50 Disraeli Street P O Box 33078
Christchurch New Zealand
Phone 64 3 962 0225 Fax 64 3 366 0680
Email: glinton@hvds.co.nz

Case Study 3

TEV discharge within a sealed Air Termination Box

The Partial Discharge survey of a switchboard in 2000 showed higher than normal readings from the Switch tank and Termination Box as shown to the right. Subsequent double probing indicated the source was the termination box and an investigation was planned.

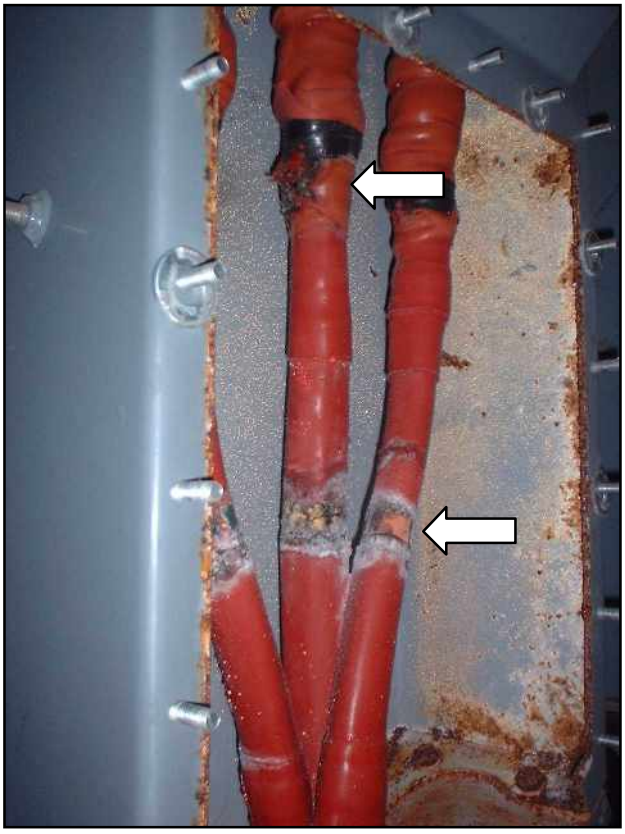
METAL WORK 8

BUSBAR 1 UPPER/FRONT	BUSBAR 2 LOWER/REAR	SWITCH TANK	CT CHAMBER	VOLTAGE TRANSFORMER	TERMINATION BOX	BAND JOINTS /END CAPS BUSBAR 1	BUSBAR 2
9		16	7		10	13	
10		9	8		10		
10		12	6		12		
9		15	8				
11		18	10		23		
16		28	18		28		
19		16	4		19		
						14	

As the box was sealed, a lack of ventilation allows for a build-up of gases. Nitrous oxide combining with water forms Nitric acid and is responsible for the Box rusting from the inside out. Dry Banding around the insulation tape fitted to each core is also evident and may have initiated this activity in the first place. This damp environment unable to breath is perfect for nurturing Partial Discharge activity.

The gasket was removed, however the level of damage would require a full shutdown at a later date to address all the problems and the following before and after shots are taken approx 10 months apart.

October 2000



August 2001

Note the deterioration to the coloured insulating tape and the “blow-out” on yellow phase where the black insulating tape is fitted to the heatshrink tape. Closeups are shown below.