

GULFTRONIC®

TURNAROUND SUPPORT AGREEMENT (TARSA) &
ONSITE TRAINING/SYSTEM INSPECTION SUPPORT



"Extending turnaround activities may result in fuel shortages, price increases, or both. Strain is increased on other suppliers to meet demands, and turnarounds which become shutdowns can be catastrophic for supply at a regional level."

*-What are shutdowns and turnarounds?,
Oil & Gas IQ Editor*

General Atomics Electromagnetic Systems (GA-EMS) understands that during a Refinery Turnaround process (TAR) unforeseen issues can arise, making it difficult to stay on schedule and on budget. With TARSA enabled for your Gulftronic® Electrostatic Separator you can be certain that it will be covered for all issues during your TAR.

TARSA for Gulftronic is a multi-year support agreement package that is designed to support the Gulftronic Electrostatic Separator, customer operations and maintenance, and to save the refinery time and money during the duration of the agreement. For five years, GA-EMS will support planned and unplanned maintenance activities, and the TAR. TARSA supports the refineries goal of increasing profits and revenue.

TAR Support

Turnaround (TAR) maintenance activities are expensive, and the schedule is always critical. With TARSA our experienced Gulftronics Support Team will be on-site, for a week or more if needed, to help keep your TAR project on time. The TARSA guarantees preferred access to GA-EMS spares and support to provide enhanced TAR efficiency.

Unplanned Maintenance Support

Unplanned maintenance requires immediate action. With Preferred Access and 40 hours of 24/7/365 Remote Support GA-EMS will be available to help you recover quickly from unplanned upsets.

- Preferred Access to Support and Spares – GA-EMS products and services at your fingertips
- Discounts – 10% discount on GA-EMS catalog items and support
- Options – Gulftronic Lab Testing and Analysis.



General Atomics is introducing three new Onsite Training and System Inspection Support package add-ons for Gulftronic Electrostatic Separator (GES) customers, designed to enhance operator effectiveness and ensure smooth, long-term equipment operation. Each package can be purchased separately or as an add-on to a standard TARSA base package. Each package offers tailored support to ensure ongoing success.

TURNAROUND WITHOUT TARSA	TURNAROUND WITH TARSA	TARSA TIER
Unplanned resource shifts can lead to Expedite Fees	Planned TAR On-site Support	TARSA Base <i>included in standard TARSA package</i>
Full price Parts and Services	10% Discount on Spares and Support	TARSA Base <i>included in standard TARSA package</i>
Increased travel expenses due to critical issues that will arise	24 / 7/ 365 Remote Support	TARSA Base <i>included in standard TARSA package</i>
Increased risk of undetected issues leading to costly unplanned downtime and repairs.	GA Onsite System Inspection Health Check Support	TARSA Tier 1 Package Add-on <i>Option as an Add-on to the standard TARSA base package</i>
Communication is delayed due to Time Zone differences. The impact to TAR can add up to 7 days.	Onsite Training Support for refinery personnel, operators and maintainers	TARSA Tier 2 Package Add-on <i>Option as an Add-on to the standard TARSA base package</i>
Increased potential for inaccurate assessments and extended troubleshooting due to lack of professional testing.	Gulfronic Lab Testing and Analysis	TARSA Tier 3 Package Add-on <i>Option as an Add-on to the standard TARSA base package</i>

Purpose of Onsite Training & System Inspection Support Packages

To define training and system inspection plans for customers that operate a Gulfronic Electrostatic Separator (GES). The onsite training and system inspection plan supports refineries that rotate teams of operators within the plant.

Maximize Efficiency & Optimize Costs with Onsite Training & System Inspection Support Packages

The key benefits of GA's onsite training and service support packages are:

- **Maximized Equipment Integrity:** Proper training helps maintain the reliability and lifespan of your equipment.
- **Enhanced System Performance:** Well-trained operators fully leverage the capabilities of the GES, thus optimizing performance.
- **Increased Operational Expertise:** Comprehensive training elevates the technical skills of your team and fosters a more knowledgeable workforce.
- **Professional GES Training:** The GA Applied Power Systems (APS) training approach serves as a proactive measure to prevent potential long-term service issues.
- **Improved Operational Experience:** A professional training approach results in a refined and productive operational workflow for system operators.

1. Onsite System Inspection Support Package

GA Engineers can be on site to provide system health checks of critical components and sub-assemblies on the GES:

- Glass Beads
- Hot Shell Wedges
- Center Ground Electrode (CGE)
- Tip, Electrode, Carbide
- Center Ground Screen
- Back Flush Distributor (BFD)
- High Voltage Bushing (HVB)
- HVPS Oil Inspection
- HV Cable Kit

2. Onsite Training Support Package

GA Engineers can be on site to provide detailed training, for refinery personnel, operators and maintainers of the GES

Subjects Covered in Onsite Trainings:

1. Theory of Di-Electrophoresis

- Separation Cycle
- Back Flush Cycle
- Purge Cycle
- Pause Cycle

2. System Requirements

- Valves
- Operating Temperatures (Min / Max)
- Air (Min / Max)
- Electrical (Min / Max)

3. Mechanical Maintenance & Module Assembly / Disassembly Procedures

- Module Purpose & Overview
- Module Components
- Module Assembly Procedure
- Module Disassembly Procedure
- Manifolds Purpose & Architecture
- System Piping Diagram
- Valve Purpose & Function

4. High Voltage Power

Supply (HVPS)

Maintenance

- Transformer Oil Purpose
- Inspection of Oil and HVPS Tank
- HVPS Oil Sampling & Testing
- HVPS Voltage Adjustment
- HVPS Troubleshooting

5. Electrical Maintenance

& Power Distribution

- Power Skid (Overview)
- Power Distribution Enclosures 1 thru 4
- Power Distribution Enclosures 5 thru 10
- Enclosure 1 Component Review
- Enclosure 2 thru 4 Component Review

6. Programmable Logic

Controllers (PLC)

- Instrumentation Hardware
- Enclosures Overview (Hardware)
- PLC Overview (Software)
- PLC Interface and Display
- Control Screens

7. Operating Procedure

- Pre-Startup Checkout
- Startup
- Cold Startup Procedure (All Modules)
- Cold Startup (One Module)
- Shut Down (One Module)
- Normal Shut Down (Complete System)

8. Troubleshooting

- HVPS Alarms
- PLC Alarms
- Instrumentation Alarms
- Periodic Adjustments
- Temperature and Power Adjustments

9. Preventative Maintenance

- Preventative Maintenance Procedure
- Inspection Intervals
- Other Inspection Procedures and References
 - » High Voltage Bushing Inspection
 - » Glass Bead Inspection
 - » Center Ground Electrode Inspection

3. Gulftronic Lab Testing & Analysis Testing

GA-EMS offers thorough laboratory-scale testing and analysis of customer-provided slurry oil in addition to other process fluid samples. GA-EMS Gulftronic lab testing can provide comprehensive sample test data to enable support like the following:

- Determine level of catalyst and other particles content prior to system design
- Provide on-going analysis of customer feedstock oil and clarified (separated) oil outputs
- Support new application and experimental testing