

federal

power transformers

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Federal Power Transformers LLC
based in Abu Dhabi, UAE



CONTENTS

The Company	03
Design Process.....	05
Manufacturing	07
Testing	11
Quality	13
After Sales Support & Other Services.....	15
Satisfied Customers	16

The Company

A UAE manufacturing company
with specific and dedicated
facility at ICAD1, Abu Dhabi



Federal Power Transformers LLC (FPT) is an ISO 9001:2008 Company established in 2006. It is currently registered in UAE with a specific and dedicated facility at ICAD1 – Abu Dhabi, for the manufacture of Power transformers.

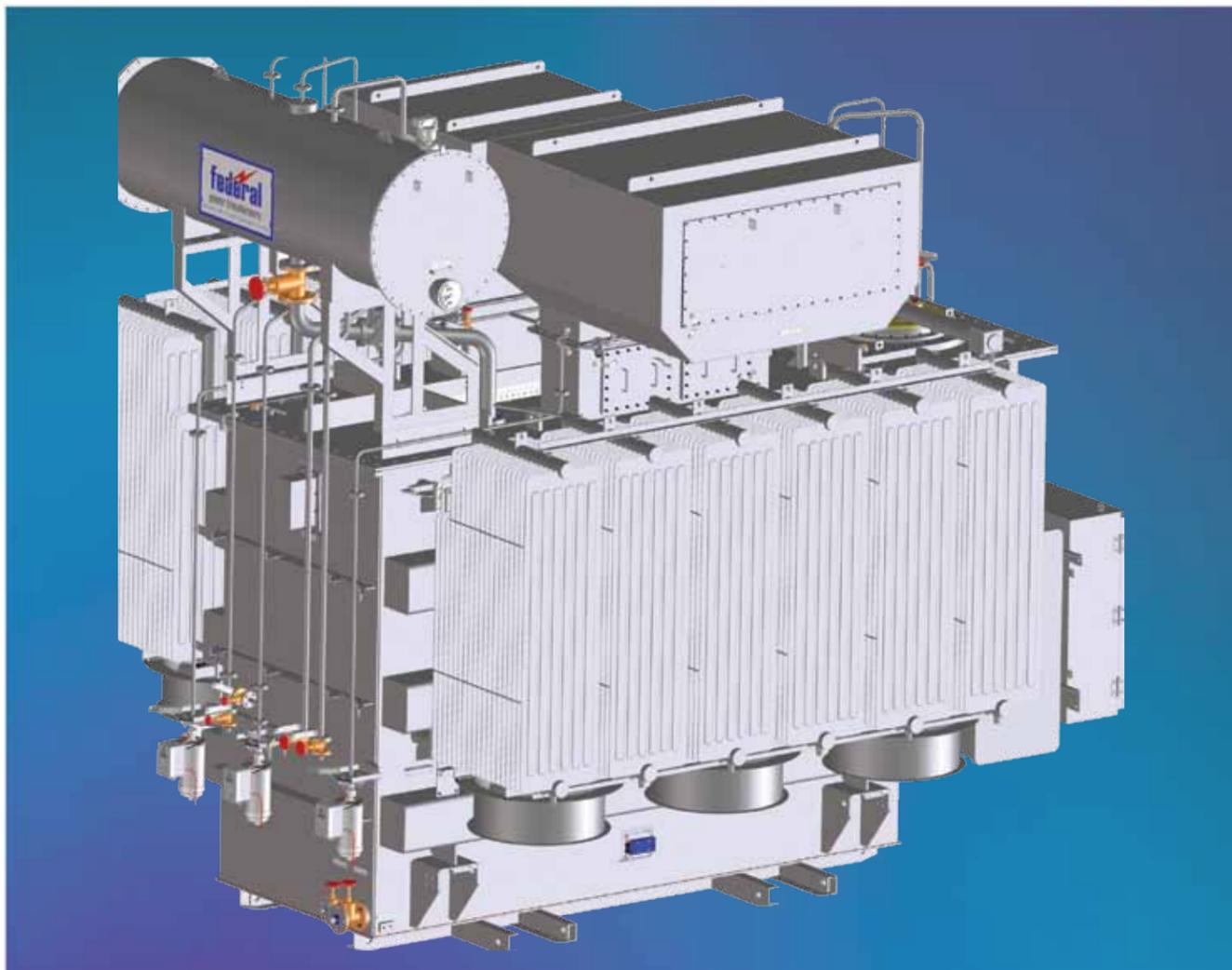
FPT manufactures a range of power transformers up to **150 MVA, 220kV** class along with a comprehensive repair facility offering refurbishment of transformers and overhaul of Tap Changers. Innovative product development and a highly advanced manufacturing system ensures that the products meet the needs of today's market by combining the latest technology with reliability and cost-effectiveness.

The products are designed, manufactured & tested to comply with national and international standards including IEC-60076/ ANSI C57/BS-171. The plant has a dust free, air conditioned environment and employs state-of-the-art technology.



Design Process

A highly innovative and experienced design team makes sure the international standards are adhered to throughout the process



Design Capabilities & Facilities

A highly innovative and experienced design team ensures use of FEM analysis and Test result analysis on regular basis to get an accurate estimation of performance figures. Every transformer is designed to actual dimensions in 3D ME-10 CAD system package to ensure the correct fixing of all fittings and accessories. 2D drawings are then produced from these 3D models for manufacturing and purchase purpose. 3D and 2D FEM analysis are used for Electromagnetic and Electrostatic distribution to finalise the winding, insulation and Core clamp structure design.

Short Circuit Strength

Transformer windings are severely affected by electromagnetic force due to short-circuit currents passing through the windings. The current carried by the winding conductors (circumferential direction) interact with leakage flux and produces force or produce forces. The leakage flux is mostly in the axial direction (except in the ends of the windings) and hence the max radial force occurs around the mid height of the coils. Radial forces act outward on the outer winding and inward

on the inner winding. As the inner winding is exposed to buckling force, the core supports it securely and bonded transposed stranded conductors are used to further improve its hardness. For the outer winding, hardened copper conductors are used.

Near the ends of the windings a large part of the leakage flux bends towards the core leg and thereby creates a radial component of the flux. The interaction of this radial component of the flux with the winding current produces axial forces that tend to compress the winding conductors along the vertical axis. By estimating the proper force on the coils the core clamp structure strength is designed to take care of these forces. By properly balancing the Ampere turns of LV and HV windings the imbalanced axial force is minimised. Short-circuit tests have been conducted on some of our power transformers by KEMA in the Netherlands. These have passed the tests successfully and the impedance variation is 0.0%. The allowed variation is 2.0% as per IEC. This shows the integrity of Design calculations and process followed by Federal Power Transformers.

Manufacturing

The core employs a mitred step-lap design ensuring **minimum noise and loss level**



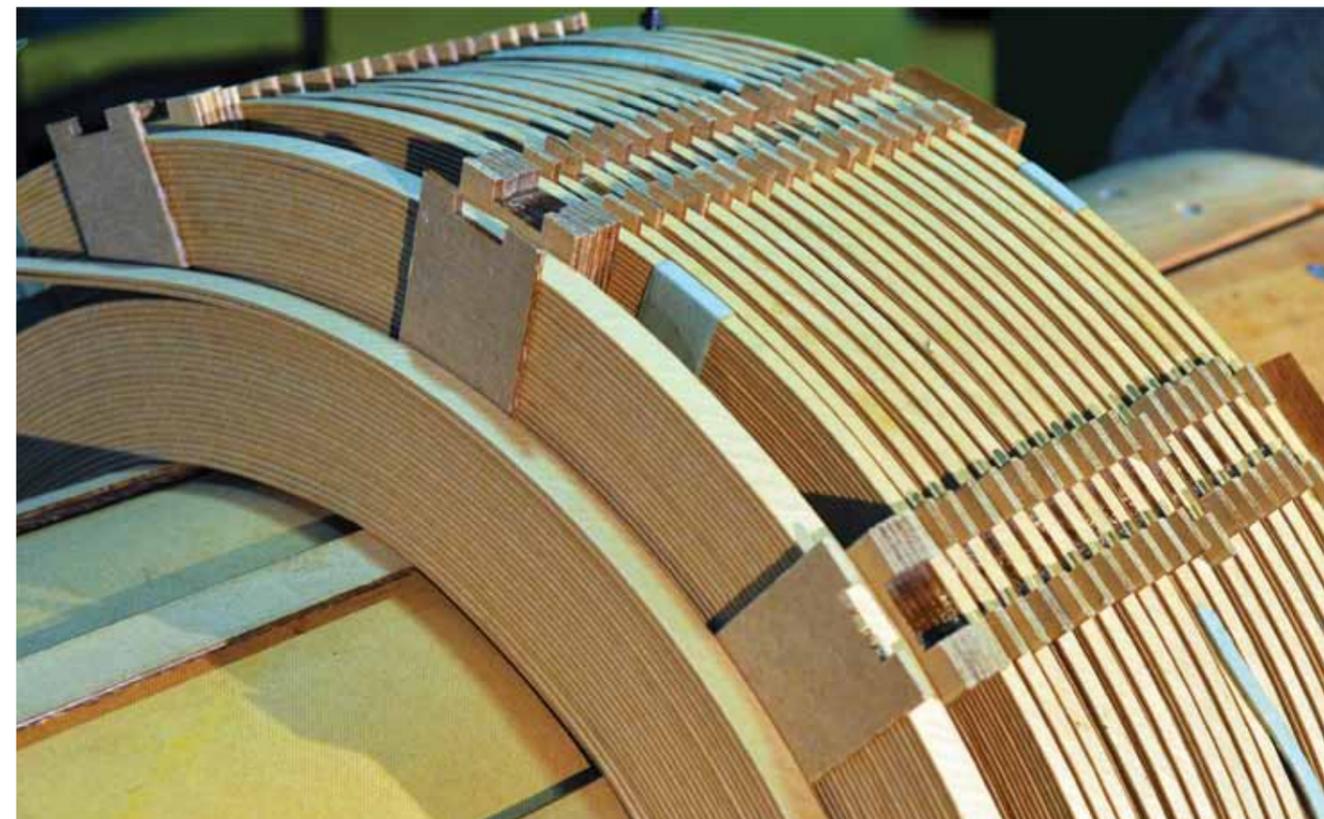
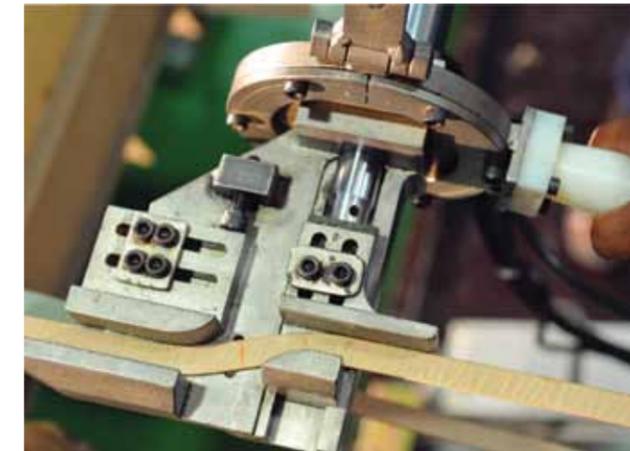
The Core

Each transformer core is produced using a computer-controlled Georg cutting machine and by using interleaved laminations of cold rolled, grain orientated, low loss electrical sheet steel conforming to BSEN 10107 and other international standards. The core employs a mitred step-lap design ensuring minimum noise and loss levels with uniform flux distribution throughout the magnetic circuit.

Windings & Insulation

All windings are manufactured to exacting standards in order to maintain strict dimensional tolerances. Clamping to a pre-determined load pressure during manufacture ensures that each winding is able to withstand the excessive axial forces which may result from external and short-circuit events.

All principal components of insulation are pre-fabricated from electrical grade insulating board and are pre-shrunk to ensure electrical and mechanical stability throughout the temperatures found in operational service.



Manufacturing

The completed core-coil assembly is dried in a PLC controlled vacuum drying chamber

Core-Coil Assembly

Each core-coil assembly is rigidly braced using steel frames, distributing the axial clamping forces around the entire circumference of the windings. Optimum dielectric strength is achieved via processing in accordance with rigorous in-house quality procedures.



Tanking

The completed core-coil assembly is dried in a PLC controlled vacuum drying oven. The dried active parts are fitted into the transformer tank and oil is filled under vacuum through a filtration machine.



Final Assembly

When the tanking process is completed all accessories are fitted.

- Bushings (Oil to Oil, Oil to SF6, Oil to Air Condenser, Porcelain, Plug-in type, Monoblock)
- Conservator with hydrocompensator (Air bag)
- Maintenance free breathers
- Remote Control Panels for automatic voltage regulation of OLTC
- Hydran/Callisto online gas monitoring devices
- Other customer specific fittings/instruments

After the final assembly process is completed the oil is filtered again and allowed to settle before the transformer is moved to the test bay.



Testing

The testing lab is fully equipped with **state-of-the-art apparatus** to carry out routine and type tests

Test Facilities Available

- Testing at 50Hz and 60Hz
- 2.65 MVA Power Regulator, which when operated in conjunction with the capacitor banks, provides power for temperature rise tests at full ratings for units up to 150MVA 220kV
- 200Hz MG set for induced over voltage test
- Haefely Impulse Test system with Impulse Analysing system type Hias 743
- Haefely Partial Discharge Detector for corona (partial discharge measurement)
- Haefely Tan Delta and Capacitance Bridge for measuring capacitance and loss angle measurements
- Flash Transformer for SSV Test
- Bruel and Kjaer sound level measuring equipment for sound level and spectrum frequency analysis
- SFRA testing
- Oil Testing



Quality

Federal Power Transformers LLC has approved Quality and EHS Management Systems conforming to ISO 9001, ISO 14001, OHSAS 18001, Test Lab accredited to ISO 17025 and IDB - Department of Economic Development(AD) EHSMS



Quality Management

Federal Power Transformers LLC operates a Quality Management System conforming to ISO 9001:2008 and Transformer Testing Lab accredited to ISO 17025:2005.

Rigorous inspection at every stage and testing after every sequence of operation is carried out with the help of check sheets and procedures to check conformity with the design and specifications at critical process steps such as winding, coil pressing, handling and stacking of laminations, coil assembly, connection, drying, tanking, oil filling, etc.

Incoming materials are procured from FPT approved sources and are subjected to rigorous quality checks as per rigid internal standards based on BS, IEC and FPT standards & practices.

The accuracy and consistency of the product is maintained through strictly following the laid down inspection and test procedures especially in critical areas such as winding, core coil assembly, drying of active parts, tanking and oil filling.

The whole Quality Management System is under constant review and is audited periodically. This is to ensure that at each stage the work is carried out to customer requirements and satisfaction.

EHS Management

Federal Power Transformers LLC has certified OHSAS 18001:2007 and EMS ISO14001:2004 by Intertek, a reputed certification agency. Our EHS Management System is also approved by Industrial Development Bureau - Department of Economic Development, Abu Dhabi, the local government body.



After Sales Support & Other Services



A highly dedicated
and experienced
after sales team

Services Offered

- Erection & Commissioning
- Repair & Refurbishment of Power transformers
- Oil filling under vacuum at site
- Oil Filtration and Testing: DGA, BDV, degree of polymerization, Moisture content.
- Oil Passivation
- Refurbishment of Tap-changers
- Spares
- Site and Commissioning Tests
- Life time Assessment and health checks of Transformers
- Annual Maintenance Contracts
- Uprating of Transformers
- Routine and Type testing of Transformers in our facility



Satisfied Customers



Benefits to Our Customers:

COMPETITIVE

- The ability to offer competitive prices compared to other quality transformer manufacturers

RESPONSIVENESS

- Preferential treatment for capacity is given to local customers, a key issue when transformer demand exceeds capacity

RELIABLE SUPPLY

- The local manufacturing location reduces the risk of transit damage, a potential problem when transformers are shipped from overseas

DEDICATED TECHNICAL SUPPORT

- Federal Power Transformers has its own dedicated team of Service Engineers providing local technical field support
- High level of support for local customers - a key offering of Federal Power Transformers

LOCAL

- A UAE manufacturing company with specific and dedicated facility at ICAD1, Abu Dhabi contributing to the local economy

Customers Served

Belco	Bermuda
Bhilai Steel Plant	India
Eni	Iran
Gecol	Libya
GE	Malaysia
KAHRAMAA	Qatar
RAS GAS	Qatar
Saudi Kayan	Saudi Arabia
SEC	Saudi Arabia
SABIC	Saudi Arabia
Kenana Sugar Co.	Sudan
Invista	Taiwan
Neal and Masey Energy	Trinidad & Tobago
Emirates Steel Co	UAE
ADCO	UAE
ADMA-OPCO	UAE
ADWEA	UAE
Dubal	UAE
Dugas	UAE
GASCO	UAE
ZADCO	UAE
TOTAL	Yemen

The manufacturing location reduces the risk of transit damage



Contact us



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