

# Remote Visual Inspection (RVI) Inspection Types

Quest Integrity provides a comprehensive range of Remote Visual Inspection (RVI) inspection types in order to reduce maintenance costs, avoid confined space entry and minimise shutdown time frames.

- + In-service
- + Condition Monitoring
- + Base Line
- + Completions/Close Up
- + Process Energy/Emissions
- + Cleaning/Treatment Evaluation
- + Fault Finding/Fault Analysis
- + Bacterial
- + Quality Control
- + Hydrocarbon Enriched Atmospheres
- + RVI Specific Inspection and Test Plans
- + RVI Specific Vessel Access Plans

## In-Service

In-service inspection Remote Visual Inspection programmes are designed to work in operational plants in conjunction with statutory Surveyors/Plant Inspectors. The purpose of in-service inspection is to efficiently and effectively inspect and evaluate the condition of pressure equipment with no confined space entry requirements or major spading/ dismantling of the plant. For General Visual Inspection and Close Visual Inspection requirements RVI provides a high level of detail, accuracy and coverage to better evaluate the condition of pressure equipment.

This type of inspection works best with our plant RVI specific Inspection Test Plans and Vessel Access Plans. With the full implementation of our In-Spec RVI programme, you can achieve savings of up to 70%, and shutdown reduction times of up to 50%, compared to traditional shut down methods with confined space entries for the purpose of GVI and CVI (based on existing plant access points).

## Condition Monitoring

Condition Monitoring Remote Visual Inspection programmes are designed to monitor specific degradation issues. The use of an additional comparative report format enables information from previous inspections to be viewed side by side.

The information captured through this program enables accurate calculation of the rate of degradation and provides guidance on when remedial action will be required to avoid potential failures. This method requires limited duration shut-down, minimising production losses and other associated costs.



## Base Line

Base Line Remote Visual Inspection programmes are primarily designed for new plants. This method of inspection is designed to capture the “as built” condition of the plant. The information gathered is used as a comparative base line for future inspections.

Base Line inspection allows accurate interpretation of future inspection data, and prevents construction or manufacturing flaws from being misinterpreted as damage caused by operational process, as well as preventing unwanted and unplanned confined space entries. Base Line Remote Visual Inspection works best with Quest Integrity’s Inspection Test Plans and Vessel Access Plans



## Completions/Close Up

Completions/Close-up Remote Visual Inspection programmes are primarily designed to confirm the cleanliness of new plants prior to construction close-up and plant start-up. This programme will identify debris and other materials that may cause corrosion, degradation, delays in plant start-up or premature damage of system components. 95% of the time we can remove the debris remotely and avoid confined space entry requirements.

Our inspection programme will provide you with an independent checking system, minimising the risk of inadequate QA/QC systems employed by some manufacturers/constructors.



## Process Energy/Emissions

The Process Energy/Emissions Remote Visual Inspection programme is designed to identify areas where emissions and energy costs can be reduced. This inspection method targets areas in the process where thermal efficiency is compromised, resulting in increased energy consumption and higher emissions. Targets are deposition, scaling, build up of deposition and surface indications such as heat indications that are not uniform for the process involved.

Typical plant items inspected using this method include boilers, heat exchangers, fin fans, air heaters, cooling systems and thermal barrier systems.



## Cleaning/Treatment Evaluation

This inspection method is designed to ascertain the effectiveness of a cleaning process and/or chemical treatment program in operational plants. The inspection programme is implemented in two stages. A pre-inspection is completed, and if required, a sample is taken to ascertain the level of buildup and composition of material. A second inspection is undertaken postcleaning/treatment to evaluate the effectiveness of the process. Comparing information from the two inspections enables decisions to be made regarding whether further cleaning/treatment is required to achieve the desired level of efficiency.

Typical plant items that utilise this method are boilers, heat exchangers, cooling systems, thermal barrier systems, pressure vessels, pressure piping, separators and scrubbers.



## Fault Finding/Fault Analysis

Fault Finding/Fault Analysis Remote Visual Inspection is designed to locate and isolate specific issues in plants without the need for expensive tear downs and plant outages. In many cases, a problem has already been identified and Fault Finding/Fault Analysis is used to locate the problem and provide information to assist you in determining a solution. This method minimises plant down-time, typically saving around 90% of the costs associated with traditional trial and error methods.

## Bacterial

The Bacterial Remote Visual Inspection programme is designed to locate and isolate bacterial issues and inefficiencies in dairy and pharmaceutical plants. This method efficiently:

- + Reduces costly product downgrades
- + Reduces the number of CIP cycles required
- + Reduces the use of chemicals
- + Increases plant availability for production.

Production run times can typically be extended by 50%, with product quality improvements of up 30% (aerobic plate counts etc).

## Quality Control

The Quality Control Remote Visual Inspection programme is designed to locate and isolate weld defects in new dairy and pharmaceutical factories as they are constructed. This method minimises the effects that poor welding standards can have on a plant, such as reduced product quality and increased plant operating costs.

Quality Control Remote Visual Inspection is more efficient than traditional NDT techniques, as the key weld formations causing problems are located and identified, enabling repairs to be made. This inspection can also be completed at any time of the day, with minimal disruption to construction crews and no issues with misinterpretation of data that can occur with radiography. This, along with higher coverage levels and 100% data accuracy results in significant savings, typically around 85% compared with other NDT techniques. Best results are achieved when combined with our “Weld Formation and Bacterial Contamination” training that we complete for welding and construction crews.

## Hydrocarbon Enriched Atmospheres

This Remote Visual Inspection programme is designed to inspect pressure equipment and piping systems that have hydrocarbon enriched atmospheres. This inspection method is used where it is almost impossible to “gas free” an item of plant, and critical inspections are required. Typically a 99.5% saving or better is made when compared to the cost of alternative inspection methods.

It is important to note that this inspection requires a high level of planning compared to other Remote Visual Inspection methods and we will evaluate and plan each and every inspection based on the item of pressure equipment before proceeding.



## RVI Specific Inspection and Test Plans

Quest Integrity Inspection Test Plans (ITPs) are designed to capture all the key target areas associated with an inspection. The ITPs capture specific information regarding items that are critical to each inspection, based on your RBI outputs and our extensive database of recorded damage. They incorporate all access points, drawing references and key items associated with the plant, and list degradation mechanisms and issues that may be found in the specified item. Specific RVI requirements and details are incorporated into the ITP to ensure that the correct tooling is selected and the cameras are positioned correctly to clearly identify degradation mechanisms. The ITP also provides the details required to accurately record and document data.

RVI specific ITPs are an essential tool for asset integrity engineers, plant inspectors and inspection technicians, as they reduce risk, further eliminate the need for Confined Space Entries, eliminate subjectivity and ensure the integrity of the inspection is maintained during time critical shutdowns. They also allow for easy comparison of data for future inspections, building a clear historical data base that is easy to use and interpret. Compared with generic ITPs, Quest Integrity's approach ensures a higher level of coverage and degradation detection, as well as a more seamless inspection approach.

## RVI Specific Vessel Access Plans

Quest Integrity Vessel Access Plans (VAPs) are designed to address and specify details of all key access points for an inspection. The VAPs are set up around access points that are most suitable to allow Remote Visual Inspection techniques to get accurate information. These points are carefully chosen by our skilled technicians to minimise mechanical, scaffolding and crane requirements without compromising the level of inspection. The use of the VAPs saves time and money, and ensures that the correct points and locations are opened for the purpose of the inspection.

Quest Integrity, a TEAM company, is a global leader in the development and delivery of asset integrity and reliability management services. The company's integrated solutions consist of technology-enabled, advanced inspection and engineering assessment services and products that help organizations improve operational planning, increase profitability, and reduce operational and safety risks. Quest Integrity is built on a foundation of leading edge science and technology that has innovated and influenced industry best practices since 1971.

