



Presented by:

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Spectrum Program Manager

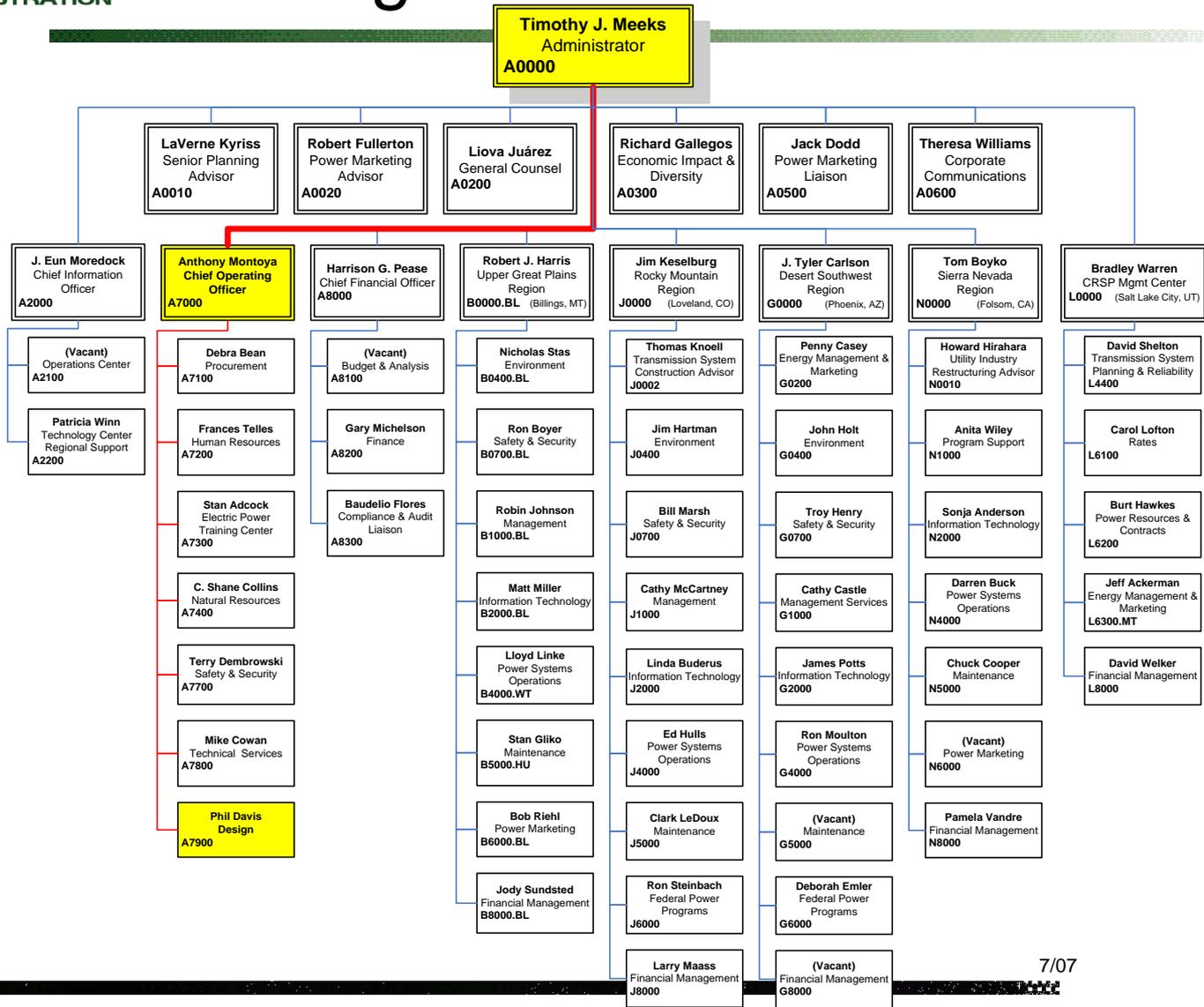
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Western markets and delivers
reliable, cost-based hydroelectric
power and related services.

Organization Chart



7/07

Organization Chart



- The Design Office
 - Electrical Engineering
 - Civil Engineering
 - System Control
 - Senior Telecommunications Engineer
 - Spectrum Program Manager

Personnel Summary

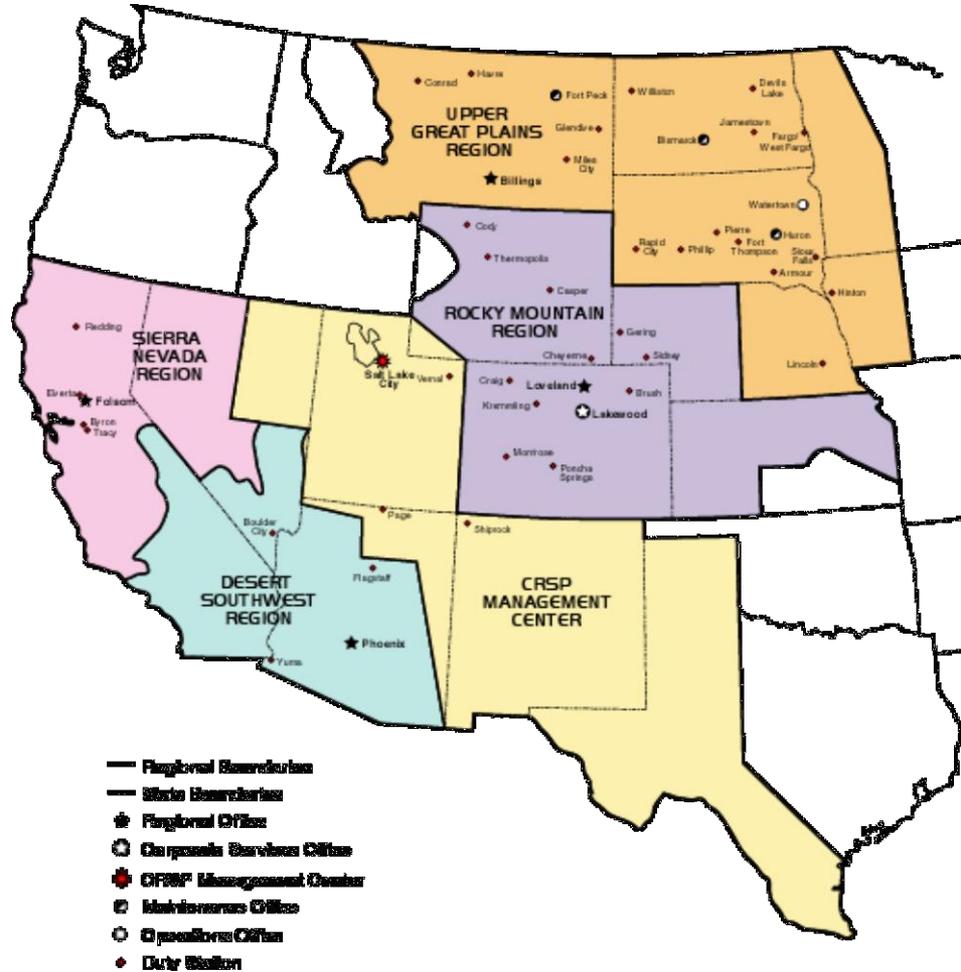


Number of Federal Employees: 1375

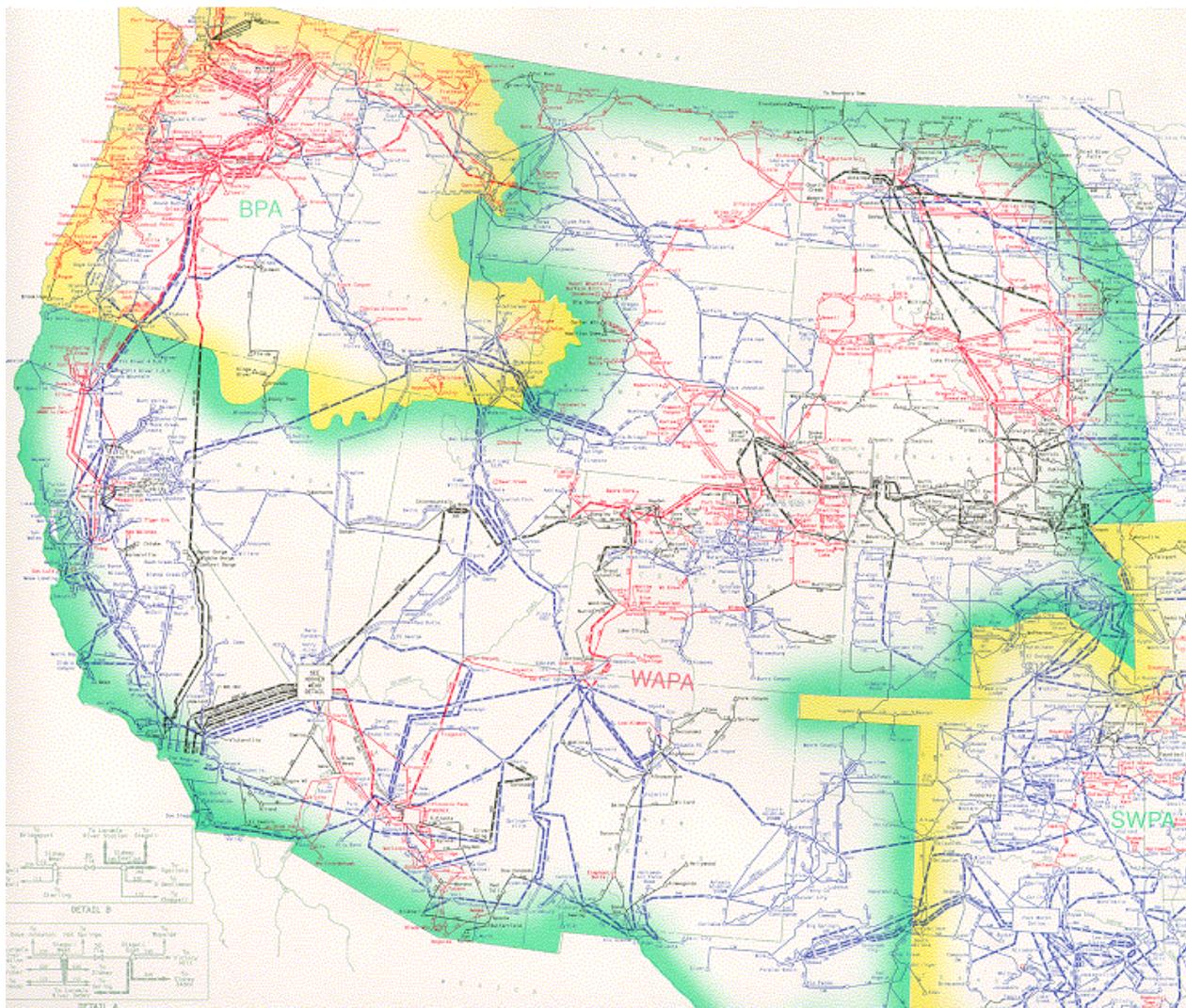
Number of Contractor Employees: 300

Training Issues: Western has generally not had any training issues other than finding time to take the training with heavy work loads.

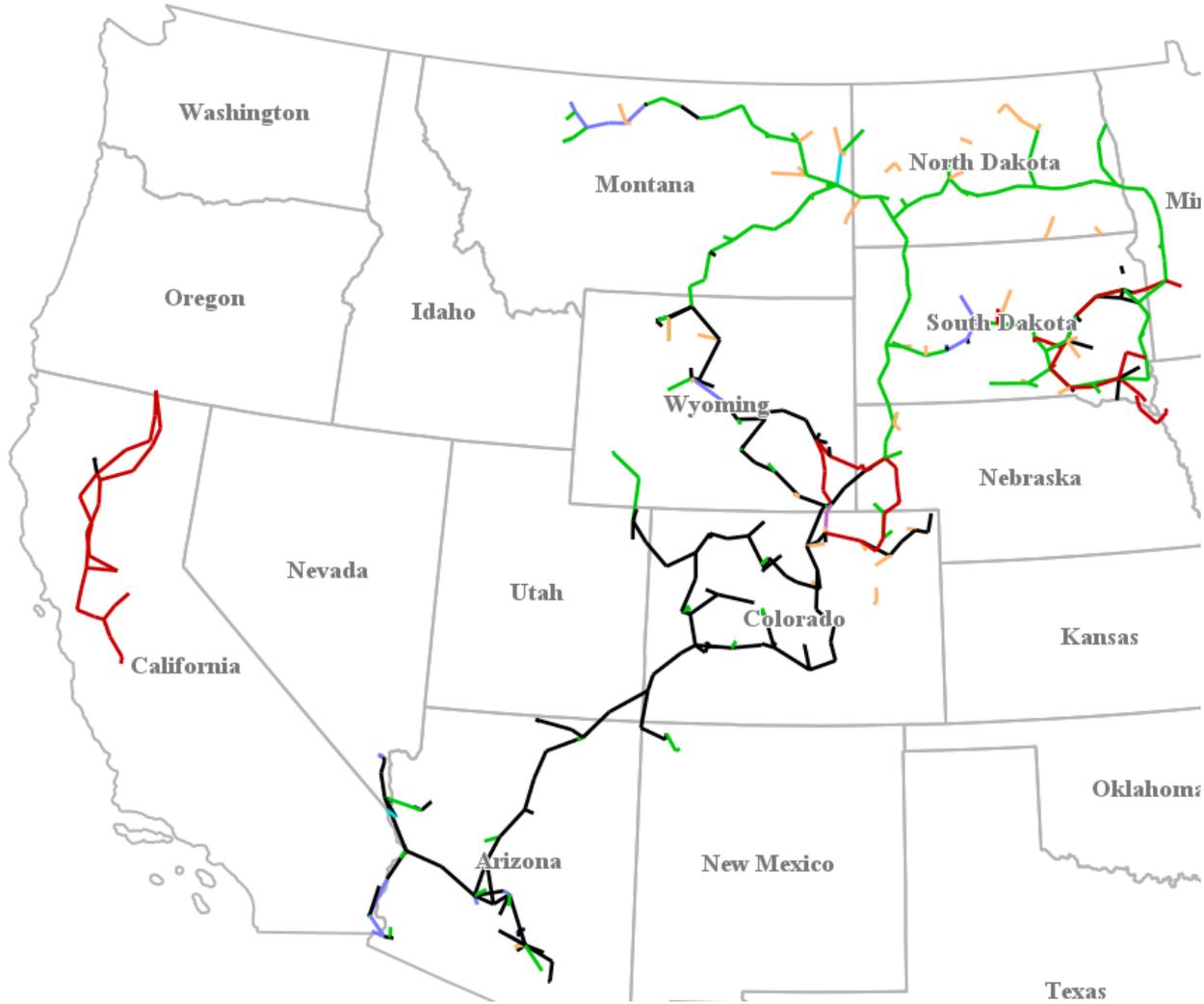
Retention / Acquisition Issues: Western has an extremely large area of operation and covers some pretty remote parts of the country. It has been difficult to find qualified communications technicians and engineers willing to accept positions at these remote duty stations.



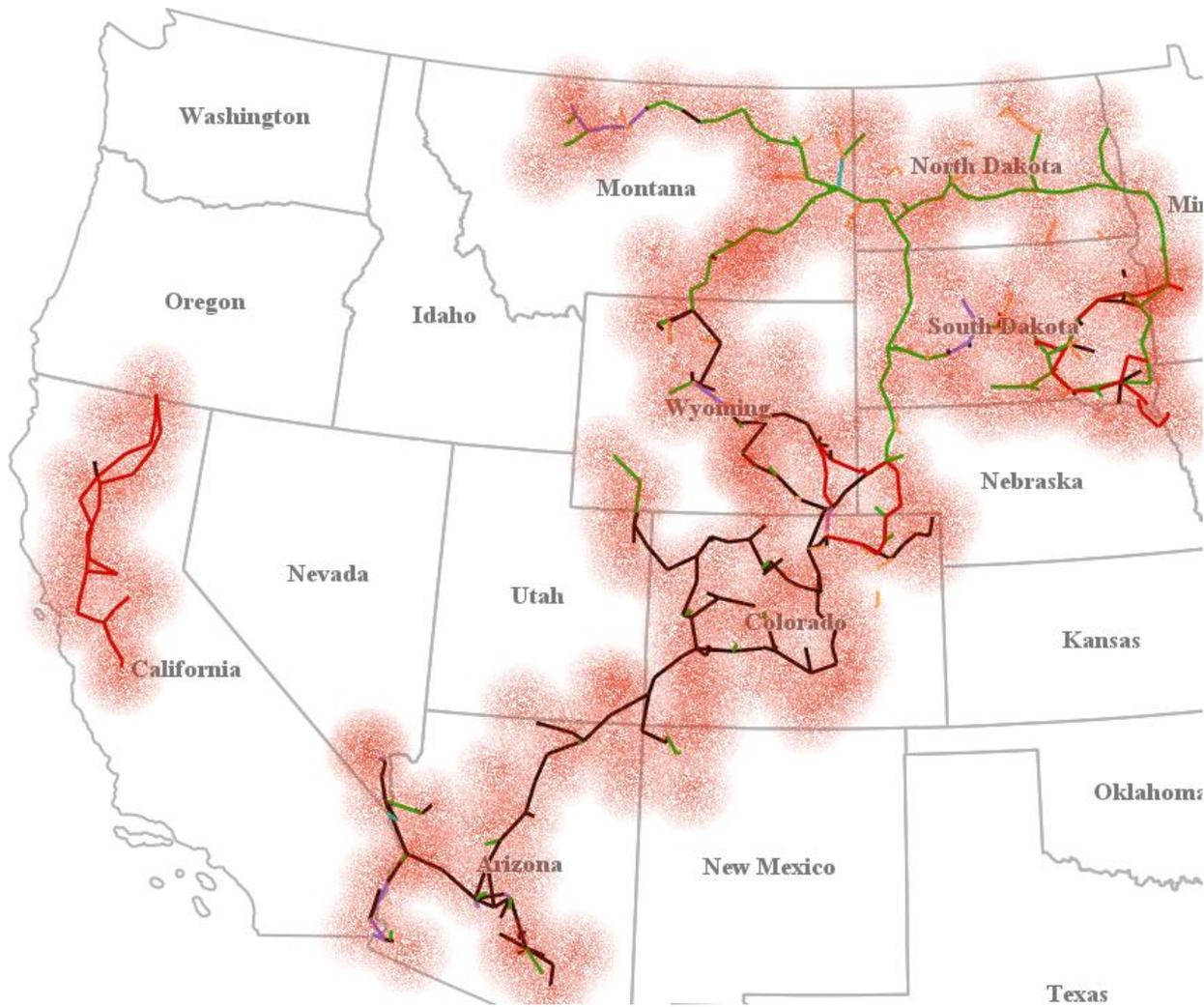
Western's Transmission System



Western's Communication System



Western's Mobile Radio System



Spectrum Use Government Owned Systems



Key User Communities: Operations – Power System Control, Maintenance – Power System Repair, and Construction

Land Mobile Radio (LMR)

- Band(s) of Operation: 162-174 MHz
- Number of Mobiles: 825
- Number of Portables: 280
- Number of Repeaters 150
- Number of Consolettes 100

Spectrum Use

Government Owned Systems



Microwave Radio Systems (fixed point to point)

- Band(s) of Operation: 406-420 MHz
932-944 MHz
4400-4950 MHz
7125-8500 MHz
- Number of Links 381

Other Systems (Video, Wireless LANs, etc)

- Unlicensed wireless networking equipment is handled by the IT group.

Unlicensed Systems

- Unlicensed (spread spectrum) wireless communications are handled by the Maintenance group. They operate in the 2 and 6 GHz bands.
 - Unlicensed radio is only used in remote rural areas with no interference potential.
 - Many unlicensed systems have been replaced with licensed ones, few remain (~8).
 - Not used for critical operations.

Leased Equipment or Services

Pagers:

- Not used for power system operations
- Limited administrative use only and being phased out by Blackberries.

Cellular Telephones:

- Quantity = ~ 615

Equipment Type:

- Fixed Point to Point Radio
- VHF Mobile Radio

Years Already in Service:

- Varies from 1- 26 years for fixed
- VHF was installed between 2000-2005

Projected Timeframe for Replacement (if known)

- Fixed radio is continually replaced based on age and resource availability, typically at 15 years.
- Currently investigating replacement of the mobile systems in the next 3 years.

Memorandums of Understanding (MOU)/Memorandums of Agreement (MOA)

Most of Western's sharing agreements are with other interconnected utilities or government entities.

- There are some sharing agreements with state agencies regarding building and tower space.

Shared Federal Frequencies

- Joint microwave systems built with other utilities operate in the 7-8 GHz band

Shared non-Federal Frequencies

- Joint microwave systems built with other utilities operate in the 6 GHz band

Participation in State, Local, Tribal Public Safety or Interoperability forums

- There are currently no sharing agreements with Public Safety entities specifically and therefore no participation in such forums.

Western's current issues and challenges:

- Wind generation farms interference with existing fixed radio
- Interference from Mexico (Ad Hoc 170)
- VHF Interference from Canada and coordination problems
- Lack of cleared DOE frequencies along the Canadian border
 - Hopeful that Ad Hoc 181 can resolve, but it may be a long time
- Currently more spectrum dependant work than staff can address

Belle Prairie, MT



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Telegraph Pass, AZ



Kremmling Solar Repeater, CO



Guernsey Repeater, WY



Guernsey Repeater, WY



Glendo Repeater, WY



Glendo Repeater, WY



Glendo Repeater, WY



Hoover Dam, NV



Hoover Dam Repeater, NV



Hoover Dam Power House, NV



Hoover Dam Generator



Hoover Dam Generator

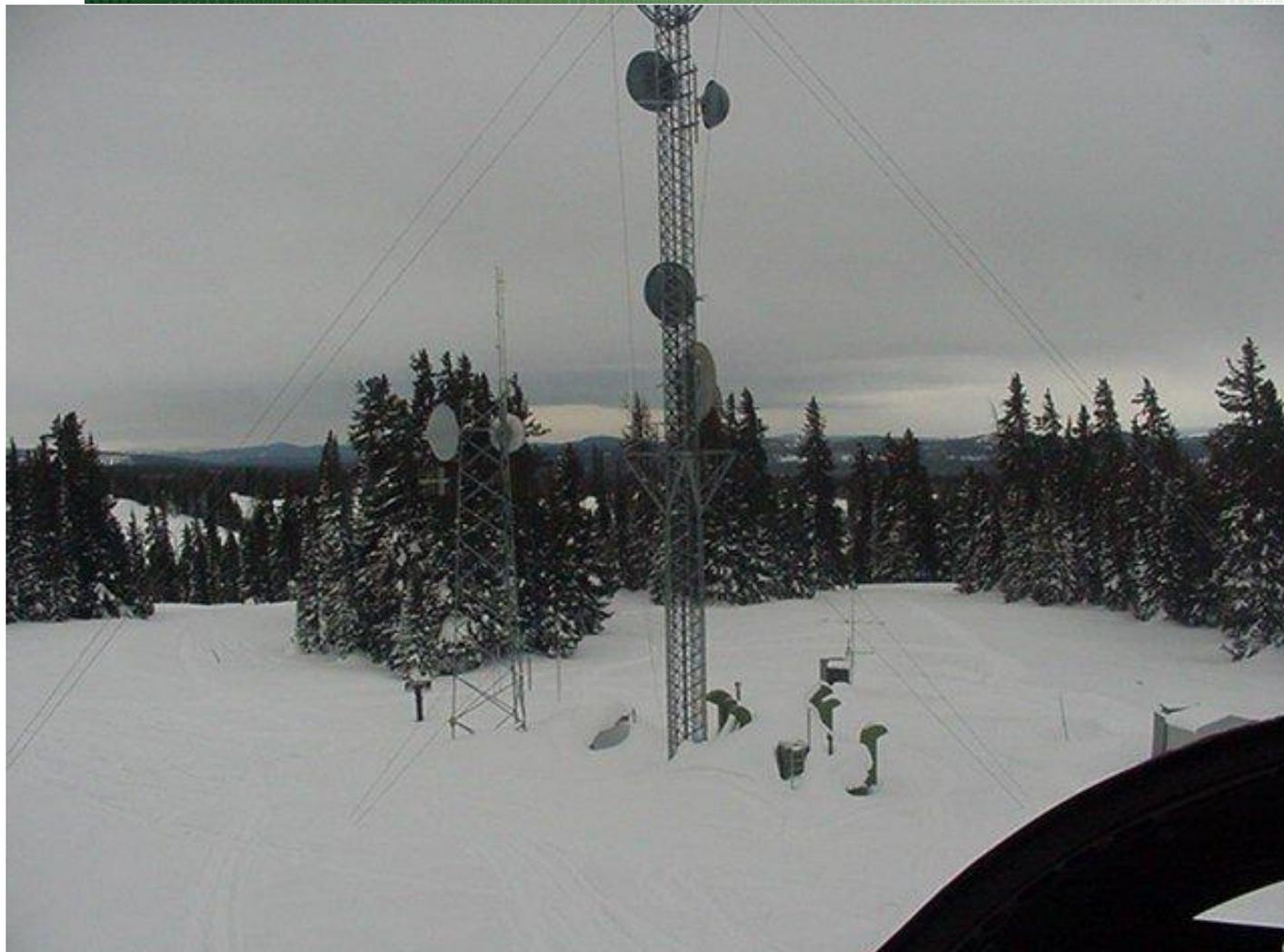


Snorkels for Ventilation in Heavy Snow



Buffalo Pass Communication Site





Tower Icing



Collapsed Steel T-Line Structure – Icing



Conductor Ice





System Protection Failures



Wind Turbine Failure



Thank You !