Electrical Pollution—
What Is It and How do you Prevent It?
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Power Quality and Reliability
Rocky Mountain Power

*Includes PacifiCorp Energy employees

<table>
<thead>
<tr>
<th></th>
<th>RMP</th>
<th>UTAH</th>
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<tbody>
<tr>
<td>Customers</td>
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<td>Rural</td>
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<tr>
<td>Urban</td>
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<td>Revenue</td>
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<td>Territory</td>
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Definition of *Electrical Pollution*

“A condition of the electric power system* wherein the normally pure sinusoidal voltage is corrupted in some way—either in form or magnitude."

*as opposed to another environment such as stray voltages and currents in the earth
Power System is like Other Environments

- Environment can be defined, and pristine vs. polluted conditions can also be defined.
- Causes of pollution can usually be identified and mitigated.
- Tolerance levels can be determined and may vary according to susceptibilities of inhabitants.
- **Correcting** an existing problem is almost always more expensive than **preventing** a problem at the design stage.

Principles of Preventing Electrical Pollution

- **Sound Fundamental Design**
  - Consider both static and dynamic load

- **Form Policies/Programs that are Fair & Complete**
  - Partition dynamic margins fairly
  - Don’t bow to the pressure to connect without conditions
  - Standards and Education are current
  - Need both proactive and reactive field monitoring

- **Have Adequate Tools and Resources**
  - Human resources
  - Office tools and field tools to model potential loads and screen out pollution
Sound Fundamental Design

- Consider short circuit duty as well as capacity.
- Most loads will be slowly changing (static).
- Some loads will be dynamic.

Fair and Complete Policies and Programs

- Partition dynamic margins fairly
- Don’t bow to the pressure to connect without conditions
- Standards and Education are current
- Need both proactive and reactive field monitoring
Adequate Tools and Resources

- Trained employees or consultants
- Office tools and accessible data on hand to model dynamic loads
- Field tools to screen simple dynamic loads

Now, introducing our Expert Panel…

- Sound Fundamental Power System Design
  - Dr. Tom McDermott – EnerNex
- Companies with Policies and Programs
  - Jon Roholt – Idaho Power Company
  - Fouad Dagher – National Grid
- Electrical Pollution Screening Tool
  - Dr. Mark Halpin – Auburn University