

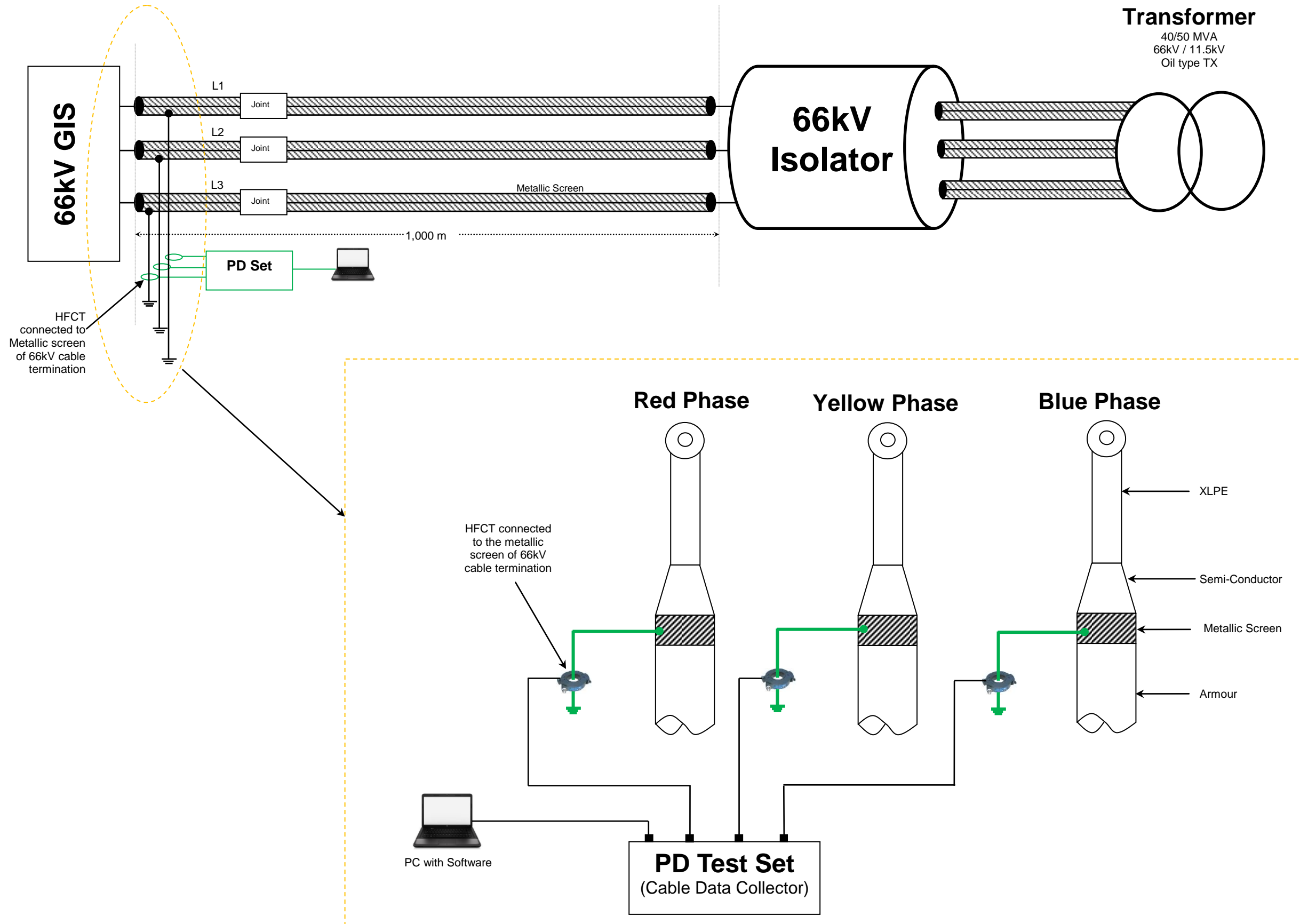
## **Case History - 21: Online PD measurement using HFCT Sensors**

Equipment under Measurement: **66kV XLPE Cable**

Date of Measurement: **20<sup>th</sup> November 2015**

Sensor Used: **HFCT Sensor**

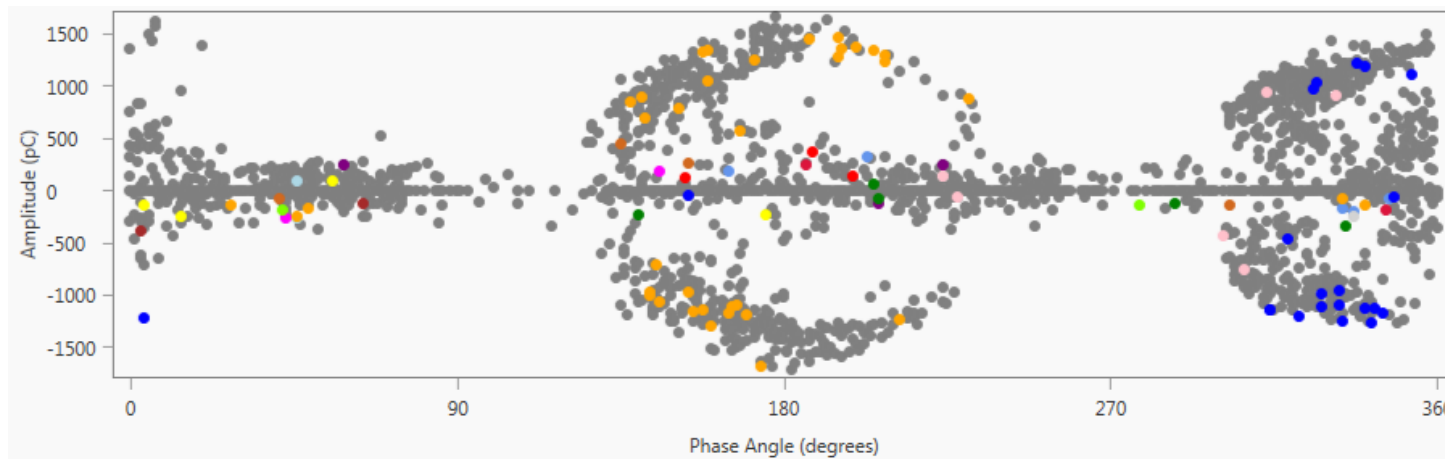
**HFCT CONNECTION DIAGRAM**



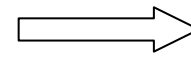
### ONLINE PD MEASUREMENT RESULT (BEFORE FAILURE) USING SNAPSHOT HFCT SENSORS

Client :	A	Identification :	66kV XLPE Cable	Sensor Used:	HFCT Sensor	Length	1,000 meter
Measurement Date :	20 November 2015	Number of Core :	Single Core	Measurement type:	Snapshot	Number of Joint	1
Measurement End	66kV GIS End	Phase information:	Three phase				

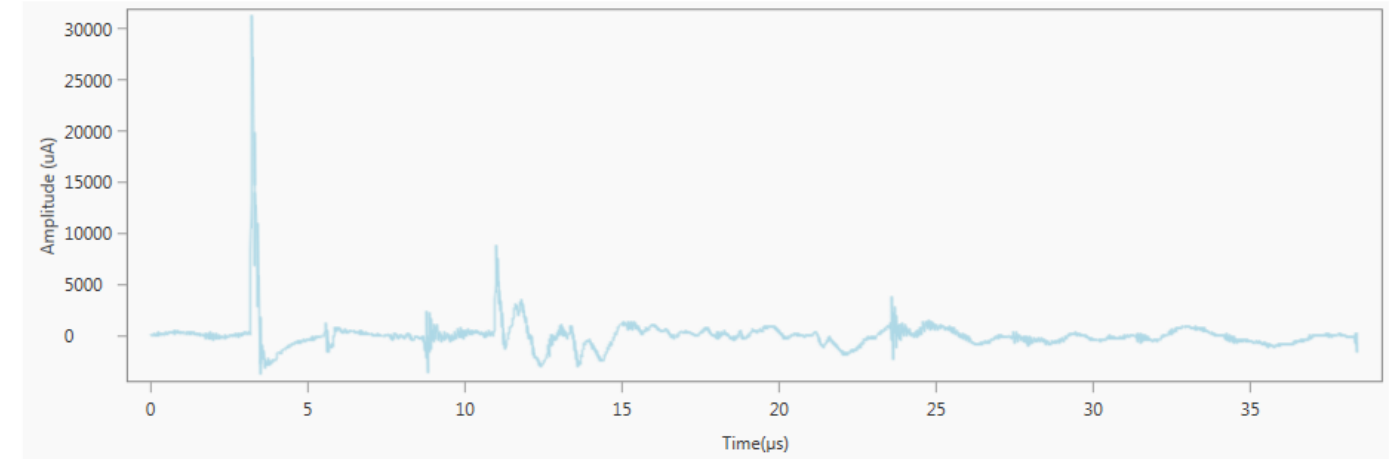
#### Frequency Domain Plot



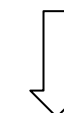
Two loose clusters 180 degrees apart, indicate possible PD



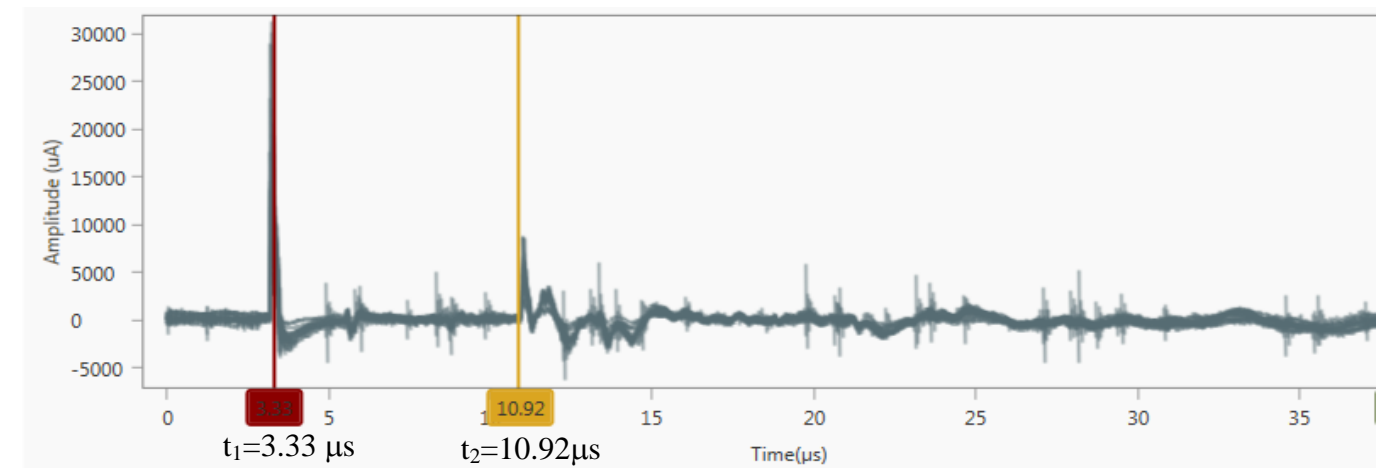
#### Time Domain Plot



First Unipolar Waveform and Reflection pulse with decreasing amplitudes, indicate possible PD



#### PD Localization



$$(t_2 - t_1) = \frac{2x}{c} \Rightarrow x = \frac{c}{2} (t_2 - t_1) \Rightarrow x = 759 \text{ m}$$

**PD location is approximately at 759m away from the 66kV Isolator End.**

FINDING

*There was a failure at the red phase of the cable joint on 13<sup>th</sup> January 2016.*

*Fault was at the cable joint, located at 750 meters away from 66kV Isolator end.*

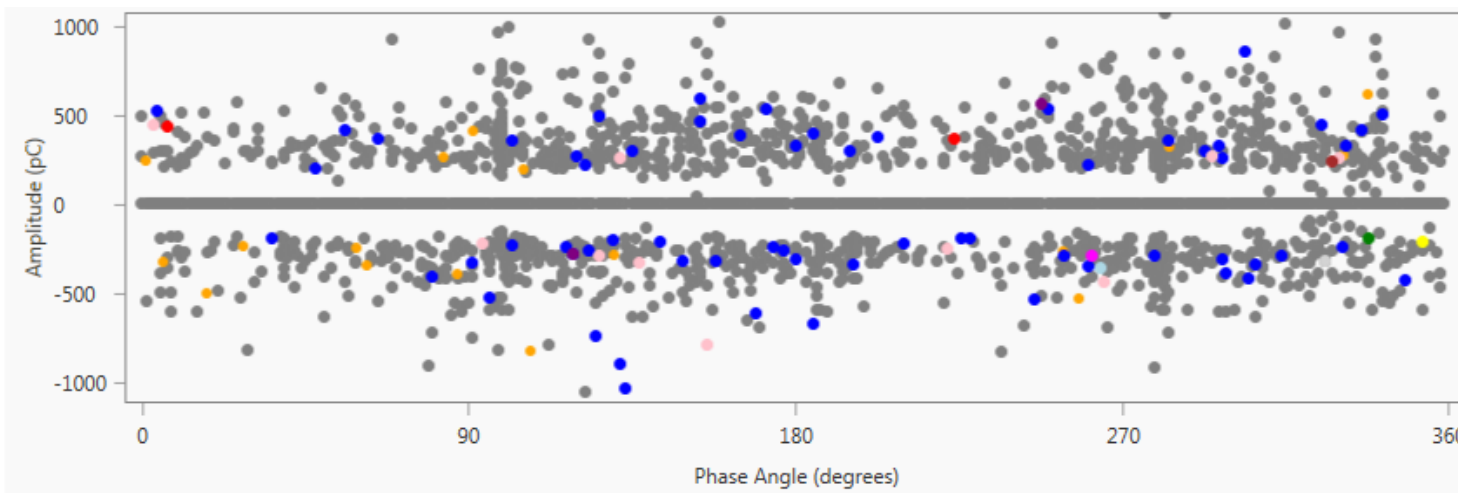
*The cable joint was repaired and was re-energized on 22<sup>nd</sup> January 2016.*

*PD measurement was again done after re-energization.*

**ONLINE PD MEASUREMENT RESULT (AFTER REPAIR) USING SNAPSHOT HFCT SENSORS**

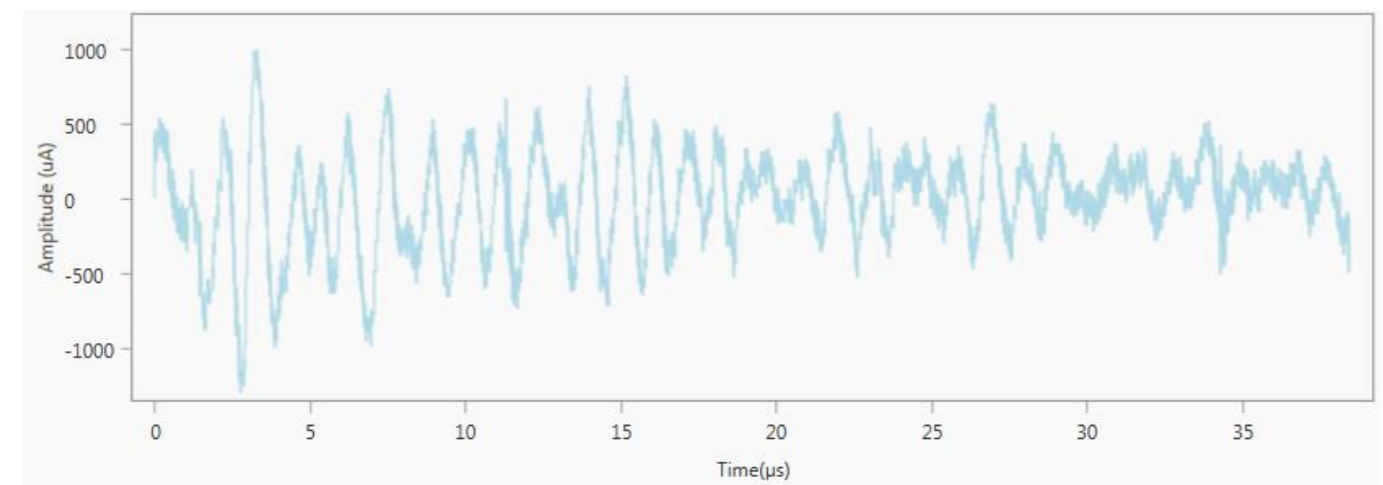
Client :	A	Identification :	66kV XLPE Cable	Sensor Used:	HFCT Sensor	Length	1,000 meter
Measurement Date :	27 January 2016.	Number of Core :	Single Core	Measurement type:	Snapshot	Number of Joint	1
Measurement End	66kV GIS End	Phase information:	Three phase				

**Frequency Domain Plot**



Events occurring randomly across the phase plot => Noise

**Time Domain Plot**



No Unipolar Waveform and No Reflection pulse => Noise