



**CORROSION TECHNOLOGY SERVICES LLC**  
"The Complete Solution Providers"

## **COMPANY PROFILE**

### **INTRODUCTION**

Corrosion Technology Services (CTS) is a market leading specialist in the provision of corrosion prevention solutions particularly cathodic protection within the Oil & Gas, Utilities and Construction industries.

CTS' strength lies in its engineering and production facilities. Consisting of around 200 employees globally across the five companies, CTS is staffed with qualified engineers specialising in all aspects of cathodic protection as well as electrical and civil engineers. In line with our philosophy of providing local service, many regions are served by local group companies and where these do not exist we have a network of representatives.

CTS can provide pre-design surveys, specialized surveys, supply of materials, design, installation supervision, energizing, testing and commissioning, monitoring and trouble shooting of cathodic protection systems. CTS also manufacture a wide range of equipment in-house including power supplies and remote monitoring systems. For items we do not manufacture, we often have relationships with leading producers.

### **CORPORATE OVERVIEW**

The CTS group consists of eight companies spread over five countries and three regions – Europe, the Middle East and India. With over 40 years of experience in some of the world's most aggressive environments from South America through Europe and the Middle East to Indonesia and Australia CTS has the deserved reputation for delivering high profile projects within budget and on time in the global stage.

#### **(i) / (ii) Corrosion Technology Services LLC (CTS) / Corrosion Technology Services Middle East LLC (CTSME)**

Corrosion Technology Services LLC and Corrosion Technology Services Middle East LLC form the focus of CTS operations in the Middle East, Africa and the Far East.

The primary business of the UAE office is the protection of oil, gas and water assets including pipelines, tanks and well casings. Besides this, the company also has extensive experience in the protection of reinforced concrete structures and jetties. CTSME has a production workshop in Sharjah and sources materials from local suppliers and other group companies in the region.

The companies are approved by all major regional operating companies and regularly undertakes projects with value in excess of \$1 million and has directly handled projects values in excess of \$5 million.

### **(iii) Corrosion Technology Services Europe Ltd (CTS Europe)**

CTS Europe (formerly known as Pipeline Maintenance Ltd – PML) is the regional headquarters for CTS operations in Europe and North Africa; with a track record spanning over four decades. CTS Europe provide cathodic protection design and engineering services, plus the supply of cathodic protection materials and equipment. The company specializes in the provision of Close Interval Potential Surveys (CIPS) and DC Voltage Gradient (DCVG) buried pipeline surveys. The PML brand is recognized as a leading manufacturer of transformer rectifiers worldwide.

### **(iv) Corrpro Arabia Cathodic Protection Company Ltd. (CACP)**

CACP alongside CAGEMCO are the leading cathodic protection companies in Saudi Arabia. CACP undertakes work on a wide range of industrial, oil and gas related projects and specializes in the design, consultancy and engineering of the protection of steel in concrete. Having undertaken several multi-million dollar contracts in this field over the past decade has led CACP to have an unrivalled reputation in the region.

### **(v) Corrpro Arabia Ground Electrode Manufacturing Company Ltd. (CAGEMCO)**

CAGEMCO specializes in the manufacture of materials and equipment for cathodic protection. The company has supplied several million dollars' worth of locally manufactured equipment to Saudi Aramco, including magnesium and silicon iron anodes, junction boxes and transformer rectifier units. These are all assembled in the purpose built facility in Dammam where a QMS system to ISO 9001 is operational.

### **(vi) Corrosion & Technical Services Co. WLL (CATS)**

CATS is a long established company in Bahrain specializing in cathodic protection. CATS maintains a permanent engineering and support staff in the office which also includes a workshop where cathodic protection materials are assembled and maintained.

CATS has carried out many of the major cathodic protection related contracts in Bahrain including pipelines, plant, jetties and wharves, as well as steel reinforcement in concrete in many bridges and sea water intakes.

### **(vii) Corrosion Technology Services India (PVT) Ltd (CTS India)**

CTS India has full design capability providing CTS products and services for the Indian subcontinent. Engineering work is carried out in-house backed by CTSME, Sharjah. CTSIL has been responsible for completion of major projects including jetties and pipelines and consultancy for cathodic protection in plant.

### **(viii) Wilson Walton Middle East LLC (WWME)**

Wilson Walton Middle East LLC specializes in the protection and servicing of ICCP and antifouling systems for ships and design of sacrificial anode protection for ballast tanks etc. WWME and CTS have also supplied sacrificial anodes for a number of major subsea pipeline and offshore jackets.

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## SERVICES

CTS specializes in the field of corrosion control and is uniquely qualified to perform high quality state-of-the-art work effectively on virtually all types of corrosion related projects.

The professional expertise of CTS comprises of engineers and technicians with various disciplines such as:

- Civil
- Corrosion
- Electrical
- Chemical
- Mechanical
- Geological
- Materials
- Computerized Data Management

Some of the industrial sectors and structures to which CTS have successfully provided services & products include:

- **Industrial Complexes:** Underground Process Facilities, Product Piping, Storage Tanks, Condensers, Water Treatment Equipment
- **Oil & Gas Pipelines:** Transmission Facilities, Tank Farms, Distribution & Gathering Facilities
- **Oil & Gas Productions:** Refineries, Bulk Handling Plants, Drilling Rigs, Oil Wells
- **Power Plants:** Underground Piping Networks, Ground Grids, Pipeline Corridors, Condensers, Cooling Water & Treatment Facilities, Underground Structures, Tanks
- **Offshore:** Drilling Rigs, Offshore Pipelines, Marine Terminals, Sheet & Tubular Piles, Loading-Unloading Terminals, Dock Structures, Jetties
- **Ship Repair Industry:** Tanker Hulls, Ballast Tanks
- **Infrastructure Concrete Industry Projects:** Bridges, Docks, Power Stations, Parking Garages, Desalination Plants, Underground Ducts, Buildings, Foundations, Swimming Pools, Yachts, Aquariums, Boat Houses etc.
- **Integrity Management:** Survey and Evaluation of Pipeline and Pant Facilities

Our regional operations have extensive technical expertise in providing solutions to corrosion problems of various projects. Some of the important sectors in which CTS specialize are:

### Industrial Cathodic Protection

CTS has been actively engaged in pre-design surveys, specialized surveys, supply of materials, design, installation, energizing, testing and commissioning, monitoring and trouble shooting of a wide range of cathodic protection projects.

Typically, industrial cathodic protection involves structures such as underground and aboveground storage tanks, buried pipelines, oil well casings and structures associated with refineries, power plants, water treatment and desalination plants, etc.

CTS has wide-ranging experience of the following types of protection:

- Temporary Cathodic Protection
- Permanent Cathodic Protection
- Sacrificial Cathodic Protection
- Impressed Current Cathodic Protection
- Computer Modelling of AC interference on pipelines

### **Offshore Cathodic Protection**

CTS has successfully completed various offshore projects such as surveys, design, testing and commissioning, research and development on a project basis and supply of materials. Our engineers have experience in ROV surveys, design of monitoring systems and retrofits for ageing offshore structures and pipelines. Some of the typical offshore structures for corrosion protection have been:

- Submerged pipelines
- Dry Docks
- Jetties
- Fixed and floating Offshore Jackets
- Single Buoy Moorings
- Various other facilities

CTS has been actively involved in various activities for offshore structures including surveys, design, testing and commissioning, research and development on a project basis, supply of materials (bracelets and other type of anodes).

### **Cathodic Protection of Steel in Concrete**

The CTS Concrete Integrity Group is responsible for carrying out some of the largest and most complex projects of this type in the world. The CTS corrosion engineers are amongst the world's leading experts in the field of deterioration and repair of reinforced concrete structures of all types. CTS possesses unrivalled expertise in the field of corrosion surveys, potential mapping, corrosion rate surveys, design and specification services, materials supply, installation, commissioning and maintenance of cathodic protection systems for steel reinforced concrete structures.

These services have been successfully implemented on a wide range of structures such as power plants, seawater cooling systems, bridges, docks, etc.

In addition to providing such services to existing deteriorated structures, CTS also provides a similar service for construction of new concrete structures that will prevent the onset of reinforcement corrosion in an economic way.

## Integrity Assessment Surveys

CTS engineers can provide detailed audits of cathodic protection systems, interference investigation or pipeline integrity assessment surveys.

CTS have completed complex evaluations of defective cathodic protection systems in plant and on pipelines. For pipelines, a complete Coating Defect Assessment Survey may include a Close Interval Potential Survey (CIPS), Direct Current Voltage Gradient Survey (DCVGS), PCM survey, soil resistivity and soil analysis to provide defect priority ranking and earmark selective coating defects for excavation and rehabilitation. CTS also follow External Corrosion Direct Assessment (ECDA) procedures as set out in current NACE standards.

Though our relationship with Speir Hunter, UK we are able to offer unique Stress Concentration Tomography (SCT) survey techniques for pipeline assessment, including non-piggable pipelines. These techniques produce results comparable with Inline (ILI) surveys but have the advantage of not requiring contact with the pipelines or expensive launchers/receivers.

## Marine Services

Through its subsidiary company Wilson Walton Middle East, CTS provide inspection and maintenance services to vessels docking in the major ports and repair yards. In addition, we also provide spare parts for all types of impressed current and anti-fouling systems and design and supply sacrificial anodes for vessels ranging from tugs to tankers.

Wilson Walton Middle East has also supplied complete cathodic protection systems for new vessels including Floating Production Storage and Offloading (FPSO's). A case study for supply of an impressed current system including computer modeling of an FPSO is included in our Case Study section.

## Antifouling system for sea water systems

CTS offers services such as surveys, design and detailed engineering, supply of material and equipment, supervision of installation, testing and commissioning to provide the best suited anti-fouling system.

The applications for which CTS design systems for include, but are not limited to:

- Seawater Circulating Systems
- Cooling and Firewater Systems
- Seawater Intakes and Piping
- Heat Exchangers
- Production Platforms
- Ships & Vessels of all size and class

## Remote Monitoring

CTS provide remote monitoring electronics and software for corrosion related applications. Remote monitoring provides companies with a cost-effective way to monitor the operational status of their corrosion protection systems. Data is collected by the remote monitoring unit and then transmitted

utilizing various communications channels, including fibre optic cables, cellular phones and low earth orbiting satellites. Remote monitoring reduces or eliminates the need for companies to send personnel on-site in order to monitor corrosion protection systems on a variety of structures, including pipelines, storage tanks and reinforced concrete structures. Data collected via the remote monitoring units can also be utilized by risk assessment and management software in order to provide customers with a comprehensive corrosion monitoring program.

The product range includes:

- Remote Monitoring Units (RMU)
- Remotely Controlled Units
- Data Loggers
- GPS Interrupters and Locators
- Associated Software for Data Management

### **Foundry**

CTS maintains a close working relationship with Wilson Walton (Gulf) Ltd in Bahrain, which is well equipped with the latest technology for anode manufacturing. The location of this foundry facility enables CTS to supply to the Middle East region with minimal transportation time and competitive pricing. The foundry has a capacity of over 1500 MT/year and is equipped with an advanced mould producing facility to ensure strict and accurate dimensional tolerances. The foundry has all the modern testing facilities such as Electrochemical Evaluation Testing, Spectrometers to ensure total quality to our customers. The anodes are manufactured under strict vigilance of internal inspection as well as third party inspections such as DNV, SGS, EIL, Lloyds, etc.

### **Preferred Partners**

CTS acts as the agent or has license agreements with the following companies:

#### **Aegis Technical Systems LLC**

- Switch Mode Power Supplies
- Remote Monitoring Systems  
[www.aegisme.com](http://www.aegisme.com)

#### **Nuova Giungas**

- Monobloc Isolating Joints  
[www.nuovagiungas.com](http://www.nuovagiungas.com)

#### **Rohrback Cosasco Systems Inc.**

- Internal Corrosion Monitoring equipment and services  
[www.cosasco.com](http://www.cosasco.com)

#### **Speir Hunter Ltd**

- Non-Contact Stress Concentration Tomography (SCT) for Pipeline Inspection  
[www.speirhunter.com](http://www.speirhunter.com)

#### **De Nora Permalec**

- MMO anodes for protection of steel in concrete

[www.denora.it](http://www.denora.it)

## PRODUCTS

In addition to complete corrosion control services, CTS can supply a complete range of materials, totally in compliance with various standards and under strict quality control. The following is a partial list of materials/ products manufactured or supplied by CTS.

- Magnesium anodes (all grades)
- Zinc anodes, including ribbon, for onshore use
- Zinc anodes, including bracelets, for offshore and jetty applications
- Aluminium anodes, including bracelets
- Silicon iron anodes, with or without chromium
- Conductive Polymer anodes
- Platinized Titanium anodes
- Mixed Metal Oxide anodes
- Lead Silver anodes
- Graphite anodes
- Soft iron anodes
- Electric cables associated with cathodic protection
- Splice Kits
- Isolating Gaps (Spark Gaps)
- Cable Tiles
- Pin Brazing Equipment and Consumables
- Conductive Resin
- Thermo Welding Equipment and Consumables
- Dielectric Shields
- Wrapping Tape
- Transformer Rectifiers (manual and automatic)
- Switch-mode Power Supplies
- Zinc Grounding Cells
- Monobloc Isolating Joints
- Cathodic Protection Monitoring Systems, Onshore and Offshore
- Acoustic Linked Cathodic Protection Monitoring System for offshore use
- Solar Powered d.c power sources
- Thermo Electric Generator (TEG), d.c power sources
- Electrolytic Antifouling Systems for Cooling Water
- Cathodic Protection Data Loggers
- Cathodic Protection Equipment Buried Pipeline Survey Equipment
- Cathodic Protection Test Posts (concrete, light weight concrete or GRP)
- Pipeline Marker Posts (concrete, light weight concrete or GRP)
- Reference Electrodes, permanent and portable
- Coupons
- Coupons with integral reference electrodes
- Instrumentation (multimeters, insulation testers, resistivity meters, etc.)
- Polarization cells and electronic equivalents
- Corrosion Monitoring Equipment and Tools:
  - Probes (Corrosometer and Corrater probes)

- Retrieval Tools
- Corrosometer & Corraters Instruments
- Remote Data Collectors
- Access Fittings
- Injection & Sampling Assemblies
- Hydrogen Probes
- Sand Probes
- Risk Assessment Software
- Remote Monitoring Equipment

### PERSONNEL QUALIFICATIONS

CTS' strength is built on a fundamental core of world class engineering professionals. This is supported by almost 200 staff worldwide with specialists in all aspects of cathodic protection as well as electrical and civil engineers.

The following is a brief resume of the key personnel in CTS:

**Steve Wroe**, has a BSc in Metallurgy and Materials and is a Fellow of the Institute of Corrosion, UK (FICorr). He has more than 30 years experience in corrosion/cathodic protection engineering and management positions. Steve's technical background combined with his management experience has significantly enhanced CTS ability to secure and successfully complete projects. He is currently the Managing Director for the CTS group of companies.

**Roderick M. Callon (Rod)**, has over 20 years of experience in the corrosion control field. He is a Fellow of the Institute of Corrosion (FICorr), NACE Corrosion Specialist and is a BSc (Hons) in Applied Chemistry from the University of Portsmouth. Rod is responsible for all aspects of our business in Bahrain and Saudi he also specializes in the protection of reinforced concrete structures. His ability in this field has lead CTS to carry out most of the largest Cathodic protection schemes for reinforced concrete structures worldwide. Rod is currently the General Manager for CTS Bahrain and Saudi Arabia operations and he is also the Technical Director of the CTS Group worldwide.

**Paul Brooks**, has over 10 years' experience in the Cathodic Protection industry, he has a degree in Industry Related Science from Durham University and worked as UK Services Manager at CCEL where he developed the field service work and managed several major projects. Paul joined PML in 2007 as Field Operations Manager setting up and growing a department which has become the major pipeline survey provider in UK. In December 2011 Paul was appointed General Manager. In addition to being in charge of the Administration of the company Paul is responsible for Business Development in Europe, Paul holds MICorr and NACE Senior Corrosion Technologist certifications.

**Subramanian Narayan (Raju)**, has a Degree in Chemical Engineering and more than 25 years of experience in the field of cathodic protection, insulation, fireproofing , coating and allied corrosion activities. He is an active member of NACE and ICorr UK, is a certified NACE Corrosion and Cathodic Protection Specialist and Fellow of the Institute of Corrosion (FICorr). Raju is currently working as Technical Director in CTS UK office (CTS Europe Ltd, UK)

**P.V. Ramanathan (Ram)**, is qualified as a Chartered Accountant (India) and Chartered Certified Accountant from UK. Ram has over thirty four years of international, post qualification experience mainly in the oilfield service industry. His previous experience includes long periods at Ernst & Young, Schlumberger and other large international trading companies. He has been with CTS and its



predecessors since 2001 and was part of the management buyout team which acquired the Middle East operations of Corrpro Companies in 2003.

**Dr. John Norris**, has a PhD in Cathodic Protection and has over 13 years' experience in the field of corrosion control. He has been involved in feasibility studies and inspection of many concrete structures in the Gulf and has extensive design, installation and commissioning experience of Cathodic protection systems for new and existing concrete structures. John is also experienced in the application of remote monitoring and control of power supply systems. John is a professional Member of the Institute of Corrosion (UK) (MICorr) and is currently working as Projects Manager for the CTS Group.

**Peter Sinclair**, has a degree in Chemistry from Heriot-Watt University Edinburgh and joined PML (now CTS Europe Ltd) in 2010. Peter has over 25 years of experience in cathodic protection, including fieldwork, sales and project management. As Engineering Manager at PML Peter has overall responsibility for the company's Project Engineering. This includes preparation of proposals and quotations, supervising and guiding a team of CP Engineers & CAD operators whilst they perform corrosion surveys, engineering designs, installation supervision and commissioning works. Peter is also an active member of the Royal Society of Chemistry, the Institute of Corrosion and the National Association of Corrosion Engineers.

**Steve Bradley**, has an MSc in Offshore Engineering and is a Chartered Engineer with 30 years of experience in the corrosion/cathodic protection engineering and management positions. He has worked both with cathodic protection contracting companies and major oil companies and has been stationed in the Middle east/N. Africa for almost 20 years. Steve has a thorough technical understanding of CP/Corrosion issues in this region and is fully conversant with the operating requirements of the large EPC Contractors and local Oil Companies. He is currently the Operations Manager of CTS Middle East.

**Vikram Prabhakaran**, has over 14 years of experience in the corrosion control field. He is an active member of the Institute of Corrosion (UK) (MICorr) and certified NACE CP Specialist. He has worked in the capacity of Corrosion Engineer and Project Manager on various projects in the Middle East and Indian subcontinent. His expertise is in the field of CP surveys, design and commissioning of Industrial and Offshore cathodic protection systems. He is currently the Senior Engineer for CTS UAE operations.

**Clive Hawkins**, has a BSc in Chemistry and a BEng in Civil Engineering. He has 21 years of experience in the fields of cathodic protection and civil engineering as a contractor and consultant. He is an active member of the Institute of Corrosion (UK) (MICorr) and certified NACE CP Specialist. Clive has been involved in development and implementation of an ISO 9001:2000 compliant quality management system, which covered design, purchasing, factory assembly and installation. He currently works in CTS Saudi Arabia Operations, Managing the Industrial Projects Department.

### **INTEGRATED MANAGEMENT SYSTEM (IMS)** **(ISO 9001:2008, ISO 14001: 2004, ISO 18001: 2007)**

The Integrated Management System (IMS) framework adopted at CTS is designed to meet and wherever possible to exceed the requirements of ISO 9001:2000, ISO 14001: 2004, ISO 18001: 2007 signifying a move towards continual improvement and total quality managements at CTS.

QHSE is a value all customers seek when selecting a product or services. CTS Companies, through its continuous improvement processes aim at providing innovative, state of the art and most cost effective solutions to its customers. To provide utmost satisfaction, CTS Companies keep its customers as the central focus of all departments, activities and improvement procedures.

CTS Companies have achieved their leading market position by putting the customer first and ensuring the needs of the customers are met. All the departments of CTS Companies (Sales, Engineering, Manufacturing, Customer Relations, Quality & HSE) work with total cooperation and coordination to meet the commitments.

Based on analysis, process improvement, technology upgrade and value-added techniques; process improvements are continuous in CTS Companies and the procedures thus evolved are standardized throughout the group. An important example of such standardization of procedures is manufacturing procedures in all production facilities of CTS Group.

All the projects (products or services) begin with execution, quality, test and inspection plans with special emphasis on the specific requirements of the customers thus ensuring the effectiveness, constructability, reliability and efficiency of the products or services rendered. The QHSE department then ensures the strict compliance of the above plans and procedures throughout the production or the execution of the project.

We have established, documented and implemented our QHSE Management System in order to continually improve the effectiveness of the system and to continually improve our services to our customers both internal and external.

A copy of the Company Quality Manual is available on request as are all insurances, as is the CTS IMS Manual.

## CONTACT DETAILS:

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