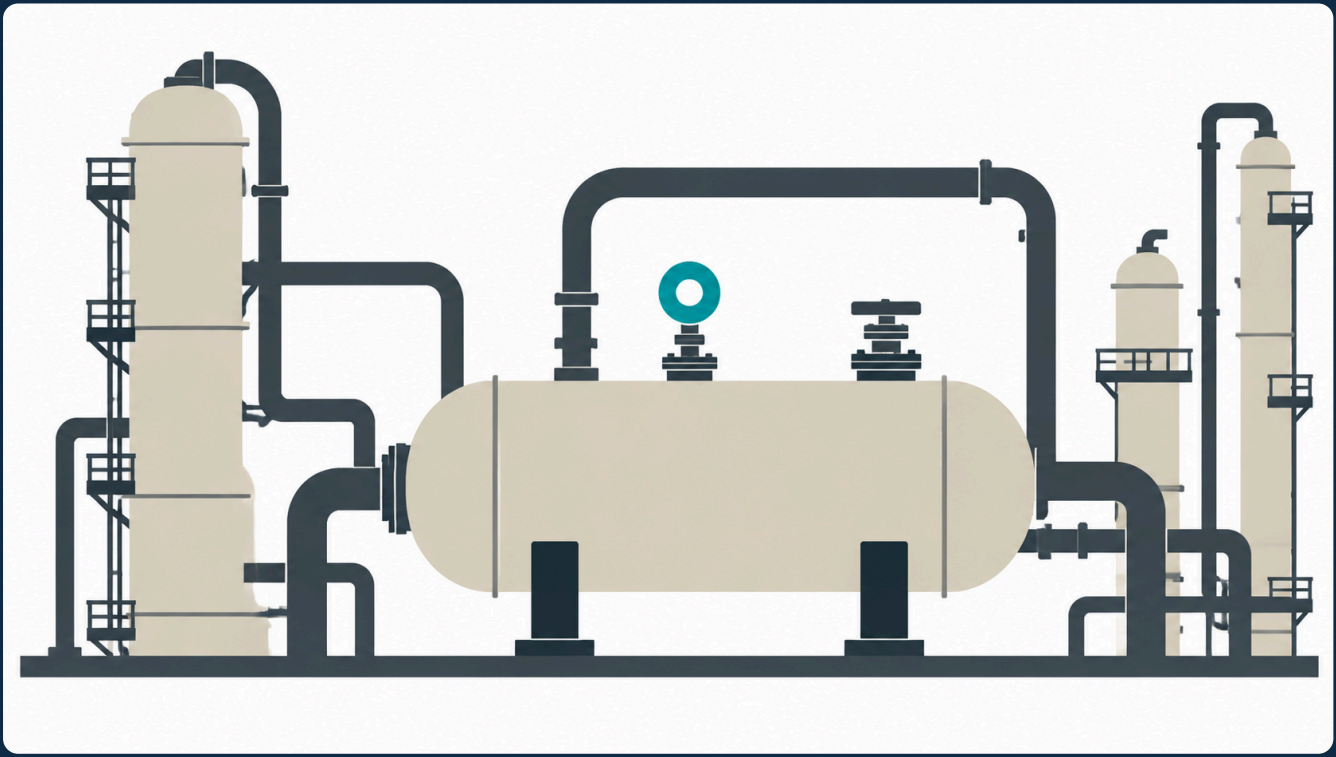
RBI Assurance

A new evidence-assurance capability in ATS-FFS for risk-based inspection and fitness-for-service programs.

PURPOSE

Helps asset owners reduce the risk of catastrophic equipment failure by exposing gaps in integrity evidence and tracking corrective actions to verified closure.



Editorial illustration. RBI Assurance checks records, review and follow-through; it does not inspect physical equipment.

WHY IT EXISTS

Integrity decisions are only as strong as the evidence beneath them

Every RBI plan and fitness-for-service assessment rests on records: inspection results, operating data, damage-mechanism reviews, repair history. When one of those records is missing, stale or unexamined, the decision above it looks exactly the same as a well-supported one. The gap is invisible precisely because nothing on the page says it is there.

Regulator guidance and incident investigations keep finding the same weak links:

> **Inspection that cannot see the damage.** UK HSE guidance on inspection and NDT warns that a "no defects found" result can conceal limitations of the technique, the coverage actually examined, or access restrictions - and that inspection only reduces the probability of failure when the results are fed back into the RBI assessment and acted on.

> **Mechanisms nobody checked.** The U.S. CSB's investigation of the 2012 Chevron Richmond refinery fire found a sulfidation failure on a component that had not been individually evaluated, and recommended component-level damage-mechanism review. Its approved Tesoro findings concerned high-temperature hydrogen attack that went undetected under the guidance then in use.

> **Actions that fade away.** A finding becomes a recommended action; the action waits for an owner, a due date, proof of completion. When any of those is missing, the risk the inspection found stays in the plant while the paperwork suggests it was handled.

What RBI Assurance is

RBI Assurance is a workspace inside ATS-FFS that sits beside your existing inspection and assessment records. It does not re-calculate anything. Instead it asks three questions of every integrity decision, and keeps asking until each has a recorded answer:

- **What does this decision rely on?** The exact records, revisions and sources behind it - linked read-only, frozen as a snapshot, never silently substituted.
- **What is missing?** Deterministic checks flag absent evidence, unsupported "not applicable" claims and records whose basis has changed since review.
- **Was anything actually done about it?** Corrective actions carry an owner and a due date, and close only when a second person verifies proof of completion.

The principle

Missing information is shown as missing. It is never converted to a zero, a default or a pass - and no green "safe plant" score pretends otherwise.

APPLICATION

When to apply RBI Assurance

- Accepting or revising an RBI plan
- Extending an inspection interval
- Signed assessment staying valid over time
- After an industry incident bulletin
- Preparing for an audit or regulator visit
- Responsibility changes hands

Apply it wherever an integrity decision will rely on records assembled by other people, at other times, for other reasons. Typical moments:

- **Before accepting an RBI plan** or extending an inspection interval - confirm the evidence the plan assumes actually exists and is current.
- **While a signed FFS assessment is in service** - track the conditions and follow-up dates it was issued under, so a quiet change cannot outlive its basis unnoticed.
- **After an incident bulletin or fleet alert** - record whether the same vulnerability applies locally, with reasons, an owner and an action - not just a read receipt.
- **Before audits** - walk in with the evidence pack already assembled, the open items visible and each one owned.

Where it starts

RBI Assurance begins with static pressure equipment and piping - vessels, exchangers, tanks and process piping - where inspection history, damage-mechanism review and fitness-for-service assessment already live side by side. It works alongside the RBI and FFS tools an owner already uses; it does not ask anyone to replace them. Rotating machinery, relief systems and instrumented protection need their own methods and are outside this module's scope.

A demonstration, not plant advice

Until an owner approves access to real plant data, every record in RBI Assurance is clearly labelled synthetic. The software opens review needs for people to settle; it never declares equipment safe or unsafe.

THE METHOD

How it works: the assurance loop

1 **Link and freeze.**

Select the asset and the exact source-record versions the review will cover. Existing inspection and FFS records are referenced read-only and frozen into a snapshot, so everyone reviews the same basis - and a later source change is detected, not hidden.

2 **Expose the gaps.**

Versioned completeness checks flag what is absent: a required source, a mechanism excluded without rationale, an inspection record with no method or coverage statement, an action with no owner or due date. Every flag opens the exact field and rule that raised it.

A flag is a review need, not a verdict - missing records never mean "unsafe", and never mean "fine".

3 **Record the evidence - with its unknowns.**

The preparing engineer records each item with its source document, revision, date, limitations and what is still unknown. Blank, unknown and not-applicable stay distinct, and "not applicable" needs a reason and a source.

4 **Independent review.**

A different, qualified engineer reviews the frozen record and approves or returns it, with open items listed explicitly. The system will not let anyone approve their own work.

5 **Verified closure - with proof.**

Each corrective action closes only when its owner submits completion evidence and a separate authorized verifier accepts it. Approval of a review never closes an action by itself. Every step, name and timestamp lands in an audit trail, and the approved review exports as a complete review pack.

One record, end to end

Because every flag, correction, decision and verification is written to the same audit trail, the exported review pack reads as a single account: the scope reviewed, the exact source versions relied on, the gaps found, the dispositions made, the actions raised and the proof that closed them. Older packs are marked superseded, never rewritten.

THE PAYOFF

Catching failures before they are failures

Catastrophic equipment failures are rarely sudden. In the investigations behind them, the mechanism was usually a known type, the inspection program existed, and the records were incomplete in ways nobody was assigned to notice. The time to find that is while repair, replacement or an operating change is still a choice.

RBI Assurance moves that discovery earlier in three practical ways:

- **Assumptions become visible.** Management sees, per asset, which decisions rest on complete evidence and which on absence - before the next interval extension or continued-service decision relies on them.
- **Follow-through becomes structural.** An action without an owner, a due date or verified proof cannot quietly age out of view; it stays open on the record until a second person verifies closure.
- **Assurance becomes demonstrable.** The audit trail and exported review pack give owners, auditors and insurers a complete, time-ordered account of what was checked, by whom, and what was done about it.

What RBI Assurance does not do

- It does not replace qualified engineers, and it makes no fitness-for-service decision. Engineering judgment, applicability of damage mechanisms and acceptance stay with named, qualified people.
- It does not certify equipment as safe to operate, issue operating permission, predict failures or set inspection intervals. It adds no risk score and changes no calculation.
- It does not turn missing data into a pass. Unknown stays unknown until a person resolves it.

Your existing FFS calculations, issued reports and signoff workflow in ATS-FFS are untouched - RBI Assurance reads them, never rewrites them. Its checks are defined with your technical authority, in line with your RBI program under API RP 580/581 and your jurisdiction's requirements.

Evidence basis

UK HSE - Inspection / Non-Destructive Testing. Regulator guidance on damage mechanisms, NDT limitations and feeding inspection results back into RBI. hse.gov.uk/comah/sragtech/techmeasndt.htm

U.S. CSB - Chevron Richmond refinery fire (2012). Final investigation and recommendations on sulfidation, component-level evaluation and damage-mechanism review. csb.gov/chevron-richmond-refinery-fire/

U.S. CSB - Tesoro refinery investigation. Approved findings on undetected high-temperature hydrogen attack and the need for effective safeguards. csb.gov

API RP 580/581. RBI program elements: data, mechanisms, roles, records and reassessment (RP 580 fourth edition 2023, per API's published reference). Licensed standards not reproduced here.

See it working

RBI Assurance has been demonstrated end to end on a validated prototype: gaps flagged, evidence recorded with its unknowns, independent review enforced, closure verified with proof, every step in the audit trail. Contact ATS-FFS through www.ats-ffs.com to arrange a walkthrough.