Transformer Health Assessment Report

TR-002: Beta Industrial Transformer

Executive Summary

Parameter	Value
Status	⚠️ WARNING
Health Score	68/100
Risk Level	Moderate
Scenario	Insulation Degradation

Transformer Information

Attribute	Details
Transformer ID	TR-002
Name	Beta Industrial Transformer
Location	Northern Industrial Zone
Rating	75 MVA
Voltage	230/33 kV
Age	15 years
Last Maintenance	2025-03-20
Next Scheduled	2026-02-01

Current Operating Parameters

Temperature Readings - ⚠️ Elevated

- **Top Oil Temperature:** 68°C (Normal: <65°C) ⚠️
- **Winding Temperature:** 82°C (Normal: <90°C) ⚠️ Near limit

- **Current Load:** 85% of rated capacity

Oil Quality Parameters

Parameter	Value	Limit	Status
Moisture Content	32 ppm	<25 ppm	⚠️ Elevated
Tan Delta	1.85%	<1.0%	❌ High
Breakdown Voltage	42 kV	>50 kV	⚠️ Low

Dissolved Gas Analysis (DGA)

Gas	Concentration	Limit	Status
Hydrogen (H_2)	125 ppm	<100 ppm	⚠️ Elevated
Methane (CH_4)	78 ppm	<50 ppm	⚠️ Elevated
Acetylene (C_2H_2)	2 ppm	<3 ppm	⚠️ Monitor
Carbon Monoxide (CO)	285 ppm	<300 ppm	⚠️ Near limit
Carbon Dioxide (CO_2)	1450 ppm	<2500 ppm	✅ Normal

Assessment Summary

Diagnosis: Progressive insulation system degradation with elevated Tan Delta values and increasing moisture content. Furan analysis indicates paper aging consistent with thermal stress over 15 years of operation.

Risk Factors

- High moisture content in oil-paper system
- Elevated Tan Delta indicating dielectric losses
- Paper aging (DP reduction detected)
- High operating temperature under heavy load

Recommendations

1. Schedule oil treatment within 30 days
2. Perform Dielectric Response Analysis (DRA)
3. Consider load reduction during peak periods
4. Plan for comprehensive insulation assessment

Report Generated: January 12, 2026
Classification: Warning - Planned Maintenance Required