

## Nuclear Weapons and Material Security 2013

# Intrinsically Tamper Indicating Ceramic Seal

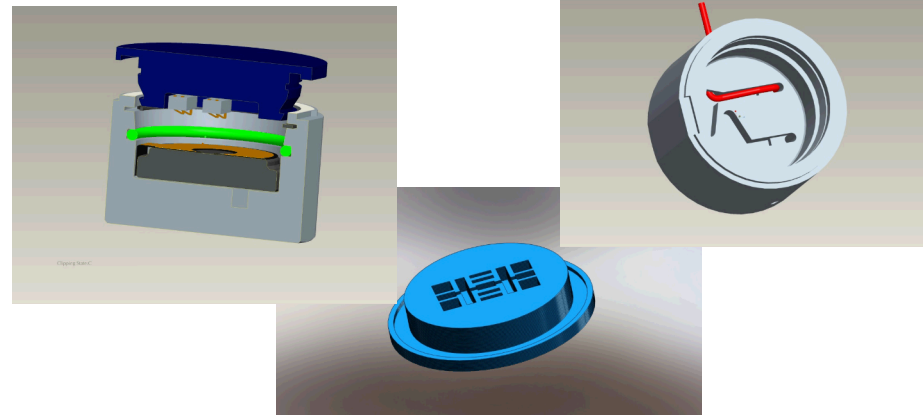
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### Prior Results

- Fabricated Gen I prototype bodies
  - Vulnerability review (VR) on components/design
  - Bench top electronics functionality testing
- Fabricated low-temperature co-fired ceramic (LTCC) prototype seal bodies with conductive tamper planes
- Electronics redesigned with single microcontroller integrated into seal cap
- Redesigned wire-routing/securing mechanism based on VR team guidance

### Concept



### Technical Challenges

- Trade space between small form factor and capabilities
- Maintaining systems view while iterating with VR team for design improvements
- LTCC fabrication of high-aspect ratio devices
- High-temperature co-fired ceramic (HTCC) fabrication
- Wire routing and securing mechanism

### Planned Accomplishments

- Complete software development
- VR on electronics and software
- Modifications to software and electronics based on VR review
- Fabricate and assemble LTCC prototype with tamper planes, electronics, battery, coatings
- Functional testing
- Comprehensive VR on prototype
- Final modifications to prototype based on VR review