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Cathodic Protection Systems
Non-destructive Testing Services
Heat Treatment Services
Inspection Services

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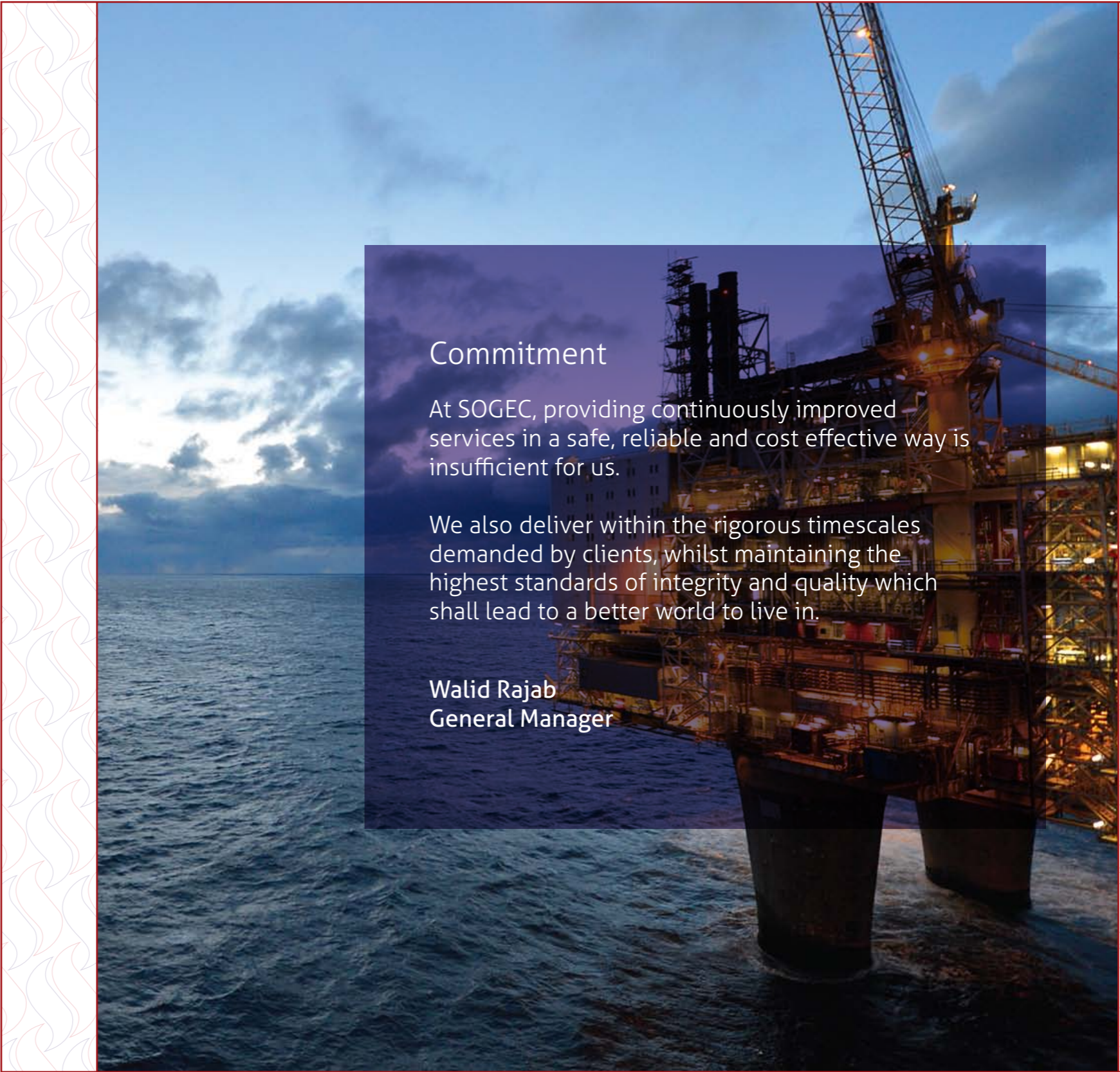
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Commitment

At SOGEC, providing continuously improved services in a safe, reliable and cost effective way is insufficient for us.

We also deliver within the rigorous timescales demanded by clients, whilst maintaining the highest standards of integrity and quality which shall lead to a better world to live in.

Walid Rajab
General Manager



ABOUT US

SOGEC – Specialized Oil & Gas Engineering Company is a part of **KABBANI CONSTRUCTION GROUP** which was established in 1979 and commenced its activities as a specialized maintenance contractor, then it grew steadily over the past 30 years to become consistently rated among the largest 50 companies in Saudi Arabia.

Taking advantage of the group's financial & human resources, **SOGEC** was initially launched in 2001 as a part of **KABBANI CONSTRUCTION GROUP** to meet the acute needs of Cathodic Protection (CP), Non-Destructive Testing (NDT) & Heat Treatment (HT) required by the oil & gas industry, through the vast experience gained by the division's engineering and technical staff.

Vision

To be the chief source of Cathodic Protection, Non-Destructive Testing & Heat Treatment in the Middle East by providing safe, reliable and cost effective solutions and services.

SOGEC believes that the ultimate goal of all companies and firms that provide different types of services on this earth is the wellbeing of human race.

Values

We **CARE** about the community by being active in social contributions.

We **RESPECT** all individuals whether customers, suppliers or team members.

We **PROTECT** assets that are the reasons for a better lifestyle.

We **SUPPORT** all our contacts, anytime, anywhere.

We **HONOR** commitments with all our affiliates.

SOGEC is a 100% Saudi National Company registered with Ministry of Commerce under Commercial registration No. 4030133192. SOGEC has acquired extensive professional experience in the field of Cathodic Protection, Non-Destructive Testing & Heat Treatment for pipelines, plant piping, tanks, vessels, jetties, steel reinforced concrete, etc...

SOGEC is a registered vendor with the following well reputed end clients:

- Saudi Oil Company-Saudi ARAMCO
- Saudi Basic Industries Corporation (SABIC)
- Saudi Electricity Company (SEC)
- Royal Commission (RC)
- Ministry of Water
- Saline Water Conversion Company (SWCC)
- MARAFIQ
- National Water Company (NWC)
- PetroRabigh

Cathodic Protection Services

Whether the project is a pipeline, tank, offshore or concrete structure, SOGEC will design the right, economical and most efficient Cathodic Protection (CP) System to protect the structure with the minimum required maintenance.

- Pre-Design & Site Survey
- Cathodic Protection System Design
- Manufacturing & Supply of Cathodic Protection Materials
- Installation of Cathodic Protection Systems
- Testing, Commissioning & Monitoring of Cathodic Protection Systems
- CIPS-DCVG Survey & Report
- AC Interference Mitigation Systems



Pre-Design & Site Survey

An initial survey is usually conducted to identify site conditions relevant to structures that require Cathodic Protection System. The survey would involve investigation of many factors. The results of survey in conjunction with information on the structure / plant to be protected provide basic information for the design.

CP System Design

Designs are done taking into consideration the aspects related to practicality, cost effectiveness client standards and specifications. It is ensured through the engineering team with qualified NACE Certified CP-3 Technologists and CP-4 Specialists. Software and complex calculations are used to decide the type of system to be used, whether sacrificial or impressed current system.

Design packages submitted to client usually include detailed drawings, materials specifications, bill of materials, installation procedures, inspection test plans, method statements construction schedules, etc...



Manufacturing & Supply of CP Materials

With a 4,000 sq. meter manufacturing facility in Dammam Saudi Arabia, SOGEC assembles and manufactures a vast variety of Cathodic Protection materials with different product lines, starting by a normal type of anode, ending up by the most sophisticated type of Cathodic Protection Transformer Rectifier.

Below is a simple list of what SOGEC can fabricate / assemble and supply to its customers with different types & sizes:

- Sacrificial Anodes (Magnesium, Zinc, Aluminum, etc..)
- High Silicon Iron Anodes (TA-4, TA-5, TA-2, etc..)
- Mixed Metal Oxide (MMO) Tubular Anodes, Ribbon Anodes, Mesh Ribbon Anodes
- Conductor Bars
- Junction & Bonding Boxes
- Test Stations
- Reference Electrodes (RE)
- Cables (HMWPE, KYNAR/HMWPE, THHN, XLPE/PVC, etc..)
- CP Transformer Rectifiers (Solar, Air Cooled, Oil Cooled, Conventional, Auto Potential, Variac, etc..)
- Monitoring Systems



Installation of CP Systems

SOGEC's highly experienced engineers and technicians are available to install or supervise the installation of any Cathodic Protection System in any part of the GCC countries.

The construction team consist one of the biggest number of NACE Certified CP-2 Technicians among CP companies in GCC and this is due to the fact of continuous training and upgrading of team members.

Complete installations provided can vary from a simple ribbon anode system for external tank bottom, to installations of deep anode ground beds including, drilling and civil works.

Testing, Commissioning & Monitoring of CP Systems

On completion of the installation of the Cathodic Protection Systems, SOGEC engineers will test, commission and make the necessary adjustments on the system to achieve the required level of protection for the structure.

A fully detailed report on the performance of the system is usually submitted along with complete AS-Built drawings at the end of each project.

SOGEC offers a monitoring procedure to maintain control of the Cathodic Protection System with regular inspection so that continuous protection is ensured and maintained.



CIPS - DCVG Survey & Report

SOGEC is the exclusive agent of DC Voltage Gradient Technology & Supply Ltd. in Saudi Arabia, which happens to be a well-recognized UK company in the field of CIPS-DCVG.

Both parties joined forces together in early 2013 to bring to the market new high end technologies, such as inspection for any holidays on new pipelines using DCVG, Pipeline current mapper services, ACVG surveys, PH and bacterial inspection, Supply of pipeline survey equipment, Design and develop software for full pipeline assessment including big ECDA software, etc...

AC Interference Mitigation Systems

Through experienced and well trained engineers and technicians, SOGEC at present time is capable of designing in-house the safest and most cost effective AC interference mitigation systems. Complicated software and authorized licenses used in design stage are one of the most advanced in its field.

Lately, SOGEC has successfully designed, supplied, installed and commissioned AC Mitigation Systems for various clients in the market.

Non-Destructive Testing services

With many years of experience in providing traditional NDT services, utilizing standardized procedures, certification programs and audit tracking, SOGEC has become a leader in the traditional NDT industry. These services are the fundamental basis for most inspection and reliability programs. Our traditional NDT services encompass a wide range of Inspection, Quality Assurance and Quality Control offerings operating within the guidelines of our ISO 9001:2000 Quality Program. All in-house and field services are supported by our highly experienced management and engineering team, dedicated to customer service. In addition to traditional NDT, SOGEC also delivers specific advanced NDT techniques.

- ASNT Level III Consulting Services
- Radiographic Testing – RT
- Ultrasonic Thickness Gauge Testing - UTT
- Ultrasonic Shear Wave Testing – UT
- Magnetic Particle Testing – MPT.
- Visual Inspection
- Phase Array Ultrasonic Testing – PAUT
- TOFD
- Leak Detection
- In-situ Metallography



ASNT Level III Consulting Services

SOGEC NDT Consulting Team has many years of individual and collective experience in the application of NDT technologies to a wide variety of complex problems and their expertise can help you find solutions to your inspection challenges. Our ASNT certified Level 3 consultants can assist you with:

- Technical Procedure Development
- NDT Process Implementation
- NDT Engineering
- Employee Certification
- Process Control Documentation
- Process Auditing
- Compliance Audit Preparation
- Radiation Safety support

Radiographic Testing – RT

Conventional RT is a nondestructive examination (NDE) method that uses X-ray and gamma ray for detecting internal imperfections, measuring wall thickness and detection of corrosion. With RT, the material is exposed to a homogenous ray from a radioactive isotope or an X-ray tube while a negative film is positioned behind the material to be examined. After development of the film, thickness and density differences (material imperfections) will show as blackness. Acceptance criteria define whether or not the indication is non-acceptable (a defect).

Ultrasonic Thickness Gauge Testing - UTT

UTT measures remaining wall thickness on piping, pressure vessels, storage tanks and other equipment, and can be used to scan bolts, shafts and raw materials for imperfections. A straight beam is directed at the test piece and utilizing the round trip time for the ultra-sonic energy, the distance to the flaw is displayed in thousandths of an inch. On UT units using A-scan, the display will show multiple flaws at different depths.





Ultrasonic Shear Wave Testing – UT

Traditional UT inspection uses high frequency sound energy to conduct examinations and perform measurements gathering considerable information such as the presence of discontinuities, material or coating thickness. Our highly qualified technicians detect surface and subsurface defects and supply accurate readings regarding discontinuity, size and shape. Ultrasonic surveys are used as the main inspection technique for a plant's erosion/corrosion programs.

Magnetic Particle Testing – MPT

Magnetic particle inspection is used to locate surface breaking defects and is used on ferrous materials looking for cracks, laps, seams, voids, pits and other surface or slightly subsurface defects. It can be performed in-house or in the field.

Dye Penetrant Testing – DPT

Penetrant inspection is used to locate surface breaking defects and is used on nonferrous materials such as metals, composites and ceramics, identifying surface anomalies such as cracks, seams, laminations, blow holes, laps, external bursts and welding defects. It can be performed in-house or in the field.

Visual Inspection

Visual inspection is the basis for all NDT inspection programs. We provide a wide variety of visual inspection techniques (VT) to various industries such as API 510, 653 and 570 inspectors to the Oil and Gas industry and Certified Welding Inspectors to a wide variety of other industries.

Phase array Ultrasonic testing – PAUT

Phased Array generates an ultrasonic beam with the capability of setting beam parameters such as angle, focal distance and focal point size through computer controlled excitation of the beam. It can be multiplexed covering large areas and the operator can vary the angle of the beam without moving the probe. Applications include weld inspection, complex geometries, defect detection and location and sizing. The ability to record weld scans and to visualize the reflectors and their position within the weld makes it a qualified technology and an excellent choice for projects constructed to ASME Code.

Leak detection

Leak Detection covers a wide range of techniques used to detect the leakage of fluids from the test part. In most cases, fluids are pressurized on one side of the test part, while the opposite surface of the piece is inspected for fluid leaking through. In general, the leakage can be detected by one of the following methods: observing formation of bubbles, monitoring for changes in pressure or volume of the fluid, or sensing for the presence of tracer fluids.

TOFD

TOFD is a code-accepted inspection and provides superior height sizing capabilities to other techniques. Ideal for inspecting and sizing defects in welds, TOFD uses two angled probes (one on each side of the weld) to transmit sound waves into the test material at angles specific to its thickness. Discontinuities are shown as breaks in the waves or as additional waves between mode lines. TOFD is normally utilized in conjunction with Phased Array UT.

In-situ Metallography

In-situ Metallography is a non-destructive testing tool and it is used for remaining life of components by preparing & evaluating the replication of microstructure. Application areas include fertilizer, petrochemical, aerospace, chemical plants, foundries, forge shops, steel plants, automobile, oil & gas, off shore structures and chemical processing industries.



Heat Treatment services

- Post Weld Heat Treatment – PWHT
- Pre-heating
- Solution Annealing
- Normalizing
- Furnaces
- Hardness testing
- Positive Material Identification – PMI
- Refractory Dry-out
- Stress relieving
- Internal firing



Post Weld Heat Treatment – PWHT

Post Weld Heat Treatment Services (PWHT) is defined as one of heat treatment method done after welding/machining to improve the Chemical and/or mechanical properties of weldments / machined surfaces. In concept, PWHT covers many different potential treatments. However, in steel fabrication, most common procedure used is Stress Relieving. It can be applied to pipelines, steel structures, vessels, boilers and tanks etc. SOGEC has variety of electrical and firing equipments to make sure that client needs are fulfilled with utmost quality.

Pre-heating

Preheating involves rising the temperature of the parent material locally, on both sides of the joint to a value as specified in codes. The need for preheat is usually determined by the applicable fabrication code and verified by the weld procedure qualification test. Preheat may be required as an aid to welding for one of the four basic reasons:

- To control the rate of cooling,
- To control the diffusion rate of hydrogen in a welded joint,
- To reduce thermal stresses,
- Compensation for heat loss.

Solution Annealing

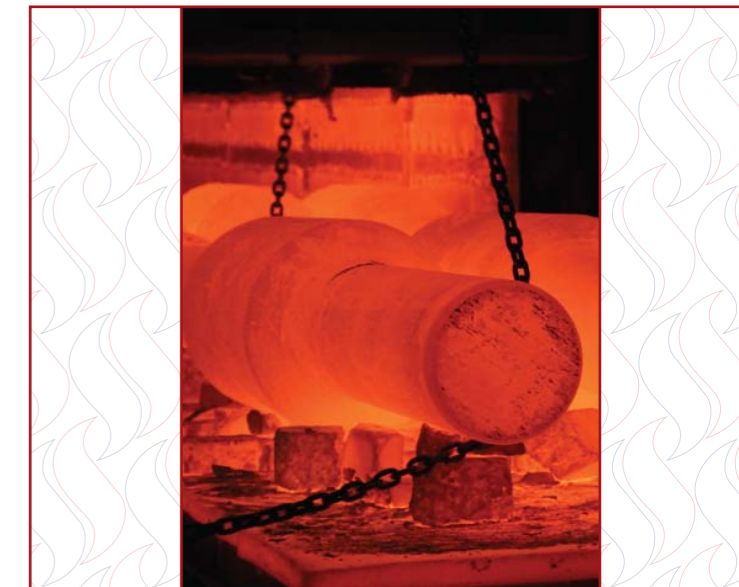
Our heat treatment services for annealing various metals, such as steel, aluminum, and copper, improve the ductility as well as cold working properties of all types of metals. It is a process in which carbides which have precipitated in the grain boundary are dissolved into surrounding matrix by taking them to material specific temperatures to allow carbon to go into solution and then quickly cooling them. Some alloys due to their low carbon content do not need a solution anneal due to carbide formation, but benefit from a solution anneal to achieve maximum corrosion resistance.

Normalizing

Normalizing Heat Treatment process is heating a steel above the critical temperature, holding for a period of time long enough for transformation to occur, and air cooling to make material softer but does not produce material properties like annealing. Normalized heat treatment establishes a more uniform carbide size and distribution which facilitates later heat treatment operations and produces a more uniform final product. This treatment refines the grain size and improves the uniformity of microstructure and properties of hot rolled steel.

Furnaces

SOGEC offer its in-house industrial furnaces, one in Dammam and another in Rabigh to perform range of heat treatment processes in it including Annealing, Ageing, Hardening, Solution heat treatment, Normalizing, and Stress relieving of various objects. We are also experienced in fabrication of temporary furnaces on site to facilitate the heat treatment of equipment which cannot be transported due to mobility restrictions.



Hardness testing

Having the correct hardness of steel structure and pipelines is critical in field and in plants. SOGEC has the ability to conduct both the methods of hardness testing which are available in today market, be it manual hardness or digital hardness. It is a major goal in quality assurance which can be achieved with SOGEC personnel having proven metallurgical knowledge and years of experience in this field.

Positive Material Identification – PMI

Positive Material Identification (PMI) quickly and accurately identifies the composition of more than 100 different engineering alloys onsite. SOGEC can perform PMI on virtually any size or shape of pipe, plate, weld, welding materials, machined parts or castings. We perform both X-Ray Fluorescence (XRF) and Optical Emission Spectroscopy (OES), two methods of conducting a PMI examination. Both methods ensure compliance with Process Safety Management (PSM) requirements and combined with the experienced personnel gives you a reliable result.



Internal firing

SOGEC has a vast experience of on-site internal firing in GCC region ranging from pressure vessels to tanks and boilers. In this method, the work pieces or equipments are themselves converted into a furnace and are heated internally by diesel or gas fired burners located at appropriate points and whole equipment is completely covered with insulation material to avoid heat losses. SOGEC has specialist personnel and portable equipments which can perform PWHT of these equipments in an efficient and most convenient way.

Refractory Dry-out

SOGEC has extensive experience in the field of refractory dryout and in controlled heating and ventilation for the drying of specialized refractory linings used in process industries such as steel, petrochemical and aluminum industries. Our expertise in these areas ensures maximum effectiveness and minimum downtime of the equipment by utilizing state-of-the-art equipment, including digital process controllers, fully proportional fuel actuators, and solid-state features, our engineers are able to provide flexible service that meets the most demanding of specifications. Moisture is removed by strictly controlling heating rates to eliminate the risk of refractory damage by spalling and enhances the life of refractory linings. Versatility and ease of flexibility of SOGEC dryout equipment makes us stand out in this field.

Stress relieving

Stress Relieving heat treatment process is heating subjects to a temperature below transformation temperature in order to relieve residual stresses in the material and lower the hardness values of the material which can cause distortions in the long term in the subjected items. Internal stresses in welded structures are removed by stress relieving method.



Inspection services

- PQR Qualification
- WQT Witnessing
- API Inspection



PQR Qualification

SOGEC helps customers to set up their own PQR (a record of the welding data used to weld a test coupon), WPS (a written qualified welding procedure prepared to provide direction for making production welds to Code requirements) and qualify their welders. In SOGEC we have highly qualified and experienced Certified Welding Inspectors and Metallurgists to develop new welding procedures and to overcome the difficulties in current procedures by providing a complete range of service like PQR qualification, NDT and PWHT of test coupons and mechanical testing of the test pieces.

WQT Witnessing

SOGEC has experienced certified welding inspectors (AWS CWI / CSWIP), who can test your welders, using the necessary methods as required by the many welding code and standards. They are fit for the required welding task as needed.

API Inspection

We are an end-to-end service provider of asset integrity management, consulting and supplier evaluation. Our API Inspection Team specializes in providing both on-site and off-site management to complete your turnaround on schedule. Our inspectors can provide support while your plant is in operation in addition to turnaround based inspection programs.



Safety

SOGEC's utmost and primary priority at all times and places is to deliver safety in all of its plans. The culture of safety is not a goal for us. It is a way of life that we implement in every aspect of our activities, whether while driving a car, installing a system, or even replacing a light bulb in our premises.

Loss prevention programs are always being audited, recorded and analyzed for implementing better and safer practices while delivering services.

For a human being is what matters most to us, SOGEC never jeopardizes or risks any of its employees or affiliate's personnel under any circumstances.

Agencies

SOGEC is the exclusive agent inside kingdom of Saudi Arabia of the following highly recognized international suppliers and service providers:



JA Electronics
Manufacturing Co.



DC Voltage Gradient
Technology & Supply Ltd.

