

# 25-Year-Old Power Transformer

Oil Test Report Shows:

Moisture	DP	Furan
40 ppm	609	215 ppb

Why ppm alone does not a sufficient decision risk.



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## 1 Moisture In Oil Is Thermodynamically Dependent

Moisture solubility in mineral oil increases exponentially with temperature.



40 ppm at 25°C

≠



40 ppm at 70°C

RS% ≡ a key moisture risk

RS% a key metric

## 2 Oil Moisture ≠ Paper Moisture

- 90–95% of total moisture mass resides in cellulose
- Oil acts primarily as a transport medium
- Moisture distribution follows equilibrium curves (temperature dependent)

## 3 Before Any Intervention

- RS% at operating temperature
- DP (remaining mechanical strength)
- Furan trend (rate of rise, not single value)
- Tan delta / Power factor trend
- Asset criticality

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Technical Justification for Moisture Management

Mid-life, thermally active transformers