Transformer FAT · Witnessed in the manufacturer's test bay · PRC

Transformer FAT witness report

Sinospect Industrial Company Limited.
Sinospect sources, quality-controls and delivers industrial equipment from China.

Fictional worked example. The project, identifiers, readings and findings are invented to show how a transformer witness report is set out; no client job is reproduced.

Equipment under test
One 20 MVA, 33/11 kV, 50 Hz, ONAN, Dyn11 oil-immersed power transformer with on-load tap changer, ±8 × 1.25% · S/N [Identifier]

Manufacturer
[Manufacturer] · [Factory location]

Prepared for
[Client company]

Order & test basis
[PO reference] · technical schedule rev. C · FAT programme rev. 2, approved by the buyer · IEC 60076-1 and IEC 60076-3 test methods; loss limits from the order annex

Report reference
SAMPLE-TFAT

Test dates & location
[Day 1] and [Day 2] · manufacturer's test bay, [Factory location]

Prepared by
Sinospect witnessing engineer · [Date]

Reviewed & issued by
Sinospect quality desk · [Date]

Recommendation of record

Hold, pending the buyer's decision on losses

Every dielectric test was withstood and the ratio, impedance and tap changer results are inside their limits. Total losses are 123.0 kW against a contract limit of 117.6 kW (NC-01, Major). They would pass the IEC default tolerance, but the order annex is tighter and the order decides. The buyer keeps the release decision and any remedy under the contract.

Three recorded states

- Released: every programme item passed as witnessed
- Release with conditions: findings listed, each with its owner and closure evidence
- **Hold: the failing item stated, with what closes it**

§	Report section	State
01	Identity against the order: rating plate, serial numbers, tap changer, bushings	**1 Minor**
02	Test conditions, instruments and attendance	**Recorded**
03	Measured values against guaranteed figures and limits	**1 Major**
04	Dielectric, tap changer and leak tests; what was and was not witnessed	**Withstood**
05	Findings register and release conditions	**1 Major · 2 Minor**

01 Identity against the order

Each row compares the order's technical schedule with what the plate or the part shows, read and photographed on Day 1 before any test started.

Item	Technical schedule rev. C	As found	Result
Rating plate	20 MVA ONAN, 33/11 kV, 50 Hz, Dyn11, impedance 10.0% at principal tap	As schedule; serial number recorded	**Pass**
Insulation levels	HV Um 36 kV: LI 170 kV, AC 70 kV. LV Um 12 kV: LI 75 kV, AC 28 kV	As schedule	**Pass**
Tap changer	On-load, HV side, ±8 × 1.25%, [Tap changer model]	Model and serial as ordered; 17 positions	**Pass**
Bushings	HV 36 kV, LV 12 kV, porcelain, creepage as schedule	Type plates as schedule; serials recorded	**Pass**
Tap table on the plate	Impedance stated at principal and both extreme taps	Principal tap only	**Minor · NC-02**
Accessories	Buchholz relay, pressure relief device, oil and winding temperature indicators	Fitted; serials recorded	**Pass**

02 Test conditions and basis of witnessing

Condition	Recorded	Attendance	Recorded
Instruments	Manufacturer's power analyser, current and voltage transformers, resistance bridge and impulse divider; each calibration certificate sighted and in date on the test days; references in the file	Sinospect	Witnessing engineer, both days, 08:30 to 18:30
Winding temperature	27.4 °C, the mean of top and bottom oil after the unit stood untouched overnight; see the note in section 03	Manufacturer	Test-bay supervisor, test engineer, quality engineer
Supply	50 Hz test generator for losses; waveform checked on the analyser, form factor correction applied to no-load loss	Buyer	Not present; readings and findings in this report
Unit state	Fully assembled with bushings and tap changer, oil filled, radiators fitted	Basis	Readings taken by the witness; the manufacturer's own test sheets compared, not relied on

The test is only as good as the instruments behind it. Each certificate reference is listed so someone who was not in the room can check that the reading on the page came from an instrument in calibration on the day.

03 Measured values against guaranteed figures and limits

Routine tests of IEC 60076-1. Each limit is the IEC default unless the order annex sets a tighter one, and the annex sets one for total losses. Losses are at principal tap, load loss corrected to 75 °C.

Quantity	Guaranteed	Limit	Source of limit	Measured	Result
No-load loss	14.0 kW	16.1 kW (+15%)	IEC default	14.6 kW	**Pass**
Load loss, 75 °C	98.0 kW	112.7 kW (+15%)	IEC default	108.4 kW	**Pass**
Total losses	112.0 kW	117.6 kW (+5%)	Order annex	123.0 kW (+9.8%)	**Fail · NC-01**
No-load current	0.35%	0.455% (+30%)	IEC default	0.31%	**Pass**
Impedance, principal tap	10.0%	9.25–10.75% (±7.5%)	IEC default	10.38%	**Pass**
Impedance, tap 1	10.6%	9.54–11.66% (±10%)	IEC default	10.82%	**Pass**
Impedance, tap 17	9.6%	8.16–11.04% (±15%)	IEC default	9.71%	**Pass**
Voltage ratio, principal tap	33/11 kV	±0.5%	IEC default	+0.21% largest phase	**Pass**
Phase displacement	Dyn11	As plate	Rating plate	Dyn11	**Pass**
Winding resistance, imbalance	Not guaranteed	2% HV and LV	FAT programme	HV 0.6%, LV 0.9%	**Pass**

The 123.0 kW total would pass the IEC default of +10%. It fails because the order annex allows +5%: the contract value decides, so a report that quotes only the standard's tolerance would have shown a pass here.

3.1 · A disputed reading, recorded as disputed

Point	Manufacturer's sheet	Witness record
Winding temperature used for the 75 °C correction	30.0 °C, the test-bay room thermometer	27.4 °C, the mean of top and bottom oil
Load loss at 75 °C	107.7 kW	108.4 kW
Total losses	122.3 kW	123.0 kW

The manufacturer did not accept the correction on the day, so both figures stay on the record. Either figure is above the 117.6 kW limit: the dispute does not change NC-01.

04 Dielectric, tap changer and leak tests

Test	Class	Programme value	Basis	Result
Separate source AC, HV	Routine	70 kV, 60 s	Witnessed	**Withstood**
Separate source AC, LV	Routine	28 kV, 60 s	Witnessed	**Withstood**
Induced voltage withstand	Routine	Twice rated voltage, 200 Hz, 30 s	Witnessed	**Withstood**
Lightning impulse, HV	Type, ordered	170 kV, per phase	Witnessed; records compared	**Withstood**
Core and frame insulation	Routine	Core–frame, core–tank, frame–tank	Witnessed	**Pass**
Tap changer operation	Routine	Cycles as IEC 60076-1 clause 11.7	Witnessed	**Pass**
Leak test with pressure	Routine	30 kPa, 12 h overnight	Start and end witnessed; gauge unattended between	**No leak at end**
Temperature rise	Type, not ordered on this unit	Certificate of a sister unit	Document reviewed, not witnessed	**Not verified here**
Oil breakdown voltage	Oil check	Factory laboratory report	Document reviewed, not witnessed	**Not verified here**

05 Findings register and release conditions

NC-01 **Total losses 123.0 kW against a contract limit of 117.6 kW** — **Major**

Requirement	Order annex: total losses no more than 5% above the guaranteed 112.0 kW	**Evidence**	Section 03, instrument references in section 02. The manufacturer's own figure of 122.3 kW is also above the limit
Manufacturer response	Asks the buyer to accept the unit under the loss clause of the order. No rework proposed.		
Owner	Buyer, with the manufacturer	**Closure point**	**Before release**

NC-02 **Rating plate gives impedance at principal tap only** — **Minor**

Owner	Manufacturer quality	**Closure point**	Before shipment, by photograph

NC-03 **Draft routine test report omits the LV bushing serial numbers** — **Minor**

Owner	Manufacturer quality	**Closure point**	Before shipment, by copy to Sinospect

C1 **Unit held until the buyer decides on NC-01.** Accepting the unit under the contract's loss clause or requiring rework is the buyer's decision. A rework that touches the active part needs the affected tests repeated and witnessed.

Limits of this record: it covers the unit and tests presented in the test bay on the test dates. Items marked as documents reviewed were read, not witnessed. Readings are the witness's own, compared with the manufacturer's sheets. The buyer keeps final acceptance.

Sample: a fictional worked example. The equipment, identifiers, dates, readings and findings are invented to show the report's structure.