

Requirements for HVDC converter transformers condition assessment

SC A2: Power Transformers and Reactors

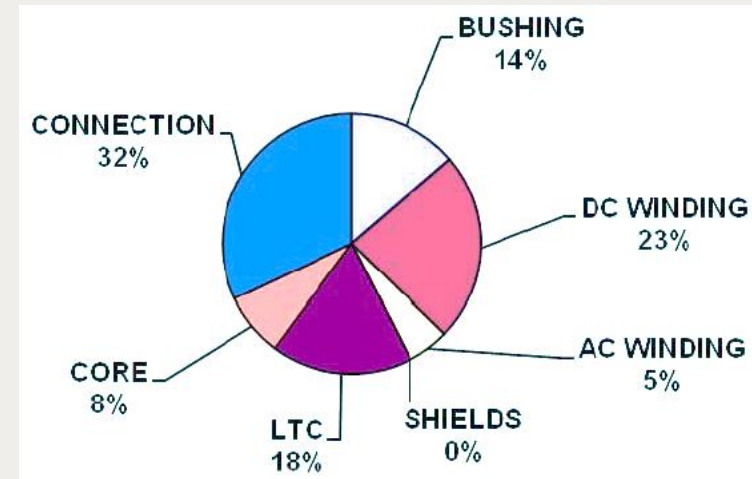
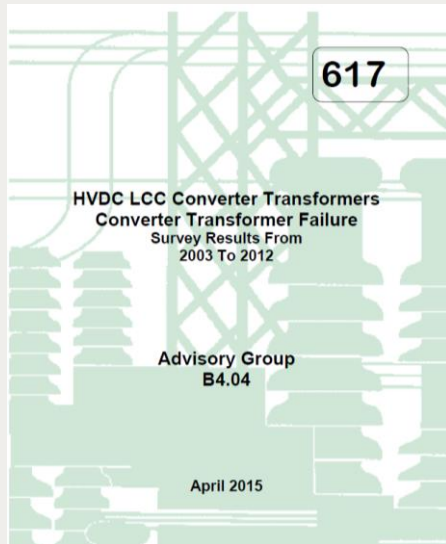
PS1; Question 1.4: Which requirements are necessary for HVDC converter transformers to do a risk and condition assessment to ensure that they will perform satisfactorily?

Evgenii Ermakov, Sweden

HITACHI
Inspire the Next

Choosing diagnostic methods

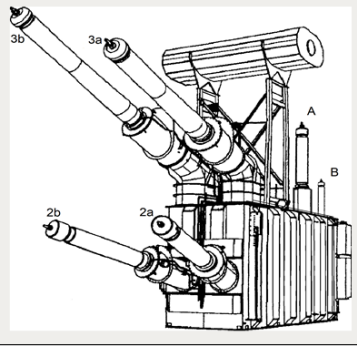
- HVDC transformers are specific in design as well as the operational stresses they face during operating life. This leads to differences in failure distribution by component and influences the choice of methods utilized for condition assessment.

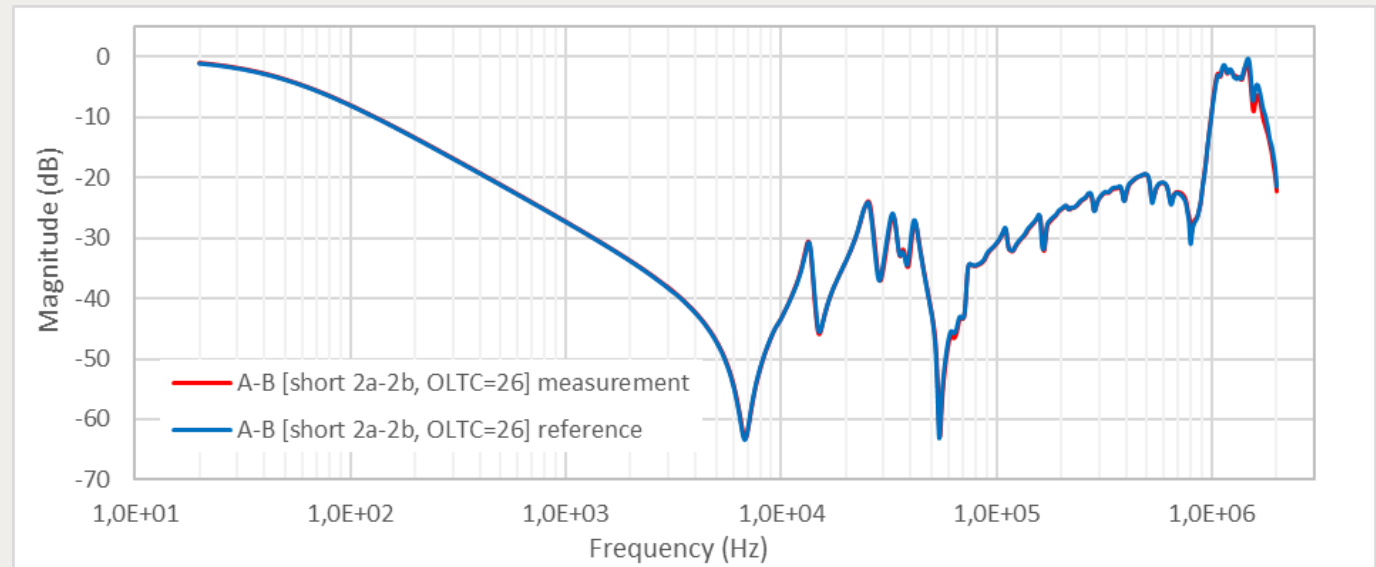


Failures of HVDC transformers by component 2003 -2012

Evaluating diagnostic parameters

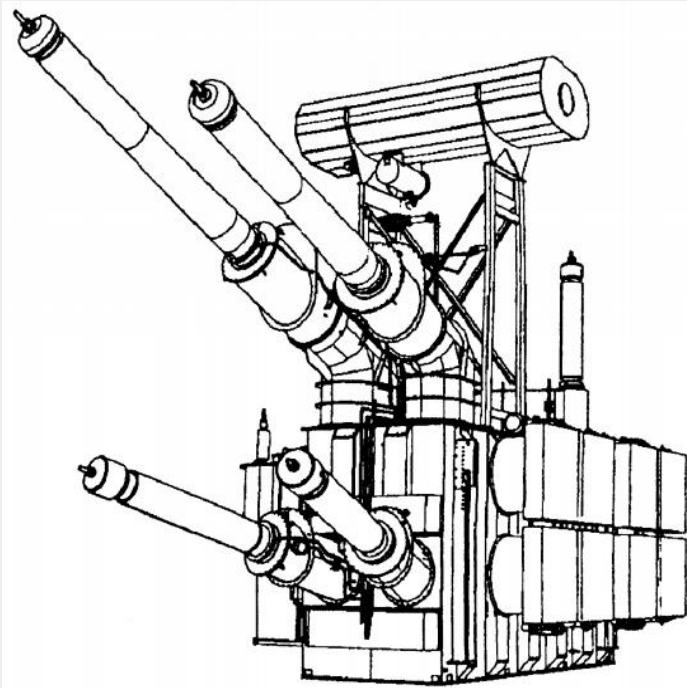
- Specifics of design and operational stresses may also lead to necessity to set specific thresholds for some diagnostic parameters (such as typical gas concentrations for DGA).
- If a converter station is served by a group of transformers identical in design (e.g., 3 or 6 single-phase units), then for many diagnostic methods, measurement results obtained on one unit may be used as a baseline for another one.

Manufacturer	Hitachi Energy (former ABB)		
Year	1988		
Cooling type	OFAF		
Number of phases	1		
Rated Frequency [Hz]	50		
			
Terminals	Rated voltage [kV]	Rated Power [MVA]	Rated Current [A]
A B (AC winding)	$405/\sqrt{3} + \frac{+18}{-7} \times 1.25\%$	194,6	680 – 832 – 913
2a 2b (Y-connected Valve winding)	$161,4/\sqrt{3}$	97,3	1045
3a 3b (Δ- connected Valve winding)	161,4	97,3	$1045/\sqrt{3}$



Group Discussion Meeting

HVDC-specific limitation factors on site



Group Discussion Meeting