

## Condition assessment of composite insulators in service

*D1*

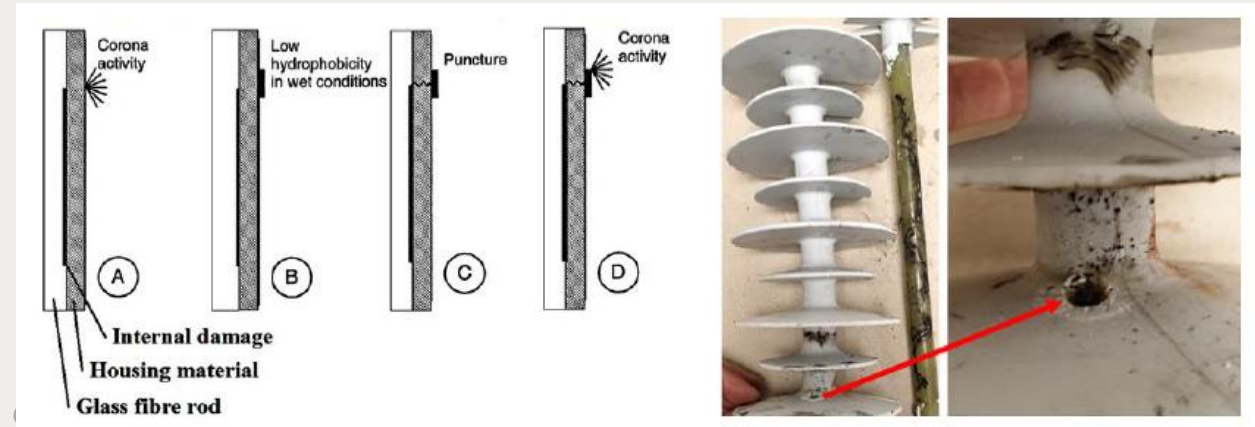
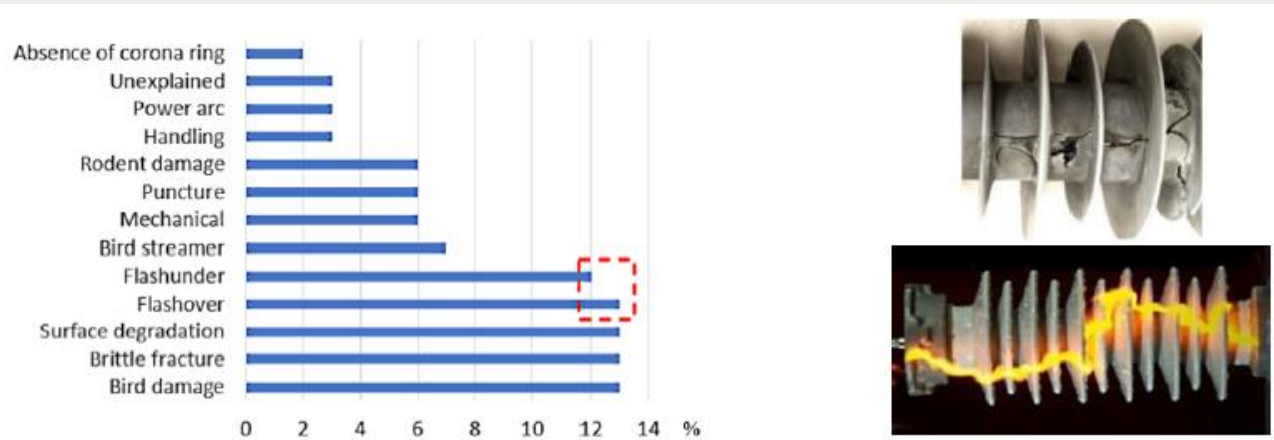
PS2, Q. 2.08: What methods exist for assessing the condition of  
composite insulators in service?

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# Weakness in core/housing adhesion is principally complicated to detect in-service by any detection technique

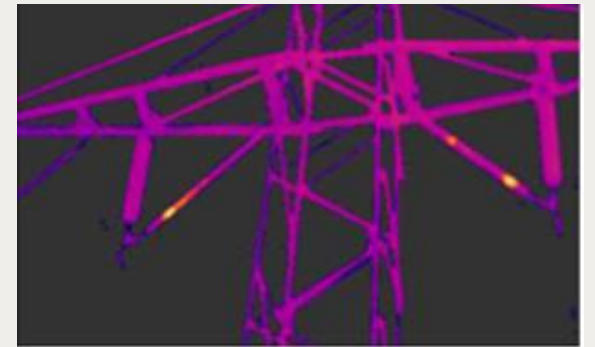
- Flashunders are the dominant type of failure or composite insulators
- Root cause of flashunders is weak adhesion core/housing and the defect is accelerated if the electric field is excessive



Group Discussion Meeting

## Traditional in-service detection techniques do not reveal adhesion core/housing issues in good time

- Recent experience in comparison of visual/IR/UV detection of core/housing issues in service followed by after-service investigations shows that the in-service detection is too late to reveal the defects in early stage:
  1. Visual inspection reveals punctures, which mean already developed conductive path in the interface
  2. IR detection reveals hot spots, which again indicate already developed conductive path in the interface
  3. UV detection reveals punctures, which again leads to item 1
- Instead of in-service inspections, the so-called “inspection-based maintenance” is proposed. The intention is to acquire limited number of insulators along with electrical and environmental data.



## Preliminary optimal test matrix for condition assessment of composite insulators (detailed paper in CSE at the end of 2022)

- The preliminary optimized minimum test program for insulators removed from service is as follows:
  - Visual inspection
  - Measurements of standard pollution parameters and hydrophobicity class
  - Measurement of hardness of housing
  - Measurement of dynamic hydrophobicity
  - Adhesion test of core/housing and dye penetration test on core
  - Inspection of cross-section of sealings and corrosion and saltwater boiling test

### **Condition assessment of line composite insulators: after-service test programs and their practical application**

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