

TE Connectivity

(Formerly Tyco Electronics (formerly Raychem Corp))

Update of Raychem Nuclear Cable Accessories

June-2013 Jonathan C. Cornelius



Nuclear Cable Accessories – Products

Safety Related Class 1E Per 10CFR50
for Nuclear Power Generating Plants

- WCSF Tubing
- Nuclear Low Voltage Kits
(Splice / Breakouts / End Cap kits)
- Cable Jacket / Wire repair and
insulating tapes
- Nuclear High Voltage Kits
(up to 15 kV)
- Cable Markers



Legacy Qualification Status

- WCSF and -52 Molded parts and Kits

♪♪♪ No required changes for existing plants ♪♪♪



Re-Qualification for Generation III+ Power Plants

- Purpose of the test program is to demonstrate by Type Tests the qualification of the Raychem Nuclear Cable accessories to new and projected EQ requirements.
- Aging data already exist → No new material needed
- Pre “RF2000” products will not be included

Type Testing Specimens

- Un-Aged samples representing beginning of life
- 60-Year accelerated aged samples (thermal acceleration and irradiated)
- Goal is to minimize the number of test specimens (50 MAXIMUM)
- Existing design/application guidelines (previously qualified)

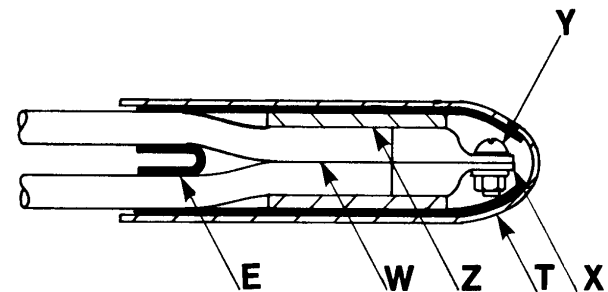
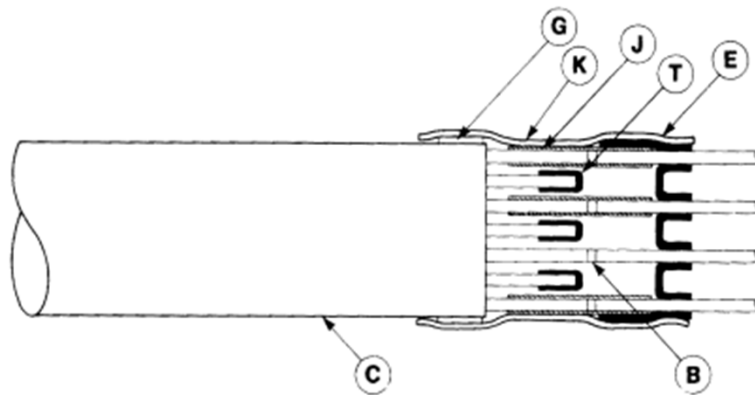
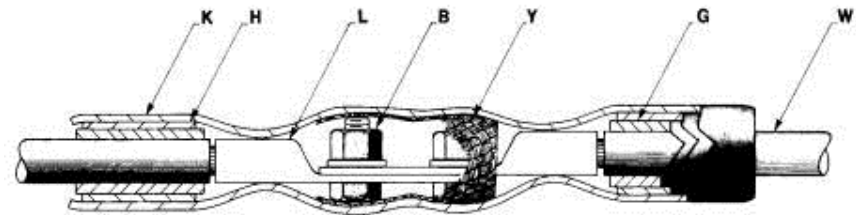
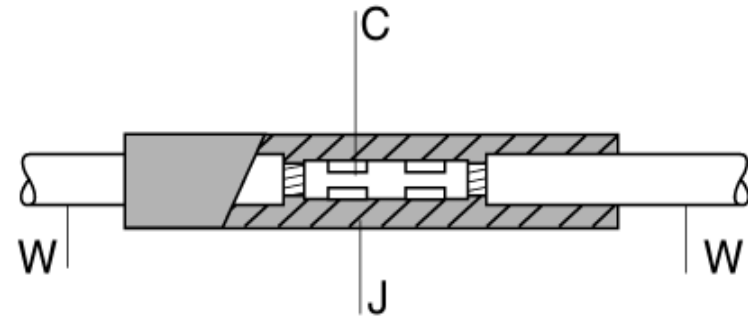
Accident Testing Conditions

DBE/DBA profile with to envelop current Gen III+

- temperature peak at ~~475 °F (245°C)~~ ~~480 °F (250°C)~~ 500 °F (260°C)
- pressure peak at 120 psig (8 bar)
- 375 Mrad accident dose (β and γ 1:1) (with margin)
 - 60 Yr Aging @ 1.25 Mrad/year
 - 275 Mrad accident dose (β and γ 1:1)
- Chemical spray
- The specific details of accident conditions will cover the current requirement of all of the NSSS requirements.

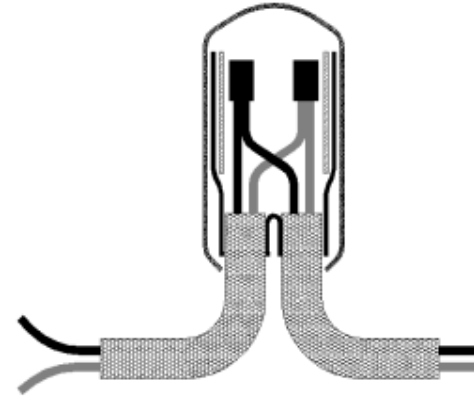
Type Testing

- In Line Splices
- Bolted splices w/ Shims
- V Stub Motor kits
- Transition Splices



Type Testing

- Multi-Conductor V-Stub “V-Stubs within a V-Stub”
- NJRT Repair tape
- MV Terminations/Motor connections



Questions?

1. Since this is initially being tested for installations in China, where are you going to have the testing done?

a. We will only use a that has a valid 10CFR50 Appendix B compliant quality program. It will be managed by TE in North Carolina and the testing will not be done in Europe or Asia.

2. What about commercial grade dedication on non-EQ but Safety Related applications/products?

a. We are currently reviewing our internal procedures anticipating the inclusion of Connectors, MV insulating materials, Gel products, etc. (Recently added HVIS-N)

Questions?

3. Sometimes lead-times seem long. Is this new?

a. No, lead times are actually quoted shorter than in the past. If you are having an emergency, be sure to let the inside-sales person know. We are constantly reviewing the business and stocking levels to prevent long lead times.

4. Any other question?

a. No, we have not changed our company name in over a year!

Legacy Qualification Status

- BBIT-N → NMCK-8 → NHVT
 - Re-Qualification Test completed in the Summer of 2012
Notification sent in September 2012
2 new EDRs
 - EDR-5563 Aging analysis
 - EDR-5037 Rev. 4

Certify to Equivalency to previous or Stand Alone qualification