



Engineered Fluids

Products for Electrical Maintenance

Featuring VoltCool VA-900 Concentrated Antioxidant

Engineered Fluids, Inc.
St. Petersburg, FL USA

Engineered Fluids, Inc.

- **Engineered Fluids, Inc. is a US-based manufacturer of specialty insulating fluids and lubricants.**
 - Headquarters, system development and prototype lab in St. Petersburg, FL
 - Chemical R&D, manufacturing and distribution in Tyler, TX
- **History:**
 - Gary Testa – Founder, President & CEO – serial entrepreneur with 30yrs experience in global sales, marketing, product management & development in mobility, telecom, cloud and software
 - Dr. David Sundin – Founder, Chief Scientist – 40yrs experience in development, manufacturing, and applications of Dielectric Thermal Transfer Fluids
 - David and Gary founded Engineered Fluids in 2017 to bring to market the Dielectric Coolants that David had spent years perfecting for electronics cooling applications
- **Engineered Fluids Today**
 - Production Capability: 750k Liters weekly via automated production line
 - Customers: thousands of customers in 80 countries; many different applications and industries
 - Distribution:
 - EU / UK Distribution from company warehouse in Amsterdam, NL
 - Global Distribution & JV Partners: Australia, China/HK, Egypt, India, Israel, Türkiye, Middle East, North Africa, South Africa, and Taiwan.

Engineered Fluids – Products for Electrical Maintenance

VoltCool Dielectric Fluids® - High Voltage Dielectric Fluids for Power and Distribution Transformers

- Power & Distribution Transformers, Switchgear
- High Voltage Battery / Fuel Cell cooling in specialty and stationary electrical storage applications

VoltCool® Additives - Concentrated Transformer Oil Protection

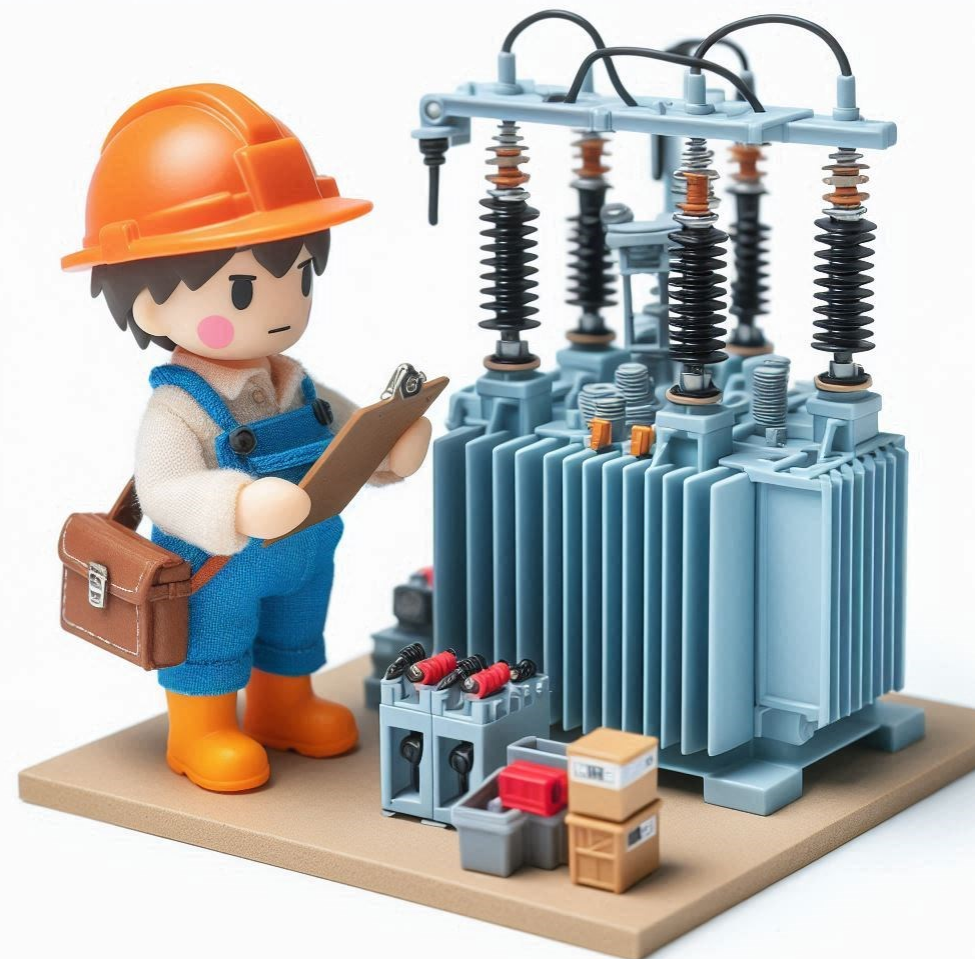
- Concentrated Antioxidant
- Corrosive Sulfur Stop Additives

DS-100 Dielectric Solvent

OC-100 OrangeCool

Safe and Effective Removal of Oils, Dirt, Grease and Pollution

- Fully dielectric solvents to clean all electrical equipment



DS-100 Dielectric Solvent Applications

Transformers, switchgear, circuit breakers and other power distribution equipment

- Cuts through dirt, oil, and pollution on exposed electrical equipment
- Displaces water, loosens rust and scale
- Removes conductive residue on bushings and insulators



DS-100 Dielectric Solvent Applications

Control Panels and Instrumentation

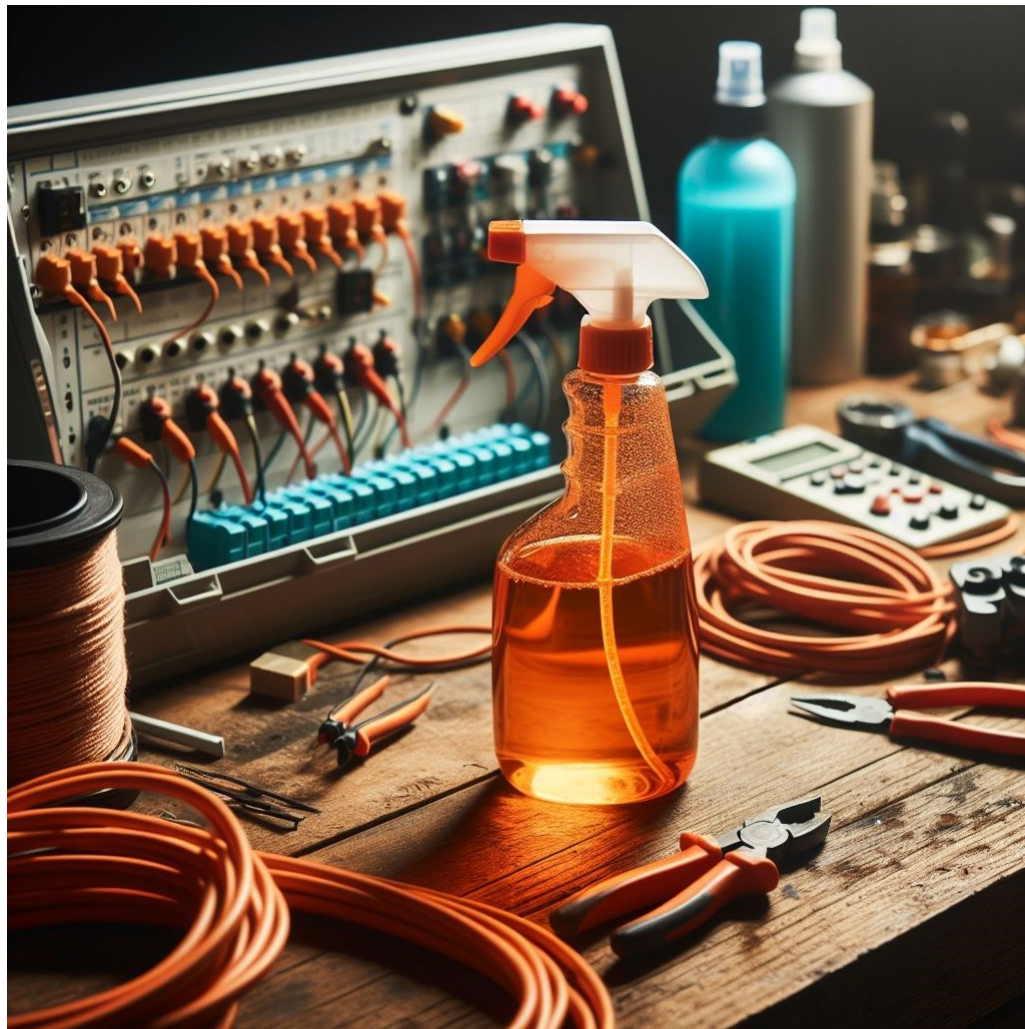
- Removes years of oily dirt accumulation with one spray
- Renews and protect both analog and digital switches, variable capacitors and rheostats, meters, displays
- Compatible with metals, glass, plastics and rubber materials



OC-100 "OrangeCool"

A concentrated, powerful cleaner for worktables, floors, counters, and nonelectrical surfaces.

- Made from renewable citrus oils
- Removes oils, grease, dirt
- Leaves a pleasant citrus scent
- Disinfects and deodorizes surfaces
- Nonflammable, biodegradable, safe for workers and the environment.



OrangeCool Applications

Removes Oils and Grease from tools and work areas

- Powerful enough to dissolve dirt and oily residue from a wide variety of surfaces
- Dries in seconds
- Leaves a clean, dry, citrus odor
- Citrus oils nourish and renews wood and vinyl



VoltCool Dielectric Coolants

VoltCool Dielectric Coolants are High-Performance, Synthetic Insulating Fluids

Designed to meet the needs of power and distribution transformers.

VoltCool Coolants:

- **VoltCool VC-110** is a synthetic, high-performance replacement for ASTM D3487 or IEC60296 Mineral Oils. Outstanding Oxidation Stability and low-temperature performance for new or retrofilled transformers.
- **VoltCool VC-140** is a High Temperature, K-Class, Fire Resistant Coolant that provides an extra safety margin against fire or explosion.
- **Both fluids** are biodegradable, non-toxic and contain no PFAS compounds



Benefits of VC-110 / VC-140 Synthetic Coolants

- Synthetic base oils are more stable, have fewer contaminants and last longer than mineral oils
- Both coolants can be used in new transformers or to “top up” existing units.
- Both coolants cool transformers better than other fluids
- Both coolants pour down to -65C
- Both Coolants can dry out insulation, increase cellulose strength and expected lifetime.

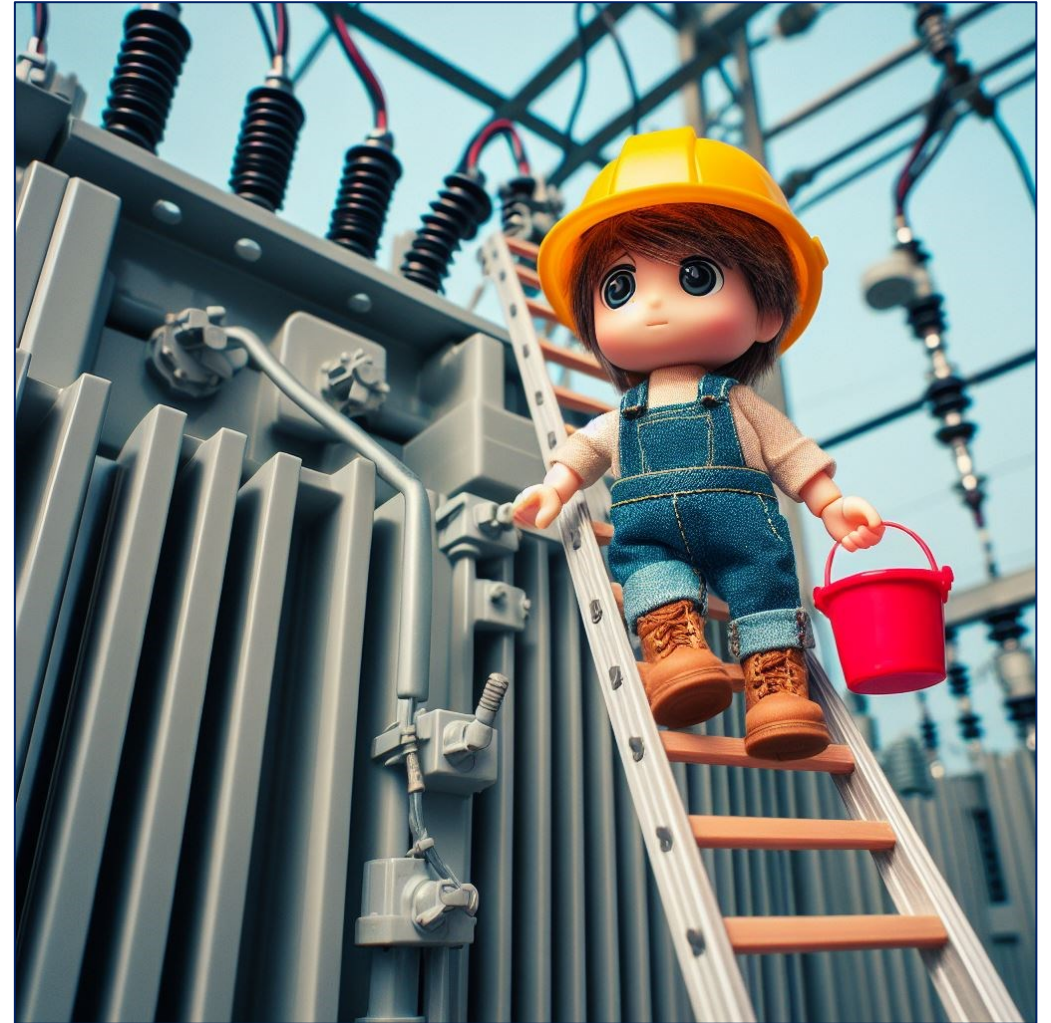


VoltCool Additives for Transformer Maintenance

VoltCool Additives Save Money and Solve Problems for Transformer Maintenance

There are two VoltCool Additives:

- **VoltCool VA-900** is a concentrated BHT antioxidant solution for field addition to transformers.
- **VoltCool VA-950** solves Corrosive Sulfur problems in transformer oils, changing aggressive sulfur compounds to nonaggressive forms.

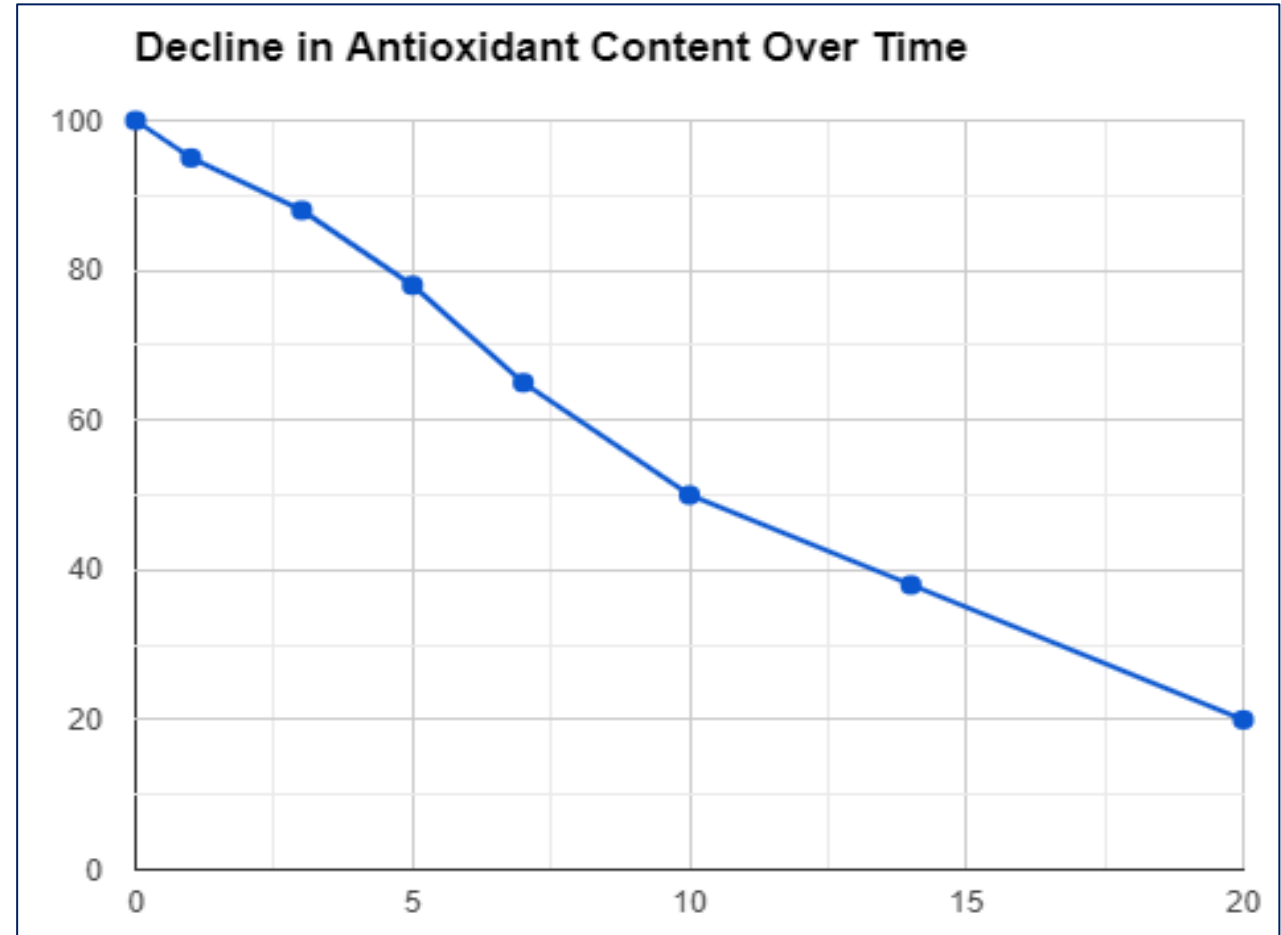


Transformer Antioxidant

New transformer oils contain an antioxidant chemical called BHT* that's added to slow down the natural ageing of the oil. It extends the life of the oil and the transformer.

As transformer oil ages in service, the antioxidant is consumed and the concentration of the additive drops. When the antioxidant level gets too low, the oil deteriorates more rapidly.

*butylated hydroxytoluene,
AKA 2, 4, di-tert-butylcresol



Transformer Antioxidant

That's why, for critical transformers, the antioxidant level is checked during annual scheduled service.

Antioxidant level is checked by sending a small oil sample to a laboratory.

Laboratories will advise the transformer owner when it's time to add more antioxidant.



Transformer Antioxidant

This is BHT, the antioxidant used in transformer oil. It's a crystalline material that must be dissolved into the transformer oil.

Mixing BHT Crystals requires heating the oil to 140F, mixing the BHT crystals into the oil, circulation and agitation to break up and dissolve the crystals, then filtration to remove any unwanted particulate matter.

This is easy to do in a factory or refinery, but more difficult in the field, at the transformer site.



Traditional Solution

When a transformer needs more antioxidant:

- A multi-day outage is scheduled for the transformer.
- A service trailer is contracted, brought to the transformer site and connected to the transformer. Spill control equipment is deployed, the transformer oil is removed from the transformer, circulated and heated.
- When the oil reaches the desired temperature, BHT crystals are added.
- Oil circulation continues for hours to dissolve the BHT and filter the oil
- Hoses are drained, the trailer is disconnected from the power source and the transformer.



Traditional Solution

Cost Summary:

Multi-day Transformer Outage	\$\$\$\$
Multi-day Service Trailer Rental	\$\$\$
2-4 Technicians	\$\$\$

The Real Cost:

- Depending on location and the type of server provided by the transformers, the total cost of the service call can run from \$25k to \$100ks.
- This does not include the planning and notifications required to take a transformer out of service.

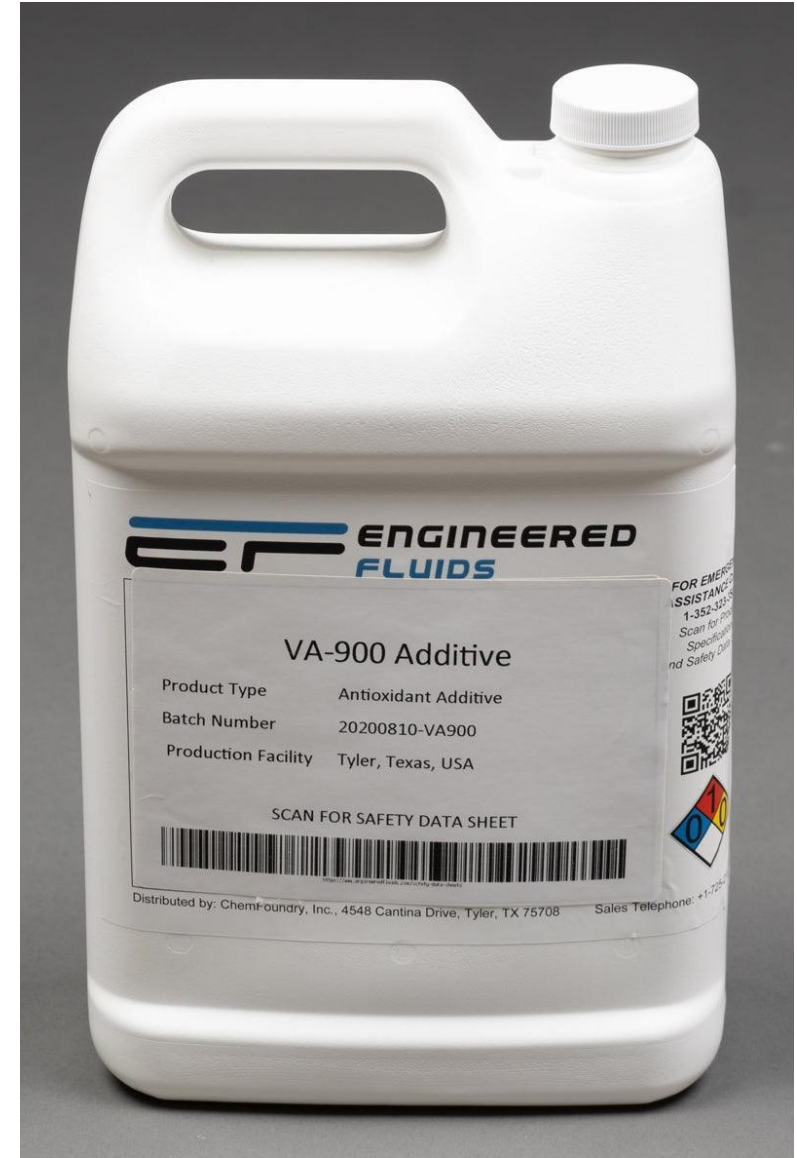


Engineered Fluids VA-900

Introducing the fastest, easiest and most environmentally friendly way to add antioxidant to a transformer of any size!

VA-900® Concentrated Antioxidant Inhibitor.

- VA-900 is the first highly concentrated liquid form of BHT made to be added directly to a transformer.
- VA-900 is the same BHT that's the standard in the industry. Engineered Fluids developed a way to microcrystallize then liquify BHT.
- VA-900 mixes directly into any mineral transformer oil without the need to remove existing oil.
- No downtime. No trailer. No heating. No Filtering.
- VA-900 is non-toxic, non-hazardous and fire resistant.
- VA-900 provides the highest level of active protection in the industry with the lowest deployment costs and least impact on production and operations.



Engineered Fluids VA-900

When a transformer needs more antioxidant:

- The transformer is de-energized for the manufacturer's recommended time period, typical a few hours.
- A technician opens the transformer's service access port (manhole).
- VA-900 is poured directly into the transformer oil, no premixing required.
- If an internal circulation pump is available, it can be turned on to ensure a even mixing of the VA-900 and transformer oil.
- The transformer is closed and re-energized.
- *The process is so simple it can be performed whenever the transformer will be de-energized for any reason.*



Engineered Fluids VA-900

Cost Summary:

Hours of Transformer Outage	\$\$
Service Trailer Rental	-0-
1-2 Technicians	\$

VA-900 saves time and money

VA-900 lowers the risk of oil spills

VA-900 extends the service life of transformer oils and transformers



Engineered Fluids VA-900

- Adding 2% VA-900 to transformer oil returns the antioxidant level back to original levels.
- The antioxidant concentration of the oil is tested in the same way as the original oil / Antioxidant mix.
- VA-900 is safe for workers, for your equipment and for the environment.



Engineered Fluids VA-900

VoltCool VA-900 is a concentrated BHT Antioxidant blend that eliminates the need for expensive service trailers to add antioxidant to transformers.

VoltCool VA-900 has been used worldwide for over seven years by power utilities, military and industrial customers.

VoltCool VA-900 lowers the risk of oil spills and is safe for workers, your equipment and the environment.

Use VoltCool VA-900 in your next scheduled transformer maintenance.





For more information...

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