

Inspecting for the Future

Are you an owner of large-diameter steel infrastructure?

Do you have a plan to:

- ◆ Prevent unexpected pipe failures,
- ◆ Reduce the costs of repair & replacement,
- ◆ Increase the life expectancy of your existing pipeline,
- ◆ Improve service reliability and customer satisfaction?

Then Russell NDE Systems' EMIT might be a valuable addition to your toolbox.

In Today's Urbanized World, Large diameter feeder mains form the backbone of our water distribution systems. They supply water to our networks and millions depend on their continuous operation. Contrary to breaks in smaller distribution lines, failure of large-diameter mains usually results in extensive disruption of the water service, impacting a relatively large number of end-users. A single feeder main break can result in costly emergency repairs, transportation shutdown, property damage, and lost revenue. In addition, the occurrence of past failures can accelerate future

ones through ground disturbance, coating damage and water induced corrosion. At the core of any preventive maintenance plan is a reliable inspection technique that provides the basis for informed decisions on selective pipe replacement and repair.



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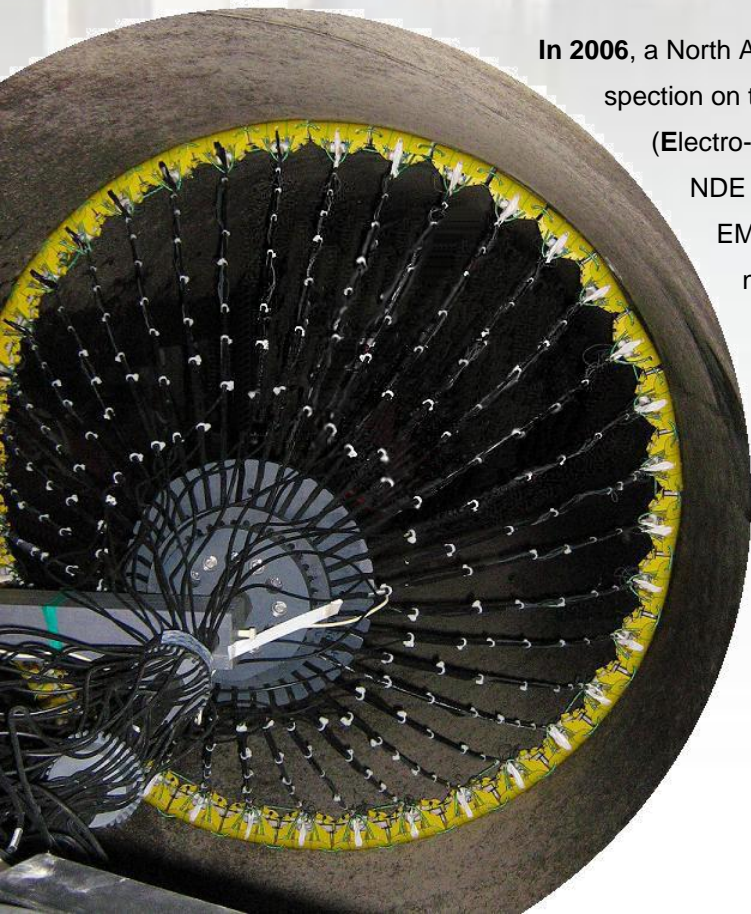
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The need to assess large diameter pipes increases as time passes.

Corrosion of large diameter pipes can lead to catastrophic leaks, collateral damage, and expensive repairs. With growing concerns about the condition of pipelines in our water distribution systems (where some pipes may be as much as 100 years old), it is evident that inspection and remedial action must be taken.

Inspection and Case Study

Most existing methods of examining feeder mains rely on indirect measurements to infer the condition of the line. Well-known examples are visual inspection, spot digs, soil potential readings, and continuity measurements to determine coating damage. The problem with these techniques is that they are slow, provide incomplete coverage of the pipe wall, and yield limited information about the extent and severity of damage. Building on our extensive experience in eddy-current inspection, we have now developed our EMIT technology to the point where it can be used for the inspection of underground pipelines.

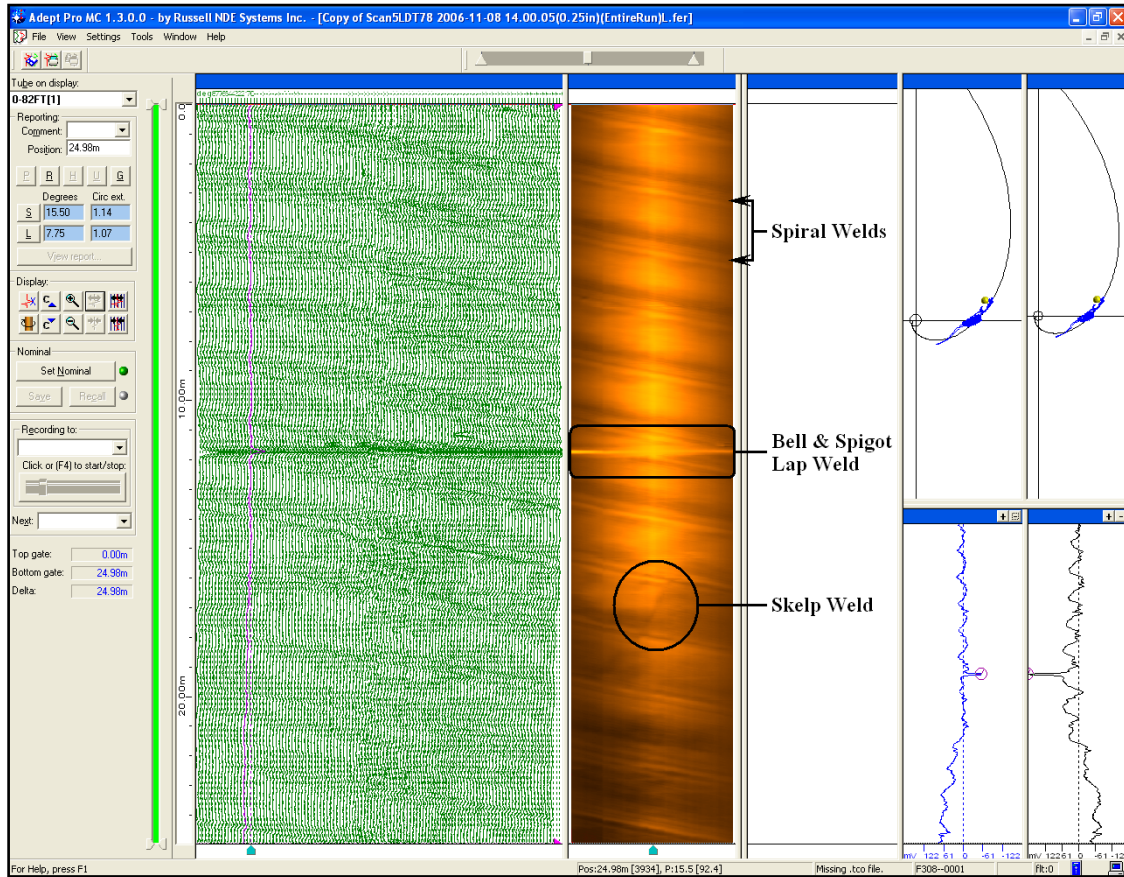


In 2006, a North American water authority had several areas of interest for inspection on their main 78-inch raw water feeder line. A custom EMIT (Electro- Magnetic Inspection Technology) tool was created by Russell NDE Systems and used to inspect these areas. The advantage of EMIT is that the tool is run on the inside of the pipe and there is no need for costly excavations.

This 78-inch main became the world's first and largest pipe-line to be inspected using EMIT. The tool was able to inspect through an internal cement mortar liner and successfully accommodated pipe deformations of up to 8 inches. Through its flexible design, the tool can accommodate a range of pipe diameters from 36 inches to 90 inches.

Data Analysis and Quality Control

Analysts at Russell NDE Systems work with the customer in troubleshooting and identifying the intricate features of their lines in order to provide a detailed report, best suited for the customer. Besides finding and sizing areas of corrosion, we can perform baseline inspections for quality control of newly installed pipe to advise on pipe features hidden behind internal liners.



As part of the quality control procedure, RNSI requires the manufacture of a calibration pipe before each inspection. Proper tool operation and sensitivity are first confirmed in the test line. Using the calibration pipe, tool settings are optimized by testing with machined defects. Once the tool is properly calibrated, the actual main can be inspected. By scheduling an inspection during a pump shut down, large diameter feeder lines can be inspected without additional outages.



EMIT Technology Applications

- Water and force mains ranging from 4 inches to 90 inches in diameter.
- Steel, cast iron, ductile iron, concrete cylinder liners.
- Steel-cased water wells.
- Offshore riser pipes.
- Oil and gas pipelines.
- Heat-exchangers and boiler tubes.

The most frequent cause of deterioration in pipeline integrity is loss of metal from the pipe wall due to corrosion or mechanical damage. A study by the U.S. National Institute of Standards and Technology estimates that in 2006, the annual cost of metallic corrosion in the U.S. was between \$300 and \$350 billion. Corrosion can attack a pipeline in many ways, and the resulting integrity loss is often difficult to measure. Specialized tools like EMIT will provide answers.



Russell NDE Systems Inc.

RNSI is a well-known manufacturer of non-destructive testing equipment with a strong expertise in eddy current methods. Building on over 20 years of experience, the company is considered one of the world leaders in Remote Field Testing (RFT). Utilizing these absolutely unique inspection methodologies, Russell NDE Systems has successfully designed and built a variety of innovative instruments for the inspection of heat exchangers, boilers, waterlines, pipelines, down-hole well casings, and now... large diameter water feeder mains.

For more information, please contact us or check out our web site (details below).



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