

# LIGHTNING ELIMINATORS

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## RGA®

### Retractable Grounding Assembly

Comprehensive Lightning Strike Protection  
for Floating Roof Tanks

**Effective:** Permanent, reliable, low-impedance bond prevents fires triggered by lightning currents

**Economical:** Low initial cost and exceptional return on investment

**Easy-to-Install:** Installation takes only two hours on both new and existing tanks

**Durable:** Engineered for years of durability and reliable performance in corrosive environments

**Low-Maintenance:** Requires virtually no upkeep as compared to shunts

**Award Winning:** Winner of the E & P Innovation Award

**Standards Conformant:** The RGA Conforms to both API 545 and NFPA 780 recommendations and is supported by API 545 as a bypass conductor.

The ATEX approved patented RGA substantially reduces the risk of tank fires by subduing sustained arcs during lightning events and other electrical phenomena. The RGA is able to do this better than other methods, because designers analyzed and found ways to overcome the weaknesses of other traditional devices for grounding floating roof tanks.

### Floating Roof Tank Fires are Common

There are 15 to 20 tank fires per year, and over half of them involve floating roof tanks

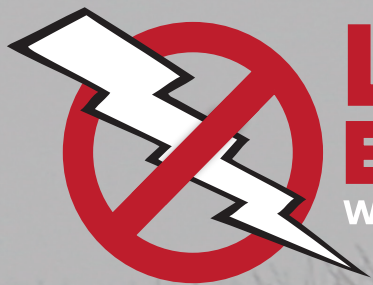


(FRT). FRT's are especially vulnerable to the direct and indirect effects of lightning. A direct or a nearby lightning strike will cause electrical currents to flow across the tank shell and roof. When these lightning currents arc across the roof/shell interface, they can ignite any flammable vapors that may be present. It is therefore necessary to bond the roof and shell to prevent arcing at the roof-shell interface.

### Inadequate Protection

To combat the risk of rim fires, the industry has been using metal strips called "shunts" that electrically bond the shell and roof of the tank in multiple locations. Unfortunately, the bond that these shunts establish is unreliable and creates a greater risk of sustained arcs:

1. Rust, waxy product deposits, and paint can line the inner wall of the shell
2. The floating roof can drift slightly off-center and disconnect some of the shunts from the shell.
3. API Testing proved that shunts will arc under all conditions, even if the tank wall and shunts are new and clean.



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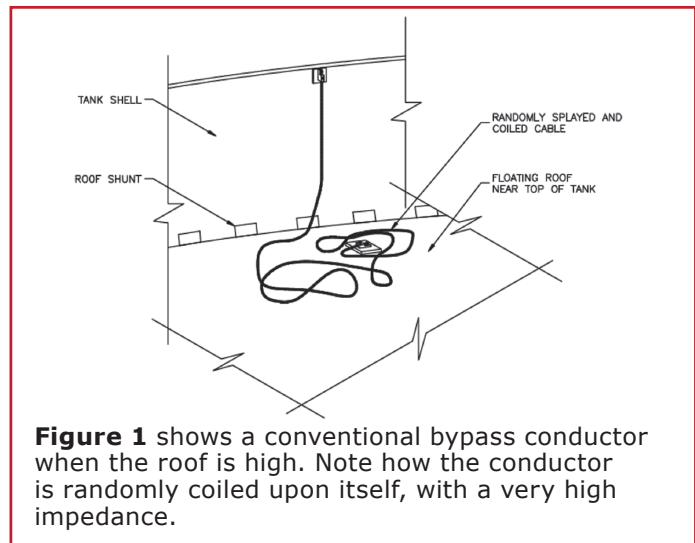
Substantially reducing the risk of sustained arcs requires a reliable, full-time, low-impedance and low-resistance connection between the tank shell and roof. Additionally, the connection must operate regardless of the tank wall's condition.

The RGA is not affected by the condition of the tank because the RGA and cable are bolted and sealed to optimal locations on the tank shell and floating roof. When properly applied, multiple RGAs on each tank provide low-impedance pathways to safely discharge lightning currents.

To resist corrosion, the reel is constructed from stainless steel and the copper cable is tinned. The RGA is designed to retrofit easily onto any existing tank, even those that are in service. It is also easy to inspect and is designed to be very low maintenance.

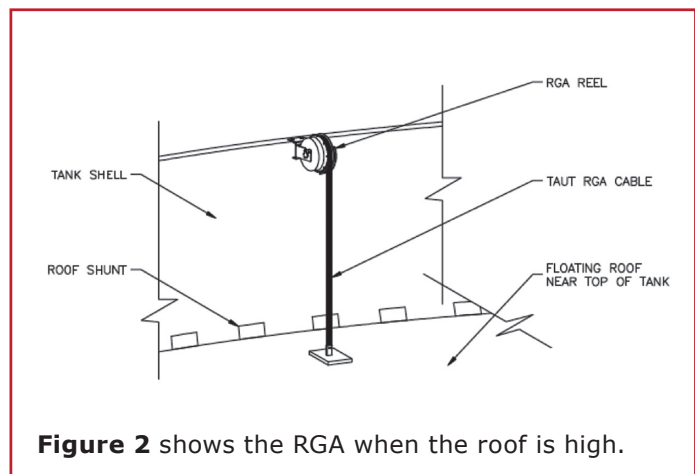
To guarantee the best level of risk reduction, the variables that can affect system impedance must be evaluated on a case-by-case basis.

Note below how the conductor is as short as possible, thus providing the lowest possible



**Figure 1** shows a conventional bypass conductor when the roof is high. Note how the conductor is randomly coiled upon itself, with a very high impedance.

impedance between the roof and shell. When a typical floating roof tank is 80% full, the impedance of the RGA is only 15% of that of a conventional bypass conductor.



**Figure 2** shows the RGA when the roof is high.

**IMPORTANT NOTE:** Please consult with representative at Lightning Eliminators for ground strap attachment methods depending on foam dam style.



US Patent # 7,078,621