

مؤسسة جودة الفحص للمقاولات



**INSPECTION QUALITY** GENERAL CONTRACTING



[www.iqmideast.com](http://www.iqmideast.com)

**NDT / Inspection Services**



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**INSPECTION QUALITY**  
**NDT & INSPECTION SERVICES**

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# Introduction

## About Us

Integral to our range of services in Kingdom of Saudi Arabia, IQ (Inspection Quality) offers Specialized Non-Destructive Testing (NDT) and inspection to complement our Quality Assurance and Quality Control Services. These services help our clients to improve plant reliability, reduce operational and maintenance costs, enhance safety, extend plant life and meet regulatory requirements. We are equipped with the latest inspection tools and technology to cater the most advanced requirements of our clients.

We believe our personnel are our greatest assets. Besides state of the art equipment for best results, we have highly trained and certified inspectors to perform the inspection activities. Our inspectors are experienced and have technical expertise to conduct the inspection surveys to international standard. We offers experience, expertise and equipment in specialised non destructive testing quality assurance, quality control. Our reputation within all industries is not only known for our quality of personnel and equipment but equally our professionalism and knowledge.

We are working with our clients to assure the achievement of their prime performance bonded with contracts reliability, this philosophy resurges from our resources of very experience professionals whom serve in this field for years and their accomplishment are visible by the range of successful project we can see all over the region.

## OUR SERVICES

- Advanced NDT Services
- Conventional NDT Services
- Other Testing & Services
- Inspection Services
- Welding Inspection Services
- Coating and Painting Inspection
- In-Service Inspection
- Shutdown & Turn Around Support



## OUR MISSION & VISION

We are committed to provide Quality Control Services to diverse industries such as oil & gas, power, nuclear, engineering, chemical, and mining industries. We accomplish this by validating their manufacturing and in-service requirements through welding inspection, NDT, corrosion survey and its allied quality consulting services. It is our intention to earn a fair profit by being ethical to our clients, employees and vendors.

It is the policy of Inspection Quality, IQ to ensure customer delight through delivering leading quality services by maintaining cost competitiveness through continual improvement of our Quality Management System, professional services of Non-Destructive Testing, Material Testing, Heat Treatment, Inspection & Expediting Services and Engineering Consultants with other Quality Services. Thereby minimizing the impact on environment, reducing occupational health hazard and safety risk.

We are committed to provide timely, high quality, cost effective testing to the Oil, Gas, Petrochemical, Pipeline, Power, Desalination, Construction and Heavy fabrication sectors.

Our vision is to achieve and maintain the highest level of customer confidence and satisfaction and to maintain a reputation for integrity, honesty, quality consciousness to our clients. We are dedicated as a team to maintain compliance with all legal and other applicable requirements.

We ensure that, our quality system & standards comply with ISO 9001: 2008.

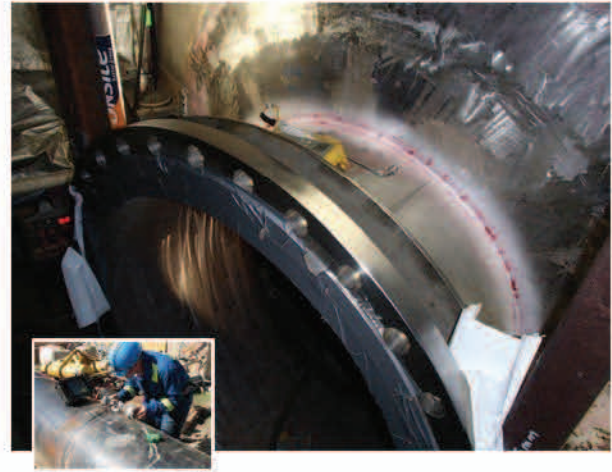
This is a living document in daily use and will be updated at appropriate times to reflect any changes that may subsequently occur. The company, therefore, reserves the right to amend it as required.

Hilal S. Al Hajri  
General Manager

## Services & Capabilities

With Non-destructive testing (NDT) we can analyze welds, piping, valves and other materials for the presence of invisible defects without causing damage to the material. All NDT methods are developed to create visual evidence of defects in materials, which would normally not be visible without these methods. Because NDT does not permanently alter the article being inspected, it is a highly-valuable technique that can save both money and time in product evaluation.

Capabilities of IQ are founded in combination of specialist professional with expertise, qualification and experience state of art testing equipment utilizing advanced but proven technology flexibility within the organization to respond to and met client requirements.



### Advanced NDT Services

- ▶ TOFD / Phased Array UT Scanning
- ▶ Corrosion Mapping
- ▶ Acoustic Emission Testing
- ▶ Electro Magnetic Acoustic Transducer (EMAT)
- ▶ High Temperature PAUT
- ▶ Eddy Current Testing (ET)



- ▶ Remote Field Eddy Current Testing (RFET)
- ▶ Magnetic Flux Leakage Testing (MFL)
- ▶ Internal Rotary Inspection System (IRIS)
- ▶ Thermography and Infrared Rays (TIR)
- ▶ Boroscopic Inspection Services
- ▶ Alternating Current Field Measurement (ACFM)

## Advanced NDT Services

### TOFD / Phased Array UT Scanning

IQ provides Ultrasonic TOFD to inspect welds of process vessel and piping. TOFD is reliable and fast advanced. In a TOFD system, a pair of probes sit on opposite sides of a weld. One of the probes emits an ultrasonic pulse that is picked up by the probe on the other side. In undamaged pipe, the signals picked up by the receiver probe are from two waves; one that travels along the surface and the other that reflects off the far wall. When a crack is present, there is a diffraction of the ultrasonic wave from the tip(s) of the crack. Using the measured time of flight of the pulse, the depth of a crack tip can be calculated automatically by simple trigonometry. This method is even more reliable than Radiographic testing of a weld.



### Corrosion Mapping

Automated Corrosion mapping utilizes one or more ultrasonic straight beam probes using dual X & Y axis scanner over a pipe or pressure vessel to map the thickness. These measurements are converted into color coded images with digital wall thickness profile. The automated corrosion mapping C scan can also be utilized to detect HIC, SWC, corrosion, pitting, blisters etc. Currently we have the capability to scan high temperature corrosion mapping up to 400 degree Celsius.



### Acoustic Emission Testing

IQ provides acoustic emission testing to inspect storage tanks, sphere, etc. Acoustic emission tank inspection service undertaken while the tank remain in service and offers the client the following economic benefits.

- Minimal pre-inspection tank preparation
- Tanks that are not structurally deficient remain in service
- Structurally deficient tanks are ranked in terms of damage and prioritized for maintenance
- Leaks are detected early, minimizing environmental damage
- Simultaneous floor and completed in one day
- Early detection of fatigue cracks in tank shell plates and welds





## Advanced NDT Services

### Electro Magnetic Acoustic Transducer (EMAT)

Electro magnetic Acoustic Transducer (EMAT) is a transducer for non-contact sound generation and reception using electromagnetic mechanisms. EMAT method does not require contact or couplant, because the sound is directly generated within the material adjacent to the transducer. Due to this couplant free feature, EMAT is particularly useful for automated inspection and hot, cold, clean, or dry environments. EMAT is an ideal transducer to generate Shear Horizontal (SH) bulk wave mode, Surface Wave, Lamb Waves and all sorts of other guided-wave modes in metallic and/or ferromagnetic materials. As an emerging (UT) technique, EMAT can be used for thickness measurement, flaw detection and material property characterization. After decades of research and development, EMAT has found its applications in many industries such as primary metal manufacturing and processing, automotive, railroad, pipeline, boilers.



### High Temperature PAUT

IQ provides high temperature PAUT. Its accessories are extremely portable and can be performed nearly anywhere. Our inspectors are extremely knowledgeable and work with your needs in mind. Our experts are trained under the strictest rules and we have state of the art equipment available for your testing needs. IQ provides ultrasonic phased array to inspect welds of process equipment, piping and structures. Ultrasonic phased array offers very reliable detection and sizing capabilities along with a permanent record of ultrasonic inspection.



### Eddy Current Testing (ET)

Eddy Current testing uses the principles of electromagnetism as the basis for conducting inspections. When alternating current is applied to a conductor a magnetic field develops in and around the conductor. When a second conductor is introduced into the magnetic field an induced current flow is created. ET is working on the principle of induced current called Eddy Current. When a current carrying coil brought in to a specimen, Indicators reveal discontinuities that alter the patch of the induced currents.



## Advanced NDT Services

### Remote Field Eddy Current Testing (RFET)

IQ Provides Remote field Eddy current testing unlike the impedance plane analysis form of common eddy current testing (ET). the remote field eddy current (RFET) technique is a through transmission effect that reduces problems such as lift - off normally associated with ET. In the inspection of steam generator (SG) tubes, the real issue is to detect the minute cracks growing up from the outside. However, using ET, it is considered infeasible to accurately find them from the inside because of the limitations of penetration of eddy currents. This describes a finite element approach to the solution of time harmonic electromagnetic fields for the RFET technique based on a magnetic vector potential and an electric scalar potential. A comparison is made of experimental and finite element predictions of electromagnetic phenomena under the inspection of nonmagnetic tubes. For the cracks outside demanding high sensitive and precise measurements in the SG tube inspection, numerical results are given for parameters to design a RFET probe.



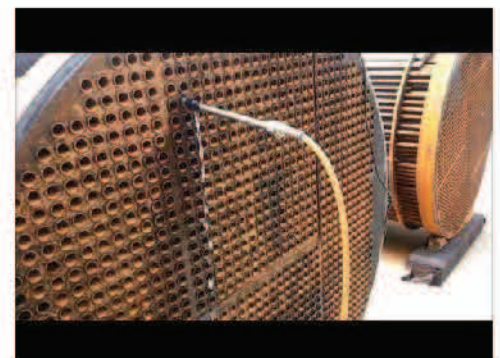
### Magnetic Flux Leakage Testing (MFL)

IQ provides magnetic flux leakage testing ,one of the NDT method that is used to detect corrosion and pitting mostly occurs in pipelines and storage tanks. MFL can detect size and map under floor corrosion on above storage tank, MFL can detect corrosion and sizing on the thicker material.



### Internal Rotary Inspection Systems (IRIS)

Internal rotary inspection system (IRIS) is an ultrasonic method for the NDT of pipes and tubes. The IRIS probe is inserted into a tube that is flooded with water, and the probe is pulled out slowly as the data is displayed and recorded. The ultrasonic beam allows detection of metal loss from the inside and outside of the tube wall.



## Advanced NDT Services

### Thermography and Infrared Rays (TIR)

IQ Infrared and thermal testing is one of many NDT techniques designated by the American Society for non destructive Testing (ASNT). Infrared Thermography is the science of measuring and mapping surface temperatures. Infrared thermography, a non destructive, remote sensing technique, has proved to be an effective, convenient and economical method of testing concrete. It can detect internal voids laminations, and cracks in concrete structures such as bridge decks, highway pavements, garage floors, parking lot pavements, and building walls. As a testing technique, some of its most important qualities are that accurate, repeatable.



### Boroscopic Inspection Service

IQ provides boroscopic inspection service it is an optical device consisting of a rigid or flexible tube with an eyepiece on one end, an objective lens on the other linked together by a relay optical system, in between. The optical system in some instances is surrounded by optical fibres used for illumination of the remote object. An internal image of the illuminated object is formed by the objective lens and magnified by the eyepiece which presents it to the viewer's eye.



### Alternating Current Field Measurement (ACFM)

IQ provides ACFM (Alternating Current Field Measurement) is used in order to identify and size surface breaking cracks in metal components. This electromagnetic technique has several benefits. ACFM may be utilized on coated materials. The coatings must be strictly adhered to the surface in order to perform the test successfully. Also, the test can be performed if the surface contains minor scaling and debris which eliminates the need for precleaning prior to inspection. Test indications can be sized to show depth and length of indications. Lastly, the test can be performed at elevated temperatures as high as 900° F (Fahrenheit).



## Conventional NDT Inspection Services

- ▶ Radiographic Testing (RT)
- ▶ Ultrasonic Testing (UT)
- ▶ Magnetic Particle Testing (MPT)
- ▶ Liquid Penetrant Testing (PT)
- ▶ Visual Testing (VT)

### Radiographic Testing (RT)

IQ provides radiographic testing services to inspect the weld of piping, pressure vessel, and other process equipment on the construction project and process plant.



### Ultrasonic Testing (UT)

IQ provides ultrasonic shear wave inspection to inspect weld of piping, pressure vessel and other process equipment on the construction project and process plants. IQ also provides ultrasonic longitudinal wave inspection to perform thickness measurements and corrosion scanning, mapping on the plant piping and pressure vessel as per the API 570 and API 510. Etc,

### Magnetic Particle Testing (MPT)

IQ provides magnetic particle testing to detect surface and sub surface imperfections in the weld and heat affected zone of the piping and process equipment. We also provides the magnetic particle testing on process equipment during plant shutdown to detect service crack on the internal surface of vessel.



### Liquid Penetrant Testing (PT)

IQ provides penetrant testing to detect the surface imperfection of the weld and heat affected zone of the piping and process equipment.

# Conventional NDT Inspection Services

## Visual Testing (VT)

Visual inspection is the process of examination and evaluation of systems and components by use of human sensory systems aided only by mechanical enhancements to sensory input such as magnifiers and the like. The inspection process may be done using such behaviors as looking, listening, feeling, smelling, shaking, and twisting.

Visual inspection is applicable to most surfaces, but is most effective where the surfaces have been cleaned prior to examination, for example, any scale or loose paint should be removed by wire brushing, etc.



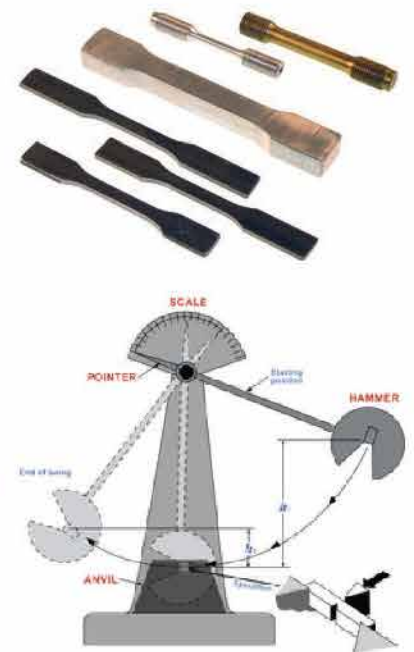
## Other Testing & Services

- ▶ Mechanical Testing
- ▶ Metallographic Test
- ▶ Vacuum Box Testing
- ▶ Post Weld Heat Treatment (PWHT), Pre-Heating & Heat Treatment Services
- ▶ Positive Material Identification (PMI)
- ▶ Hardness Testing
- ▶ Holiday Detection

## Mechanical Testing

Mechanical testing is the first step in putting your design into practice. However, calculated values alone cannot give you an accurate picture of how materials and products will perform. That is why our mechanical testing services provide you with real data to ensure that your products meet specifications and comply with the required regulations.

In addition to NDT and inspection services, IQ also provides the service of various Mechanical Testing's like Charpy Impact Testing, Tensile Testing, Vickers, Rockwell Hardness Testing, Bend Testing, Fillet Weld Break Test, Nick Break Test, Micro Macro Examination and others. Our mechanical testing services can help you gain accurate data to put your design into practice and meet the required quality standards.



## Other Testing & Services

### Metallographic test

IQ provides metallographic test services to find out in-service degradation of critical component of process plant. Operating under the high temperature, high pressure corrosive atmosphere this method gives actual condition can be monitored and any acute need for microscopy and bring them to laboratory for further evaluation.



### PWHT & Heat Treatment Services

Our Field Heat Treating technicians can precisely apply heat to components ranging from small, complex fittings to massive loader assemblies. Preheating is a very means of preventing weld or parent material from cracking without changing the properties of the materials. It is the concurrent application of the heat base metals prior to and during the welding or cutting operation and has the effect of retarding the cooling process. Post weld heat treatment is the heating of the material to a relatively high temperature shortly after being worked on Preheating and post-weld heat treating for welded repairs on heavy equipment. Thermal expansions to assist in removal and insertion of bolts and pins, generator housings and retaining ring. Combustion heating for refractory curing, post-weld heat treating large vessels and components.



### Vacuum Box Test

IQ provides vacuum box testing it is one of the reliable and safe NDT method. The vacuum box test can locate leaks in the test area that can not to directly pressurized primary application is new tank construction in the petrochemical field has been performed lap welds to confirm leakage condition on tanks that are being taken out services.



### Positive Material Identification (PMI)

IQ provides positive material identification (PMI) services to construction projects to identify or sort the different type materials with positive materials identification the alloy composition of materials can be determined. PMI is particularly used for high quality metals like stainless steel and high alloy metals. While engineers push the boundaries of material capacities their limits, we offer PMI with the XRF technology and OES technology for lighter element like carbon.

## Other Testing & Services

### Hardness Testing

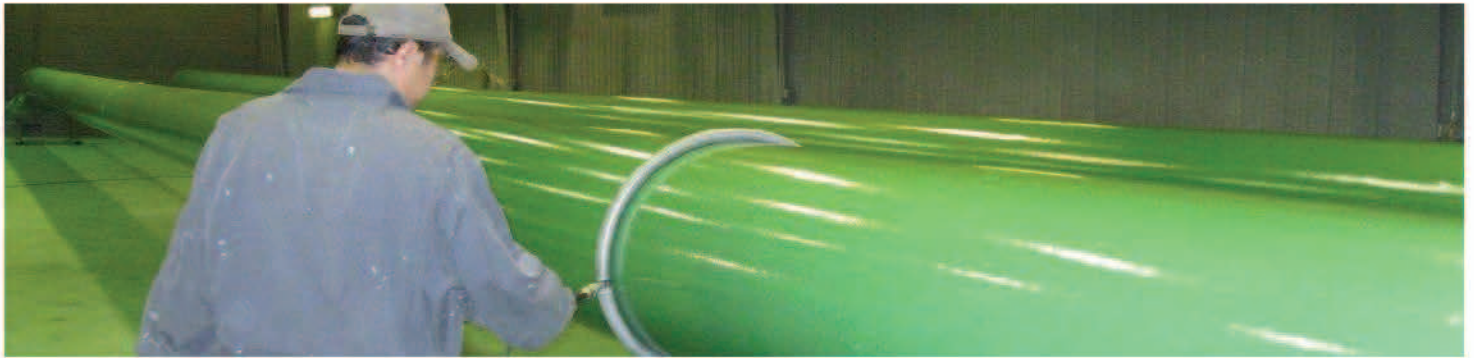
IQ provides hardness testing, hardness is the measure of how resistant solid matter to various kind of permanent shape change when force is applied this method is widely used in oil and gas sector. Hardness is dependent on ductility, strain, strength, toughness. Macroscopic hardness is generally characterized by strong intermolecular bond.



### Holiday Detection

Holiday detection or a Continuity test is one of the non destructive test method applied on protective coatings to detect unacceptable discontinuities such as pinholes and voids. The test involves checking of an electric circuit to see if current flows to complete the electrical circuit. IQ professionals are trained in Holiday (Continuity) test method in accordance with ASTM G62, AS 3894.1, and similar national and international standards.

Wet sponge method is one the Low Voltage Detectors type commonly used and is suitable for coatings up to approximately 37 microns (15 mils). For thicker film a higher voltage spark detectors either with AC or DC voltages are used, it has regulated 'pulsed' output up to 20kv, 40kv or 60kv, it can be used for porosity and holiday testing of carbon impregnated coatings such as carbonated rubber, thick coatings such as rubber linings, FBE/PE Coatings and on plastic /fibreglass type coatings.



## Inspection Services

IQ provides thorough inspection services for Static & Rotary Equipments, pipeline, Structure and other equipment using a variety of state of the art techniques, and provides recommendations to meet your goals; extending useful life, improving efficiency, reducing emissions or other issues that are most important. IQ inspectors are certified, trained in conjunction with key industrial technical societies and continuously updated on issues such as inspection best practices for specific equipment types and failure mechanisms prone to each industry we serve.

Our technical knowledge and experience to providing leak testing, valve testing, non-destructive testing and inspection services. We are provider of customized services to various industries, including power generation, chemical and petrochemical, oil & gas, mining and other high risk industries. Our independent, objective, customer satisfaction through services that meet or exceed their expectations or international standards. Our expertise can support our customers throughout the project cycle.



## Inspection Services

### Vendor Inspection & Expediting Services

We provide a complete solution, covering every aspect of supply chain management. Our global network of competent, qualified experts is strategically located to serve our Clients in Middle East. Our technical specialists are on hand to carry out inspection and verification services whenever and wherever you need them.

Our expediting services include preventative checks designed to prevent potential delays. The process includes, but is not limited to, order verification, review of production schedules and specifications, as well as validation of packaging and shipping details. We monitor production, making you aware of any delays or revisions, and give you an independent overview of progress. We also help to manage production milestones, and work to get things back on schedule if deadlines are missed.

Organizing Pre Inspection Meeting at Vendor's/ Sub Vendor's facility. Documents review at different stages of inspection such as Initial level, Mid Level, Final Level. All type of Inspection coverage for the Project at Vendor's/Sub Vendor's facilities. Vendor's/ Sub vendor's Production Capability Study Final Release of Inspection items from Supplier's/Sub Supplier's Production Facility. Pre Shipment Inspection coverage including Marking, packing and loading.

### Third Party Inspection Services

We provides third party inspection services, it requires good neutral outside party possessing, high level technical competence various engineering an important function that shop inspection and site inspection oil and gas sector carried out satisfactory only trusted and experienced inspectors whose integrity and competence are beyond doubt.



### Coating and Painting Inspection

IQ undertakes inspection of various Coatings, Linings & Painting as applied to internal or external surface of metal surfaces of Equipment, Piping, Structural items and others. IQ has a team of experienced & internationally Certified Coating / Painting inspectors capable of inspecting & verifying all the activities of below listed applications.

- Fusion Bonded Epoxy (FBE), Baked Phenolic Epoxy (BPE) Coatings on internal & external surface of metal piping.
- Field Girth weld coating on joints, Tape Wrapping, Heat Shrink Sleeve application
- 3-Layer External Polyethylene (PE) & Polypropylene (PE) Coatings on metal piping.
- Various painting system in accordance with the Engineering Standards of SAUDI ARAMCO & SABIC.
- Rubber lining on the internal surface of piping for critical services.
- Cement mortar lining on the internal surface of sweet water pipe lines for clients like SWCC & other.
- Hot dip galvanizing inspection of various components.





## Inspection Services

### In-Service Inspection

#### Business Challenge

In-service inspections are more formally controlled by statutory requirements than other types of inspections. The 'duty of care' requirements are placed on plant owners, operators, and inspectors. All equipment should pass safety and compliance standards, regulations, and guidelines. Mechanical equipment can break down at any time when it is in service, which can lead to delays in production, increasing costs and liability. To prevent these situations from occurring, it is important to schedule inspections regularly. This will ensure the equipment has been installed, operated, and maintained properly under the watch of a qualified inspector.

#### Solution

Inspection Quality provides a full range of inspection services designed to help customers monitor the condition of owned equipment or in-service leased equipment during their life cycle. In-service inspections include estimate verification, facility audits, on-hire / off-hire inspections, post-repair inspections, intermodal terminal inspections, and fleet condition assessment.

The inspection requirements will be as per API510/570/653 & Risk Based Inspection 580. Statutory and other local rules will be governing the requirements.

What are the key benefits?

- Avoid risks linked to the quality and safety problems of equipment
- Independent advice and support given by knowledgeable technical experts in all critical areas
- Benefit from experts who are aware of the latest technology and equipment
- Optimizing the breadth and depth of inspection to be performed within the planned time frame
- Ensuring the safety of all personnel during the shutdown
- Limiting the number of incidents



## Welding Inspection Services

Inspection Quality, IQ is well furnished with Certified & experienced welding inspectors, welding engineers and welding experts to perform various welding related inspections activities.

The team consists of AWS-CWI, CSWIP, Internationally certified welding inspectors, they perform various activities related to welding quality like Witnessing, third party inspection of welder qualifications tests, Training of welders on various welding processes and others.

We provides welders qualification test welders or welding operators used to produce weldment shall be tested under the full supervision of certified welding inspectors.

### WPS/PQR Qualification Test

We provides WPS/PQR qualification test written procedure specification shall be qualified by sample welding as per the written draft WPS/PQR is a record of variable recorded during the welding of test coupons .it is ensure that welding procedure are qualified by the fabricator prior to application.

### Welder Qualification Test

We provides welders qualification test welders or welding operators used to produce weldment shall be tested under the full supervision of certified welding inspectors.

IQ provides the complete T/A & Shutdown support. We build-up with a strong team strength includes, Metallurgists, API 510, 570 & 653 Inspectors, ASNT Level III Experts, BGas Coating Inspectors, Multi Skilled NDT Level II Technicians, CSWIP/AWS Certified Welding Inspectors and QA/QC Inspectors and plant Reliability Engineers. Our inspection teams works for pre shutdown preparation , during shutdown our inspectors performs initial inspection during ,reporting of deterioration, preparation of repair procedure and recommendation ,follow up of repair ,final inspection and the preparation of inspection report.

## The Importance of Shutdown Turnarounds in a Plant's Operations

Plant turnarounds, also known as shutdowns, are one of the most crucial events in the routine operation of an oil or gas plant. They also have the power to strongly affect a company's bottom line. A turnaround that goes badly, lasts for too long, or exceeds its budget could result in the company unexpectedly reporting fiscal losses. On the other hand, a turnaround that goes well and stays within its budget and timeline will make a huge contribution to the plant's efficiency and safety...setting the plant up for even bigger success in the future.



Minimizing downtime in a safe manner Every industrial plant encounters several shutdowns during its lifetime, be it for scheduled maintenance, replacement of parts, modification or expansion. Whatever the reason, the overriding challenge is to adhere to the most stringent safety standards and keep downtime to a minimum. To

achieve that goal, the whole of logistical processes – comprised of the lifting, transport, installation and removal of many components – plays an important and interdependent role. Many plants, however, were not designed with shutdown activities in mind. Adding to shutdown complexity is the fact that in such projects, multiple parties are generally working simultaneously at the same site. These realities call for new and comprehensive approaches that take into account not only the movement of the different components, but also the safe coordination of activities carried out by different subcontractors.



# مؤسسة جودة الفحص للمقاولات



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