REACTANCE
Power Engineering

Comprehensive Modernization of a 60 MVA 132 kV Power Transformer

PROJECT OVERVIEW

CASE STUDY 01

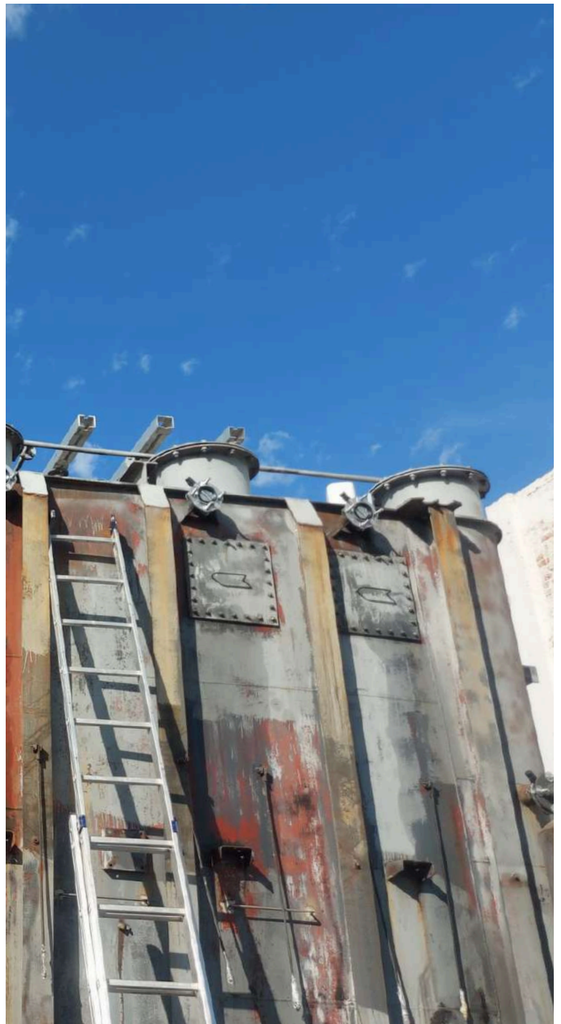
Comprehensive Modernization of a 60 MVA
132 kV Power Transformer

OVERVIEW

Asset: 60 MVA 132 kV Power Transformer
Year of Manufacture: 1992
Service Life: 29 Years

OBJECTIVE

Lifecycle extension, structural refurbishment, and digital integration.



THE CHALLENGE

After nearly three decades of continuous operation without a major overhaul, this 60 MVA unit required more than just routine maintenance. Reactance was commissioned to perform a full internal inspection and a deep modernization to bring the asset up to modern monitoring and reliability standards.

Despite the transformer maintaining stable Dissolved Gas Analysis (DGA) and electrical test results, its age and nearly 30 years of thermal cycling necessitated a proactive intervention. The goal was to transform a "blind" legacy asset into a modernized unit capable of precision monitoring, while ensuring its structural integrity for the next decade of service.

INTERNAL AUDIT & ACTIVE PART INSPECTION

The process began with a controlled tank opening. To prevent insulation degradation, the active part was pre-heated to +50°C before exposure

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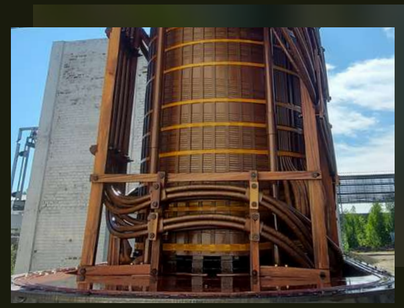

OUR TECHNICAL APPROACH

- **Core & Grounding**: We conducted a rigorous check of the magnetic circuit. All grounding pins and yoke beams were tested for unintended contact; the magnetic system remained perfectly isolated and centered.
- **Structural Integrity**: While the windings were in satisfactory condition, we identified and cleared mechanical debris (insulation scraps and fasteners) from the tank floor. All core-clamping bolts were re-torqued to factory specifications to prevent vibration-induced wear.
- **Insulation Refurbishment**: We identified minor cracking in the varnished cloth insulation on the leads. While non-critical, these were addressed to ensure long-term dielectric strength.

TANK MODERNIZATION & DIGITAL INTEGRATION

To align the 1992 unit with modern Grid 4.0 requirements,
we performed extensive structural modifications

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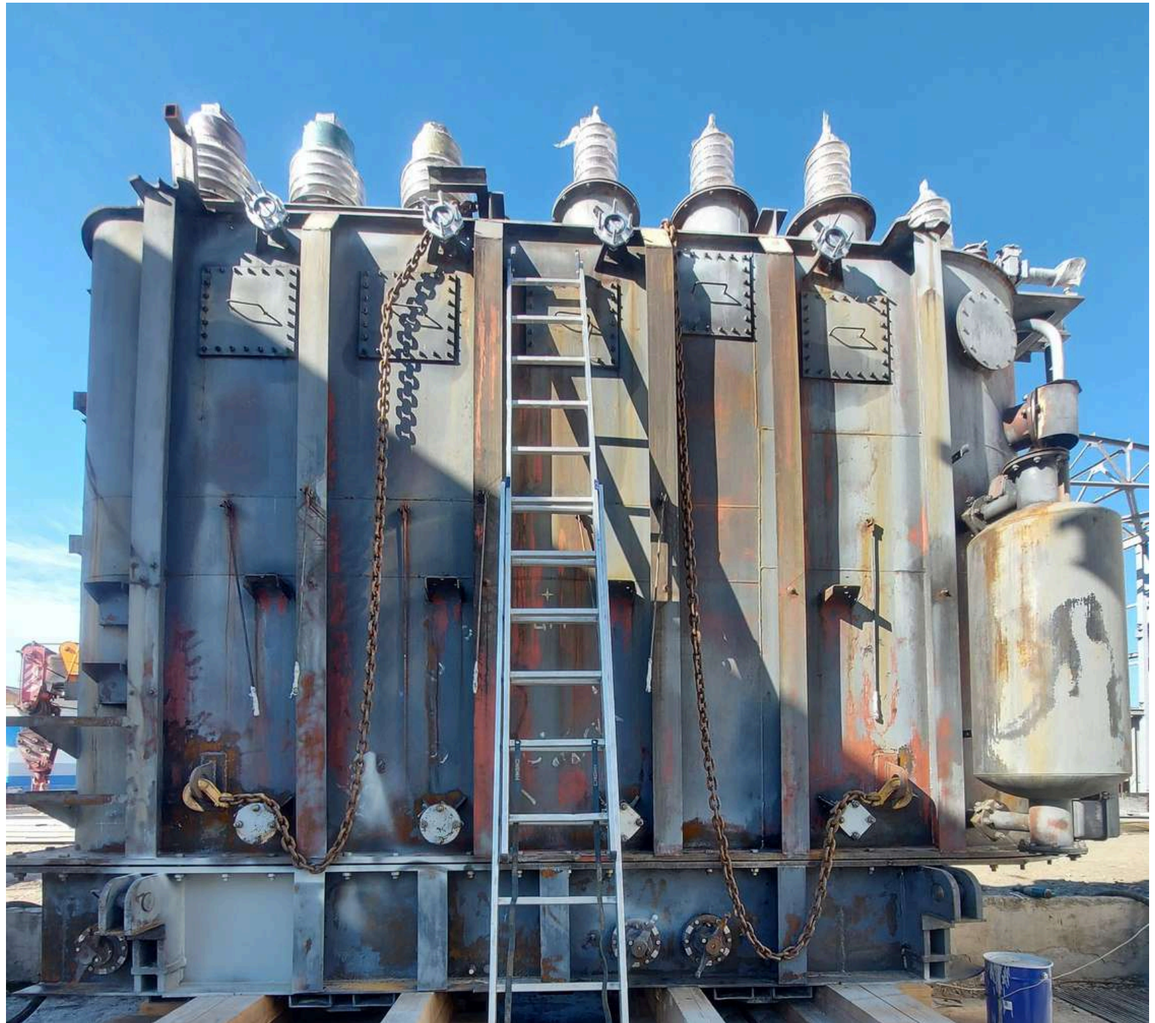

ONLY TRUSTED SUPPLIERS

- **Instrumentation**: Welded new thermowells and flanges to accommodate advanced temperature sensors and an automated gas analyzer.
- **Infrastructure**: Replaced all legacy valves, cooling system shut-off valves, and the pressure relief valve.
- **Seal Integrity**: A 100% replacement of gaskets and seals (main tank, OLTC, and hatches) was performed to ensure a leak-free environment.

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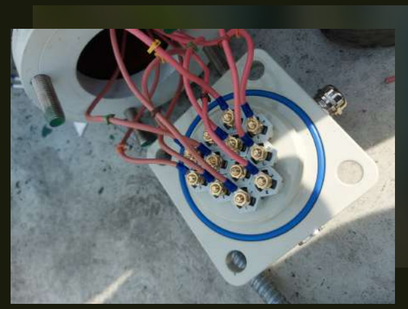
COMPONENT UPGRADES

To extend the transformer's predicted lifespan and ensure long-term operational stability, we replaced crucial legacy components.

CRUCIAL UPGRADES FOR AN EXTENDED LIFESPAN

- **Bushings & CTs**: Installed new high-voltage bushings (HV-0, MV-0) and current transformers across all phases.
- **Moisture Management**: Mounted new dehydrating breathers to maintain oil dielectric health.
- **Control Systems**: Installed a new terminal cabinet and cooling system control cabinet, including a full suite of control cabling



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THE RESULT

The transformer successfully passed all post-modernization electrical tests and oil analysis

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