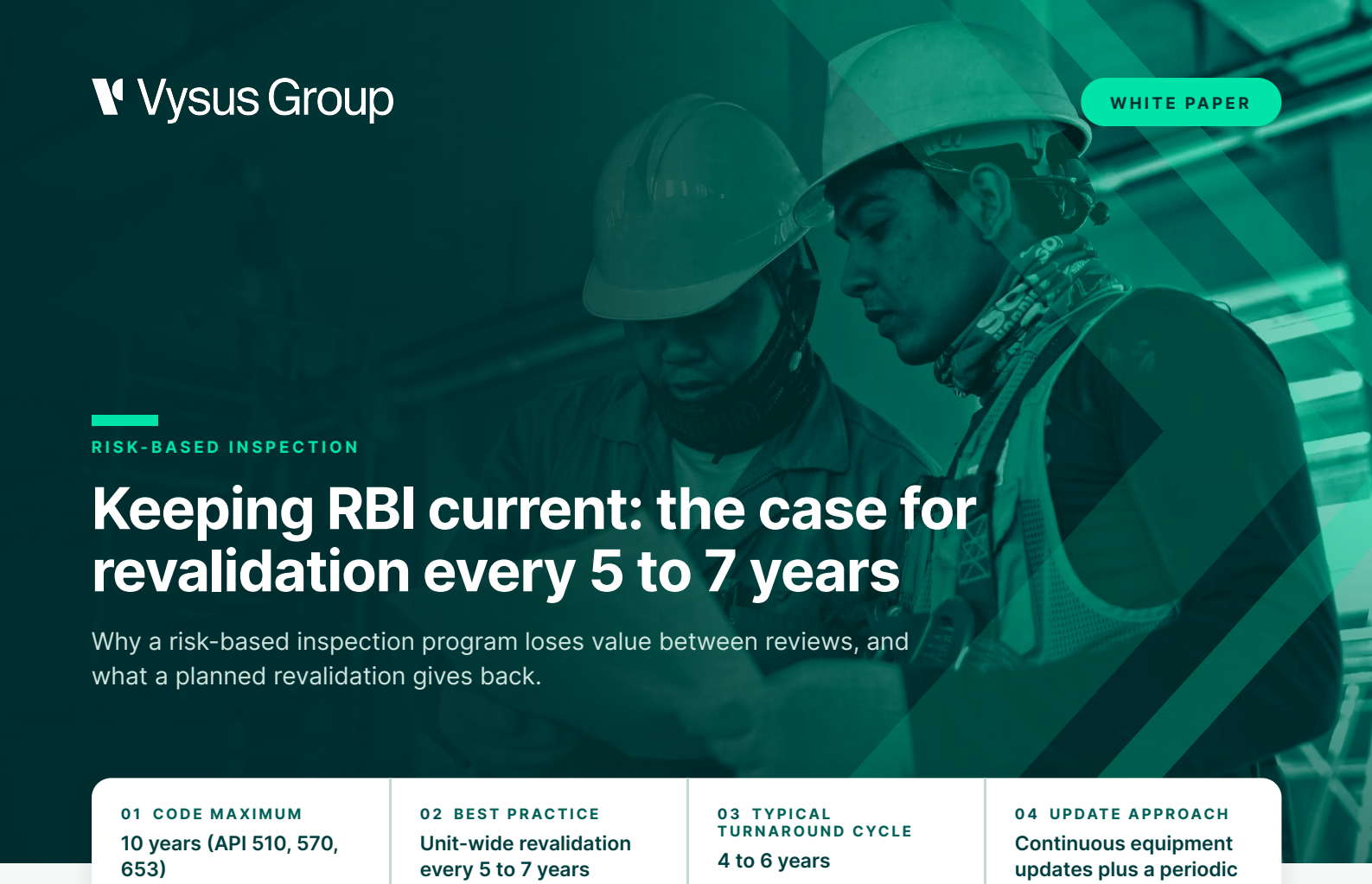
Vysus Group

WHITE PAPER



RISK-BASED INSPECTION

Keeping RBI current: the case for revalidation every 5 to 7 years

Why a risk-based inspection program loses value between reviews, and what a planned revalidation gives back.

01 CODE MAXIMUM	02 BEST PRACTICE	03 TYPICAL TURNAROUND CYCLE	04 UPDATE APPROACH
10 years (API 510, 570, 653)	Unit-wide revalidation every 5 to 7 years	4 to 6 years	Continuous equipment updates plus a periodic unit-wide review

EXECUTIVE SUMMARY

RBI assessments lose accuracy between reviews

A risk-based inspection program is only as good as the data and assumptions behind it. From the day it is approved, process conditions drift, inspections return new findings, equipment is modified and the people who built the model move on.

The inspection codes allow up to 10 years between reviews. Most owner-users do not wait that long. A unit-wide revalidation every 5 to 7 years, timed around turnarounds, keeps inspection spend pointed at real risk, supports safe interval extensions and gives management a defensible basis for budget and deferral decisions.

This paper sets out what the codes require, why a shorter cycle pays back, and what a revalidation involves, so integrity teams can make the case to the people who approve the budget.

KEY INTERVALS

10 yrs
maximum interval for reviewing an RBI assessment under API 510, 570 and 653

5–7 yrs
the cycle most owner-users work to for unit-wide reviews

1
major turnaround typically falls within each 5 to 7 year review cycle

Talk to our team

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WHAT THE CODES REQUIRE

A 10-year maximum, with earlier review triggers

All three in-service inspection codes cap the interval for reviewing an RBI assessment at 10 years, and each requires an earlier review when conditions change. API RP 580 does not set timing itself; it defers to the inspection codes.

API 510, 10TH ED., 2ND ADDENDUM

Clause 6.3.2

The RBI assessment shall be reviewed and approved by the engineer and inspector at intervals not to exceed 10 years or more often if warranted by process, equipment, or consequence changes.

API 570, 4TH ED., 2ND ADDENDUM

Clause 5.2.5

The RBI assessment shall be updated at least every 10 years or more often if process or hardware changes are made, or after any event occurs that could significantly affect damage rates or damage mechanisms.

API 653, 5TH ED., 2ND ADDENDUM

Clause 6.4.2.2.2

The RBI assessment shall be reviewed and approved by a team at intervals not to exceed 10 years or more often if warranted by process, equipment, or consequence changes.

TWO KINDS OF TRIGGER

What this means for the inspector

EVENT-BASED

New information

New inspection findings, a change of feedstock or operating mode, an unexpected failure or a unit revamp all bring information the original analysis did not have. Any of these can trigger a review of the affected assessments.

TIME-BASED

Elapsed time

Even with no single trigger, small changes add up. The codes set a maximum of 10 years for review and approval of the whole assessment, whatever has or has not happened in between.

HOW OWNER-USERS MANAGE IT

Continuous updates plus a periodic unit-wide review

DAY TO DAY

Equipment updates

When an event occurs, individual assessments are updated and a new RBI interval set. This happens continuously as new information arrives.

EVERY 5 TO 7 YEARS

Unit-wide updates

The whole unit is reviewed to catch changes that never reached the model, including equipment not inspected since the last assessment. Most owners time this before or after a major outage, and use it to realign corrosion control documents and integrity operating windows (IOWs) with RBI.

Reassessment, revalidation, evergreening and updating mean different things to different operators, and API committees have found them hard to define. This paper focuses on what needs to be done rather than what it is called.

WHY 5 TO 7 YEARS

Four reasons for a shorter review cycle

1 **It lines up with turnarounds**

Most oil, gas and petrochemical facilities run 4 to 6 years between major turnarounds. Revalidating before a turnaround makes the out-of-service plan target the highest-risk equipment. Revalidating after one banks the new NDT and internal inspection data for the next run.

2 **Plant data drifts**

Feedstocks shift, temperatures, pressures and chemistry change, and damage mechanisms follow. Time spent outside integrity operating windows can accelerate degradation without anyone updating the model.

3 **Original assumptions need testing**

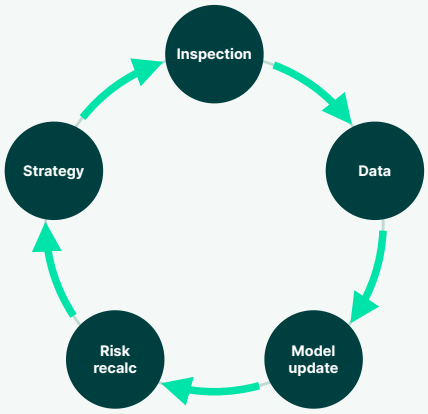
First-pass studies often rely on conservative, qualitative data or assume a threat is absent. A revalidation compares the model against what inspection actually found, so low-risk intervals can be extended safely and unexpected damage gets shorter ones.

4 **Plants change and age**

Over five or more years a unit sees revamps, replacements and piping modifications through management of change, on top of natural ageing and fatigue. A unit-wide review confirms the risk picture still matches the hardware.

THE RBI UPDATE CYCLE

How inspection data improves the risk model



RBI rewards good data. Each effective inspection reduces the uncertainty in the probability of failure, which can lower calculated risk and support longer, safer intervals.

That only works if the loop is closed: inspection results go into the data, the model is updated, risk is recalculated and the strategy is optimized before the next inspection. Let the loop break and the program falls back to conservative assumptions, and the inspection budget follows.

RISKS OF DELAYING REVALIDATION

Consequences of a delayed revalidation

Over-scoping

Without current risk data, turnaround worklists default to conservative scope. More inspection than the risk justifies means longer outages and higher contractor spend.

Hidden risk

Active damage mechanisms that are not in the model are not being inspected for. This increases the likelihood of unplanned outages and loss of containment.

Poor prioritization

Budget gets spread across the unit instead of focused where the risk is. Low-risk items continue to be inspected at historical intervals while high-risk items wait.

Audit exposure

An assessment past its 10-year review is out of code. Regulators, insurers and auditors ask for the approval record, and a lapsed review is difficult to justify.

FOR THE BUDGET CONVERSATION

Questions your approver will ask

We already did RBI. Why pay for it again?

A revalidation is not a rebuild. It reuses the validated data and focuses effort on what has changed: new inspection results, process and hardware changes, and equipment the last cycle did not reach.

What do we get back?

Inspection scope matched to current risk, defensible interval extensions and deferrals, a turnaround worklist set early enough to plan, and an approval record for auditors and insurers.

When should we do it?

Ahead of a turnaround to shape the worklist, or straight after one to capture the new data.

Can it wait until year 10?

It can, but 10 years is a maximum. By then much of the model reflects past operating conditions and hardware, and inspection plans are likely to have drifted from current risk.

TIME-BASED AND EVENT-BASED

Three review horizons

Review type	Interval or trigger	What it achieves
Event-based update	Immediate and continuous	Responds to unexpected failures, process shifts and newly logged inspection data
Best-practice revalidation	Every 5 to 7 years	Captures unrecorded process drift and unit-wide modifications, aligned with turnaround windows
Code maximum	10 years	The latest point at which the assessment must be reviewed and approved under API 510, 570 and 653

WHAT A VYSUS REVALIDATION INCLUDES

Built on your existing data and software

- Data gap review and inspection history load, including corrosion rates
- Process, IOW and management of change review since the last assessment
- Damage mechanism review refresh with our corrosion specialists
- Risk recalculation, updated inspection plans and turnaround scope recommendations

We work in the major RBI and integrity software platforms on the market, so the revalidation is delivered in the system your team already uses.

GETTING STARTED

A practical route to revalidation

01

Scope and data check

Confirm units, last review dates and data gaps.

02

Refresh the inputs

Load inspection history; review process changes and IOWs.

03

Recalculate risk

Update damage mechanisms, rates and risk.

04

Plan and hand over

Updated inspection plans and turnaround scope.

WHY VYSUS GROUP

About Vysus Group

200+
consultants across our global team

270+
customers served every year

4.9/5
customer satisfaction score

Our Americas team works from Calgary, Houston and Trinidad, and draws on specialists across the wider group for corrosion, materials and process safety.

Is your RBI program due for revalidation? Let's talk.
Email **Americas@vysusgroup.com** or visit **vysusgroup.com**

Calgary
Houston
Trinidad

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