Stator Winding
Surface Discharge

www.AGTServices.com

518.843.1112 or 24-hr
518.857.8306

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Surface Discharge Summary

- End winding surface discharge
  - “CORONA”

- Slot section surface discharge
  - “BAR VIBRATION SPARKING”
  - Can lead to SPARK EROSION

- Either way
  - High frequency / low energy (?)
  - Slow growers (?) / damage over time
Why surface discharge?

- Two surfaces with voltage differential
- Gap
  - Air or H₂ Insulation
- Voltage builds to levels that gap can’t sustain
- Voltage discharges across the gap

Kinda like a “Spark Plug”
So what?

- High frequency (K-Hz. / M-Hz.)
- Low energy (usually)
- Can degrade semi-con & binder
- Can degrade insulation over time

*Un-like a “Spark Plug”*
End Windings
Grounding & Grading 101

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Think “Spark Plug”
End Winding Corona / Poor Spacing
EW Corona @ Phase Break
EW Corona / Poor Spacing

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Top to Bottom Bar Corona

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EW Corona & Contaminates

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How to stop / fix?

- **Increase gap**
  - Sustains the voltage
- **Eliminate gap**
  - Short it out
- “Foul” the area
  - Bleeds off voltage

*Think “Spark Plug Failure”*
Close the Gap

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Corona Bridges would Have Been Effective as Well
Corona Resistant Paint
Grounding & Grading 101

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Slot Cross Section

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Why slot discharge?

- Two surfaces (bars & core) tied together electrically by semi-con armor
- Loose wedges allow for bar vibration
- Surfaces lose contact due to vibration
  - Voltage builds
  - Voltage discharges across gap
Slot Discharge Damage
Painted Semi Con Layer

Puncture
Slot Discharge Damage
Tape Semi Con Armor
Slot Discharge Damage Tape Semi Con Armor
Slot Discharge Damage
Tape Semi Con Armor
Slot Discharge Damage
Side Ripple Spring
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Slot Discharge Damage
Side Ripple Spring
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Slot Discharge Products
Slot Discharge Products
How to avoid *slot discharge*?

- Loose wedges allow for bar vibration
- Bar vibration allows for slot discharge

**MAINTAIN A TIGHT WEDGE SYSTEM**

*Demand Side Ripple Springs*