ABSTRACT

A METHOD OF LEAD TAKEOUT USED FOR VARIOUS CLASS AUTO TRANSFORMER

Method of placing the HV/IV winding of a transformer the method comprising the step of lowering common winding (IV) and projecting an portion, said portion of the IV coil is projected out on a horizontal axis making an angle of may be 45^0, said projected portion is then placed on a static ring horizontally along 180^0 plane, wherein the project lead portion of IV coil is winded with a HV lead portion through a HV lead insulation, to reduce dielectric stress

Fig.1

WE CLAIM

1 Method of placing the HV/IV winding of a transformer, the method comprising of following steps

- lowering common winding (IV) and taking out lead,
- said portion (lead) of the IV coil is projected out on a horizontal axis making an angle of may be 45^0,
- said projected portion (lead) is then placed on a static ring horizontally along 180^0 plane;

wherein the project lead portion of IV coil is winded with a HV lead portion through a HV lead insulation, to reduce dielectric stress.

2 A method as claimed in claim 1, said transformer is an autotransformer.

Dated this 28th day of August, 2014

(I. BANERJEE)
OF L S DAVAR & CO
APPLICANT'S AGENT

FIELD OF INVENTION :

This invention relates to a method of lead takeout used for various class auto transformer. In particular, it relates to method of routing the leads to provide sufficient clearance between HV-IV leads and earth parts of auto transformers

BACKGROUND OF THE INVENTION :

765kV class di-electric design necessitates proper control of stress in the insulation system with the help of 2-D & 3-D FEM analysis. The insulation arrangement of major insulation has to be quite reliable and effective during long term operation. In 765 kV HV winding, sufficient disc to disc insulation and insulation paper covering on turns has been kept to withstand operating voltages Andover voltages/surges.

When a lightening strikes transformers on site, the transformer windings are subjected to superposed stress of the lightening surge and AC operating voltage. Therefore, it is important to study dielectric strength of windings for AC/impulse superposition voltages in a viewpoint of insulation reliability in operation.

a) Common (IV) winding in case of auto transformer is third from the core and is not the outermost winding. HV winding comes over it. Hence certain techniques are to be adopted to take out IV leads from the active part for connections.

b) In case of standard 400kV class Auto transformer, tapping winding is placed at common end of series winding for HV variation due to availability of OLTC upto 245kV class. This type of transformer is CFVV (Constant Flux Voltage Variation) type. For 765kV class Auto transformer, OLTC is placed at neutral end of HV and the type of transformer is VFVV (Variable Flux Voltage Variation) due to non-availability of OLTC beyond 245kV class.

c) In 765kV class auto transformer there were two limbs in the transformer and the interconnection of HV-IV leads of both the limbs was to be done.

d) In case of standard 400kV class Auto transformer the interconnection of HV, IV conductors with copper cables is done by brazing but in 765kV class auto transformers brazing alone was not sufficient.

e) Other suppliers of UHV equipments use a detached (Chimney type) HV line lead arrangement which is connected at site to actibve part through a turret.

Due to above mentioned features the interconnection of HV & IV leads becomes a critical issue and needs special lead take out arrangement so that there is sufficient clearance between the HV-IV leads and earth parts. Special techniques

for routing the leads as shown below in Fig 1 was followed. For interconnection of HV conductors to cable Aluminum shielding tubes was also used in addition to brazing joints covered with sleeves. Bhel provided the line lead integral with the active part thereby avoiding any assembly of same at site.

OBJECTS OF THE INVENTION:

Following are the main advantages of the new lead takeout arrangement:

- The object of the present invention is to provide a new lead take out method in autotransformers.
- Another object is to provided low dielectric stress over the line leads.
- Yet another objection is to provide an improved withstand ability to external impulses on line leads, resulting to advantages like:-
    - Better cooling of leads due to less hot spots over lead surfaces.
    - Better distribution of charges over covering encircling the current carrying conductor.

BRIEF SUMMARY OF THE INVENTION:

The present invention provides an unique method of unique method of inter connection of HV-IV leads for both the limbs/lead takeout arrangement of developed HV class auto transformer.

In high voltage transformers for eg 500MVAm 765kV class, 1-phase auto transformer the 400 kV IV leads are taken out horizontally instead of vertical takeout and are joined with the 765KV HV lead and covered by an Aluminum shields.

The connection of HV-IV leads of both the core limbs is also established, by brazing, covered by sleeve followed by Aluminum shields.

No active part is left outside tank for assembly at site normally adopted by other manufacturers so as to avoid ingress of any moisture/dust/foreign matter into the active part of transformer. Moreover this type of transformers are atmosphere meeting all international standards for manufacturing UHV class power transformers.

Dated this 22nd day of January, 2014

(I. BANERJEE)
OF L.S.DAVAR & CO
APPLICANT'S AGENT