


Transformer Health Assessment Report

TR-004: Delta Regional Transformer

Executive Summary



Parameter	Value
Status	 WARNING
Health Score	72/100
Risk Level	Moderate
Scenario	Moisture Ingress

Transformer Information

Attribute	Details
Transformer ID	TR-004
Name	Delta Regional Transformer
Location	Western Grid - Zone C
Rating	40 MVA
Voltage	115/11 kV
Age	6 years
Last Maintenance	2025-05-12
Next Scheduled	2026-01-20

Current Operating Parameters

Temperature Readings

- **Top Oil Temperature:** 55°C (Normal: <65°C) 
- **Winding Temperature:** 65°C (Normal: <90°C) 

- **Current Load:** 58% of rated capacity

Oil Quality Parameters - ⚠ Moisture Issue

Parameter	Value	Limit	Status
Moisture Content	48 ppm	<25 ppm	❌ HIGH
Tan Delta	1.12%	<1.0%	⚠ Elevated
Breakdown Voltage	35 kV	>50 kV	❌ LOW

Dissolved Gas Analysis (DGA)

Gas	Concentration	Limit	Status
Hydrogen (H ₂)	85 ppm	<100 ppm	✅ Normal
Methane (CH ₄)	52 ppm	<50 ppm	⚠ Slight
Acetylene (C ₂ H ₂)	0 ppm	<3 ppm	✅ Good
Carbon Monoxide (CO)	165 ppm	<300 ppm	✅ Normal
Carbon Dioxide (CO ₂)	980 ppm	<2500 ppm	✅ Normal

Assessment Summary

Diagnosis: Progressive moisture contamination detected. The source is identified as a malfunctioning silica gel breather combined with suspected gasket degradation. Breakdown voltage has declined significantly.

Root Cause Analysis

1. **Primary:** Breather malfunction allowing moisture ingress
2. **Secondary:** Possible gasket degradation at tank seams
3. **Contributing:** Temperature cycling causing condensation

Risk Factors

- High moisture content (48 ppm vs 25 ppm limit)
- Critically low breakdown voltage (35 kV)
- Breather malfunction confirmed
- Gasket degradation suspected

Recommendations

1. **Immediate:** Replace silica gel breather
 2. **Within 14 days:** Schedule vacuum dehydration treatment
 3. **During treatment:** Inspect all gaskets for deterioration
 4. **Post-treatment:** Verify oil quality improvement
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Report Generated: January 12, 2026

Classification: Warning - Corrective Action Required