

Scope of Applications

The USM Vision has been developed to simplify and to democratize the ultrasonics inspection according to the international codes and standards through:

- Optimizing the use of specialized inspection personnel
- Increase productivity
- Reducing the current weld inspection radiographic constraints
- Reducing the ultrasonic weld inspection complexity

USM Vision is especially dedicated to:

- Energy construction industry
- Pre-service inspection
- Carbon steel pipe
- Diameter from 73 mm (2.875") up to 1219 mm (48")
- Thickness from 6 mm (1/4") up to 50 mm (2") in automatic set-up, beyond with manual intervention
- Circumferential welds
- Single or dual access depending on geometric restrictions
- Other type of welds and indications will be available



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USM Vision a Total Weld Inspection Solution

The USM Vision is supplied as a complete weld inspection solution, consisting of:

- IPC software for creation of the inspection plan and automatic generation of the UT set-ups. Integrate a database with procedures based on international codes and standards and ray tracing functionality for the validation of the UT parameters.
- The USM Vision hand-held flaw detector, featuring:
 - Conventional channel, TOFD, 16/64 Phased Array, Real Time Volume Corrected Images, A-scan saving
 - Unique user interface to operate a pointing device by two trackballs
 - Ease of use for untrained operators
 - 26,5 cm (10.4") color touch screen with 1024 x 768 resolution
 - Weighs only 4 kg (8.8 lb)
 - Hot swap battery exchange for continuous operation
 - Robust, rubber housing, IP 54
 - Dimensions:
 - Length top: 367 cm (144.4")
 - Length bottom: 310 cm (122")
 - Width: 250 cm (98.4")
 - Height: varying from 60 to 100 cm (23.6" to 39.3")
 - Modern PC interfaces including USB, Ethernet, wireless connection (WiFi)
 - IPC and analysis software can be operated from the USM Vision
 - Transport case
- An encoder-scanner, designed for TOFD and Phased Array manual acquisition including:
 - Manual handle cart with magnetic wheels
 - Optional chain for the inspection of pipes
 - Arm with probe and center line pointer holders, forks for TOFD and PA wedges
 - Transport case
- Set of probes and wedges relating to the specified pipe ranges and inspection codes
- Rhythm Review 4.0 software for the analysis and reporting
- Optional Rhythm modules for archiving, sharing and advance reporting functionalities

Regional Contact Information

North America

50 Industrial Park Road
Lewistown, PA 17044
USA

+1866 243 2638 (toll free)
+1 717 242 0327

Europe

Robert-Bosch-Strasse 3
50354 Huerth
Germany

+49 2233 6010

Asia

5F, Building 1, No.1 Huatuo Road,
Zhangjiang High-Tech Park,
Shanghai 201203
China

+86 (0)21-3877 7888



www.ge-mcs.com

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GE Measurement & Control Solutions

USM Vision

A Total Weld Inspection Solution to Increase Productivity in New Process Pipework Fabrication



The USM Vision from GE's Inspection Technologies business allows optimum sharing of inspection tasks, is simple to operate and can remove the constraints associated with radiography.



GE imagination at work

Introduction

The USM Vision has been developed to meet a market need to transition from radiographic inspection to ultrasonic inspection in the fabrication of new process pipework for the process, water, power generation and oil & gas sectors. Conventional film radiography has long been the preferred method of weld inspection in fabrication shops and it provides excellent results, which are easy to understand.

However, film radiography is necessarily accompanied by significant restraints, such as safety considerations, chemicals storage, waste disposal, long film development times, and film archiving.

Ultrasonic inspection suffers from none of these restraints and, although it cannot be used instead of radiography in every instance, it offers accurate, code-compliant, reliable and fast data. Unfortunately, this type of inspection requires a qualified ultrasonics inspector. And highly skilled ultrasonics inspectors can often be very difficult to find.

USM Vision, the Efficient Solution to Managing Task Sharing

The USM Vision provides a cost-effective and elegant solution to the problem. It allows ultrasonics to be applied to pipe weld inspection, eliminating the constraints of film radiography and allows tasks in the inspection process to be shared among non-ultrasonics specialists (e.g. radiography inspectors with minimum ultrasonics training) and highly qualified ultrasonics experts, so that optimum use is made of the time of all levels of NDT technicians. The highly qualified ultrasonic personnel can focus on the task for which he is most valuable, like set-ups validation and data analysis, and manage several UT trained operators doing inspection plan creation, calibration and field data acquisition.

And all this with no compromise on accuracy and reliability of data and a significant improvement in productivity.

Compliance codes

ASME V
B31.3
API 1104
ASTM E 2373
B31 Case 181
Code Case 2235

EN ISO 17640
EN ISO 10863
Pr EN ISO 13588

DICONDE

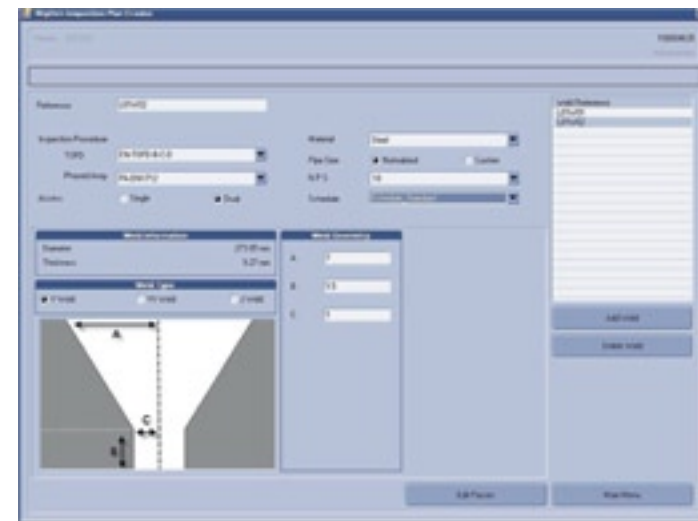
USM Vision Rationalizes the Weld Inspection Process Ensuring Efficient and Accurate Inspection

Inspections Plan Creation and Validation

Creating an Inspection Plan

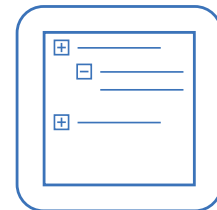
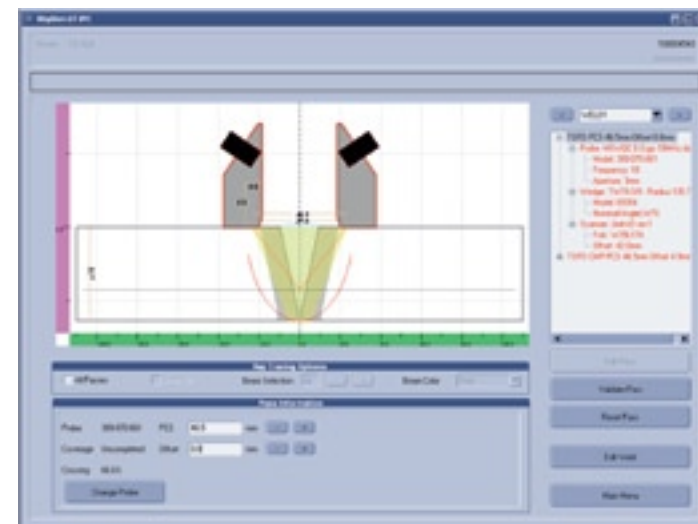
No ultrasonic knowledge is required to create and populate an inspection plan. All that is required is to describe the inspection task, and enter the basic information such as site location, number of welds, pipe diameter, thickness and material, weld preparation, procedure and method to be used. The software will then calculate and generate all the UT set-ups required to perform TOFD and/or Phased Array inspection of the specified welds. These set-ups include:

- selection of the correct probes and wedges from a database
- positioning of the probe
- positioning of the required UT parameters to perform an efficient inspection according to the standard and code-based procedure selected.



Validating an Inspection Plan

A technician qualified in ultrasonics must then validate the set-ups. Each weld is split in one or several passes with TOFD or PA technique. The UT specialists have to validate these passes by using a ray tracing tool. They also have the ability to modify them by selecting another probe from the database, adjusting the probe(s) position(s). When all the passes are validated, the inspection plan can be exported to the acquisition unit.



Calibration and Data Acquisition

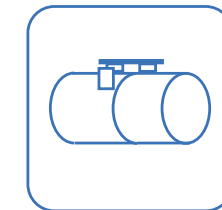
Calibration

As the data acquisition is 100% guided, this task doesn't require a highly trained UT operator. The technician merely selects an inspection plan, and is then guided through a step-by-step process from the probe and wedge validation, UT calibration (PCS and sensitivity calibration for TOFD, element and wedge check, DAC / TCG curve recording for PA), scanner settings and calibration.



Acquiring the Inspection Data

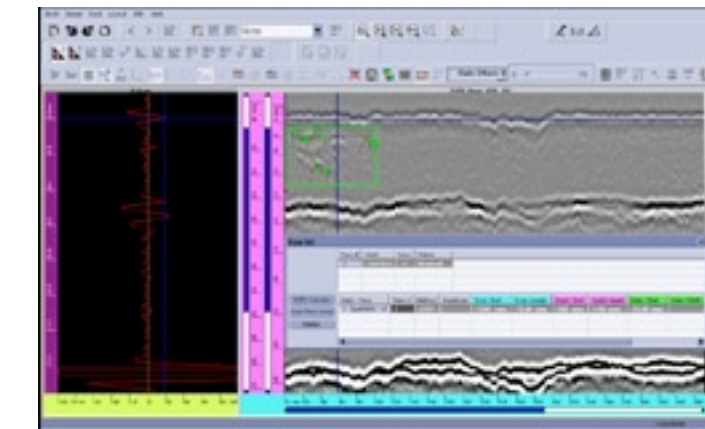
The inspection data for each weld, is simply acquired by following the inspection plan and the different TOFD and PA passes calculated by the IPC. After each pass the software will propose the next weld or pass to be inspected helping the operator to use the best, most productive way in the inspection plan. Data can be exported, for one pass, one weld or for the complete inspection plan, for analysis and reporting at any time during the inspection.



Data Analysis and Reporting

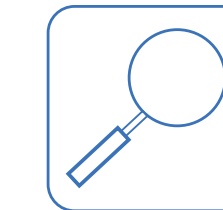
Analyzing the Inspection Data

All inspection data is communicated to an analysis station using the Rhythm software platform. Here the suitably qualified ultrasonic inspector can review and analyze the inspection data, using advanced analysis tools such as real time, volume-corrected imaging, as well as conventional digital tools features for image analysis, enhancement and measurement. In addition, a variety of measurement and viewing tools is contained within the analysis software.



Reporting

Expert interpretation of inspection results can be provided immediately and reports can be printed off in real time. This offers a very fast assessment of the weld status as feedback for weld repairs.



Archive and Share Data

Archiving the Inspection Data

The inspection data are saved in the Rhythm Archive software, allowing to save the raw data with necessary tags. Input and retrieval of information is quick and easy. This accepts data from any number of LAN-connected, remote Rhythm Review workstations and stores them using various compression techniques to save storage space without sacrificing data quality.



Sharing the Inspection Data

All inspection data can be shared with other interested parties, either as enhanced imagery or as raw data. It can be transmitted to other Rhythm Review stations for third party verification.

Turning information into intelligence and sharing inspection data across experts and locations with ease!

