ANIMAL MITIGATION COMMITTEE – PROTECTING ENCLOSURES

2018 IEEE Substations Committee Meetings

Why Protect?

EQUIPMENT	230 KV SUBSTATION	345 KV SUBSTATION	500 KV SUBSTATION
Base Cost	$1,706,250	$2,132,700	$2,559,250

The Usual Suspects

Protecting Your Equipment

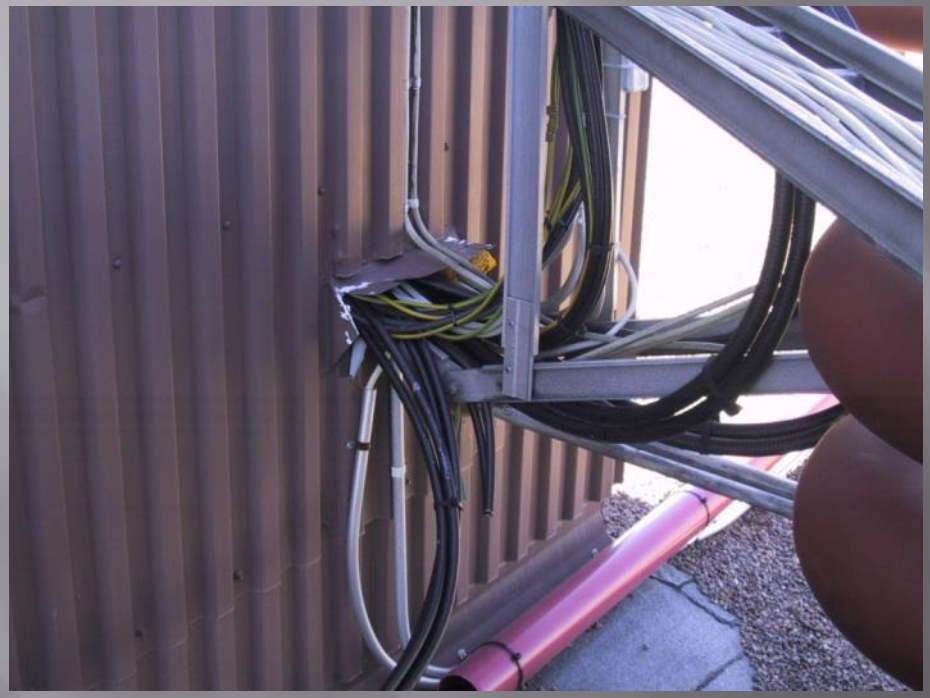
Industry Wide Problems

Industry Wide Problems

Common Sealing Methods

- No solution
- Spray foam
- Fire putty / pillows
- Duct seal
- Field based solutions
- Mechanical seals

No Solution

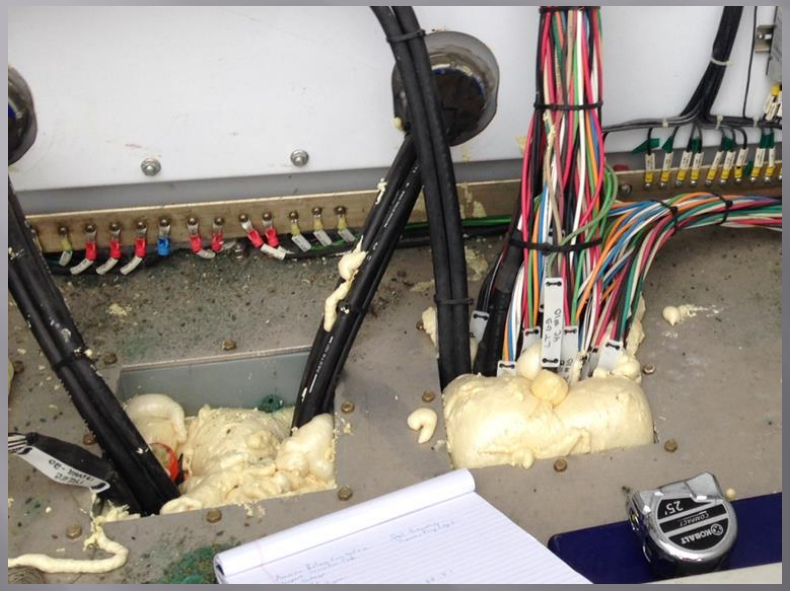


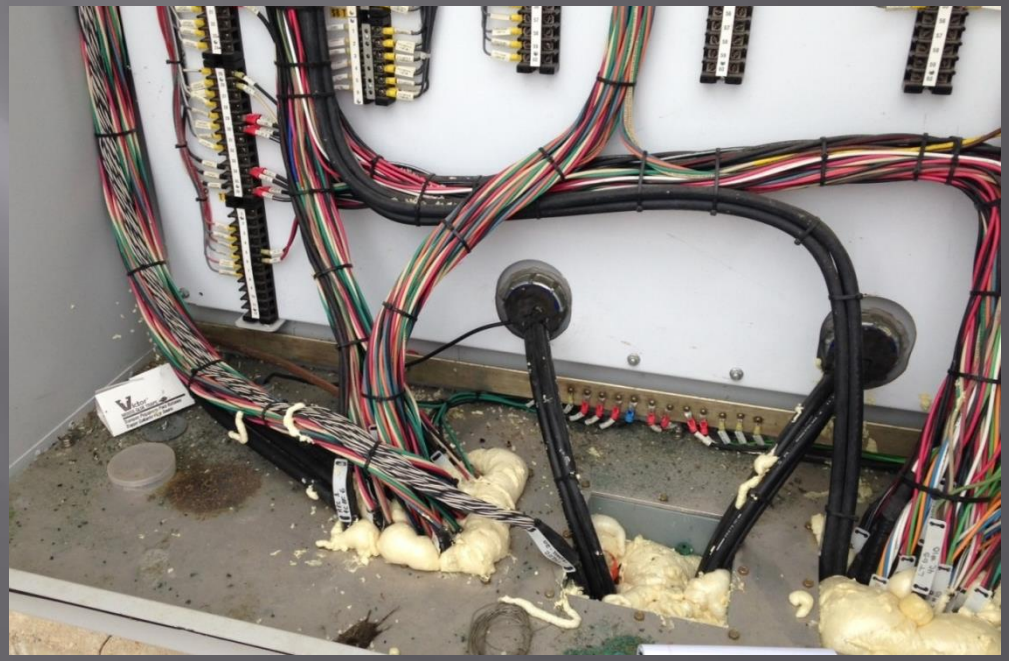
Spray Foam

- Pros
  - Quick, easy, cheap
- Cons
  - Messy
  - Labor intensive to add or remove cables
  - Time to set properly
  - Rodents eat and nest with it

Spray Foam

Spray Foam





Spray Foam

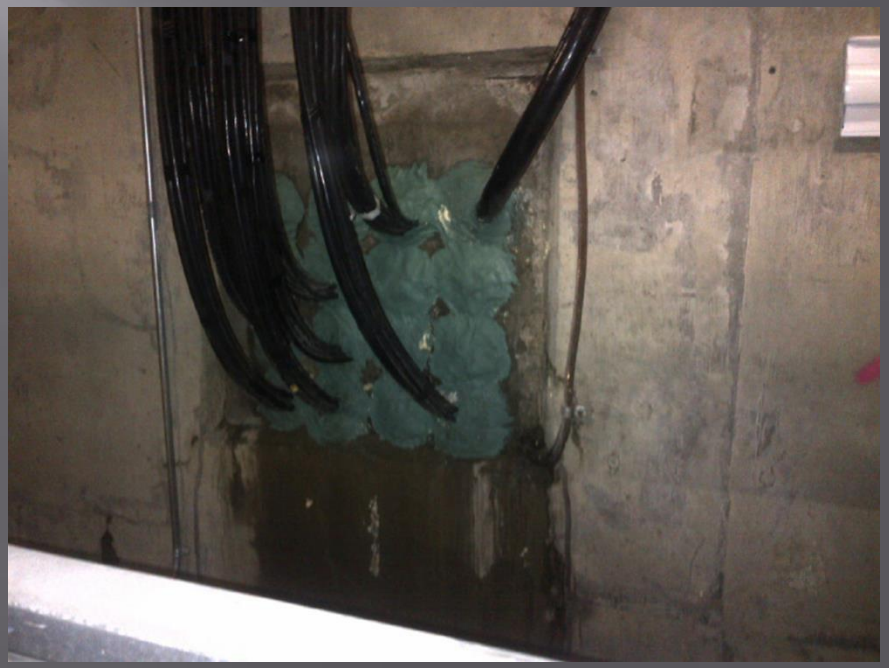
Duct Seal

- Pros
  - Relatively cheap and easy
- Cons
  - Minimal long term protection
  - Time to set properly
  - Labor intensive to add or remove cables

Fire Putty / Pillows

- Pros
  - Easy
  - Good fire protection
- Cons
  - Expensive
  - Labor intensive to add or remove cables
  - Not intended as an environmental seal exposed to water

Fire Putty / Pillows



Field Based Solutions

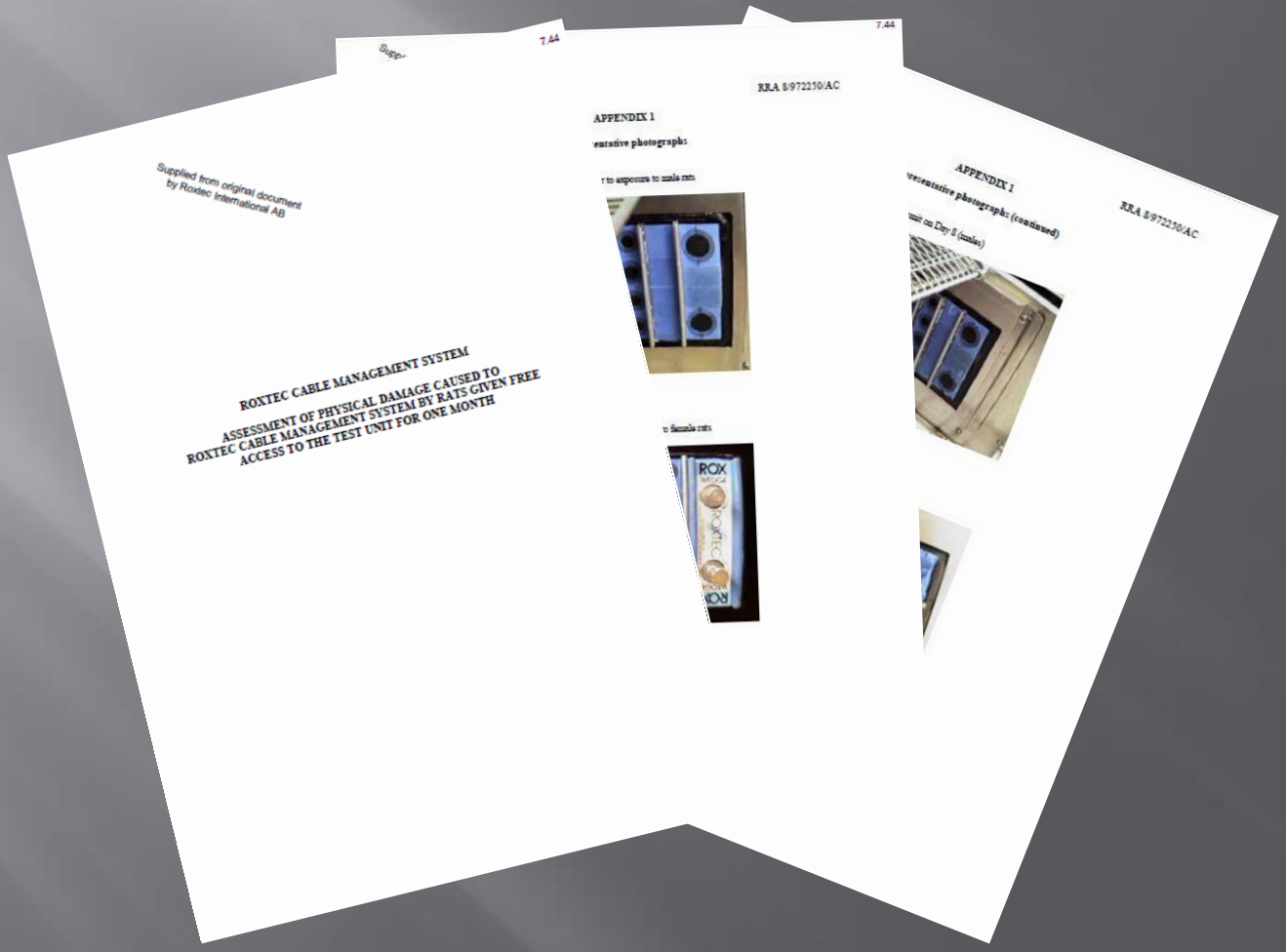
- Pros
  - Cheap, easy
  - Potentially solves rodent issues
- Cons
  - Very difficult to add / remove cables
  - Peat gravel only a bandaid

Field Based “Solutions”

Mechanical Seals – Individual Cables

- Pros
  - Highest protection level
  - Easy to add / remove cables
  - Clean installation
  - Maintenance free
- Cons
  - Comparatively expensive to putty and foams
  - Installation time

Mechanical Seals – Individual Cables



Supplied from original document
by Roxtec International AB

ROXTEC CABLE MANAGEMENT SYSTEM

ASSESSMENT OF PHYSICAL DAMAGE CAUSED TO
ROXTEC CABLE MANAGEMENT SYSTEM BY RATS GIVEN FREE
ACCESS TO THE TEST UNIT FOR ONE MONTH

RRA 8/972250/AC

APPENDIX 1

RRA 8/972250/AC

Mechanical Seals - Bundled

- Pros
  - Proven rodent barrier
  - Easy to add / remove cables
  - Cheaper than individual cable seal option
  - Installation time
- Cons
  - Bundles must be sized properly to seal

Key Takeaways

- Cable seals often overlooked
  - Nothing specified – no industry standards
  - Contractor's choice
- Real world costs
  - Maintenance time
  - Cleaning fees
  - Cable replacement / rewiring costs
  - Potential outages

Key Takeaways – Avoid This

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