

# **IXAR** Group

(An ISO 9001: 2008 Company)

EXPERIENCE....OUR EXPERTISE

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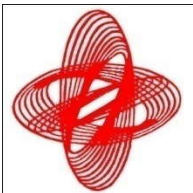
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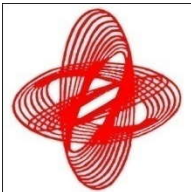


# Company Statement

Over Forty years of experience in the field of Non-Destructive Testing having operation in India, Abu Dhabi, Oman and expanding worldwide.



# AUT: NDT Revolution



# ***AUT : NDT Revolution***

**By embracing the latest technologies, Automated Ultrasonic Testing (AUT) is achieving the highest ever probability of detection and sizing accuracies of any NDT technique, at a level of speed and efficiency never seen before.**

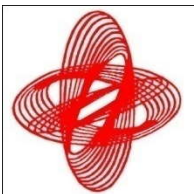
**By also applying the comprehensive information we are able to gather and working smarter, we are able to enjoy the following benefits;**

- Reduced repair rates
- Reduced inspection cycle time
- Increased accuracy
- Increased quality



**The **Weldstar** system takes full advantage of today's leading edge technologies;**

- Phased-Array Ultrasound
- Computing Power
- Global Positioning
- Data Management



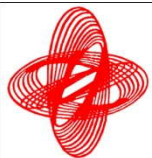
## Data Management – *Information Is Power*

The **Weldstar hybrid Girth Weld Inspection** system takes full advantage of database technology and has a host of available automated reports and tracking tools.

This results in a powerful tool for quality control and project efficiency .

Benefits include;

- Instant inspection results
- Traceability / auditability
- Post-project review and storage
- Automated inspection reporting to eliminate human error
- Automated welding/production/repair statistical analysis
- Integrated system QA controls
- Automated system performance verification



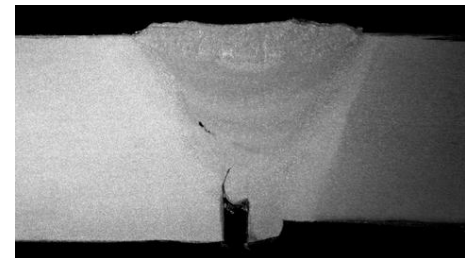
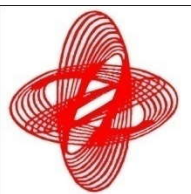
## ***AUT : NDT Revolution***

**Detectability – “*With RT you see the tip, with AUT we see the iceberg*”**

**AUT is a 3 dimensional inspection technique, the only TRUE full volume NDT method. The fundamental advantage of AUT is it’s ability to locate and size flaws in the vertical dimension, unlike radiography, a 2 dimensional technique.**

**The ability to measure welding flaws in all 3 dimensions, has the following benefits;**

- Ability to apply Engineering Critical Analysis Criteria (ECA)
- More consistent indication interpretation and weld sentencing
- Accurate flaw locating and communication to welding crews for process rectification and flaw prevention

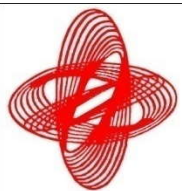


## Efficiencies – *Embrace Technology*

AUT and **Weldstar hybrid Girth Weld Inspection** system are specifically designed with high speed and efficiency in mind. Each aspect of the process streamlined to provide the highest level of automation and control for quality and production purposes alike.

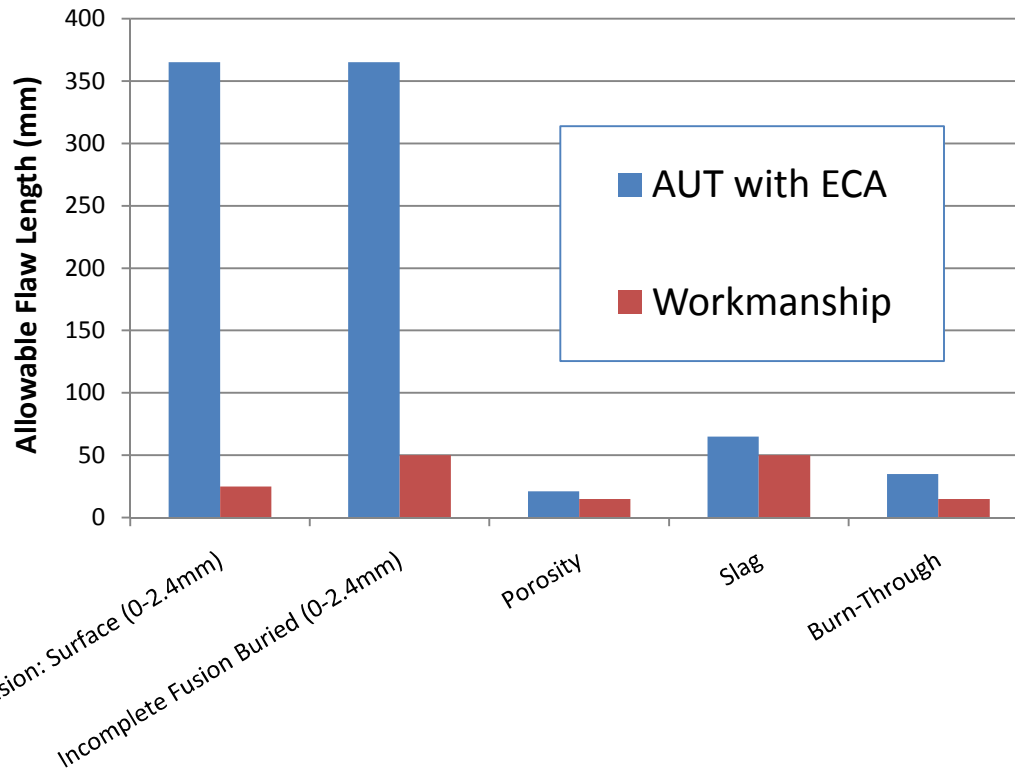
**Key efficiencies lie in these areas;**

- Instant results ensures that precise information regarding welding problems are immediately communicated to the welding crews to minimise costly repairs.
- Ability for the adoption of ECA “Fitness for purpose” criteria further greatly reduces repair rates. An analysis is undertaken to determine actual allowable flaw sizes for the specific pipeline, based on fracture mechanics studies. AUT’s superior sizing ability is the key to this opportunity in reducing repairs and increasing the integrity of the welded joints.
- No radiation means no costly delays due to personnel evacuations or increased inspection crew distance



# Engineering Critical Analysis (ECA)

## Superior Technology



- Superior sizing capability of AUT over RT allows the use of alternate acceptance criteria through calculation of an Engineering Critical Assessment (ECA).

- Lower repair rate by 50 – 90%

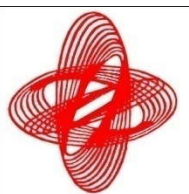
- Enhanced welding quality

- Higher pipeline operating reliability

- RT is 30%+ more expensive per project

- 16% higher welding production on M/L

- 60% higher welding production on Tie-ins



# Weldstar hybrid Girth Weld Inspection

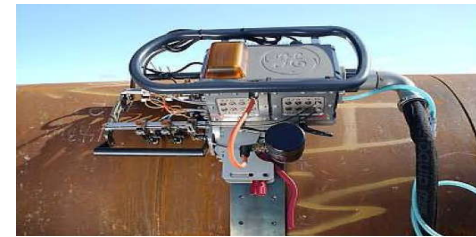


# Weldstar hybrid Girth Weld Inspection

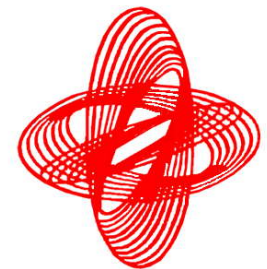
## General Description

The Weldstar inspection system represents a new generation in mechanized girth weld inspection for the Oil & Gas industry. Weldstar introduces improved reliability, increased probability of detection, advanced features and the ability to operate in the vicinity of automatic welding equipment without detriment to its superior performance.

A modular design concept, with built-in diagnostics and system monitoring, allows Weldstar to operate reliably providing a comprehensive, results oriented solution for weld inspection. The system's versatility provides testing capabilities for tube manufacture; on-shore pipeline construction and offshore lay barge operations.



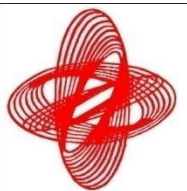
The system consists of a motorized ultrasonic scanner head mountable on a standard welder guide band a control computer for weld data acquisition and storage, and the AUT industries only quick connect detachable umbilical cable. The in corporation of the ultrasonic electronics within the scanner head and the proprietary electro-magnetic interference (EMI) shielding methodology allows for uninterrupted scanning; resulting in reduced opportunities for missed indications and false calls.



## Weldstar hybrid Girth Weld Inspection

The Weldstar scanner head is configured as a hybrid phased array system providing 128-channels of phased array capable offering up to two – 32 element or four – 16 element virtual probes operating in tandem per shot, combined with 16 conventional pulse – echo channels . This set-up allows unsurpassed inspection flexibility and weld coverage. In addition to providing transverse defect detection capability, and excellent time off flight diffraction (ToFD) performance, the conventional UT capability may also provide more accurate defect sizing and detection over phased array in specific zones of some welds. The need for compromise in AUT inspection is eliminated. Weldstar provides the advantages of both ultrasonic methods, seamlessly integrated into a highly configurable package

A major advancement introduced in the Weldstar system is the integration of set-up software, which dramatically decreases job preparation times. One to five days of planning and system preparation using previous manual methods is now reduced to less than a day. Upon input of the data, the operator is instantly presented with a full job plan from calibration block drawings to the physical stand offs for transducer positioning..



## UT Main (UTM)

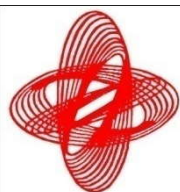
The **UTM** is the control computer. The operator's interface comprises a standard Windows® XP operating system with keyboard, mouse and high resolution 21" monitor display.

Along with the computer processor and video display hardware components, it also houses components houses the proprietary ultrasonic processing hardware and scanner control interface hardware.

In a typical installation, the **UTM** is located in the inspection vehicle, in a climate controlled position accessible to the operator.

Multiple hard-drives and a DVD drive are installed to manage the automated back-up operations.

The front panel of the **UTM** contains the array of status lights which the operator uses to monitor system operation.



## UT Remote (UTR)

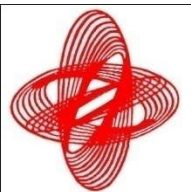
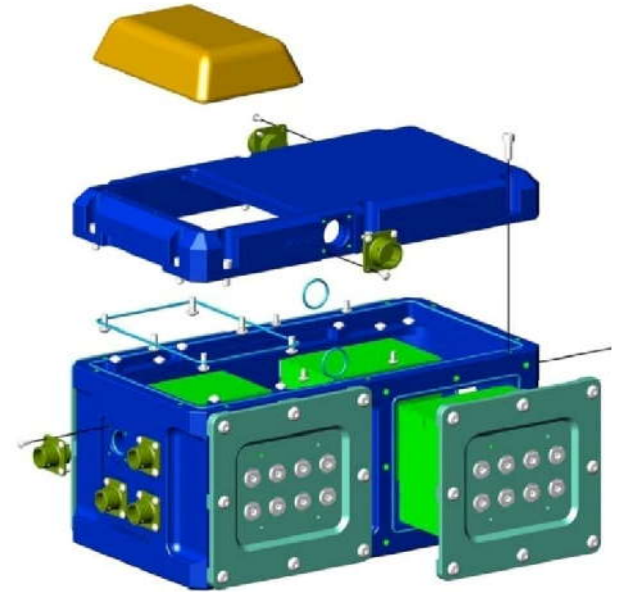
The **UTR** is the remote ultrasonic and scanner control CPU and electronics module located on the scanner assembly. It is connected to the **UTM** via an umbilical.

The **UTR** is the point of connection for the;

- Position encoder
- Temperature sensor
- High-Low encoder
- Umbilical
- Drive Motor
- GPS Receiver
- Ultrasonic transducers (Single element and Phased-Array)

Key features of the **UTR**;

- Short probe connection for lowest possible signal interference
- High strength pulse generation for unsurpassed signal quality
- Superior design ensures The Weldstar hybrid Girth Weld Inspection system is not susceptible to RF interference or “Noise” as with other systems.
- Integrated internal GPS receiver
- Sealed and pressure tested chassis



## Transducers

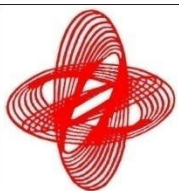
The Weldstar scan is a **Hybrid** system, that is, it contains both Phased-Array and conventional single-crystal transducers. Each of these transducers are individually coupled to the **UTR** and calibrated.



There are two **PA** transducers, one on each side of the weld. Their function is to interrogate the weld with the multiple pre-programmed sound beams to cover the entire weld volume .

Other transducers include;

- Transverse (Internal and External surface). These are designed and setup to detect internal and external surface breaking transverse flaws such as cracking or porosity.
- Time Of Flight Diffraction (TOFD). This technique is a full-volume inspection method with excellent detection, locating and sizing capabilities that perfectly supplement conventional pulse-echo inspection methods.



# Weldstar hybrid Girth Weld Inspection

## Scanner

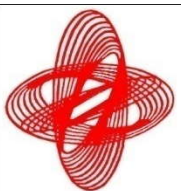
The **Scanner** is the complete assembly that is placed on the weld to conduct the inspection scan.

The components of the **Scanner** include;

- UTR
- Couplant manifold
- Drive motor
- Scanner buggy
- Probe frame and legs
- Transducers
- Position encoder
- Temperature sensor
- High-Low encoder



The scanner is fitted with grooved wheels and is locked onto a steel band, such as an automatic welding band.



This band is placed in reference to the **scribe line**. The scanner drives around the weld circumference during which time the **transducers** interrogate the full weld volume in a single revolution of the scanner.

## Calibration Block

The **Calibration Block** is used to verify the sensitivity and gate locations of the inspection system. For each separate zone and beam, there is a unique calibration reflector.

Calibrations are performed;

- Prior to the start of inspection and / or every time a new technique is loaded.
- The frequency of calibration shall be: (1calibration per every 10 welds) or (1calibration per 1.0 hour) which ever period is less.
- Following any power off situation.
- Start and end of each day / shift
- If the system is deemed to be “out of calibration” in any way.

The **Calibration Block** is mounted into a “Dummy” for production calibration.

