

## OpsPilot

# Remaining Life Assessment — User Manual

Fitness-For-Service · API 579-1 / ASME FFS-1 · AI Engineering Co-Pilot

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**What this guide covers** — what a Fitness-For-Service assessment is, how the OpsPilot module structures it, what to have ready, and the assessment you receive.

**Professional accountability.** OpsPilot structures the analysis; the inspection/materials/integrity engineer bears the professional liability for the Fitness-For-Service determination. The output is a DRAFT — regulator or contractual use requires certification by a competent engineer.

## 1. What is a Remaining Life Assessment?

A Remaining Life Assessment — formally a Fitness-For-Service (FFS) assessment — answers a hard question about damaged equipment: given the thinning, cracking or other damage we've found, is it still safe to run, for how long, and should we run it, derate it, repair it, replace it or retire it? It turns an inspection finding into a defensible decision rather than a nervous guess.

OpsPilot follows *API 579-1 / ASME FFS-1*, *BS 7910*, *R6*, *AS/NZS 3788* and *ASME PCC-2*, and uses the standard three-level hierarchy:

Level	What it is
Level 1	Conservative screening — quick, simple, deliberately cautious. If it passes, you're done.
Level 2	Detailed quantitative assessment — used when Level 1 fails screening.
Level 3	Advanced analysis — finite-element / fracture mechanics — for the hardest cases.

## 2. What the OpsPilot module does

Role	Responsibility
<b>AI Coach — Plant Integrity Engineer (OpsPilot)</b>	Structures damage-mechanism identification, the assessment at the appropriate level, the remaining-life calculation, and the Run / Derate / Repair / Replace / Retire decision.
<b>Inspection / Materials / Integrity Engineer (you)</b>	Provide the equipment context, NDT data, operating history and vendor advisories — and you bear the professional engineering liability for the determination.

### 3. How it works — the process

#	Stage
1	Equipment context and damage-mechanism identification
2	Level 1 conservative screening
3	Level 2 detailed quantitative assessment (if screening fails)
4	Level 3 advanced analysis (only where needed)
5	Remaining-life calculation
6	Run / Derate / Repair / Replace / Retire decision

### 4. What you will be asked — have this ready

- The equipment, its materials and operating history.
- The NDT / inspection data — measured wall thickness, flaw size and location, corrosion rate.
- Any vendor advisories or known damage mechanisms for the service.

### 5. What you receive — the output

A complete Remaining Life Assessment (Word): the damage-mechanism basis, the assessment at the level reached, the remaining-life calculation, and the Run / Derate / Repair / Replace / Retire decision — issued as a draft for competent-engineer certification.

### 6. Worked example (illustrative)

A vessel shows measured wall thinning from internal corrosion. Level 1 screening asks the conservative question: is the remaining thickness still above the minimum required for the design pressure, with a margin? If it comfortably passes, the assessment ends there — run on, with continued monitoring. If it's marginal, the analysis escalates to Level 2, bringing in the measured corrosion rate to calculate how many years of life remain before the minimum is reached — which might support running with a tighter inspection interval, or point to a derate or repair. The escalating levels mean effort is spent only where the simple check can't settle it.

### 7. Getting the best result

- **Start at Level 1.** The conservative screen settles most cases quickly — only escalate when it doesn't.
- **Base it on real NDT data.** The assessment is only as good as the measured thickness and flaw data.
- **Identify the damage mechanism.** The right assessment method depends on how the material is degrading.
- **Get it certified.** The FFS determination carries engineering liability — the draft needs competent sign-off before it's relied upon.

OpsPilot — AI Engineering Co-Pilot. Learn more at [opsinnovatech.com](https://opsinnovatech.com)