

SPECIALIST PACKAGE

REMOTE INTERNAL INSPECTION (RII)

THE PURPOSE

This document is composed to assist our clients and the supply chain in understanding our group operating structure and a high-level understanding of the benefits, services, key people, and equipment associated with our world-leading Remote Internal Inspection and Robotic Services.



SONOMATIC



RII SOLUTIONS

The Sonomatic RII Division, in collaboration with Geo Oceans and AUAV, is the amalgamation of cutting-edge technology, multi-skilled site-based crews and a technically experienced management team. This strong foundation has allowed us to become the pathfinders of this emerging industry, setting the standard for others who follow.

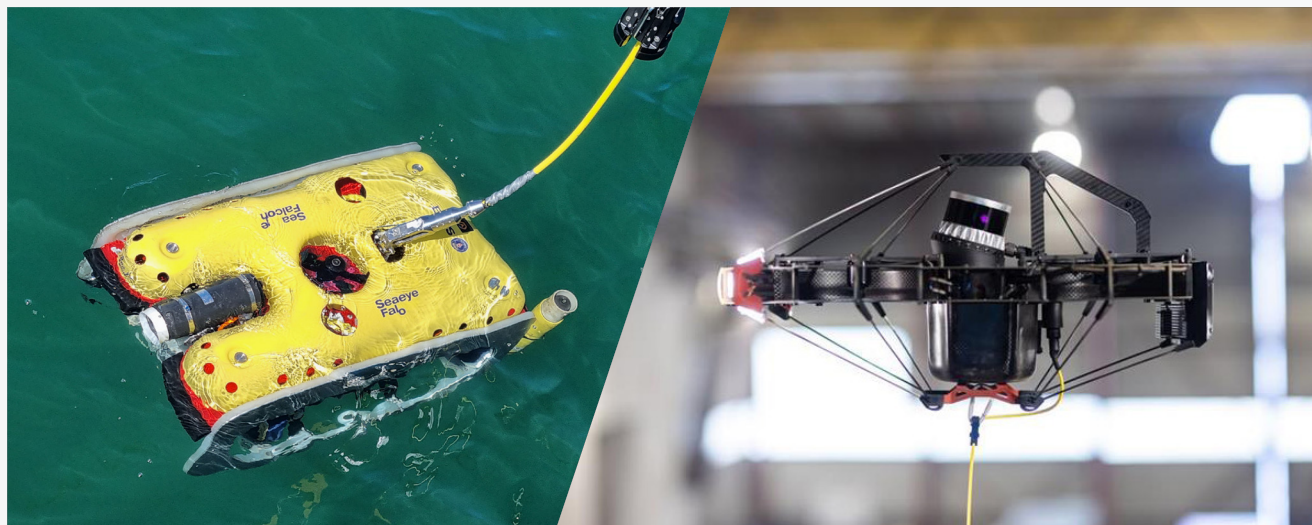
Our multi-company staff expect excellence from themselves and each other, which has led to the RII team being known throughout the industry as the service provider of choice. Across the whole of Sonomatic, we pride ourselves on executing and delivering high-profile, technically challenging scopes due to our commitment to innovation, the best people and our absolute client focus.

OUR ADVANCED RII

RII is the use and application of Remote Internal Inspection systems to internally inspect equipment without the need for Confined Space Entry (CSE).

RII methods are ideal for In-Service Inspections, conditional assessments, process efficiency assessments, and removing or retrieving debris and foreign objects in various systems. Sonomatic's RII experience and understanding of the industry have led us to create advanced RII specialist packages. These complete, integrated, and pre-planned packages deliver a higher level of data and a more comprehensive service. The results can be used for statutory equipment sign-off in the field and post-inspection analysis, risk reviews, and process operational requirements.

What makes these Advanced-RII specialist packages unique is each package can be crafted and tailored to suit specific project needs and requirement depending on the requirement and life cycle of the project. This ensures your inspections are completed with the highest level of integrity and are repeatable for future comparative purposes.



RII SPECIALISED ENGINEERING SERVICES

INCREASED PRODUCTION TIME /
OPERATION TIME FOR FACILITIES

REDUCTION OF SHUTDOWN
RESOURCE REQUIREMENTS

IMPROVED INSPECTION
REPEATABILITY

REDUCTION IN OVERALL RISK
PROFILES

INCREASED INSPECTION
COVERAGE

REDUCTION IN POTENTIAL
LEAK POINTS

ENSURING SAFETY EXCELLENCE ACROSS ALL PROJECTS



RII SPECIALIST PACKAGES

Remote Internal Inspection or RII is the application of remote inspection systems such as cameras, robots or crawlers to inspect internally and asses challenging access areas without the need for intrusive inspections and the associated Confined Space Entry. RII methodologies work for condition assessment, process efficiency assessments and Foreign Object Search And Retrieval (FOSAR).

RII SPECIALISED ENGINEERING PACKAGES

FRONT END ENGINEERING DESIGN (FEED)

Our RII team collaborates with our clients during the FEED and planning phase of a project to define critical asset areas where RII can be applied, what will be required to access these areas, and the likely degradation mechanism.

RII integration in the Pre-FEED and FEED stages of the project maximises RII capabilities and results in the most significant savings, exceptional inspection coverage, a reduction in turnaround time frames and fewer resource requirements. This process also dramatically reduces the possibility of substantial changes being required during the execution phase.

OPERATIONAL PLANNING AND REVIEW

Sonomatic's Facility Review and Planning service provides clients with focused campaign planning for the internal inspection requirements of pressure equipment. Our processes ensure that the correct inspection equipment, support tooling and techniques are applied promptly and efficiently.

We have taken full advantage of our team's extensive campaign and project experience to create a specialised array of procedures and methods to help reduce execution windows, bringing assets back online faster.

RII SPECIALISED SITE EXECUTION PACKAGE

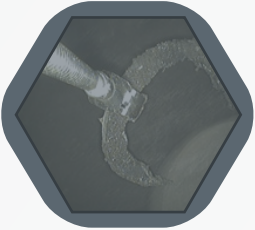
ONSITE EXECUTION SERVICES

Sonomatic's Campaign Execution Team provides complete end-to-end assistance with campaigns, projects and turnarounds. Our RII technicians have a wide variety of inspection experience. They are trained explicitly across the full suite of RII technologies, allowing them to assess each situation and apply the correct tooling on a case-by-case basis.

What sets Sonomatic's RII Team apart is that our experts understand the needs of various stakeholder groups, from onsite personnel to upper management. Our team works with each group every step of the way to help them understand and interpret the relevant data, results, and information.

RII SERVICES

Sonomatic offers industry leading equipment suitable for the tasks required and some of the very best people in Asia Pacific. The equipment and supporting tooling we use have been custom-designed and fabricated to suit specific requirements within each sector to ensure a best-in-class outcome and safety excellence on all projects we undertake.



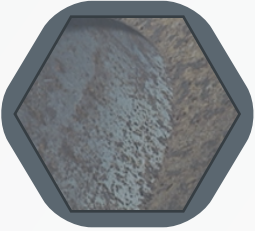
FOREIGN OBJECT SEARCH AND RETRIEVAL (FOSAR)

Sonomatic employs a suite of off-the-shelf and custom-built tooling systems to remove items of foreign debris found during an inspection without costly CSE and to ensure the ongoing integrity of the client's plant and process.



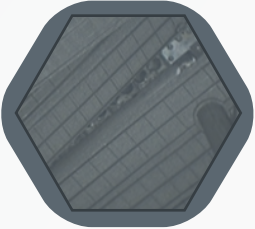
RII IN-FIELD INSPECTION

Sonomatic's In-Field Inspection execution team works alongside statutory and class societies to assess and record the condition of an asset without the need for CSE. Our technicians have an extensive track record in this area and can draw on their experience to complete inspections efficiently, even when limited inspection data is available.



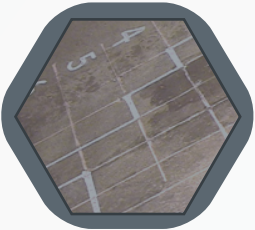
BASELINE, COMPLETIONS, CLOSE UP AND QA/QC

Our QA/QC RII package builds upon the best practice principles of conventional QA/QC inspections, using RII technology to identify items of pressure equipment that have been constructed out of specification, with any damage or anomalies.



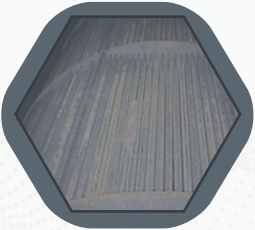
PROCESS EFFICIENCY

Sonomatic engineers will work with our clients to evaluate critical areas of a plant's processes and identify potential issues and points of failure. Our team has the knowledge to identify the key indicators when critical regions of the plant process are upset.



CONDITIONAL MONITORING

The RII Conditional Monitoring package assists our clients in monitoring specific degradation issues. Using specialised tooling and procedures that are developed in-house, we can ensure that the target areas are assessed in the same way each time, in the most efficient manner possible. Our analysis experts can then collate, compare and evaluate these inspection results to ensure reproducibility.



HYDROCARBON ENRICHED ATMOSPHERE INSPECTIONS

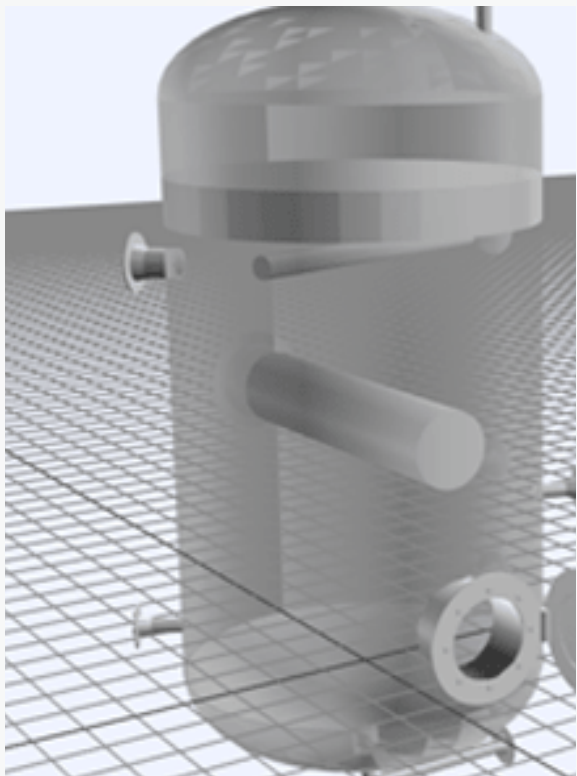
Sonomatic has developed dedicated and specialised procedures, equipment and tooling to inspect pressure equipment and piping systems. By using RII, these hydrocarbon-enriched atmospheres do not have to be purged, saving our clients time and money.

OUR TEAM

You need the right people with the proper training to get results. Sonomatic is proud to have the world’s most experienced RII technicians as part of their team, ensuring that you get an accurate outcome the first time, every time.

Our team of specialists have in-field execution experience and are equipped with an extensive range of proprietary equipment. This offers an integrated execution approach and inspection approach that meets the requirements of your engineers, planners and statutory inspectors, helping you get results even when your contracted day-to-day resources are stretched.

Our extensive recruiting process requires each applicant to display skills across a wide range of areas in the initial stage before progressing. Our RII-specific training program fully prepares our team for the field by educating them in six areas: systematic inspection procedures, degradation identification, tooling identification competency, tooling application competency, process optimisation training, and safety training.



With our team’s vast experience, we bring more to every inspection. Drawing upon the years of global expertise on degradation and operational issues allows us to help you further reduce risk and increase your confidence in operating the plant reliably and safely.

TO GET THE RIGHT RESULTS, YOU NEED THE RIGHT PEOPLE

SYSTEM INSPECTION PROCEDURES

RII technicians are trained in systematic inspection procedures to enable higher levels of coverage, record, secure and prepare data in a logical format for communication, and correctly perform the post-inspection review processes.

DEGRADATION IDENTIFICATION

Our team has been trained in degradation identification and detection utilising 2D imagery. This is important as technicians must know what they are looking at to capture all relevant data.

TOOLING IDENTIFICATION COMPETENCY

Sonomatic technicians are trained across a range of digital camera systems, so they know what camera is required and why, how to set it up correctly and what specific lenses need to be applied to get the best results.

TOOLING APPLICATION COMPETENCY

Our team is trained in using and applying specialist support tooling that we design and build to ensure cameras are placed in the correct focal ranges, giving the most transparent view of possible degradation.

PROCESS OPTIMISATION TRAINING

Sonomatic RII technicians are trained in process and operational aspects to ensure they can detect and highlight indications of process reliability, helping your functional team run your facility at the highest efficiency.

SAFETY TRAINING

Our team has been trained to safely use, operate, and get equipment into high-level work environments without causing sim-ops conflicts, incidents, or accidents.

RII & NII: COMPLEMENTARY SOLUTIONS

2 SIDES OF THE SAME COIN

RII and Non-Intrusive Inspection (NII) are complementary inspection strategies that, when applied together, can provide higher overall confidence without the need for vessel entry. NII is generally preferred for quantitative inspections, such as estimating corrosion rates, whereas RII is highly effective in cases where NII cannot meet all inspection objectives or when direct insight into vessel internals is required. In practice, inaccessible areas to RII can often be inspected using NII, ensuring broader coverage. The relative importance of each method may also evolve throughout the asset lifecycle: RII is often needed in the early life to validate absence of degradation associated with fabrication flaws, while NII becomes increasingly valuable over time for quantifying in-service degradation.

RII

- ✔ Provides high coverage.
- ✔ Capable of capturing “unexpected” mechanisms.
- ✔ Captures condition of internal linings.
- ✔ Captures condition of internal furniture.
- ✔ Captures conditions of locations inaccessible to NII, e.g. bottom domed ends in skirts.
- ✔ Can be used to identify locations to focus application of NII on.

NII

- ✔ Provides quantified data.
- ✔ Capable of detecting subsurface (non-visible) damage.
- ✔ Can use data analysis to estimate condition in uninspected locations and corrosion rates.
- ✔ Captures condition of locations inaccessible to RII, e.g. areas of packing or areas with trays.
- ✔ Can confirm damage identified in RII.

Non-Intrusive Inspection (NII) for pressure vessels is increasingly being utilized as an alternative approach to the traditional Internal Visual Inspection (IVI), with some bodies aiming to eliminate vessel entry by 2026.

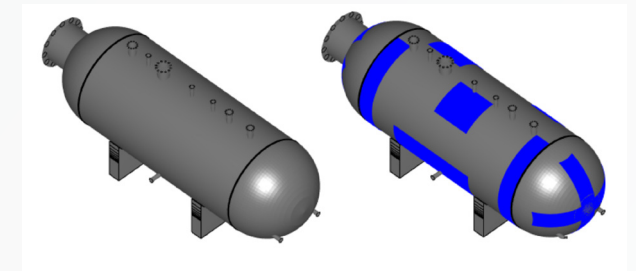
NII offers several advantages, including:

- ✔ Reduced shutdown time, leading to increased production.
- ✔ Reduced personnel requirements.
- ✔ Removal of hazards associated with confined space entry (CSE).
- ✔ Removal of internal cleaning requirements.
- ✔ Does not affect the vessel integrity.
- ✔ Inspection data can be used as input for Fitness for Service (FFS) calculations, where required.
- ✔ More quantified and accurate results.

Sonomatic has pioneered the formal industry approach for NII and RII are leaders in the implementation of the developed NII approaches. Our clients include many of the major international operators and our involvement at the assessment, planning, inspection and evaluation stages. Sonomatic's ability to offer the full range of NII campaign services, ensures that clients get the maximum benefit while retaining full confidence in equipment integrity.

ASSESSMENT AND WORK SCOPE

Each vessel is individually considered to determine whether NII and RII is appropriate and, where applicable, a work scope will then be developed. As part of the work scope, a 3D model of the vessel will be created using Sonomatic's SIMS software.



It is important to note that NII assessment is not a push button approach. While the recommended practice does stipulate a process to follow, experienced technical input and understanding is required. The assessment will consider the following:

- ✔ Vessel information, including inspection history, operating conditions, and degradation threats.
- ✔ Required inspection coverage.
- ✔ Key inspection locations based on potential threats.
- ✔ Appropriate inspection techniques.
- ✔ Appropriate accuracy and probability of detection targets for the inspection.

INSPECTION

Throughout the inspection phase of an NII, seamless interaction between the Integrity and Inspection team is vital to ensure an efficient and accurate inspection. Sonomatic offer a complete NII package from assessment to evaluation. During the inspection phase, any amendments to the inspection scope or follow-up on unexpected results is managed through efficient interaction between the relevant teams.



Sonomatic's fully integrated approach to NII ensures:

- ✔ Expert review of work scopes.
- ✔ Live 3D corrosion maps produced at collection.
- ✔ Any substitute/additional areas or techniques can be included when required.

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