Incident Summary (#5610850)

SUPPORTING INFORMATION	Incident Date			January 9, 2016
	Location			Panorama Mountain
	Regulated industry sector			High Voltage Electrical System
	Impact	Injury	Qty injuries	None
			Injury description	N/A
			Injury rating	N/A
		Damage	Damage description	Three 65E High Voltage fuses blew at the Main High Voltage Switch. The 500KVA 25/14.4KV to 120/208V pad mounted transformers oil pressure relief valve discharged, signalling an internal fault.
			Damage rating	Minor
	Incident rating			Minor
	Incident overview			A fault occurred in the 500KVA Transformer which caused the overpressure in the transformer oil tank to operate the oil pressure relief valve, also at the same time the High Voltage Primary 65E Fuses ahead of this transformer blew in the High Voltage Switch Gear de-energizing the electrical system.
INVESTIGATION CONCLUSIONS	Site, system and components			When there is an internal fault on an oil filled transformer the operation of the pressure relief valve signals an internal mechanical failure. The draw-out bay-o-net 18C fuses at the transformer would not react as fast as the 65E primary fuses, these primary fuses would blow or react protecting the system. The safety components in place operated as designed.
	Failure scenario(s)			It is very likely the transformer failed due to its age and the gradual mechanical internal deterioration over time. Regular transformer oil tank sampling had been taking place and the last sample pointed to some possible degradation and arcing and/or discharge activity, which is expected as the transformer ages and reached the end of its life span. This could mean that the transformer would fail without warning.
	Facts and evidence			The onsite electrician provided the history of the transformer and also the oil testing report showing the recently found issues. The visible blow out of oil at the pressure relief valve indicates the overpressure in the transformer oil tank and an internal mechanical failure. The reaction of the 65E fuses across all three phases indicates a dead short on all phases which indicates a major failure. When the transformer was isolated and the 65E primary fuses replaced, the electrical system resumed operation without any other problems. The load supplied by this transformer has not changed and no construction activity or renovations where happening to indicate any possible damage to the electrical system on the low voltage side or high voltage side.

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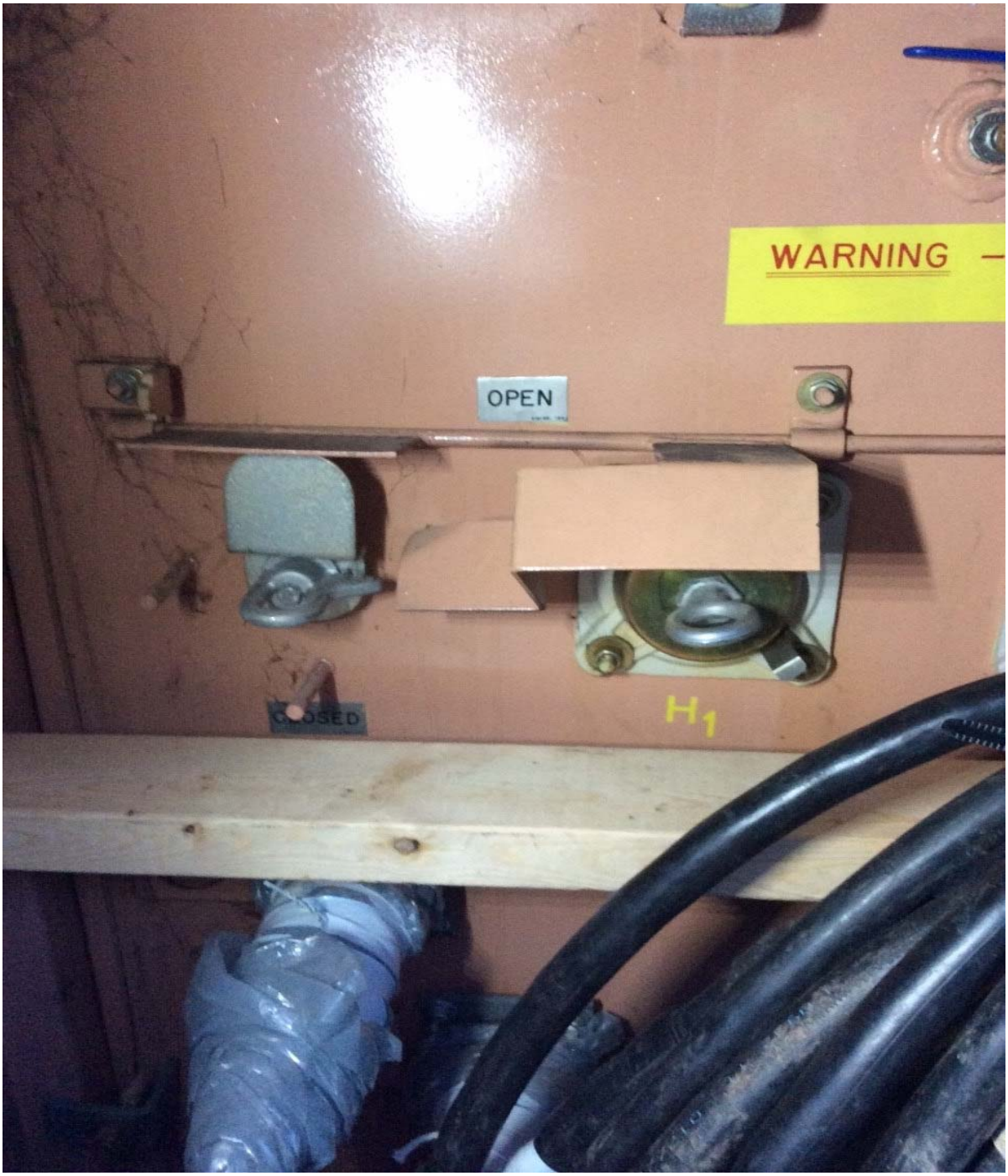
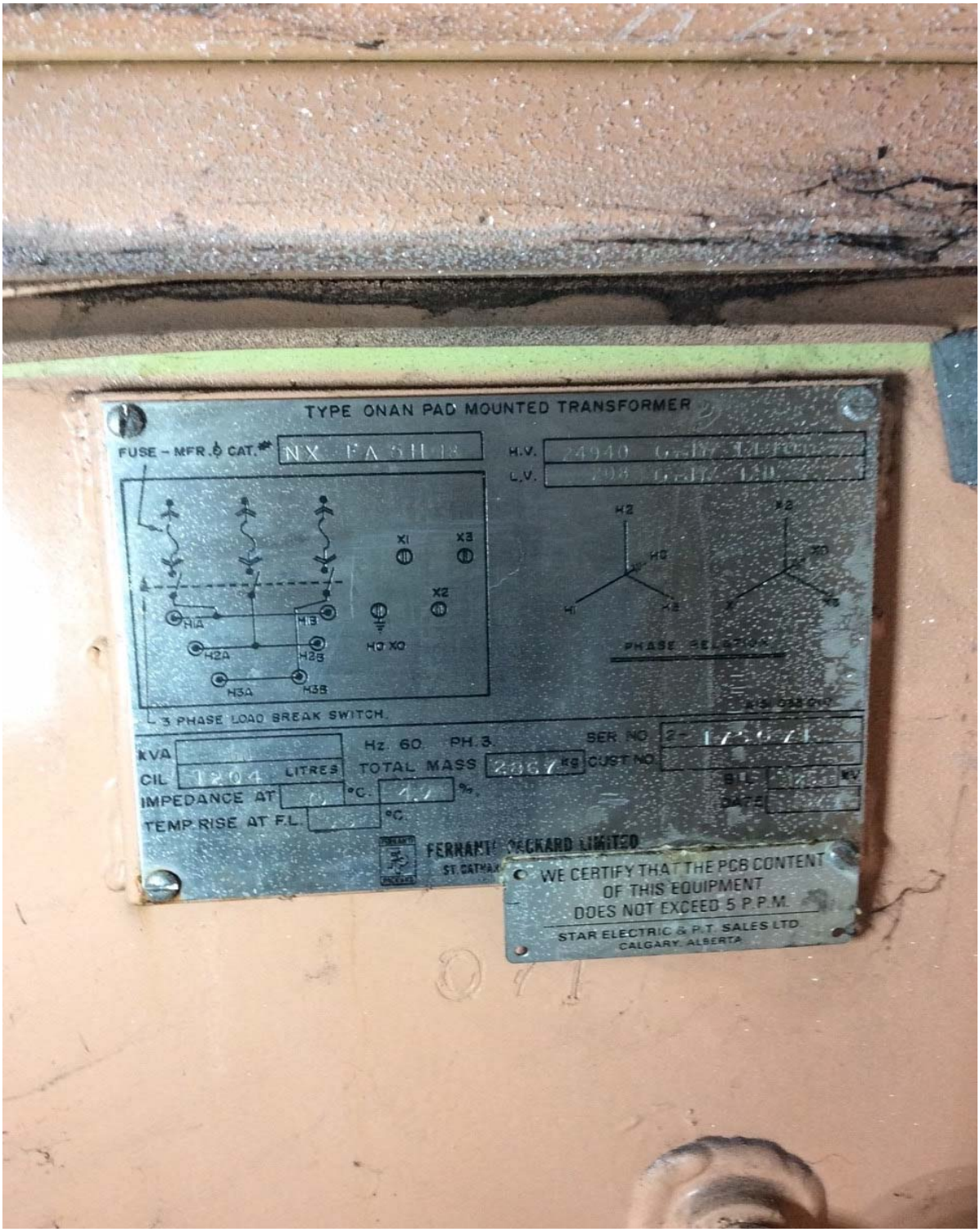
	Causes and contributing factors	The 500KVA transformer was manufactured in 1978 and used previously elsewhere, it was brought to its present location in the late 1990's to replace the old transformer, as a used product there is no information to indicate if the transformer was reconditioned before re-use. Oil samples indicated that there where issues developing and the transformer would eventually need to be replaced.

Transformer Compartment, High Voltage connections removed and Low Voltage Connection isolated for temporary Generator connection.



Close up of the High Voltage H1 connection to the draw out bay-o-net fuse.

View of the Oil Pressure Relief Valve, showing blow out of oil.



Name Plate of the blown Transformer.

View of Bay-O-Net fuse pulled out of the H1 connection point.

High Voltage connection parked in approved location at the 500KVA Transformer upstream from the blown 500KVA Transformer.