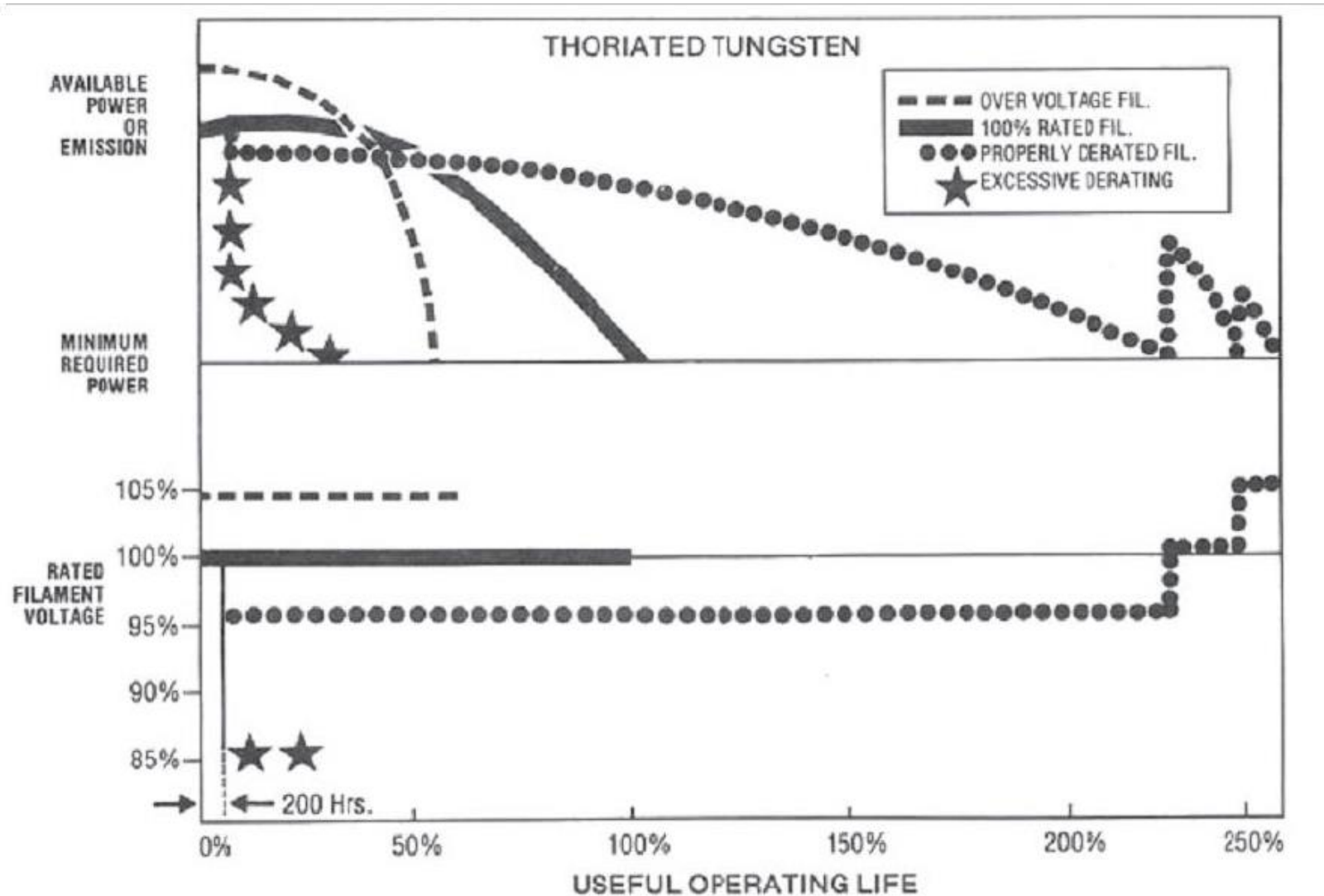
Housekeeping



Maintaining Older Gear



Maintaining Older Gear



Start at rated voltage.

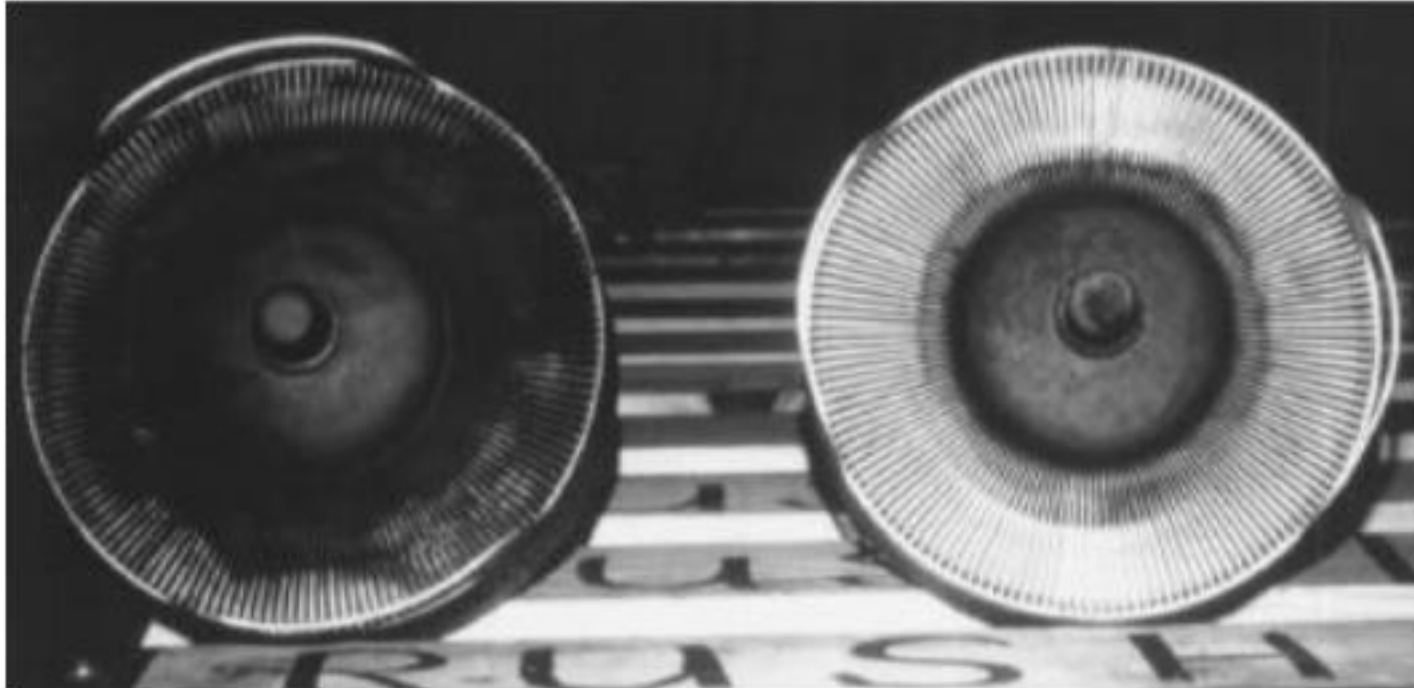
Run for 200 hours.

Back off until power starts to drop, then increase slightly.

As output drops, raise voltage and order new tube.

Maintaining Older Gear

Just pop 'em in and forget about them, right?



Air Conditioners



- Compressor coils need cleaning
- Check condensate lines for blockages
- Belts and filters

Generators

- Fluid levels and changes
- Belts and filters
- Check for leaks
- Fuel conditioning/treatment
- Battery check



Photo credit: www.cat.com

Online Information

- **Nautel Waves Newsletter**
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