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Case Studies – PDS100





Cases

1. Transformer 400/220/33kV
 2. Transformer 220kV, 70MVA
 3. Transformer (6 sisters) 229kV, 115MVA
 4. Transformer Online DGA and RFI logger
 5. Transformer 400/275/22kV 800MVA
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Case 1:
Transformer
(India)



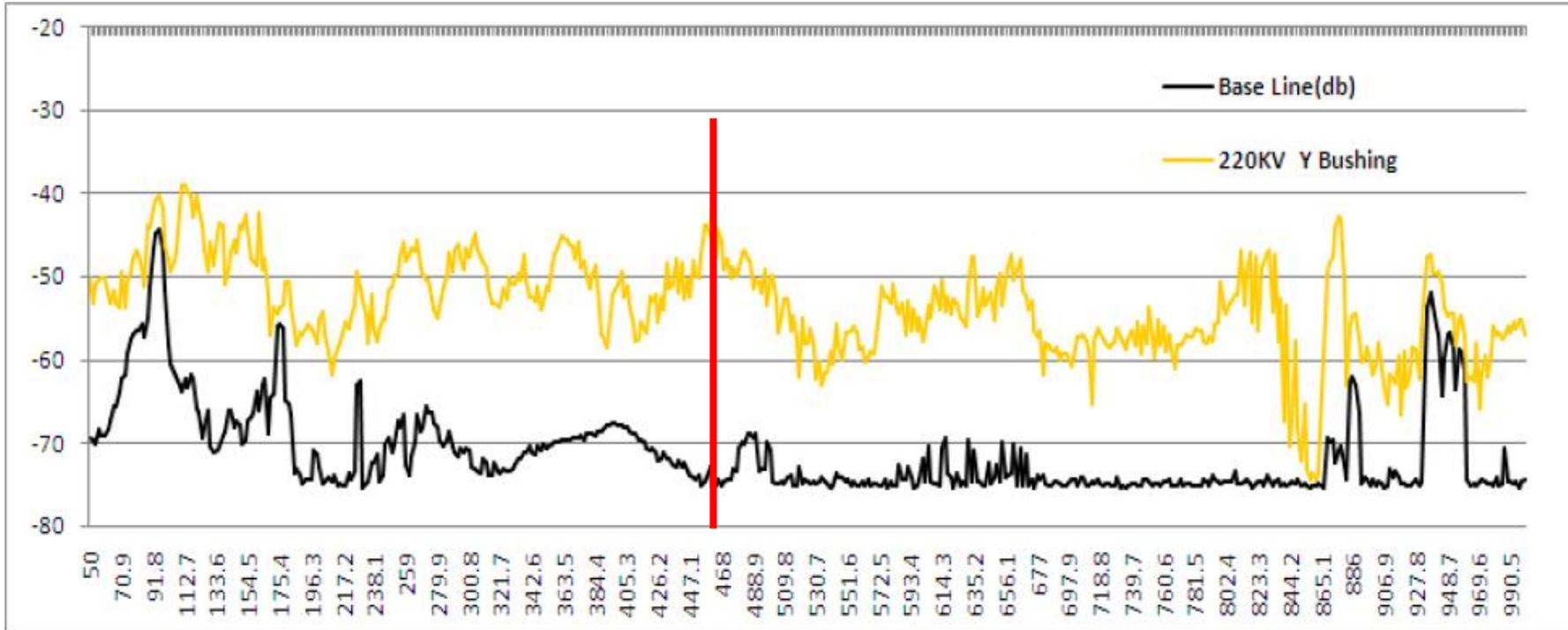
TX - 400/220/33kV



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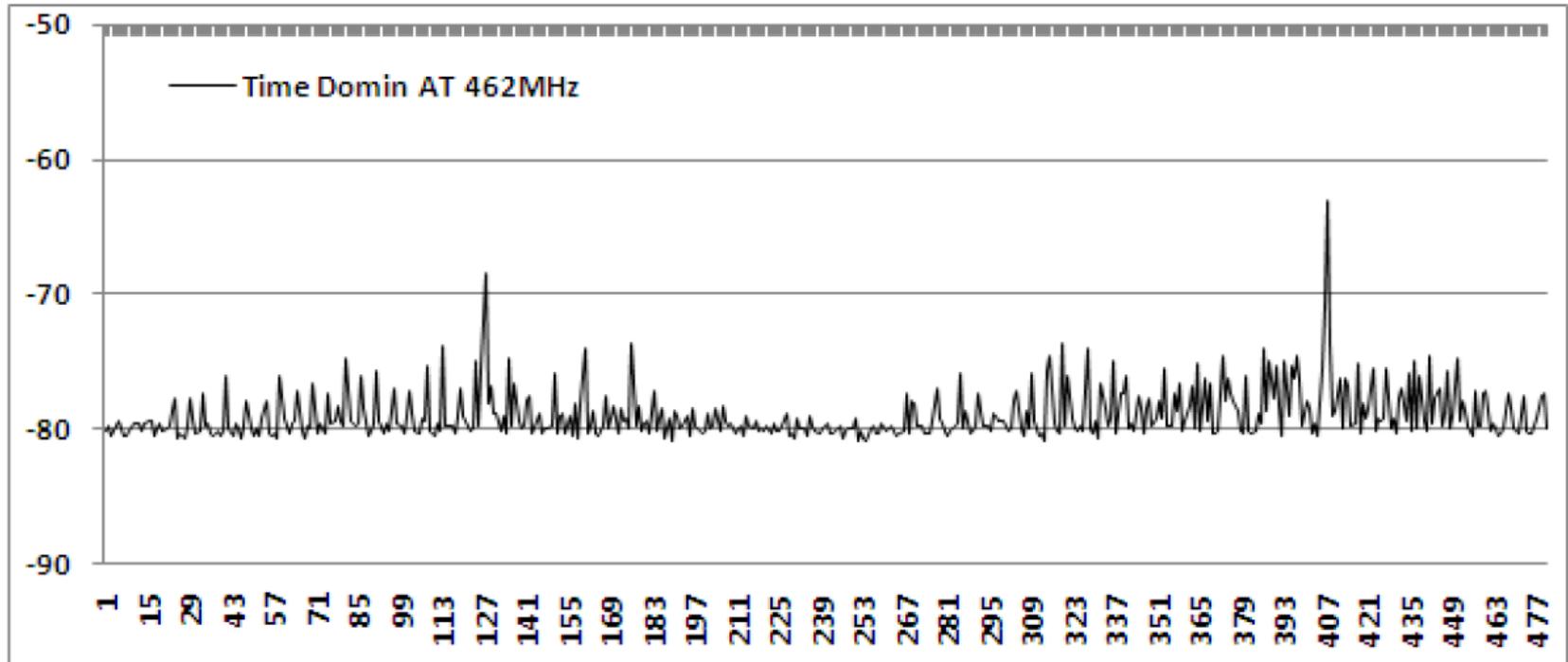
PDS100 survey



- RFI from 220kV bushing side, Y-phase



PDS100 survey



- Time Domain Mode @ 462 MHz



Opening the LTC



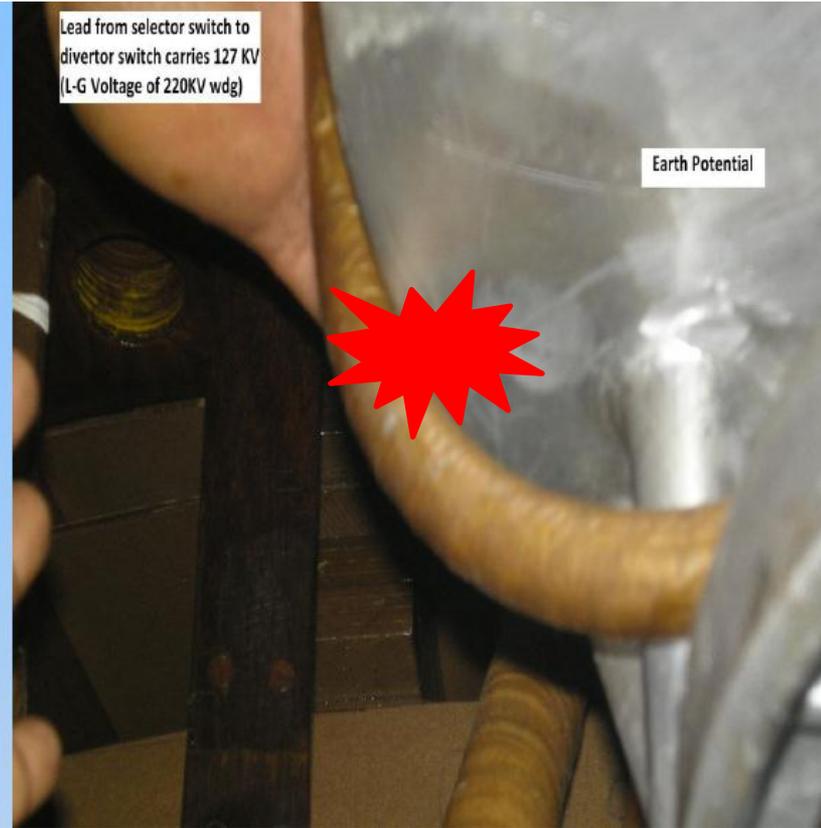
Drained LTC



Opening the LTC



R-phase



Y-phase





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Case 2:
Transformer
(India)





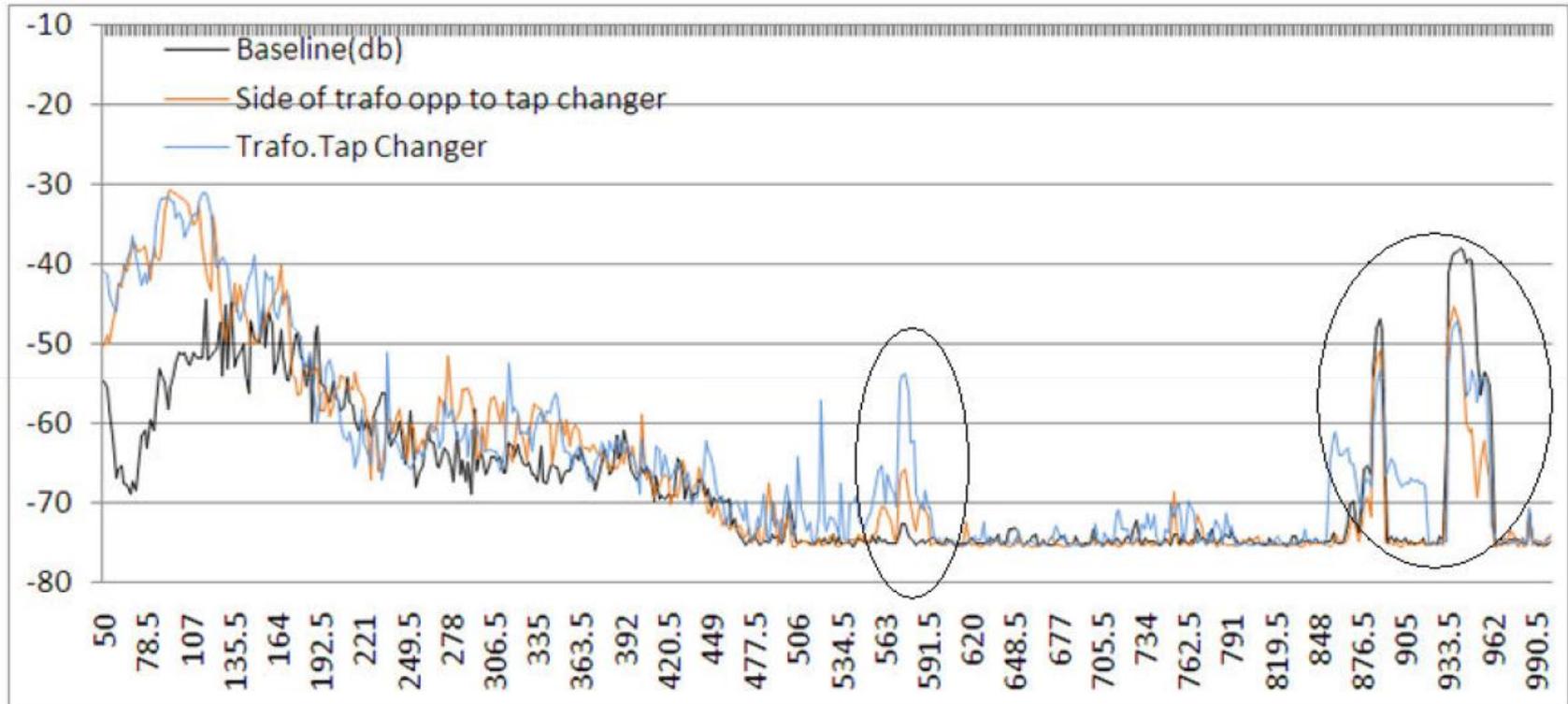
GSU Transformer

- Voltage rating : 220 kV
- MVA rating : 70 MVA
- Year of mfg : 2001

In service for 8 years without any history



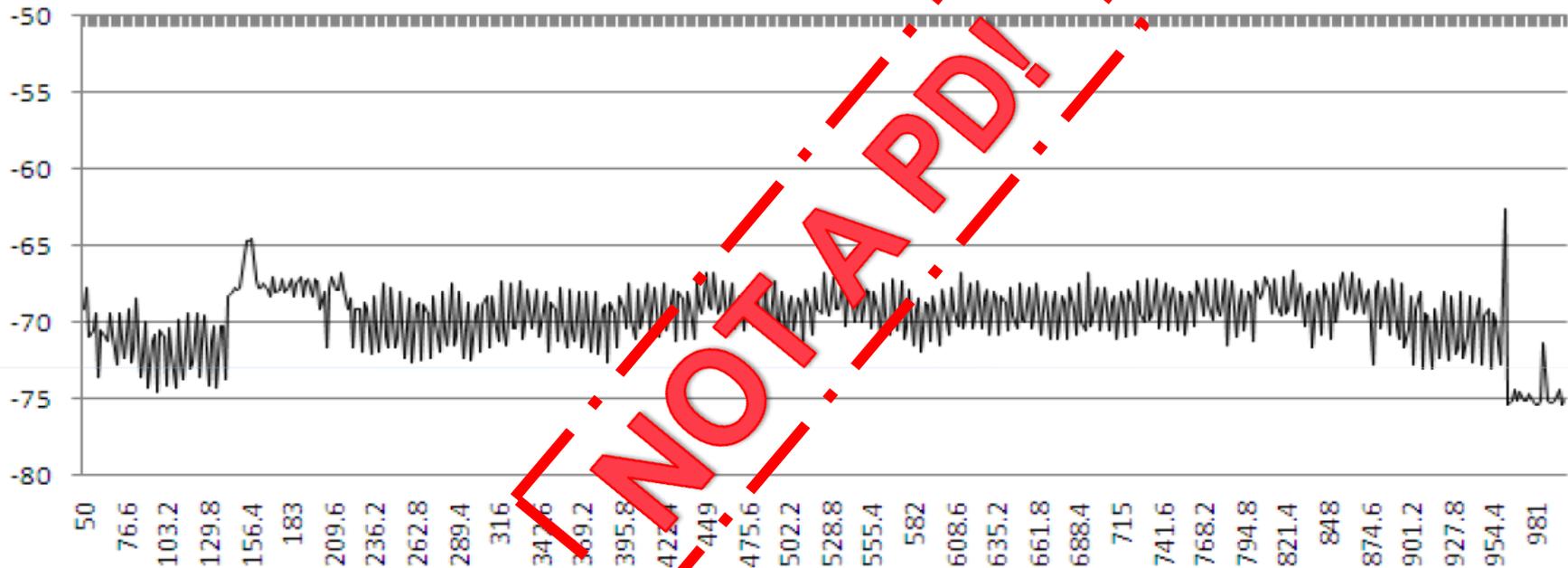
GSU – TX (Spectrum mode)



- TX RFIs close to base line both on HV & LV side
- Uplift @ 570MHz



GSU – TX (Time domain)



- Time domain plot @ 570MHz
- In-service oil pump on TX oil cooling system



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Case 3:
Transformer
(India)





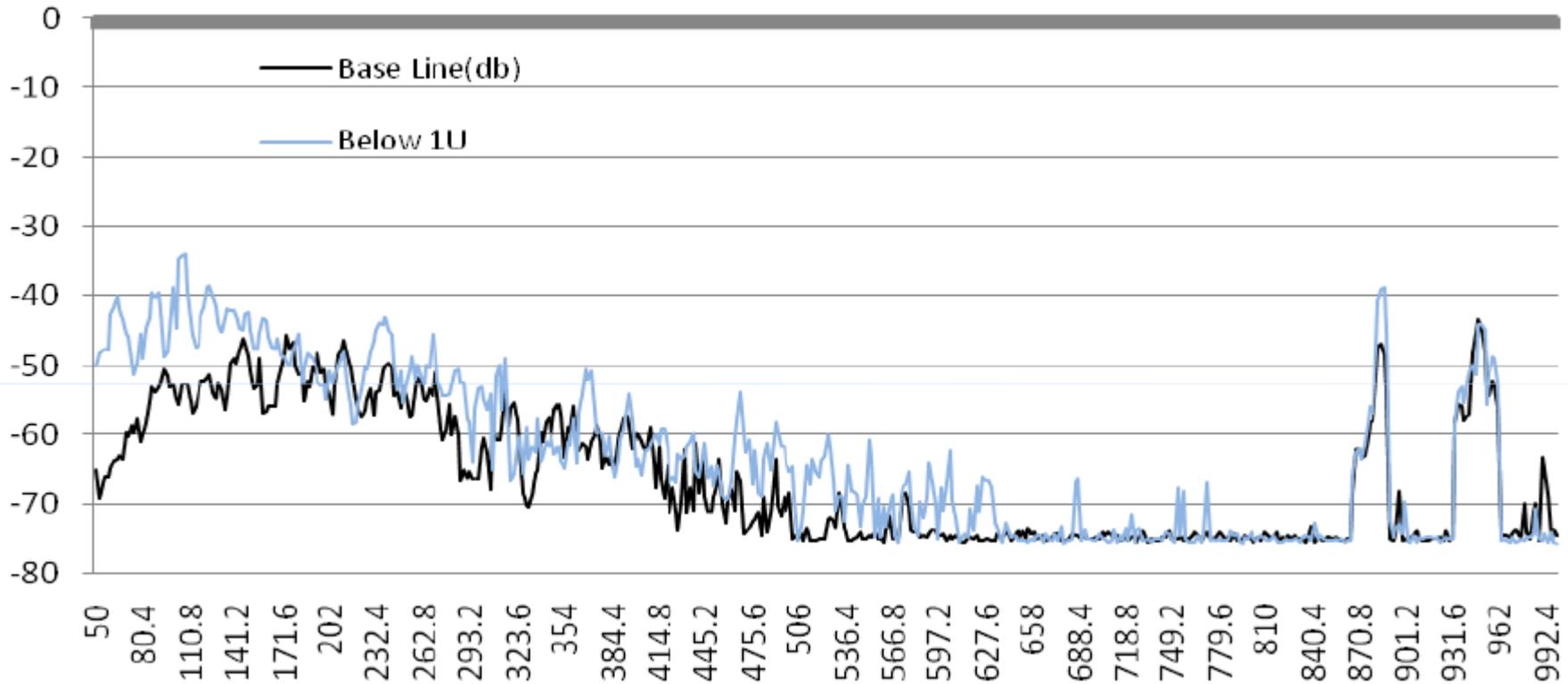
6 Sisters

- Voltage rating : 229 kV
- MVA rating : 115 MVA
- Year of mfg. : 1991
- History : NIL

Identically transformers (6 units) referred to as GT1a, GT1b, GT2a, GT2b, GT3a and GT3b



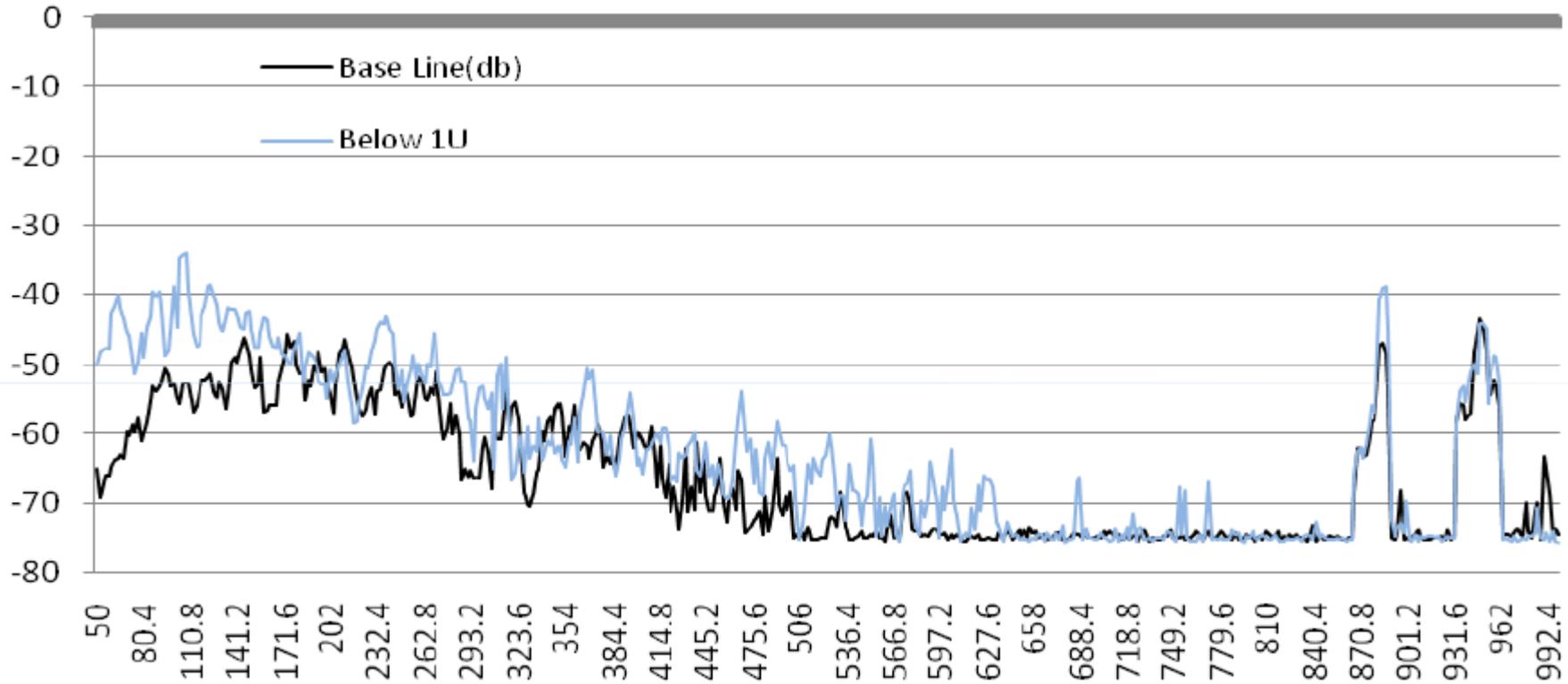
GT1a



- PD or not?



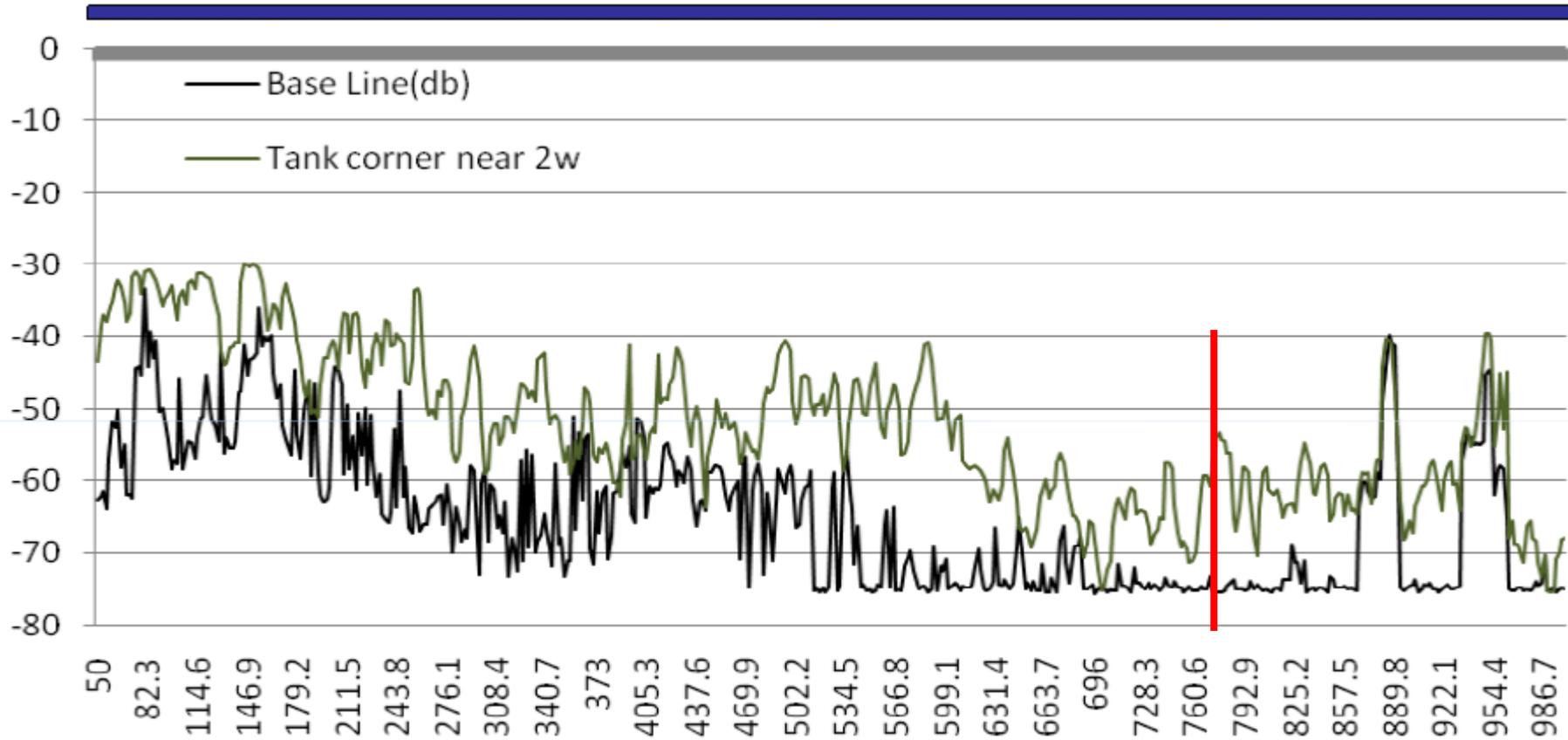
GT1b



- PD or not?



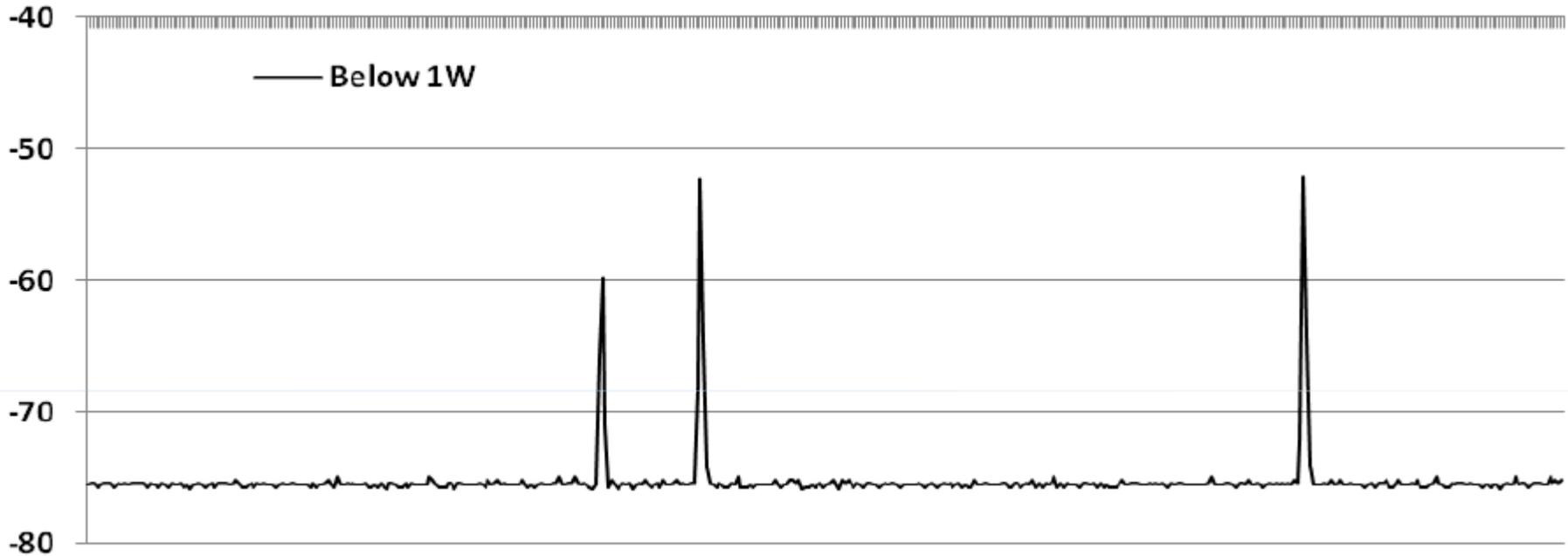
GT2a



- PD or not?



GT2a



- Time domain at 770MHz, - low repetition rate





6 sisters

- All units showed no dramatic changes in DGA samples
 - The other 3 looked more or less the same as the 2 first ones
 - GT2a clearly showed different behavior
 - Finding by comparing!
-





Case 4:
Transformer
(UK)



Instrumentation

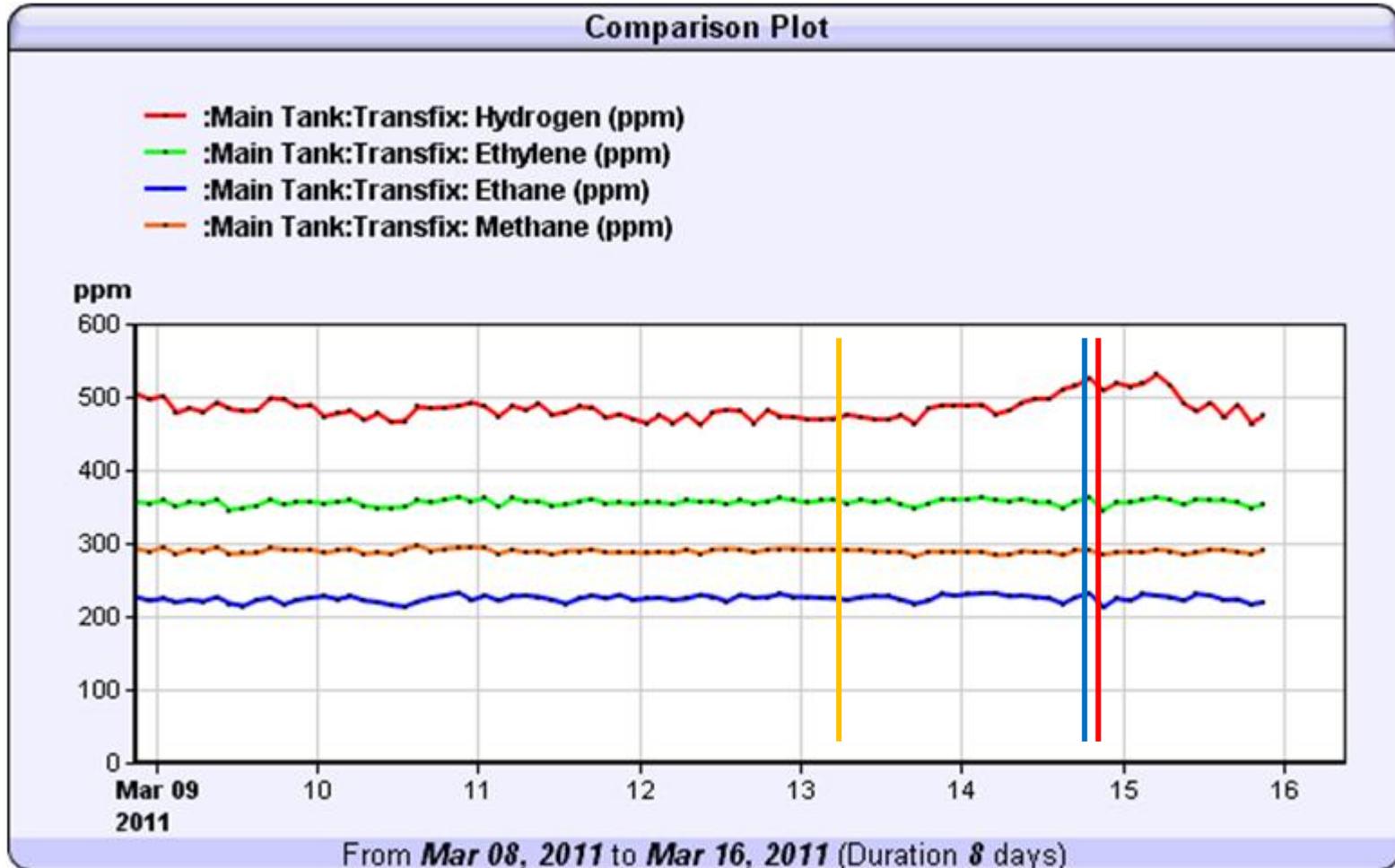


The DGA is done by a Kelman Transfix for permanent installation

The RFI scans is done with a PDS100 with fw ver 1.10 with logging functionality and a High Frequency Current Transformer (BW < 300MHz)

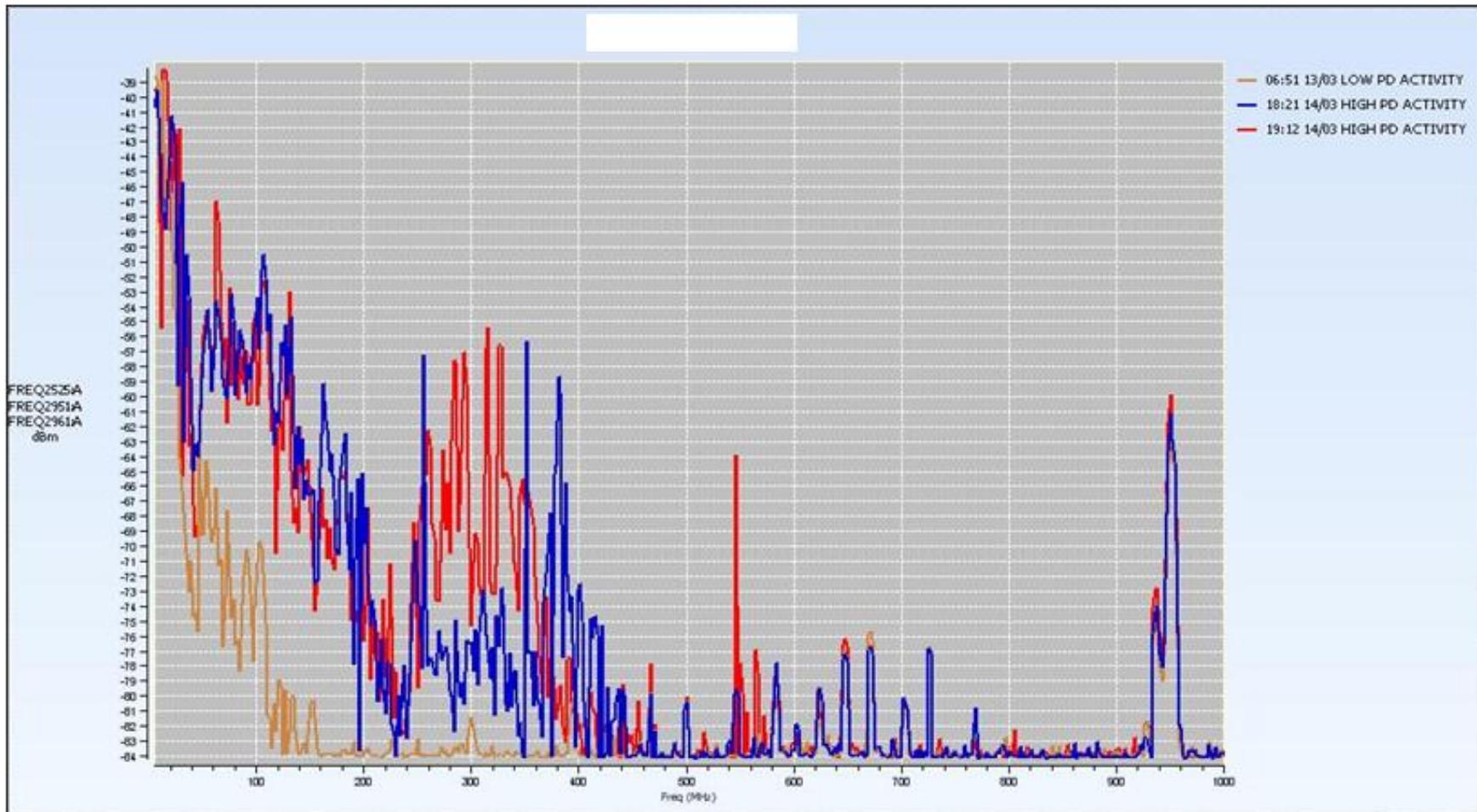


Online DGA – Kelman



Logging – HFCT on GND

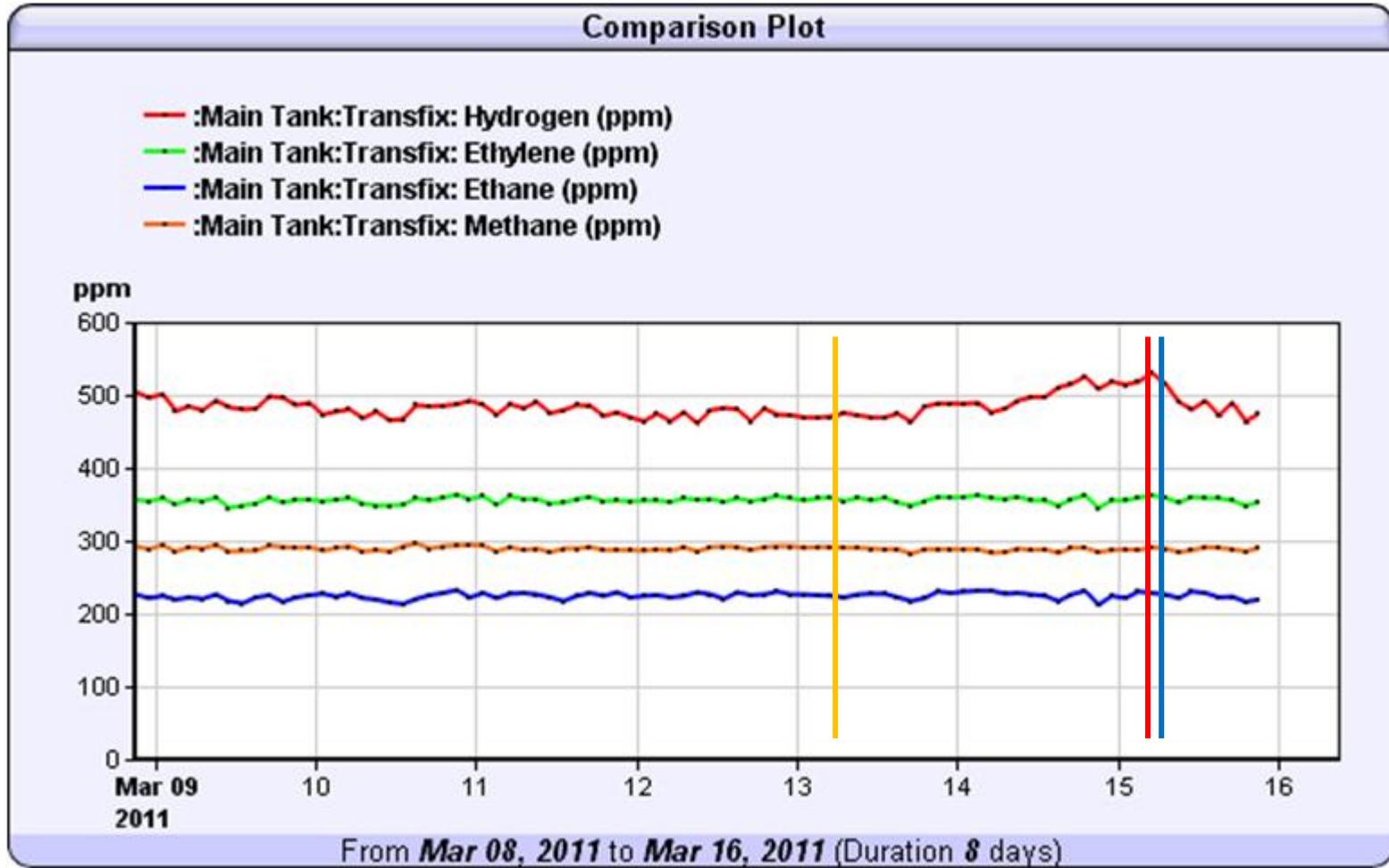
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Online DGA – Kelman

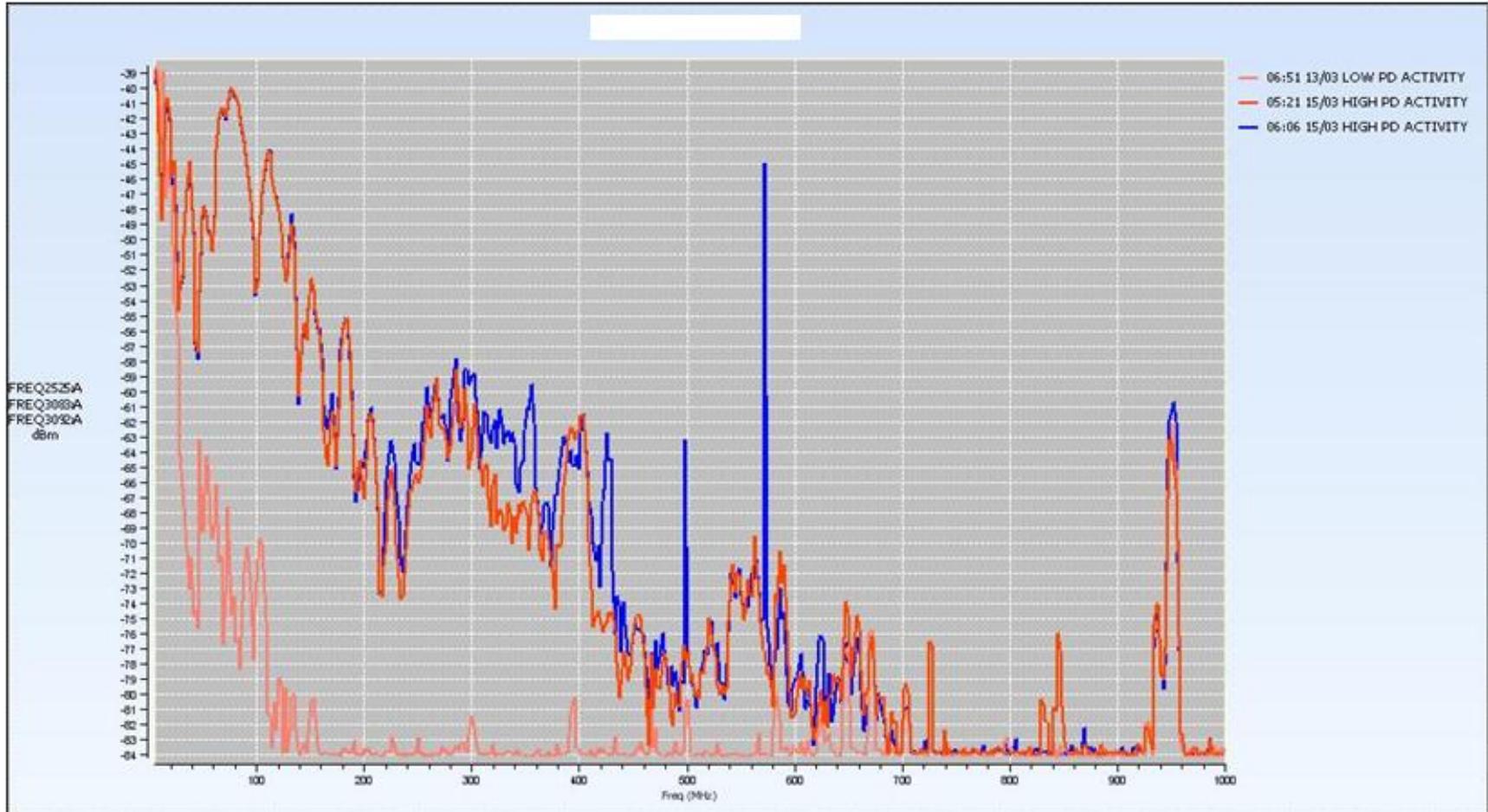


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Logging – HFCT on GND

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Case 5:
Transformer
(South Africa)





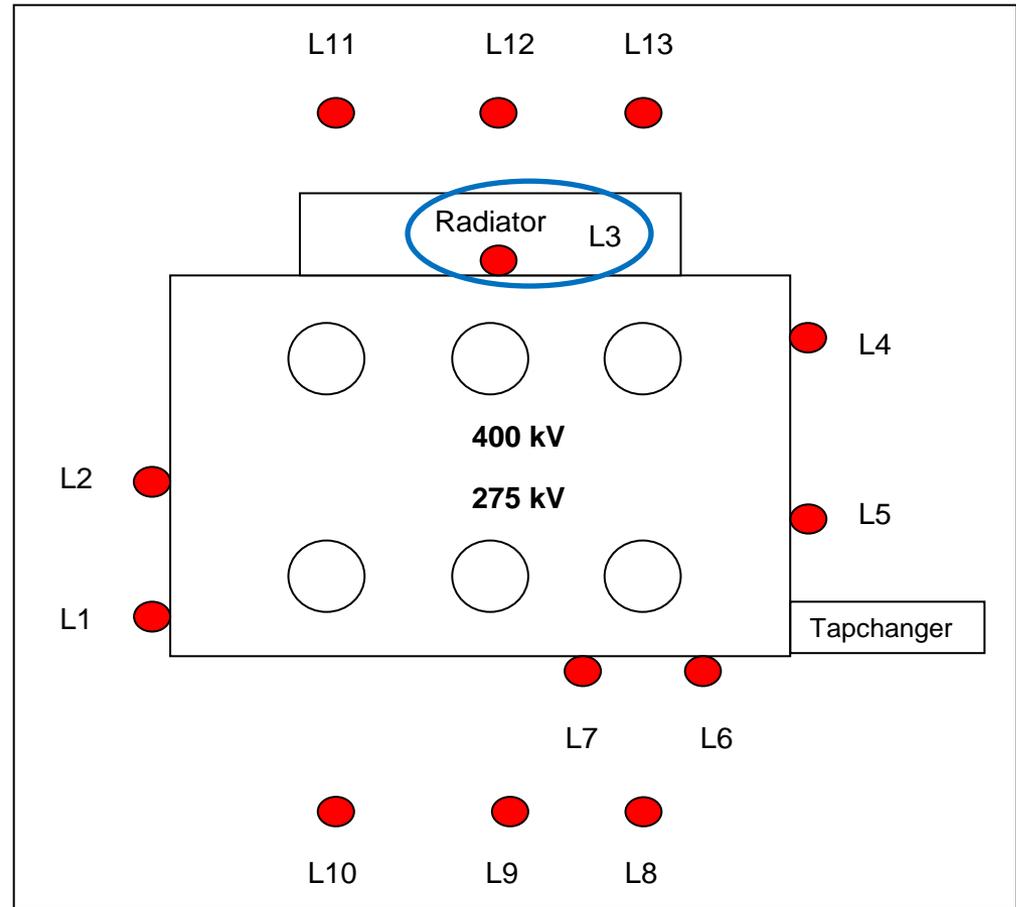
Hector T4

- Manufacturer : ABB (1993)
- Voltage : 400/275/22kV
- Rating : 800MVA

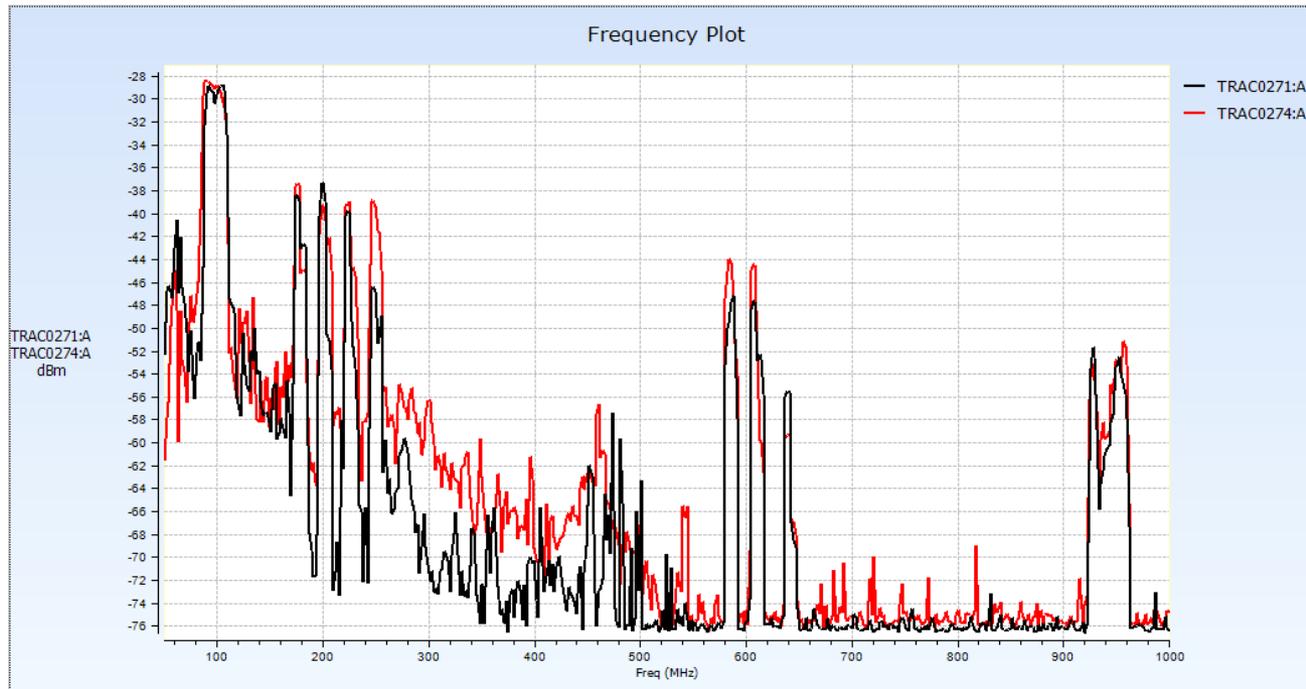


Hector T4 (Sept 2010)

- RFI scans performed on places indicated by red dots
- Sensor: UHF antenna



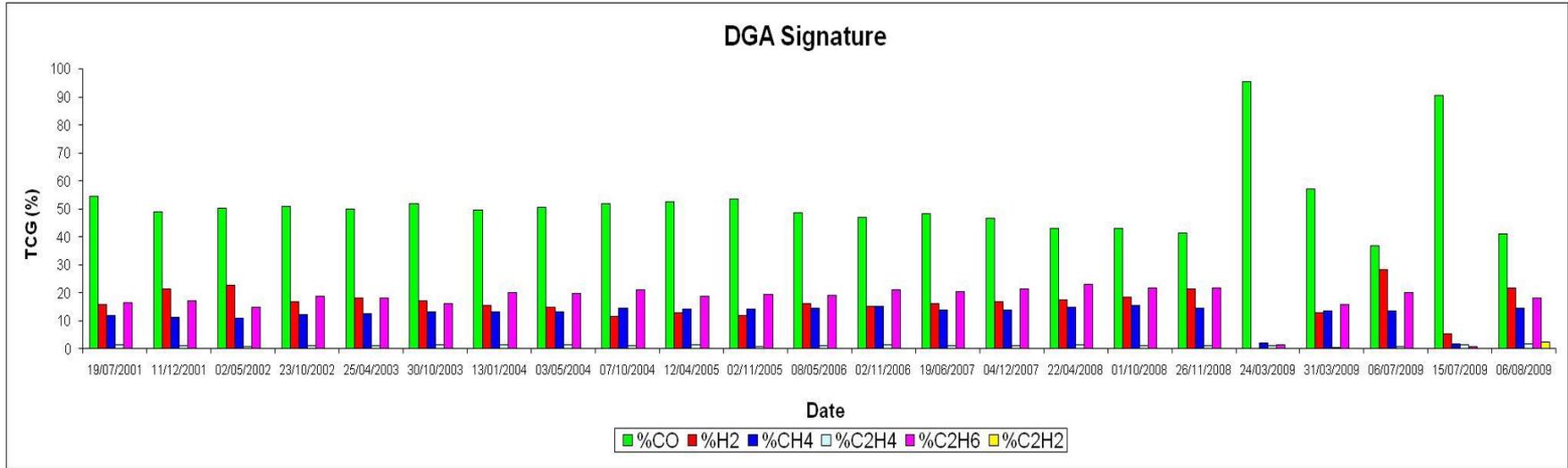
RFI at L3



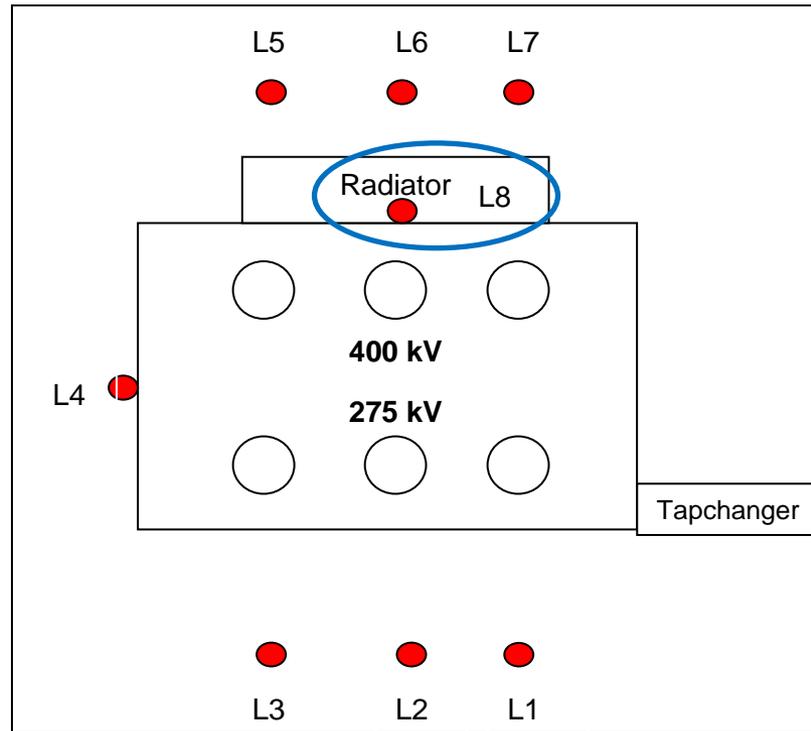
The PD scans at location L3 and the baseline is shown .
The PD measurements showed increases in amplitudes when compared with the baseline measurement indicating evidence of discharge activity.



Oil samples (DGA)



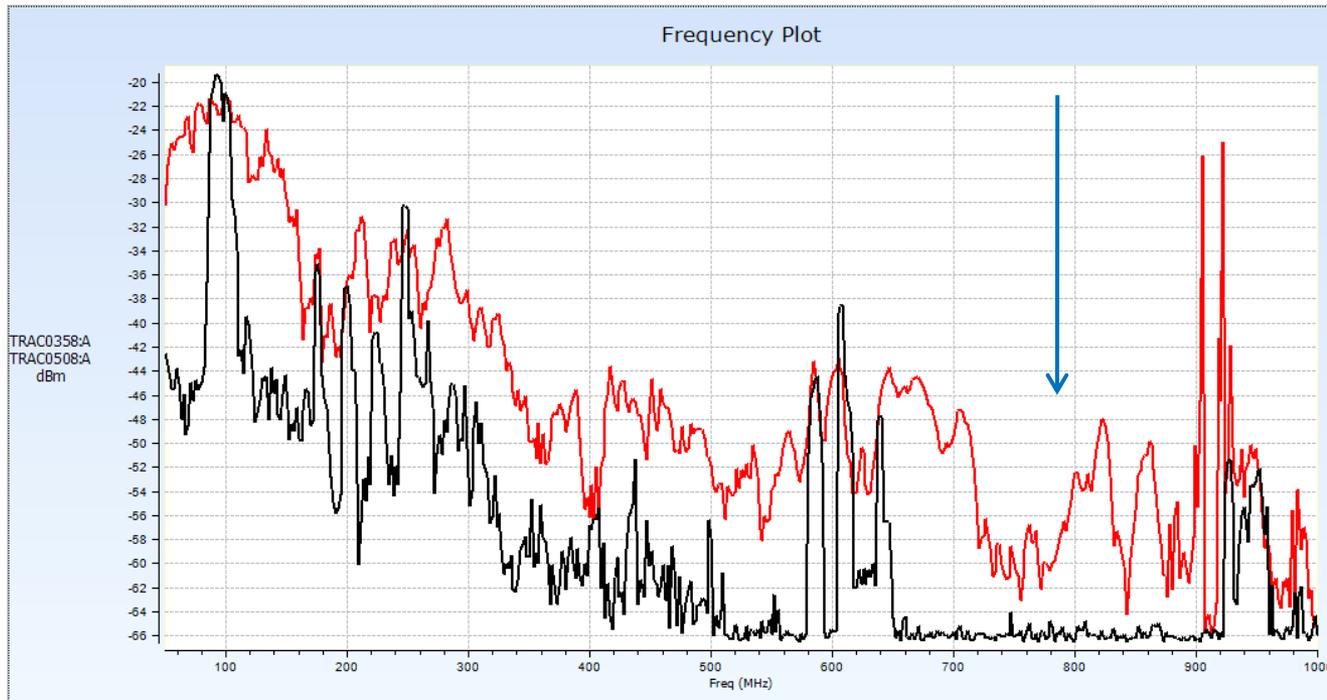
Hector T4 (Nov 2010)



- Points of measurement



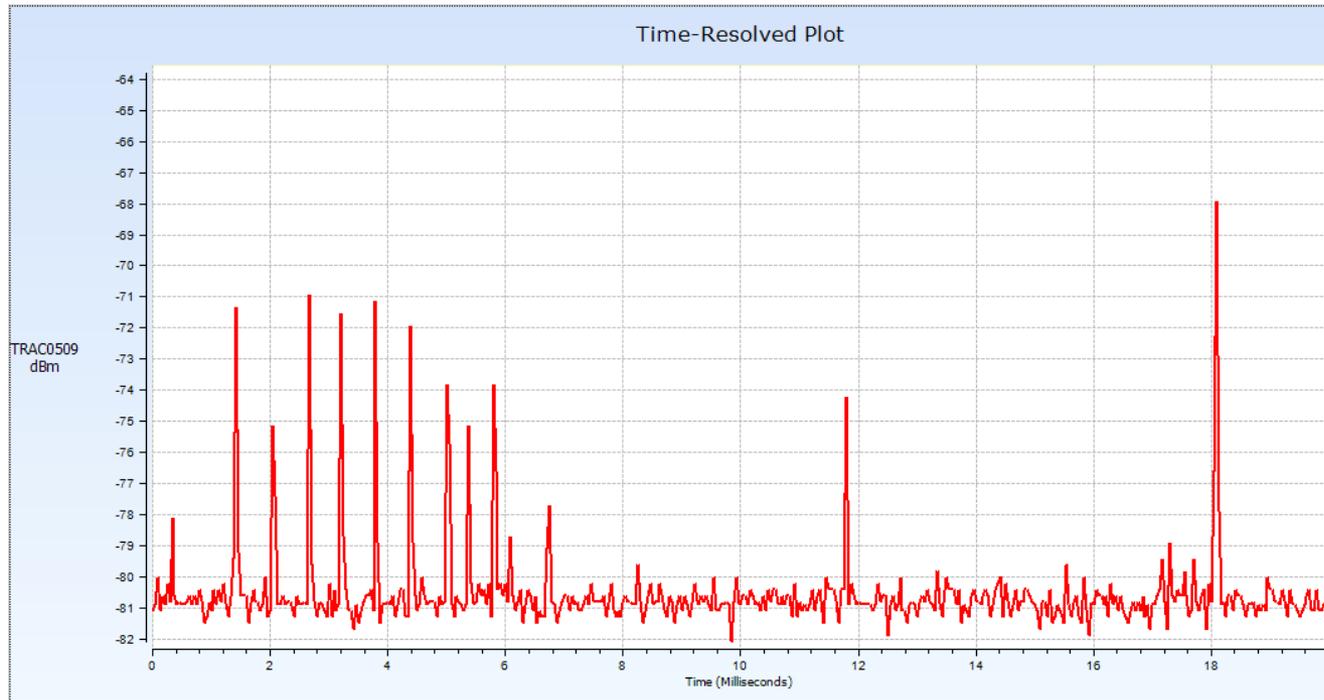
Hector T4 (Nov 2010)



- RFI scan at L8 (TDM at arrow 790MHz)



Hector T4 (Nov 2010)



- Time domain mode at 780MHz – Pos. L8



Hector T4 (Nov 2010)



- Clear signs of severe and mature PD
 - The transformer failed 2 weeks after this survey
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Questions...?

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