

SEISMIC Qualification Certificate

Delivered on: Friday, 31 August 2012

References:

- VIRLAB test procedure number 120410E1, issue 0, dated 10/04/2012: "STANDARD TEST PROCEDURE FOR THE SEISMIC QUALIFICATION OF A TRANSFORMER FROM "ELTAS" (TURKEY), ACCORDING TO EUROPEAN STANDARD EN60068-3-3:1993".
- European standard EN 60068-3-3: 1993: *Environmental testing – Part 3: Guidance. Seismic tests methods for equipments.*
- European standard EN 60068-2-57: 2000: *Environmental testing - Part 2-57: Tests - Test FfVibration, time-history method.*
- European standard EN 60068-2-6: 2008: *Environmental testing – Part 2: Tests – Fc: Vibration (sinusoidal).*
- European standard EN 60068-2-47: 2005: "Environmental testing - Part 2-47: Tests. Mounting of specimens for vibration, impact and similar dynamic tests".

Laboratory Name: VIRLAB, S.A. (accredited by ENAC, Spanish National Accreditation Entity).
ENAC certificate number 54/LE131.

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Equipment tested: A "1600 kVA Transformer, 34'5 Kv / 0'4kV dry type", serial number 12/KT-2075, of "ELTAS", according to drawing number 12.K.250.2916, dated 18/07/2012.

VIRLAB, S.A., certifies that this *Transformer* has been tested between the 30th and the 31th of August, 2012, according to VIRLAB test procedure; elaborated in agreement with European standard EN 60068-3-3: 1993.

The *Transformer* has been submitted to five (5) S1 (50% S2) level tests plus one (1) S2 level test, carried out in the two main horizontal directions, front-to-back and side-to-side with regard to the *Transformer*, simultaneously with the vertical direction.

The ZPA (*Zero Period Acceleration*) of the S2 level applied was 0.5 g in horizontal direction and 0.4 g in the vertical one.

The horizontal ZPA, 0.5 g, corresponds to the AG5 "Ground Acceleration Reference" defined in Table 3 of European standard EN 60068-3-3: 1993.

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The vertical ZPA, 0.4 g, is higher than the corresponding to the AG5 "Ground Acceleration Reference" defined in Table 3 of European standard EN 60068-3-3: 1993, 0.25 g.

On the other hand, resonance search tests have been performed in the three main directions of the *Transformer*, in order to obtain the resonance frequencies below 35 Hz.

The *Transformer* has successfully passed the Seismic Qualification Tests to which it has been subjected, without any anomaly or structural deterioration having been detected. The "Qualification Criterion 0" defined in point 4.3 of European standard EN 60068-3-3: 1993 has been satisfied.

In test report number 121780 of VIRLAB, S.A., will be included all the information obtained, with tables, photographs and so on.

VIRLAB representative


Mr. ALBERTO CORELLA
Engineer of Laboratories 