

# EGS Quick Disconnect Connector

## Generation 3

**CURTISS -  
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Nuclear Power Products and Services



### Product Description

The EGS Generation 3 Quick Disconnect Connector (QDC) is an improved version of the current QDC (Generation 1). The Generation 3 QDC has increased total integrated radiation dose, applied thermal aging for greater than 1,000 hours, attained higher LOCA temperature/pressure, attained greater MSLB temperature and included submergence during LOCA design basis accidents.

### Design Features

The Generation 3 QDC is the same as the original QDC (Generation 1 QDC) except for the following design changes:

- Elastomer seals have been installed in the QDC backshell to enhance the sealing capabilities of the potting seal.
- The wave spring force has been reduced to allow easier closure and opening of the bayonet ring.
- The wire/cable strain relief on the QDC socket side (field side or plug side) has been enhanced to provide a more robust strain relief.
- The setscrew material has been changed from alloy steel to stainless steel and the sealant is epoxy.
- A two-piece housing, connector head and backshell, has been added to allow alternate backshell configurations and provide flexibility in matching installation geometries.
- Epoxy Types 7 and 8 provide sealants with higher temperature ratings.
- PEEK insulators provide improved resistance to temperature and radiation effects.

Generation 3 QDCs are intermateable with the original Generation 1 QDC, except for the following:

- 1/2" QDC with 12 AWG pins will not intermate.

### Gen. 3 QDC Enhancements

#### Inner Seal

The inner seal is a redundant seal supplied for enhanced hermeticity that is an optional back-up for the standard coupling O-ring. A special socket-side housing must be used in conjunction with the inner seal, i.e. it cannot be used with standard Gen 3 QDC socket-side assemblies.

#### 360 degree EMI Shield and Double Shielded Cable

A 360° EMI Shield and Double Shielded cable is available as an option to improve resistance to EMI/RFI effects. Consult factory for specific configurations available.

#### Welded QDC Pin Side Housing

Gen 3 QDC pin-sides may be supplied with a welded backshell as an alternative to the standard NPT threads. Consult factory to discuss the specifics of the welded backshell design with respect to the particular host equipment.

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### Qualification Levels *(Chronologically listed by test sequence)*

- Vibration Aging: .025" double amplitude, <0.75g, 5-200-5 Hz
- Thermal Cycling: 10 cycles, 30°C-121°C-30°C
- Cycle Aging: 160 connection cycles (not a limit)
- Thermal Aging: 1227.55 hours at 126.6°C, QL = 60 years at 144°F (62.22°C)
- Normal Radiation: 3.15E7 rads-air (315 KGy-air) gamma
- Thermal Cycling: 10 cycles, 30°C-121°C-30°C
- Seismic Qualification:
  - RIM Sine Sweep OBE: 10g, 2-100-2 Hz;
  - RIM Sine Beat SSE: >10g, 2-64 Hz
  - RMF Triaxial SSE: ZPA = 7g

### Design Basis Accident and Submergence Levels

- LOCA Radiation: 2.0E8 rads-air (2.0 MGy-air);  
TID = 3.15E7 + 2.0E8 = 2.315E8 rads-air (2.315 MGy-air)
- Containment Integrity Test: 24 hours at 68 psig (570.2 kPa)
- LOCA Accident:
  - (Specimens 1, 3, 5, 7): Peak = 495°F/108 psia (257.22°C/675.7 kPa), 4-day chemical spray, 31 day duration
  - (Specimens 2, 8): Peak = 498°F/98 psia (258.89°C/675.7 kPa), 24-hour chemical spray, 32 day duration
- Submergence:
  - (Specimens 1, 7): 284°F/74.5 psia (140°C/513.7 kPa), 30 days in chemical spray fluid. Submergence time may be extrapolated to up to 1 year
  - (Specimen 8): 285°F/62 psia (140.56°C/427.5 kPa), 31 days in chemical spray fluid. Submergence time may be extrapolated to up to 1 year
- MSLB Accident:
  - (Specimens 4, 6): Peak = 491°F/109 psia (255°C/751.5 kPa), 24 hour duration
- MSIV Accident:
  - (Specimens 2, 8): Peak = 525°F/98 psia (273.89°C/675.7 kPa), 27.5 hour duration

### Qualification Standards

Successfully qualified by test in accordance with:

- 10CFR50.49
- IEEE 572-1985
- IEEE 323-1974/1983
- IEEE 344-1987
- IEEE 382-1980
- ANSI N45.2
- 10CFR50/Appendix B
- CSA Registered

#### CONTACT INFORMATION:

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