

## **Case History - 14: Using Online Ultrasonic Method**

Equipment Under Measurement: **22kV AIS, FUJI**

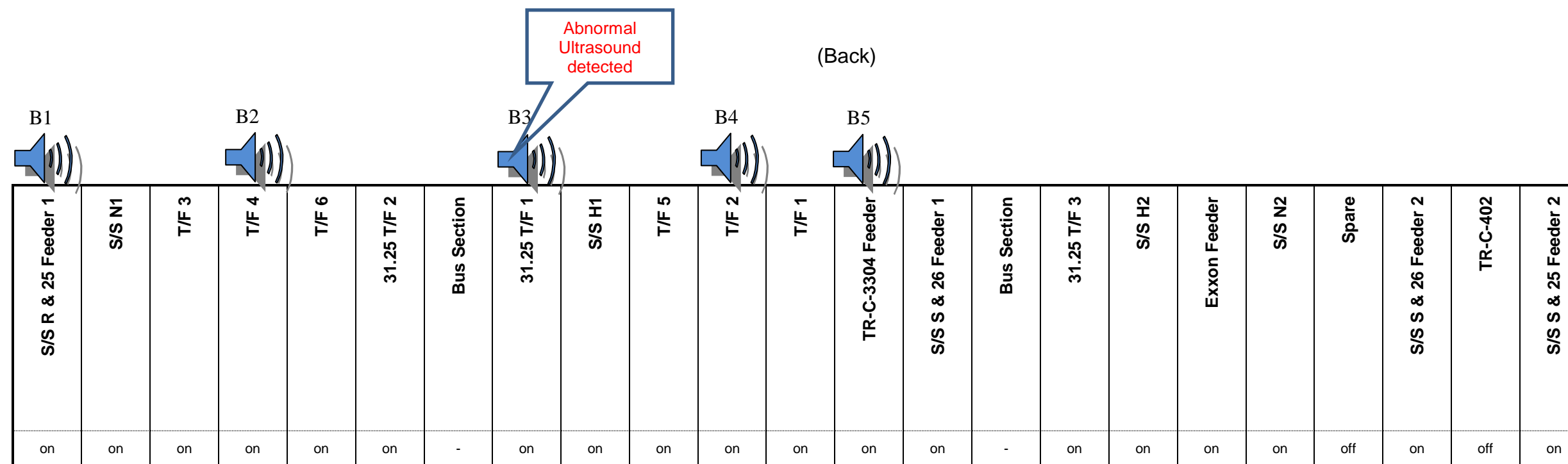
Date of Measurement: **15<sup>th</sup> July 2015**

Sensor Used: **Airborne Ultrasonic sensor**

Observation: **Visible electrical treeing which originates from the point of touching with cable and the black insulation cover.**

**ONLINE PD MEASUREMENT USING SNAPSHOT ULTRASONIC SENSORS  
FOR 22kV FUJI AIS @ HT SWITCHROOM**

Client : <b>A</b>	Identification : <b>-</b>	Type : <b>AIS</b>	Substation location: <b>HT Switchroom @ Substation A</b>
Measurement Date : <b>15<sup>th</sup> July 2015</b>	Sensor Used: <b>Airborne Ultrasonic sensor</b>	Serial No: <b>-</b>	Rated (kV): <b>24 kV</b>
Measured By : <b>Lee Ah Khaw / Muru</b>	Measurement type: <b>Snapshot</b>	Manufacturer /Year: <b>Fuji</b>	Operating Voltage (kV) : <b>22kV</b>
			Air-con : <b>Yes</b>



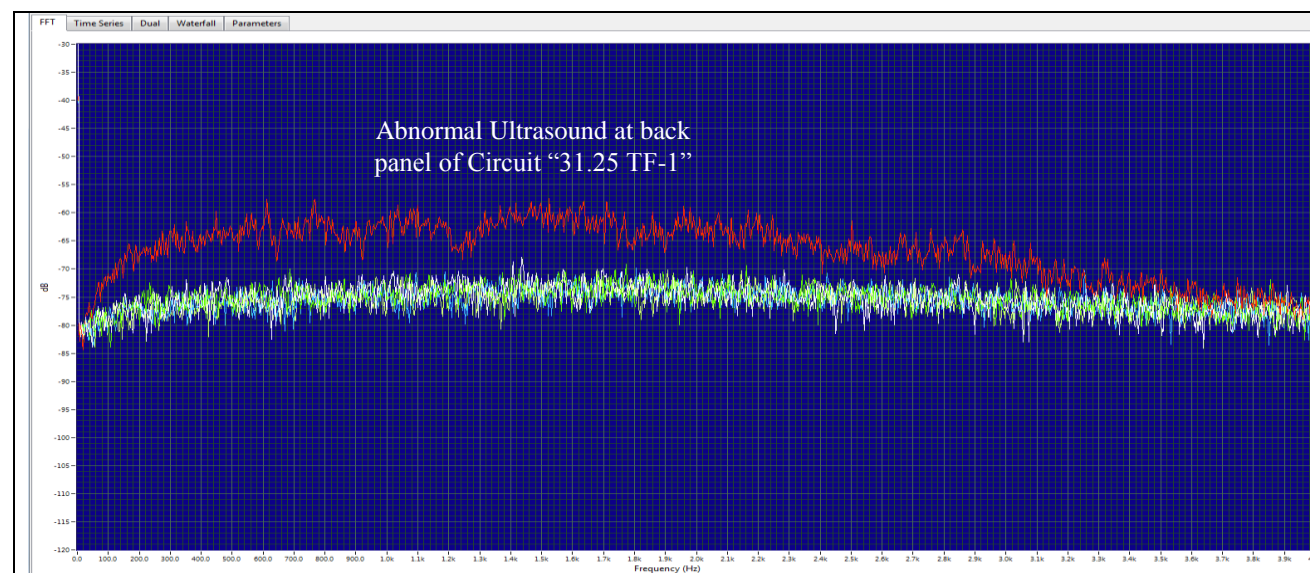
(Front)

ULTRASONIC ACCESS POINT :	
Back side of Switchgear	<input type="checkbox"/> Louver <input type="checkbox"/> Screw Opening <input checked="" type="checkbox"/> Gap in between Panels <input type="checkbox"/> Others
Front side of Switchgear	<input type="checkbox"/> Louver <input type="checkbox"/> Screw Opening <input checked="" type="checkbox"/> Gap in between Panels <input type="checkbox"/> Others
ON-SITE AUDIO MEASUREMENT DETAILS :	
Background Ultrasonic Scan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Abnormal Source Detected (Background)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No   If Yes, _____
Component Ultrasonic Scan	<input checked="" type="checkbox"/> Cable termination <input type="checkbox"/> Circuit Breaker <input type="checkbox"/> VT <input type="checkbox"/> Bus Bar <input type="checkbox"/> Others
Abnormal Source Detected (Component)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No   If Yes, <b>At the back panel of Circuit "31.25 TF-1"</b>
LEGEND :	
	Ultrasonud at the back of Switchgear

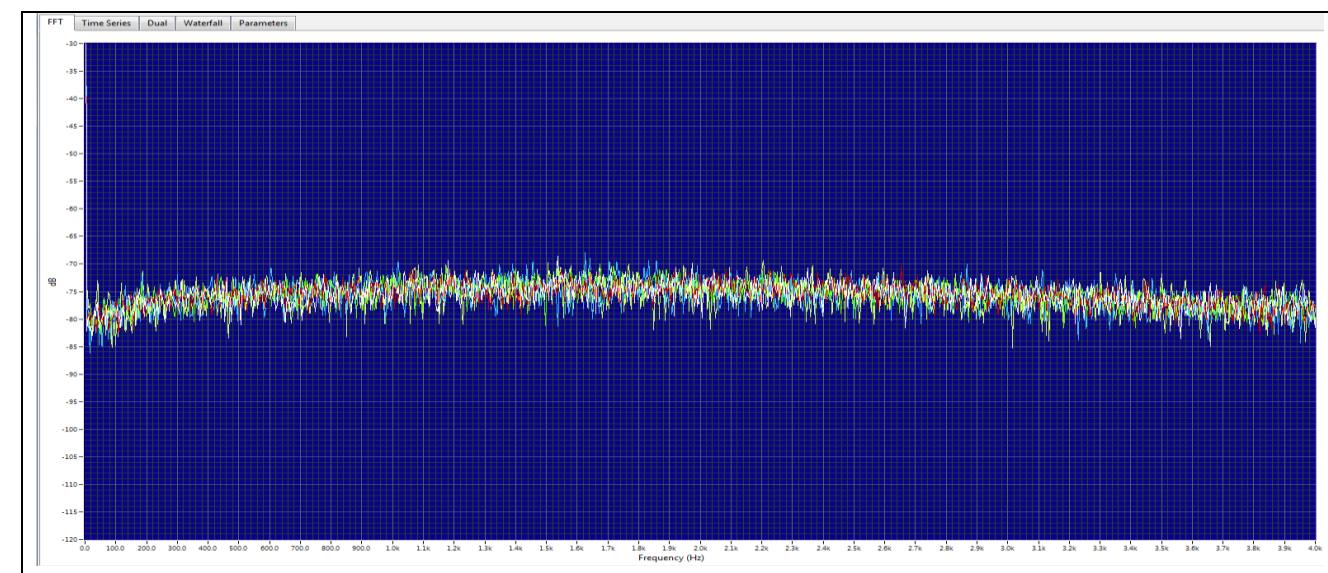
## COMPARISON OF ONLINE PD MEASUREMENT (BEFORE AND AFTER SDM) USING SNAPSHOT ULTRASONIC SENSORS FOR 22kV FUJI AIS @ HT SWITCHROOM

Client : <b>A</b>	Identification : <b>-</b>	Type : <b>AIS</b>	Substation location: <b>HT Switchroom @ Substation A</b>
Measurement Date : <b>-</b>	Sensor Used: <b>Airborne Ultrasonic sensor</b>	Serial No: <b>-</b>	Rated (kV): <b>24 kV</b>
Measured By : <b>Lee Ah Khaw / Muru</b>	Measurement type: <b>Snapshot</b>	Manufacturer /Year: <b>Fuji</b>	Operating Voltage (kV) : <b>22kV</b>
			Air-con : <b>Yes</b>

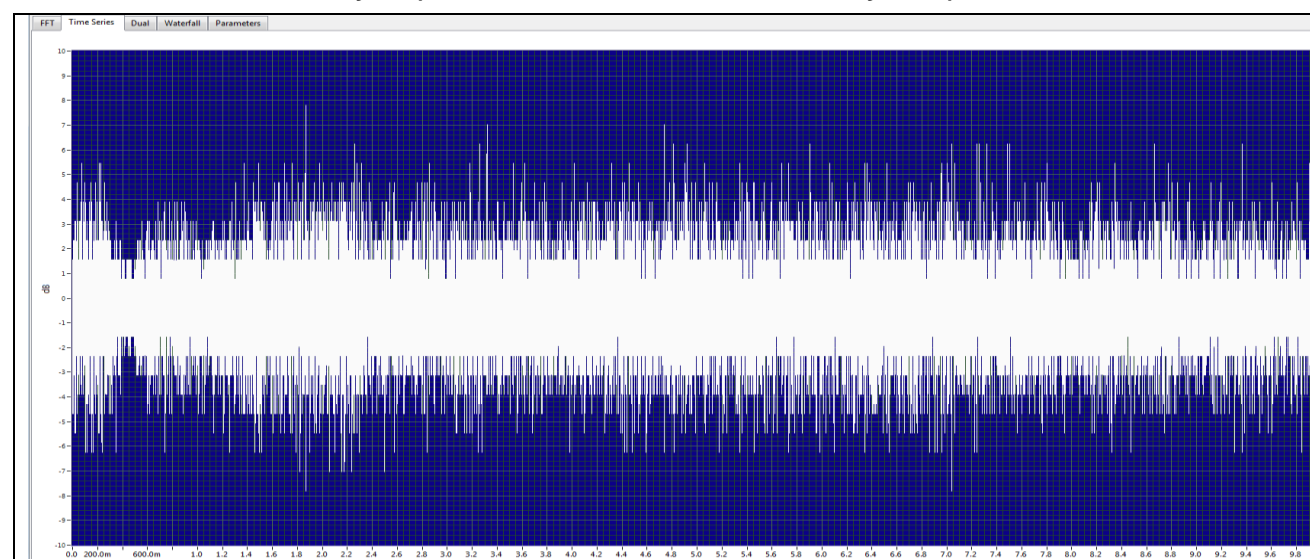
• **Frequency Domain Analysis (Before SDM \_ Measured on 15<sup>th</sup> July 2015)**



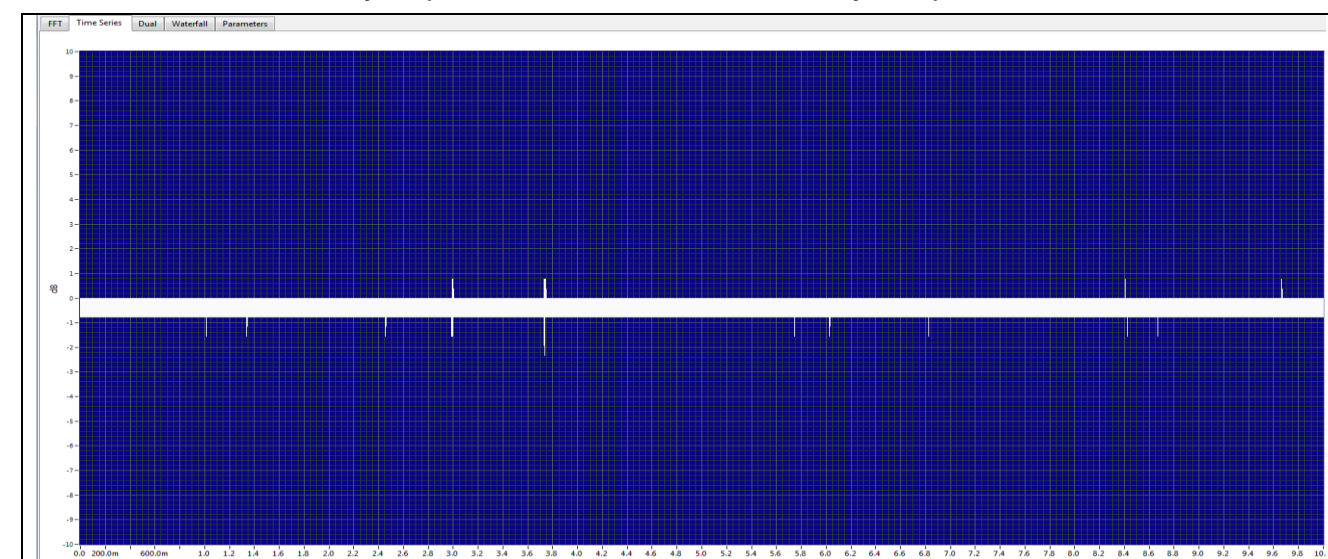
• **Frequency Domain Analysis (After SDM \_ Measured on 20<sup>th</sup> July 2015)**



• **Time Domain Analysis (Before SDM \_ Measured on 15<sup>th</sup> July 2015)**



• **Time Domain Analysis (After SDM \_ Measured on 20<sup>th</sup> July 2015)**



• Audio Analysis => **Abnormal ultrasound was detected.**

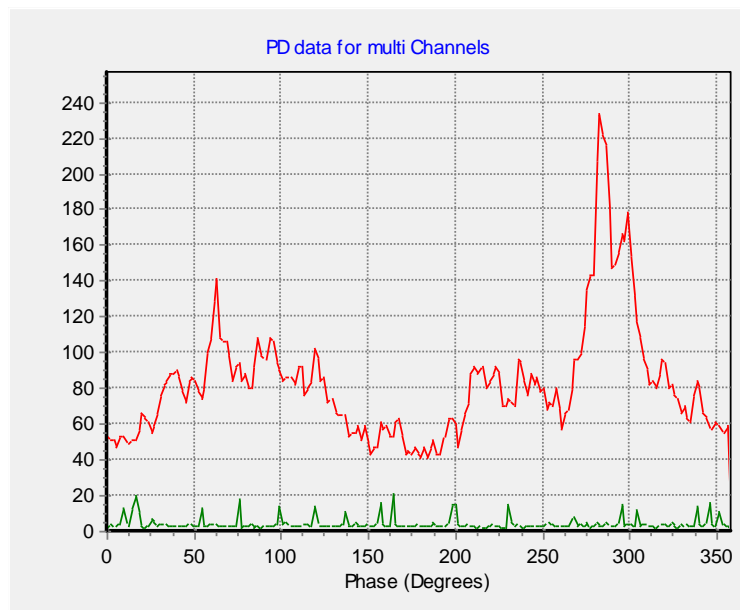
*\*SDM was done on 16<sup>th</sup> July 2015.*

• Audio Analysis => **No Abnormal ultrasound was detected**

## COMPARISON OF ONLINE PD MEASUREMENT (BEFORE AND AFTER SDM) USING SNAPSHOT ULTRASONIC SENSORS IN PHASE RESOLVED FOR 22kV FUJI AIS @ HT SWITCHROOM

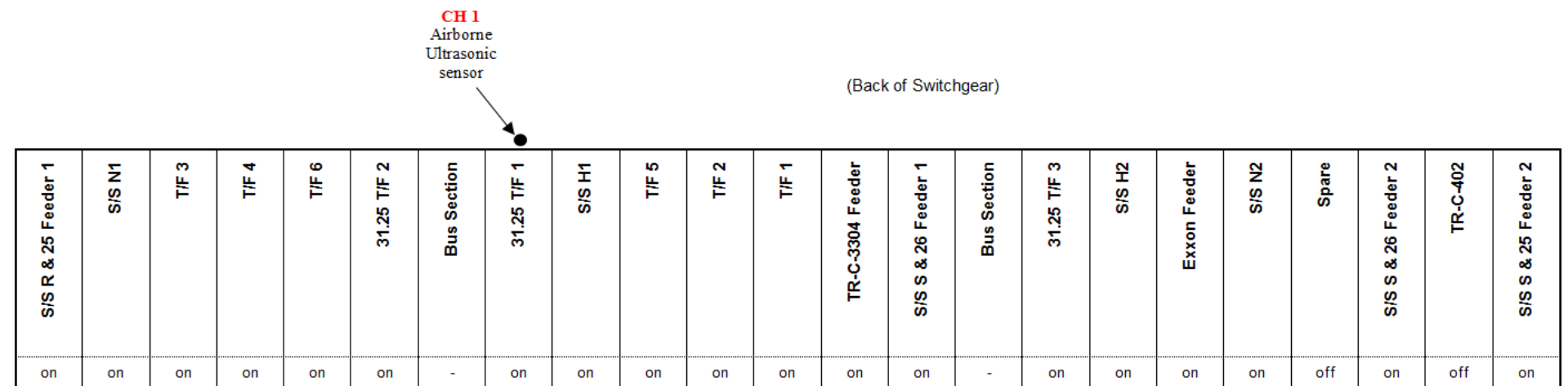
Client :	<b>A</b>	Identification :	-	Type :	<b>AIS</b>	Substation location:	<b>HT Switchroom @ Substation A</b>
Measurement Date :	-	Sensor Used:	<b>Ultrasonic in phase resolved mode</b>	Serial No:	-	Rated (kV):	<b>24 kV</b>
Measured By :	<b>Murugesan</b>	Measurement type:	<b>Snapshot</b>	Manufacturer /Year:	<b>Fuji</b>	Operating Voltage (kV) :	<b>22kV</b>
						Air-con :	<b>Yes</b>

- Airborne Ultrasonic in Phase Resoled Mode Measurement (Before SDM \_ Measured on 15<sup>th</sup> July 2015)**



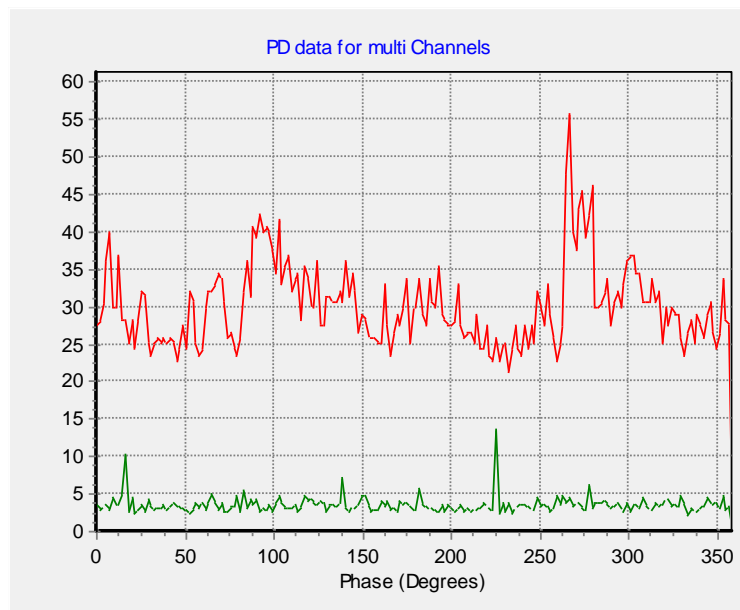
PASS	<input type="checkbox"/>
FAIL	<input checked="" type="checkbox"/>

### SENSOR PLACEMENT LAYOUT



(Front of Switchgear)

- Airborne Ultrasonic in Phase Resoled Mode Measurement (After SDM \_ Measured on 20<sup>th</sup> July 2015)**



PASS	<input checked="" type="checkbox"/>
FAIL	<input type="checkbox"/>

■ Panel ultrasound in phase resolved mode  
■ Background Noise

\*SDM was done on 16<sup>th</sup> July 2015.

**OBSERVATION DURING SHUTDOWN MAINTENANCE FOR 22kV AIS @ HT SWITCHROOM**



**Visible Electrical treeing which originates from the point of touching with cable and the black insulation cover.**

*\*SDM was done on 16<sup>th</sup> July 2015.*