



Guided Wave Analysis LLC

9735 Keeneland Run, San Antonio, TX 78254-5830
Tel. 1-210-842-7635 www.gwanalysis.com

Level I Training Course of Guided-Wave Testing (GWT) for Pipeline Inspection

Pipeline is the primary structural component in processing plants such as refineries, petrochemical and chemical plants, and electric power plants. Maintaining the structural integrity of the tens and hundreds of miles of piping is an important issue for safe operation of a plant. One of the emerging technology for piping inspection and monitoring is long-range guided-wave technology. This technology is in commercial use and new options for assessing pipeline integrity. It can inspect and monitor long sections of pipeline and can detect quickly and economically a cross-sectional defects when properly applied.

The ultrasonic guided wave travels along the pipe with 100% coverage of the pipe wall and rapidly surveys a long length of pipeline from a single test location. The corrosion wall loss and cracks in aboveground, insulated, and buried pipe can be detected, and their locations and sizes can be estimated by analyzing the data with user-friendly software. The guided wave is useful for inspecting and monitoring areas that are difficult to access, such as those at high elevation, behind wall, or under insulation, from a remote accessible location. This saves the time and money that would otherwise be used for scaffolding, insulation removal, or excavation.

The Guided Wave Analysis LLC (GWA) provides Level I training to inspectors for long-range ultrasonic testing (LRUT) of pipeline with Magnetostrictive Sensor (MsS) system. The MsS system uses Magnetostrictive sensor, developed and patented by Southwest Research Institute[®] (SwRI[®]), for generating and receiving of ultrasonic guided wave in pipe.

This 5-day Level I course is designed for inspectors and management personnel responsible for long-range guided wave testing in oil or gas companies, refinery, chemical, petrochemical plant, or offshore pipeline. Participants will be trained to do field testing with MsS system, to do data analysis, and to understand the capability and limitation of guided wave technology.

The course will teach physical background on guided waves, commercialized system for long-range guided-wave inspection and monitoring, probe installation, data acquisition software operation, sample pipeline inspection, data analysis software operation, generating inspection report, practice of generating inspection report with field test data, frequency selection for guided wave inspection, effect of geometric feature on guided wave testing, limitation and capability of guided wave, guided wave monitoring, and application examples of guided wave technology. On successful completion of the Level I course, a temporary Level I certification is issued by the trainer and an 1-year certification is issued by SwRI®.

Where: Guided Wave Analysis LLC and Southwest Research Institute (SwRI) located at San Antonio, TX 78238 USA.

Training cost: \$2,500.00 per person (minimum 4 people required for course to make)

Instructor: Sang Kim at Guided Wave Analysis LLC is the instructor. He is Level III in guided wave testing and ASNT NDT Level III in UT and ET. He has been researching and developing the technology for last 11 years, training inspectors or operators in inspection companies, consulting companies using MsS guided wave systems, and inspecting pipeline, boiler tube, bridge cable, anchor rod, stub angle, HX tube, and plate in facility using MsS system.

Registration: Upon email response of attending the course, the registration form and invoice will be emailed. The registration form includes the information of name, company name, address, telephone number, email address of trainee. The training fee should be paid at the time of registration. The registration is accepted up to five business days prior to the training.

Cancellation: Guided Wave Analysis LLC makes the decision to offer each course based on advanced registration. We reserve the right to cancel the course if there is insufficient enrollment.

Refunds: Guided Wave Analysis LLC will refund the course fee for the cancelled course. If the registered person does not attend to the course with a written notice through email until 1 day before the course start, the half of the course fee will be refunded.

Contact Information: If you need any help in attending the course, email Heui Kim at hk@gwanalysis.com or call 210-842-5819.

5-DAY TRAINING COUSE SCHEDULE FOR LEVEL I

MsS TRAINING SUBJECTS

- (1) Technical background on the long-range guided-wave inspection and MsS
- (2) MsS system operation for data acquisition
- (3) T-wave pipe testing/inspection and calibration procedures
- (4) Data analysis and reporting software operation
- (5) MsS application to long-term structural health monitoring (SHM) and the monitoring software operation
- (6) Other MsS guided-wave inspection applications.

COURSE OF DAY1

8:00 am	Introductory Remarks and Course Handouts -- Manuals and presentation materials Course overview of MsS guided wave inspection
9:00 am	Technical Background on Guided Waves and MsS System Physical background on guided waves MsS system for guided-wave inspection and monitoring
12:00 pm	Lunch
1:00 pm	Installation of software and checking probe and system accessory MsSR3030R specification and system interconnection Software operation for MsSR3030R MsS probes and system accessory
2:30 pm	Data Acquisition Software Operation MsSR3030R functions and operation Data acquisition software operation and acquire data from sample pipe
5:00 pm	Adjourn

COURSE OF DAY2

8:00 am	MsS Principle and Operation for T-Mode Pipe Inspection and Monitoring MsS probe operation principle MsS torsional mode generation and detection Direction control of guided wave MsS test procedures Examples of good and poor bonding/conditioning MsS amplitude calibration methods Phase checking principle of signals
12:00 pm	Lunch
1:00 pm	MsS Probe Installation and T-mode test on a Sample Pipeline Demonstrate and practice of strip bonding and conditioning Practice adhesive bonding of strips and strip conditioning on a pipe sample Practice MsS data acquisition and T-mode test
5:00 pm	Adjourn

COURSE OF DAY3

8:00 am	Data Display and Print Software Software demonstration and practice
9:00 am	Introduction of MsS Guided-Wave Data Analysis Software Presentation about MsS data analysis and reporting software
10:00 am	Operation of Data Analysis and Reporting Software Software demonstration with sample data acquired in 6-inch pipe
12:00 pm	Lunch
1:00 pm	Operation of Data Analysis and Reporting Software Software demonstration with sample data acquired in 6-inch pipe
2:00 pm	Practice Data Analysis and Reporting Software operation with sample data
5:00 pm	Adjourn

COURSE OF DAY4

8:00 am	Introduction of MsS Monitoring Technique
9:00 am	MsS Monitoring Technique Practice on a Sample Pipe Coil installation procedure for long-term monitoring Coil installation demonstration and practice Data acquisition practice (acquire data for practice of monitoring software)
10:00 pm	Monitoring Software Operation Data subtraction training and practice
12:00 pm	Lunch
1:00 pm	T-mode test on field pipeline
3:00 pm	Practical examination Procedures for MsS probe setting Setting of MsS equipment and data acquisition Exam is performed individually
5:00 pm	Adjourn

COURSE OF DAY5

8:00 am	Written examination for Level I - Multiple choice with 40 Questions - Basic understanding of guided wave, MsS technology
10:00 am	Test of Data Analysis and Reporting Software Operation with Data Acquired in Actual Pipe
12:00 pm	Lunch
1:00 pm	Reviewing Test Results
2:00 pm	MsS Technology Applications
4:00 pm	Final Discussion Questions and answers about MsS technique
5:00 pm	Adjourn

Notice: The above agenda may be changed depending on weather conditions or trainee's schedule.