RCM decision — which maintenance task each failure mode deserves

Menu: CMMS ▸ Assets… ▸ the Reliability tab

Part 1 — What the function does

What it decides. Reliability-centred maintenance (RCM) asks, for every way an asset can fail, which maintenance task is worth doing. ReliaEn answers it in a table on the asset's Reliability tab: one row for each failure mode of the asset's FMEA study, and for each row a decision with its interval and the reason in words.

Decision	When ReliaEn chooses it
On-condition (CBM)	The failure gives warning before it happens (detection rank 5 or less): monitor the condition
Scheduled replacement (PM)	The component wears out and planned replacement pays, or the failure is a safety failure on a wearing-out component
Failure-finding task (FF)	The failure is hidden and no age-based task pays: test the function at a fixed interval
Run to failure (RTF)	No task pays
Redesign	A safety failure that no maintenance task can prevent

From which data. Three things ReliaEn already holds for the asset: the severity, occurrence and detection ranks (S, O, D, each 1 to 10) of each failure mode from its FMEA study; the asset's fitted two-parameter Weibull distribution from its reliability record (shape β: above 1 the component wears out); and the optimal replacement age T* of the PM interval card.

When an engineer uses it. To choose the task, and its interval, for each failure mode in the maintenance plan.

When not to use it.

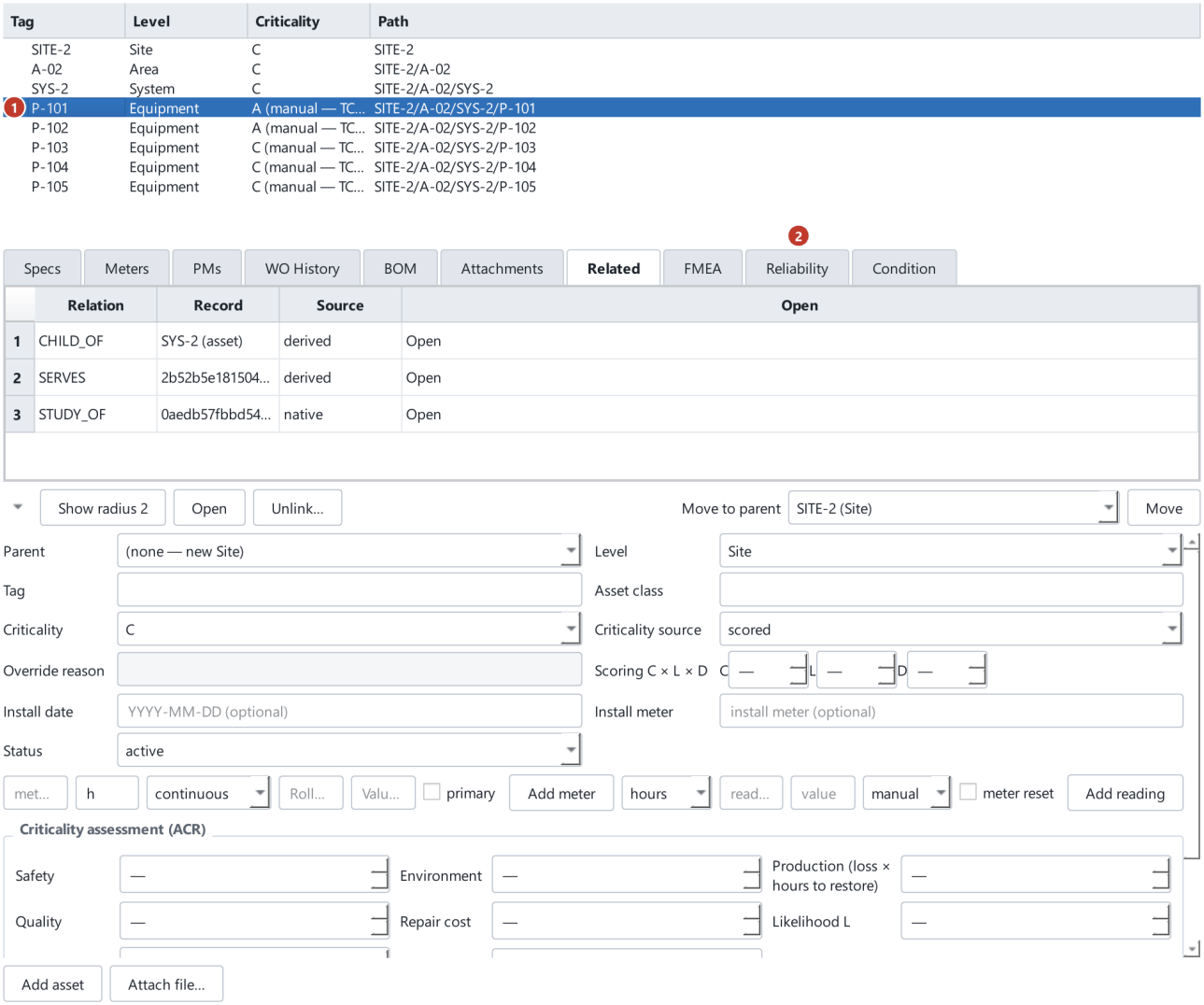
Situation	Use instead
You want the optimal replacement age and its costs	The PM interval card on the same tab - the chapter on the PM interval and spares policy
You want to rank and review failure modes across a system	System ▸ FMEA Study…

Part 2 — The example's input data

Setting. The pump P-101 wears out: its record gives β̂ 2.7226 and a B10 life of 1407.9062 h, and its PM interval card, on the plant's costs Cp 8,000 and Cf 40,000 baht, gives T* = 1,595 h. Its FMEA study has four failure modes.

Mode	S	O	D
Bearing seizure	7	5	4
Impeller wear	6	4	7
Casing rupture	9	2	7
Relief valve stuck	8	3	10

Input	Value
File in the worked-example zip	6-PM-Interval-RCM/ReliaEn-Five-Pump-Plant.reliaen - the five-pump plant with one FMEA study per pump; open a fresh copy for the example

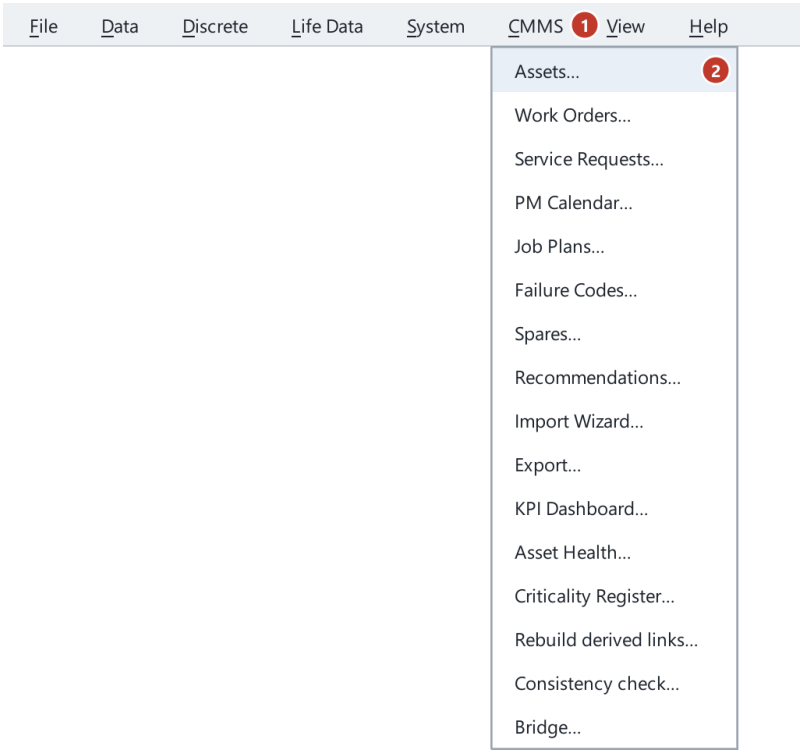


The example data: P-101 in the asset tree

- ① P-101: the pump of this example, in the plant's asset tree.
- ② The Reliability tab: its record, its PM interval card and its RCM table.

Part 3 — How to use it, step by step

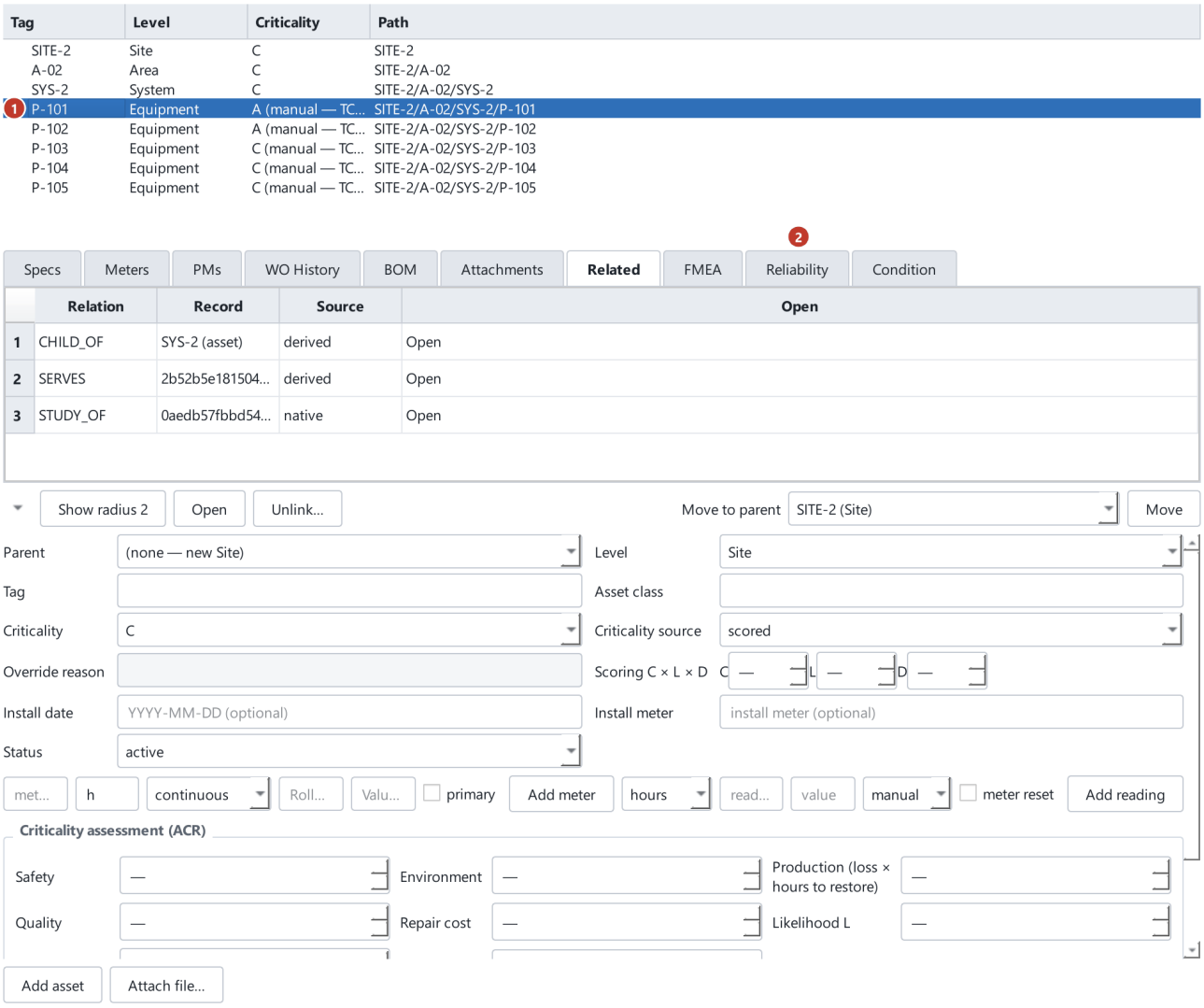
1. **Choose CMMS ▸ Assets…** in the menu bar. The first time in a session ReliaEn asks for the file in the box Open or create a CMMS file: choose your copy of ReliaEn-Five-Pump-Plant.reliaen. The window with the asset tree opens.



Step 1 — the menu path

- ① CMMS: the menu.
- ② Assets…: the entry to click.

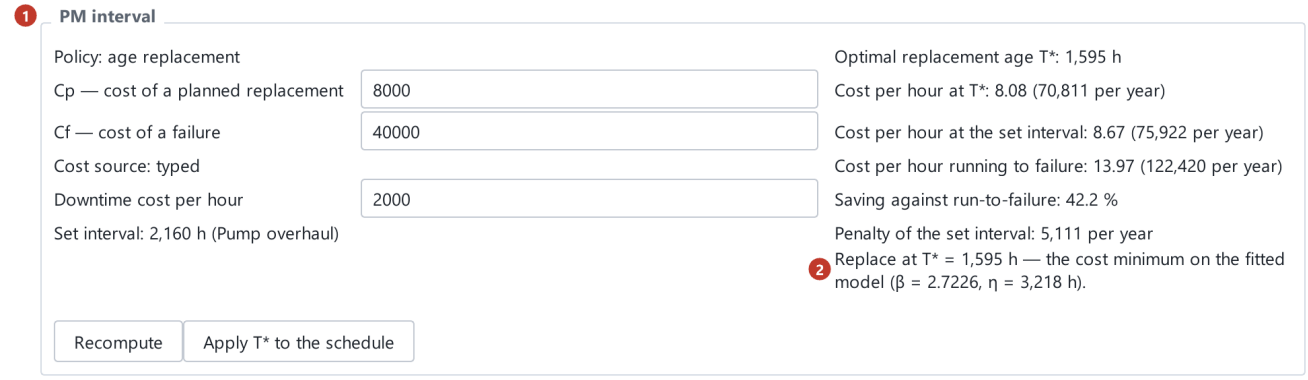
Steps 2 and 3 are marked ① and ② in the picture:



Steps 2 and 3 — P-101 and its Reliability tab

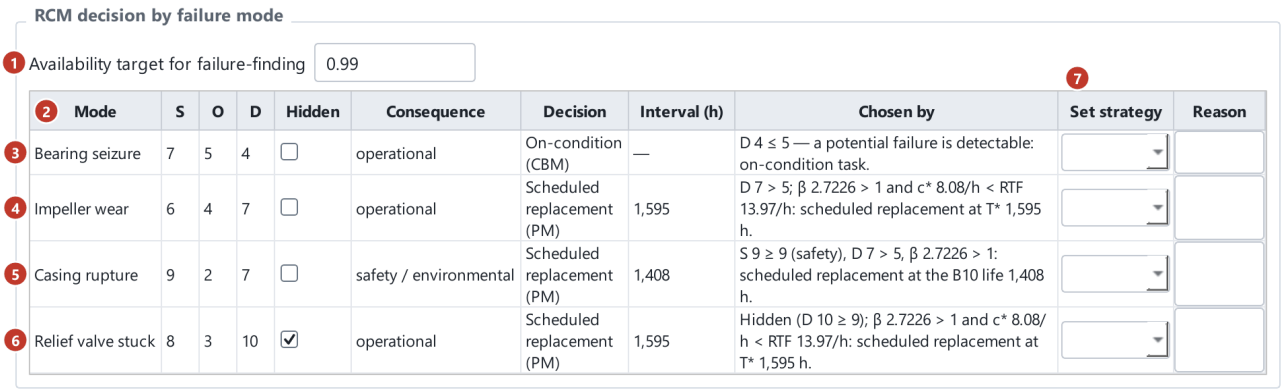
2. ① **Click P-101** in the asset tree.
3. ② **Click the Reliability tab.** ReliaEn shows P-101's reliability record, the PM interval card and, below them, the RCM table. Nothing is typed: ReliaEn decides from what the file holds.

Part 4 — The result, card by card



The PM interval card of P-101

- ① PM interval: the card above the table, calculated on the plant's costs Cp 8,000 baht and Cf 40,000 baht.
- ② The verdict line: Replace at T* = 1,595 h — the cost minimum on the fitted model (β = 2.7226, η = 3,218 h). The pump wears out and an age replacement pays; the table reads its T* from here.



The RCM table of P-101

- ① Availability target for failure-finding: 0.99, the default. It matters only for a failure-finding task; no row of this pump needs one.
- ② The column headings: Mode, S, O, D, Hidden, Consequence, Decision, Interval (h), Chosen by, Set strategy, Reason.
- ③ Bearing seizure (S 7, O 5, D 4): operational, On-condition (CBM), Interval (h) —. Chosen by: D 4 ≤ 5 — a potential failure is detectable: on-condition task.
- ④ Impeller wear (S 6, O 4, D 7): operational, Scheduled replacement (PM), Interval (h) 1,595. Chosen by: D 7 > 5; β 2.7226 > 1 and c* 8.08/h < RTF 13.97/h: scheduled replacement at T* 1,595 h.
- ⑤ Casing rupture (S 9, O 2, D 7): safety / environmental, Scheduled replacement (PM), Interval (h) 1,408. Chosen by: S 9 ≥ 9 (safety), D 7 > 5, β 2.7226 > 1: scheduled replacement at the B10 life 1,408 h.
- ⑥ Relief valve stuck (S 8, O 3, D 10): Hidden ticked, operational, Scheduled replacement (PM), Interval (h) 1,595. Chosen by: Hidden (D 10 ≥ 9); β 2.7226 > 1 and c* 8.08/h < RTF 13.97/h: scheduled replacement at T* 1,595 h.
- ⑦ Set strategy, and Reason beside it: blank on every row. The plant has recorded no strategy of its own.

Part 5 — How to interpret the results

The task for each failure mode. Bearing seizure gives warning before it happens (D 4), so vibration monitoring is the task: put it on the pump's condition route. Impeller wear cannot be seen in time (D 7), but the pump wears

out and replacing at T* costs 8.08 baht an hour against 13.97 baht an hour running to failure: plan it at 1,595 hours.

The safety failure. Casing rupture is a safety failure (S 9). ReliaEn replaces at the B10 life of 1,408 hours - earlier than the cost optimum - to keep the chance of a rupture low.

The hidden failure. The relief valve fails unseen (D 10). Because the pump wears out and replacement pays, it is replaced at T*, 1,595 hours, and no failure-finding test is needed.

What to put in the plan. When the tasks share one overhaul, the shorter interval governs: 1,408 hours. Read each Chosen by against what the plant knows before you accept it; where the plant follows another strategy, record it in Set strategy with its Reason - ReliaEn marks the row and keeps its own decision.