MAKING THE RIGHT CALL: REPAIR, REPLACE, OR EXTEND ASSET LIFE?

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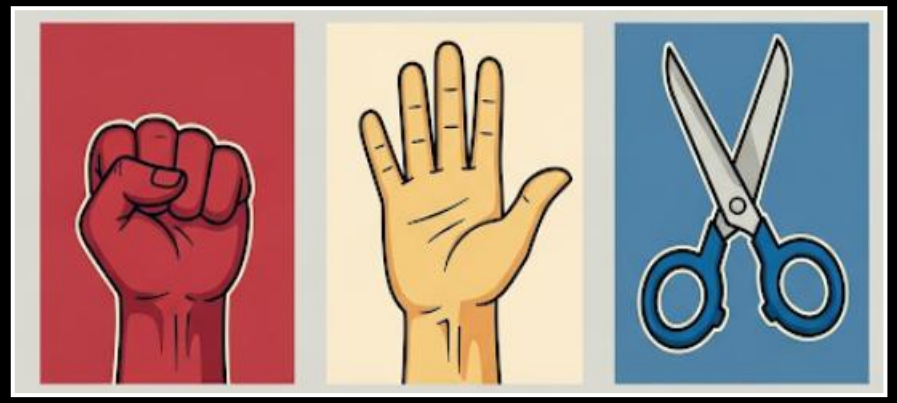


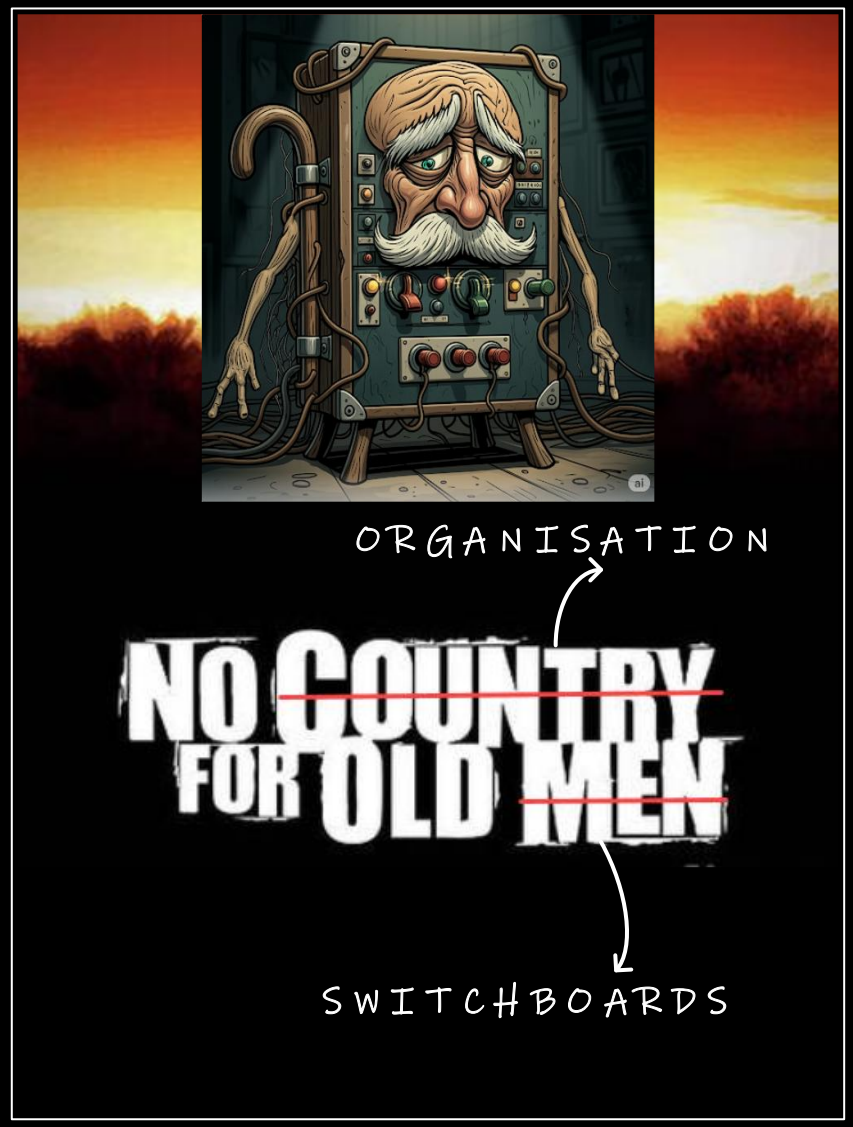
PROLOGUE

- As equipment reaches the end of its lifecycle, decisions become increasingly **complex.**

- Complexities in the water industry
  - Service discontinuity
  - Regulatory compliance
  - Environmental and Sustainability Goals
  - Cost and Funding Challenges

- The million-dollar question: repair, refurbish or replace?

CASE STUDY: **SWITCHBOARDS**



CHAPTER 1: THE PROBLEM

- Yarra Valley Water (YVW) identified that several of their facilities have electrical installations that may not comply with Australian and YVW standards.

- YVW did not have information on the condition of the asset class from an AS/NZS 3019 lens.

CHAPTER 2: **ECAP**

- YVW commences the Electrical Condition Assessment Program (ECAP) for approximately 200 main switchboards (2022-23).

- Yarra Valley Water (YVW) received reports from the contractors that contained the following information –
  - Condition of the asset (IPWEA): A score from 1 (very good) to 5 (very poor)
  - ***Test results of AS/NZS 3019***
  - Hazards associated with the asset and recommended rectification
  - ***NPV analysis***

Table 12 Asset Condition Results Summary

Group	Asset	Condition Assessment Technology (CAT)								
		Visual inspection – AS Compliance	Visual inspection – YVW Standard Compliance	Polarity	Polarisation	Insulation resistance	Earth Fault Impedance	Protective device fault rating	RCD verification	Thermography
Power Distribution Circuits	Mains Supply Isolator	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Generator Supply Isolator	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 1	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 2	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 3	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 4	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 5	✓	✓	✓	✓	N/A	✓	✓	N/A	N/A
	Pump 6	✓	✓	✓	✓	N/A	✓	✓	N/A	N/A
	Pump 7	✓	✓	✓	✓	N/A	✓	✓	N/A	✓
	Pump 8	✓	✓	✓	✓	N/A	✓	✓	N/A	✓

Table 15 NPV Analysis for Main Switchboard

ITEM	VALUE
Estimated cost of replacing entire switchboard	$395,600.00
Estimated Cost of remedial works	$7,700
Estimated residual book value of switchboard	$279,722.00
Estimated remaining switchboard life	20 years
Investment period	25 years
Inflation rate	2.5%
Company tax rate	30%
Discount Rate (Cost of Borrowing)	3.76%
NPV of replacing switchboard	-$676,580.91
NPV of repairing existing Switchboard	-$500,018.73
NPV saving by performing rectification works	$176,562.18
Entire switchboard replacement recommended?	No

CHAPTER 3: **NPV ANALYSIS**

- Based on the NPV reports, YVW started assessing the switchboards that were flagged to be replaced in the NPV analysis.
- Even though the NPV analysis triggered a replacement, YVW found a **discrepancy** between the NPV advice and the asset condition.
- This discrepancy skewed the organisation's capital renewals program as the switchboards that were flagged for replacement increased significantly.

TYPICAL SEWAGE PUMP STATION MAIN SWITCHBOARD

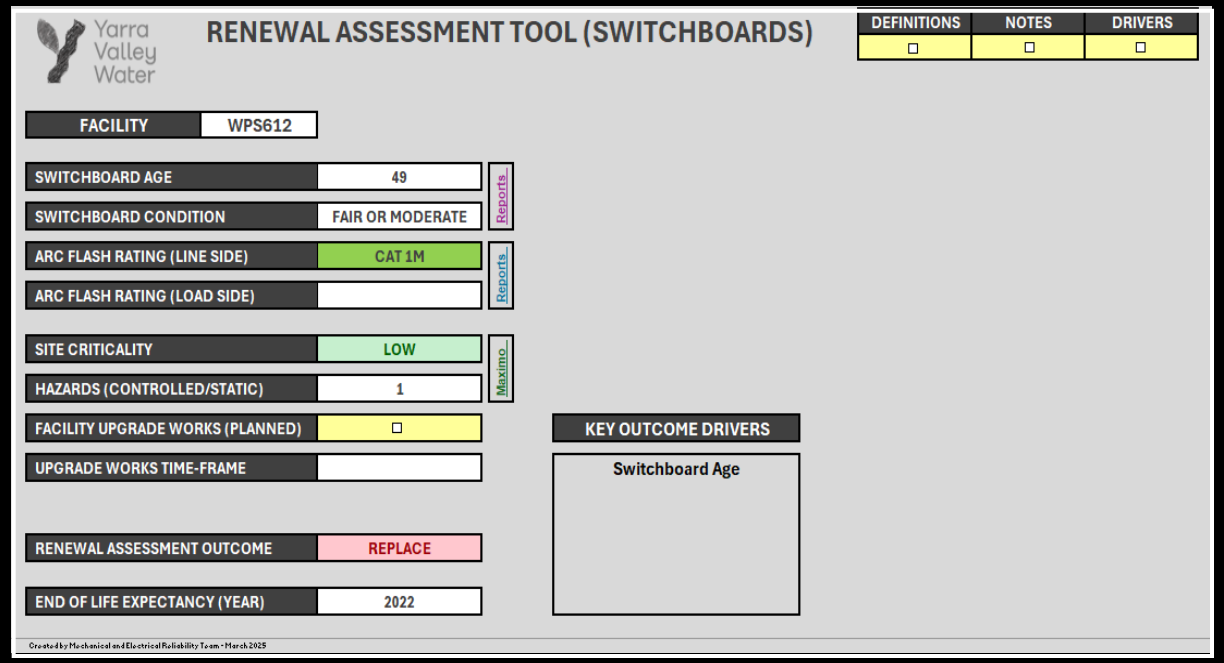
CHAPTER 4: THE TOOL

- This triggered a review exercise that led to the creation of the Renewal Assessment Tool.

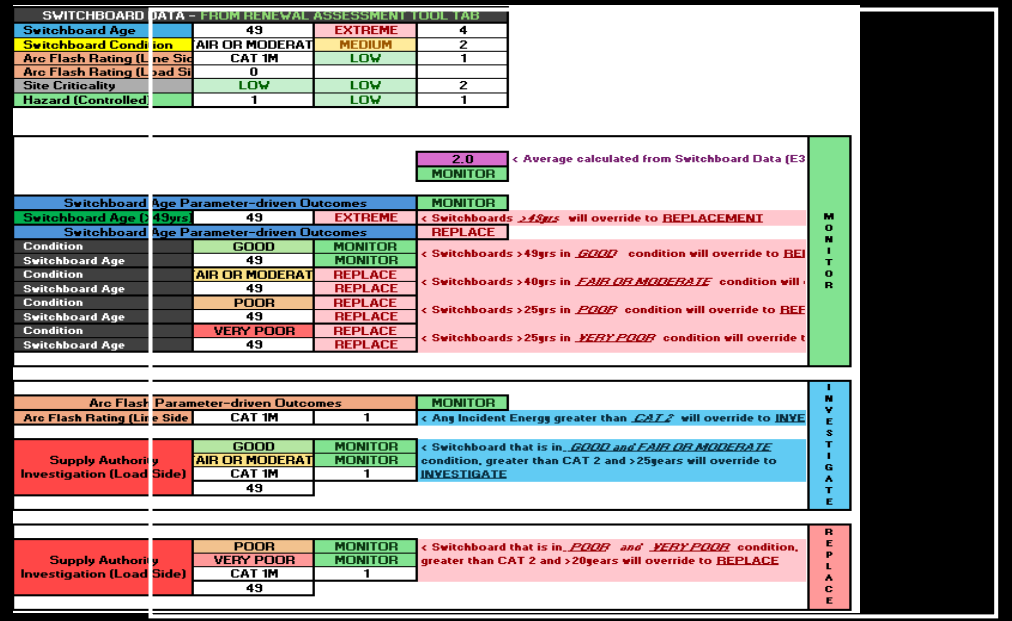
- This tool weighted and rated the different variables that contributed to the decision of replacing a switchboard –
  - Age
  - Condition
  - Hazards
  - Arc flash rating
  - Site criticality

- One **major difference** in the input of the tool was that the usable age of the switchboard was 49 years, which was based on the empirical data of the existing YVW switchboards.

- The use of the tool changed the CAPEX profiling of the switchboards. As a result, YVW saw fewer switchboards being replaced in a financial year.



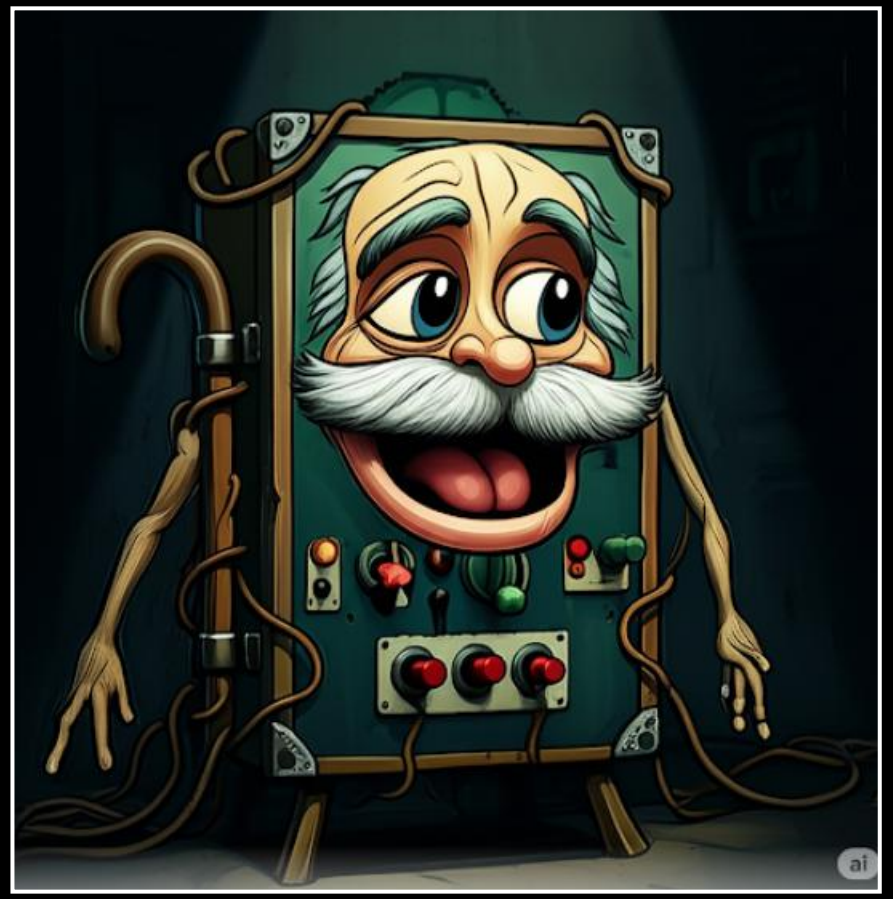
SWITCHBOARD RENEWAL ASSESSMENT TOOL (FRONT END)



SWITCHBOARD RENEWAL ASSESSMENT TOOL (BACK END)

CHAPTER 5: **COROLLARY**

- Optimised capital renewal plan due to fewer switchboards replaced per year. This resulted in an improvement in the pricing submission.
- Gave YVW an advantage to build a case for the upliftment of the maintenance plan of the switchboards.
- Significant milestone in the journey to achieving the preventative: reactive maintenance budget ratio of 70:30.
- Maximum utilisation of the asset, whilst maintaining its safety and reliability.



QUESTIONS?