

AEGIS® Reactor Pump Protection Rings: Protecting Critical Face Seals and Reducing the Risk of Unplanned Shutdowns

Electro Static Technology, an ITW company, is the manufacturer of AEGIS® Shaft Grounding Rings—patented solutions designed to protect electric motors and rotating equipment from damaging stray electric currents. Used in millions of installations worldwide, AEGIS® technology provides a highly reliable, low-impedance path for shaft voltage to travel safely to ground rather than discharging through seals, bearings, or other critical components. The result is longer equipment life, lower maintenance requirements, and reduced risk of costly, unplanned downtime.

While AEGIS® Shaft Grounding Rings are widely used to protect VFD-driven motors in pumping, HVAC, industrial processing, water treatment, and power-generation applications, Electro Static Technology has also successfully applied its expertise to one of the most demanding reliability challenges in the nuclear energy industry: protecting reactor recirculation pump (RRP) and reactor coolant pump (RCP) mechanical face seals.

In nuclear plants, these seals are essential components of the reactor cooling system. They mitigate leakage of reactor cooling water along pump shafts and are therefore critical to safe, dependable plant operation. Yet stray voltage can accumulate on the pump shaft,

creating an electric potential difference between the faces of the seal. When that voltage discharges across mechanical face seals, it can contribute to electrostatic erosion and electrochemical corrosion. Over time, the damage can create channels in seal faces, increase leakage, and potentially cause an unplanned shutdown.

Electro Static Technology developed the AEGIS® Reactor Pump Protection Ring (RPPR) to address this issue. Built around the company's conductive microfiber shaft-grounding technology, the RPPR provides a full-circumference, very-low-impedance electrical path between the rotating shaft and seal housing. Its specially engineered microfiber brushes safely dissipate shaft voltage before it can damage the seal faces. For optimal performance and reliability in nuclear applications, RPPRs can feature stainless steel construction and purpose-designed mounting fixtures in order to meet the physical, safety, and installation requirements of individual pump systems and planned outage schedules.

The company's nuclear experience includes installations in both Europe and the United States. In one documented U.S. reactor coolant pump application, shaft voltage measurements taken before installation

showed approximately 8 volts peak-to-peak. Following installation of a custom AEGIS® RPPR, measurements were reduced to a maximum of approximately 600 millivolts peak-to-peak. The project was installed during a scheduled shutdown with engineering support from Electro Static Technology, helping the plant address a potential source of premature face seal damage without adding unnecessary maintenance complexity.

Electro Static Technology's nuclear offering reflects the same practical engineering philosophy behind the AEGIS® brand: identify a source of hidden electrical damage, provide a durable and low-maintenance path to ground, and help operators protect critical assets over long service intervals. By reducing the risk of electrically induced face seal damage, AEGIS® RPPRs help nuclear facilities improve pump system reliability, avoid avoidable repair costs, and support safer, more predictable operation of reactor cooling systems. The company reports successful RPPR installations at multiple nuclear power plants and continues to work with plant engineers on application-specific solutions.

Don't Risk an Unplanned Shutdown

Prevent Reactor Recirculating Pump Seal Electrical Damage with AEGIS® RPPR Shaft Grounding Rings

Stray voltage on cooling pump shafts can electrically damage reactor pump face seals. Over time, the damage can create channels in seal faces, increase leakage, and even cause an unplanned shutdown.

By mitigating electrically induced face seal damage, AEGIS® Reactor Pump Protection Rings (RPPR) can reduce the risk of unplanned shutdowns, costly emergency repairs lost generating revenue, and the other problems that can result from avoidable reactor coolant system problems.

AEGIS® RPPR Rings have been successfully deployed in both the US and Europe.



Face seal damage caused by electrostatic erosion.



Reactor recirculating pump protected by AEGIS® RPPR.



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