

Electrical Condition Monitoring with Ultrasound

Charlee Lipham

Background

7 Years of Experience:

- 4 years as a Reliability Co-Op

- 3 years as a Condition Monitoring Engineer

BSME from Auburn University

Certifications:

- Vibration Level II

- Ultrasound Level II

- Thermography Level I

- Machinery Lubrication Analyst Level 1



Developing a Program

Safety

NFPA 70E, PPE

Frequency

Routes semi-annually

Criticality

All Critical Equipment above 480V (13.8kV switchgear, transformers, 4160V feeder breakers)

Documentation

Stored in Ultratrend DMS 5, area ultrasound reports, and work orders

Documentation

Ultrasound MCC Scans

Area: <u>Powerhouse</u>	Humidity: <u>90%</u>	Equipment #: _____
Record #: <u>1</u>	Location of Recording: _____	Voltage: <u>4160V</u>
Comments: <u>Tracking</u>		
Area: _____	Humidity: _____	Equipment #: _____
Record #: _____	Location of Recording: _____	Voltage: _____
Comments: _____		

Documentation

Ultratrend DMS

File Edit Communications Help

All Data

- Bearing
- Electrical
 - #1 PAPER MACHINE
 - #2 PAPER MACHINE
 - CHEMICAL RECOVERY
 - COLOR PLANT
 - GENERAL
 - MCC Route
 - POWERHOUSE
 - Points Currently In
 - PH0
 - PH2
 - PH3
 - PH4
 - PH5
 - PH7
 - PH8
 - PH10
 - PH12
 - PH15-3BB
 - 0443B100 022
 - 9/18/2017 9:20 AM
 - 9/18/2017 9:24 AM
 - 8/10/2018 1:00 PM
 - 8/10/2018 1:02 PM
 - 1/2/2019 11:27 AM
 - 1/2/2019 11:32 AM**
 - PH17
 - PULPMILL
 - RECYCLE
 - RIVER WATER
 - SHIPPING
 - Test
 - TURBINE DECK
 - U1
 - WASTE TREATMENT
 - WOODYARD

Record Information

Date/Time: 1/2/2019 11:32:21 AM

Module Type: SCM

Test Result: TRK

dB: 14

Frequency: 40

Inspector ID: CAL

Temperature: 32

Mode: Real Time

Sensitivity: 67

Meter Response: Slow

Location: NE

Offset: 0

Alarm: 122

Units: Standard

Item Component: SGR

Location / Machine: PH15-3BB

Scale: Relative

Voltage: 138KV

Point: 0443B100

Instrument: UP15000

Humidity: 90

Comments: Frontside of switch. Bottom of door.

Serial Number:

Baseline? ☒

WAV File

C:\DMS Plants\All Data\All Data\Electrical\MCC Route.WAV\SA011_01021911315467040.wav

Open

Record Path

All Data\Electrical\POWERHOUSE\PH15-3BB\0443B100.022

Documentation



Powerhouse MCC Room Ultrasound Report

Equipment Inspected:
August 2018
Inspected by: Charlee Lipham



Types of Operating Problems

Arcing is very abrupt, and can sound violent. Arcing develops a high current path to the ground and is often accompanied by heat.

Tracking is often referred to as "baby arcing". It starts silent and builds in intensity, or amplitude, until it reaches flashover and discharges.

Corona is the electrical discharge around conductors when the surroundings air is stressed beyond its ionization point without developing flashover.

For questions or additional information please contact:
Charlee Lipham



Powerhouse Electrical Problem Summary Page

Location	Room	Problem
##-##-###	PH#	Tracking



Electrical Faults

Corona – glow or electrical discharge around conductors when the surrounding air is stressed beyond its ionization point without developing flashover.



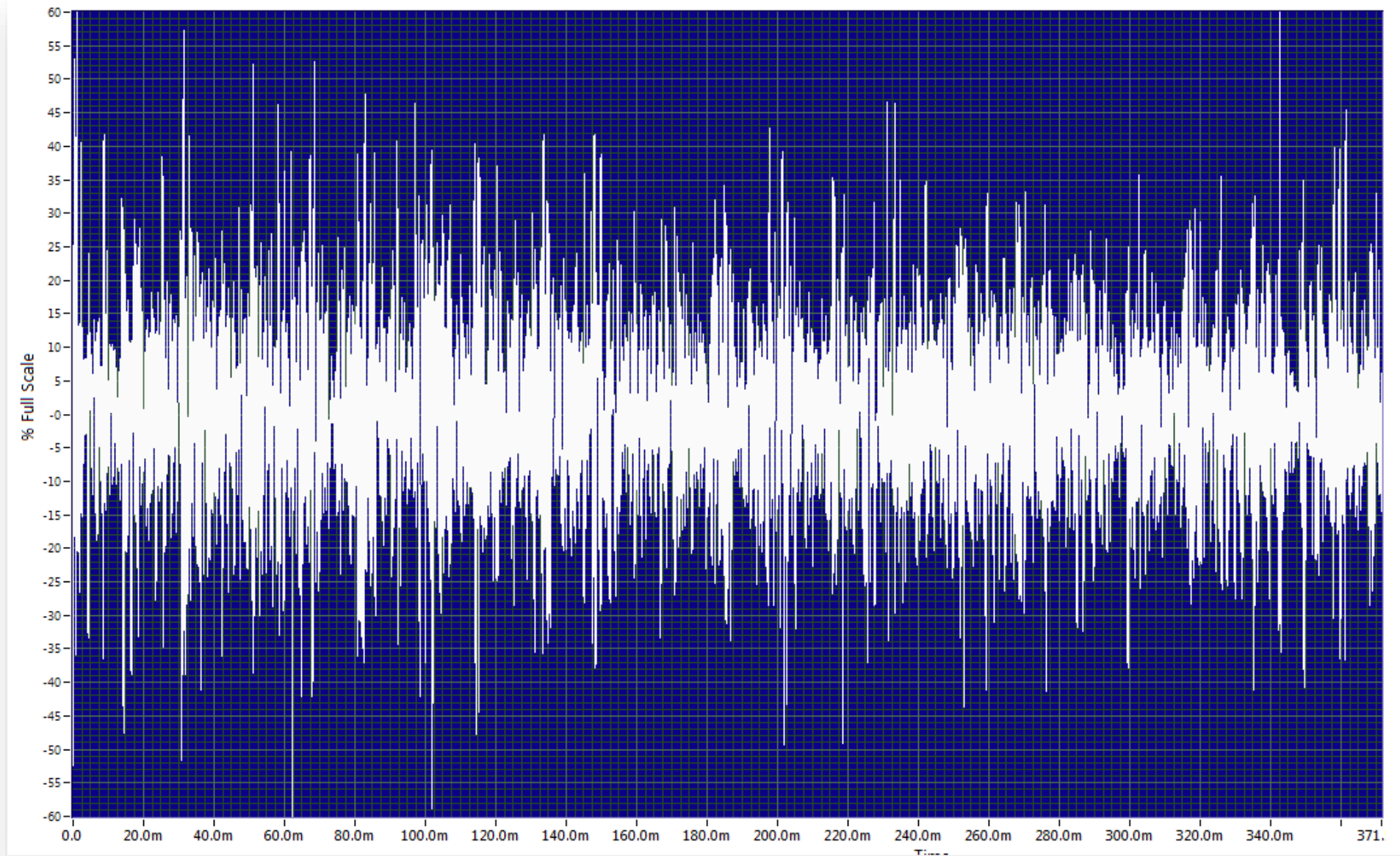
Tracking – “baby arcing” is an electrical breakdown on the surface of an insulating material.



Arcing – develops a high current path to ground and is often accompanied by significant heat, as well as sound.



Primary Switch



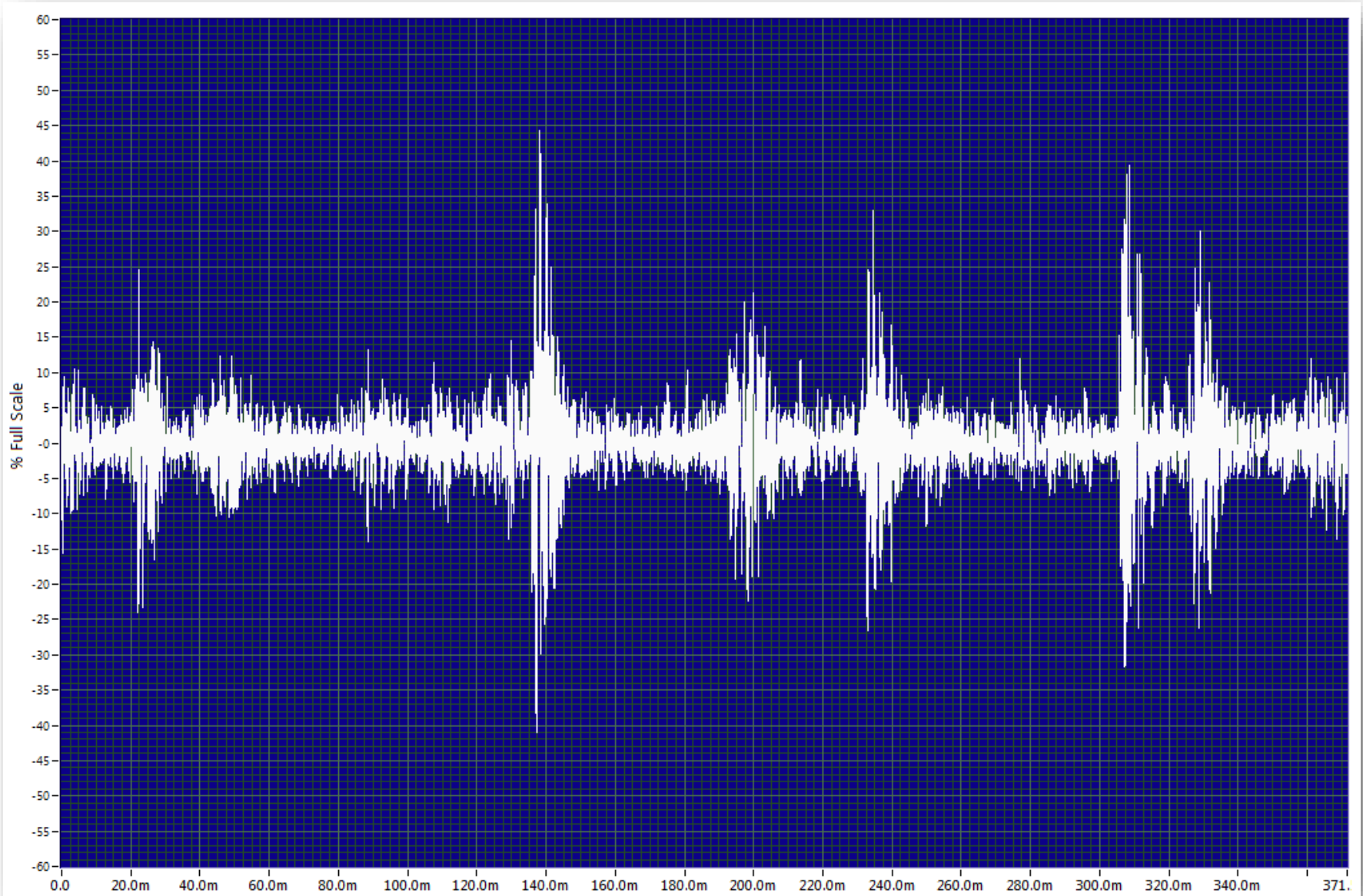


Location of recording.

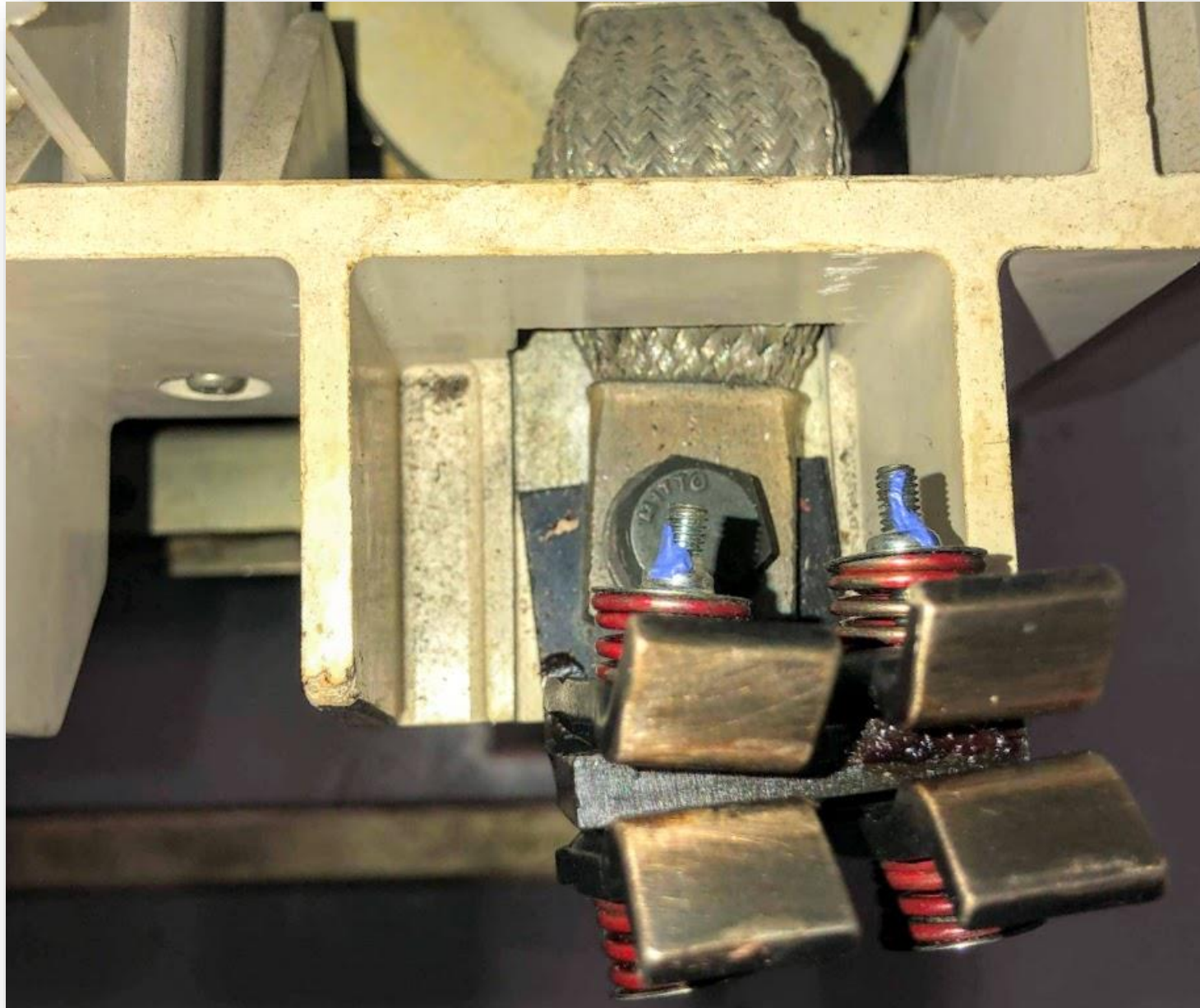
Primary Switch - Tracking



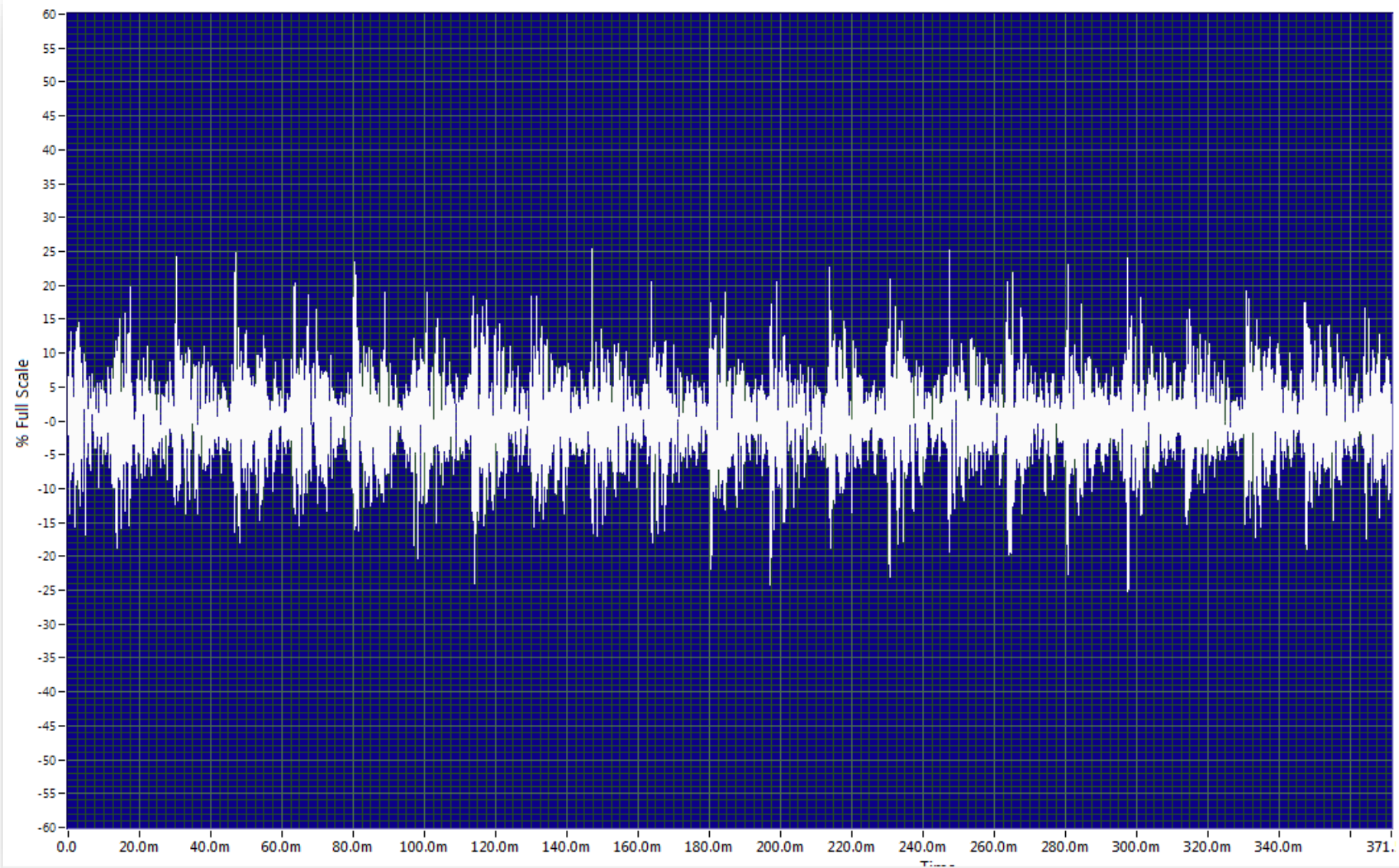
4160V Starter



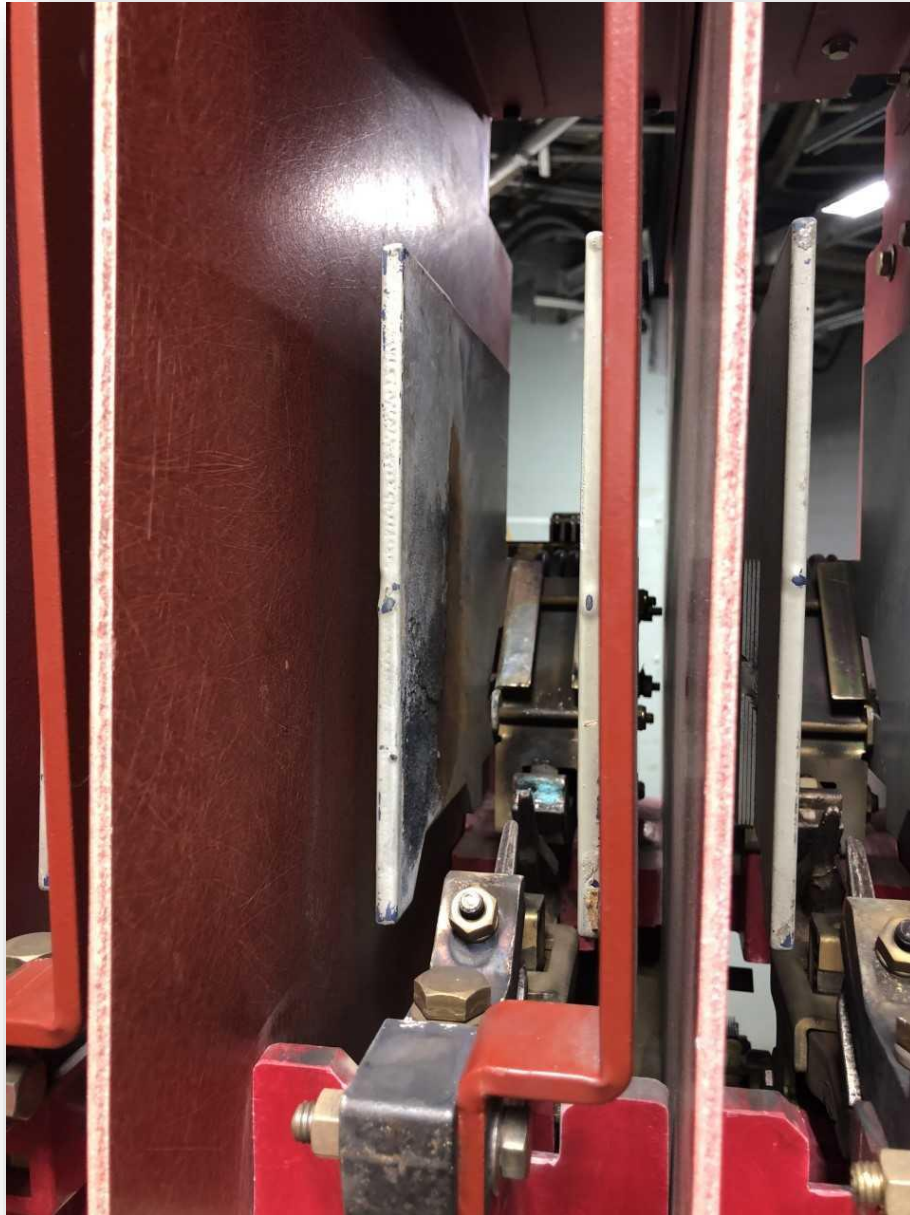
4160V Starter - Arcing



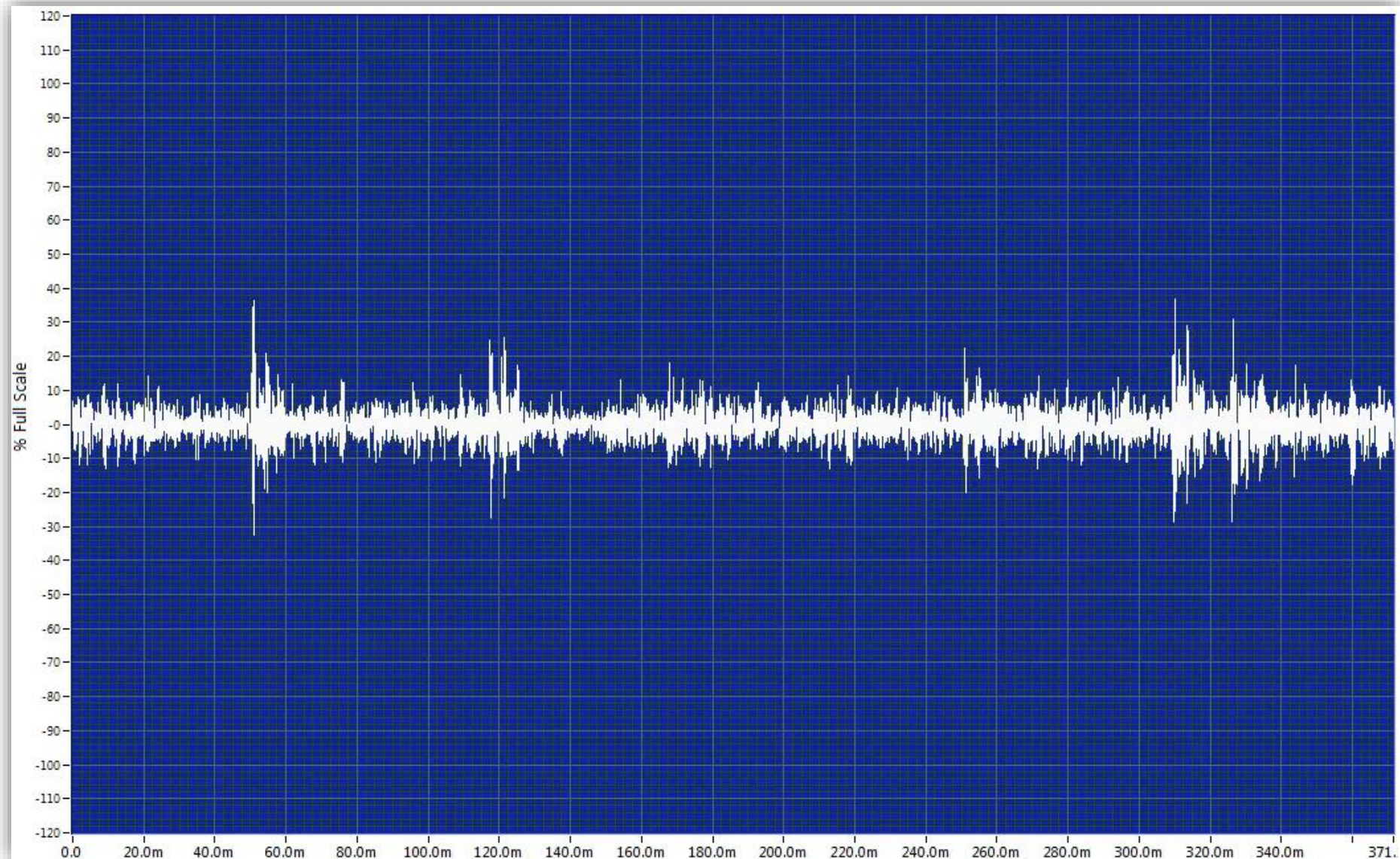
4160V Starter



4160V Starter – Corona



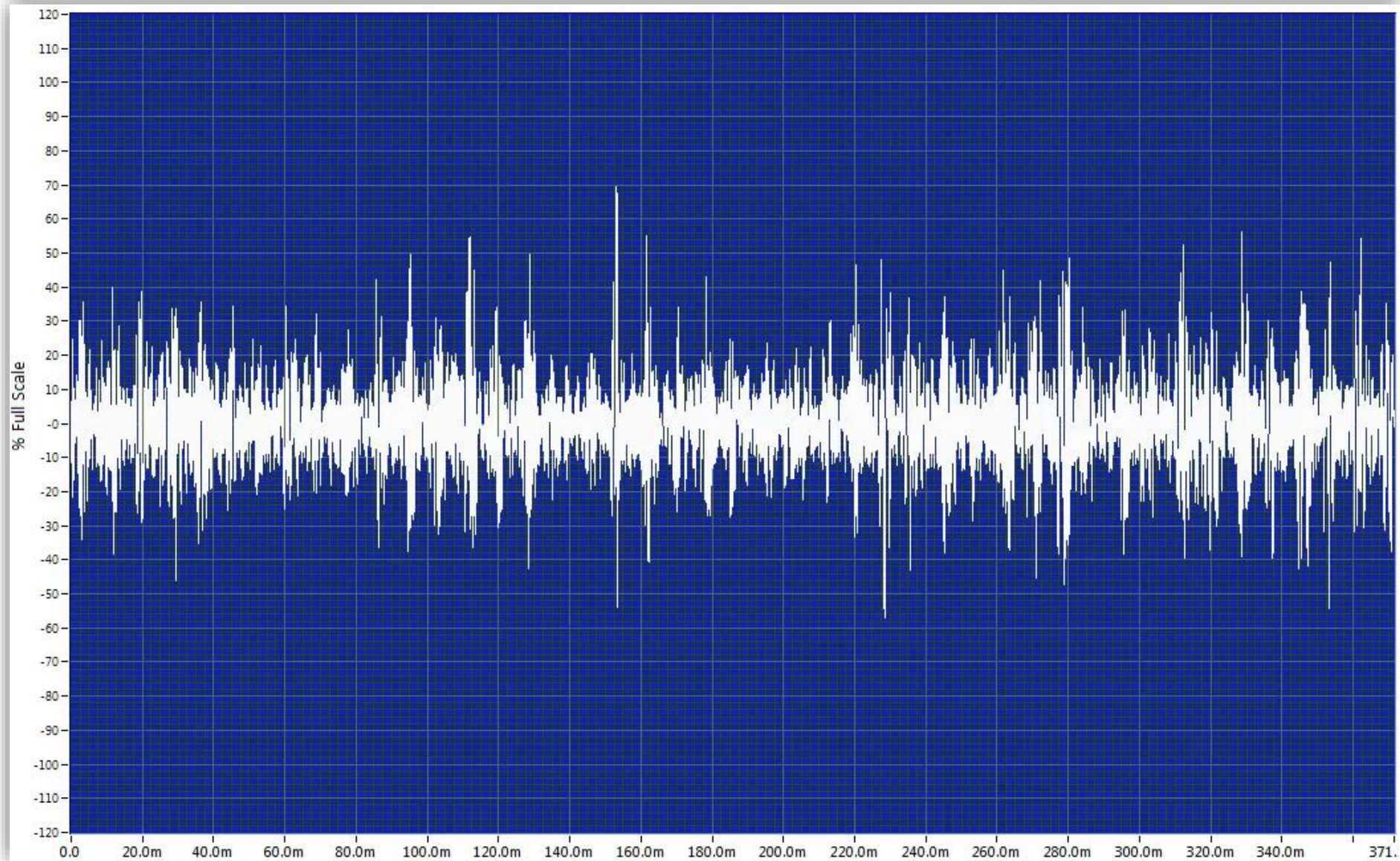
4160V Starter



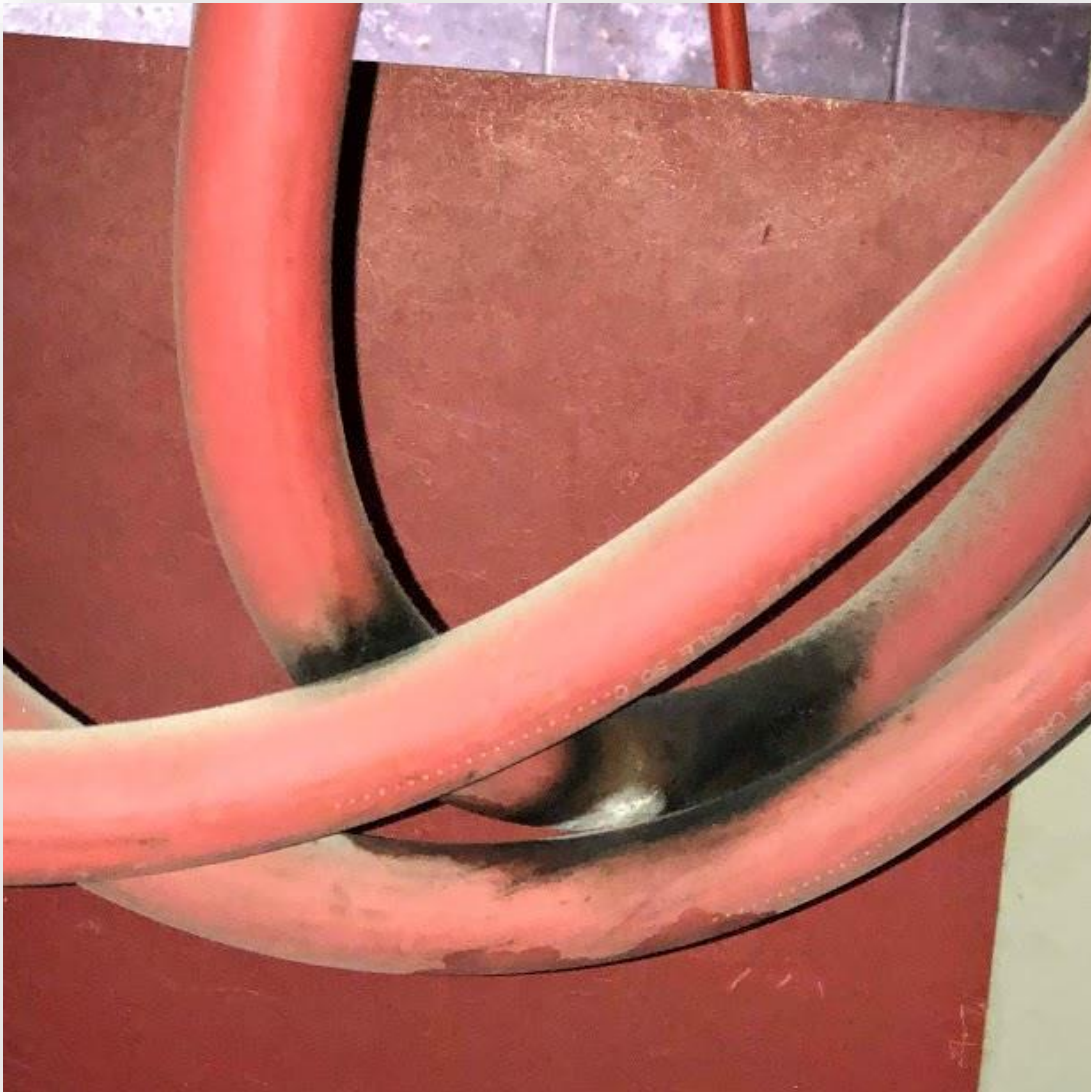
4160V Starter



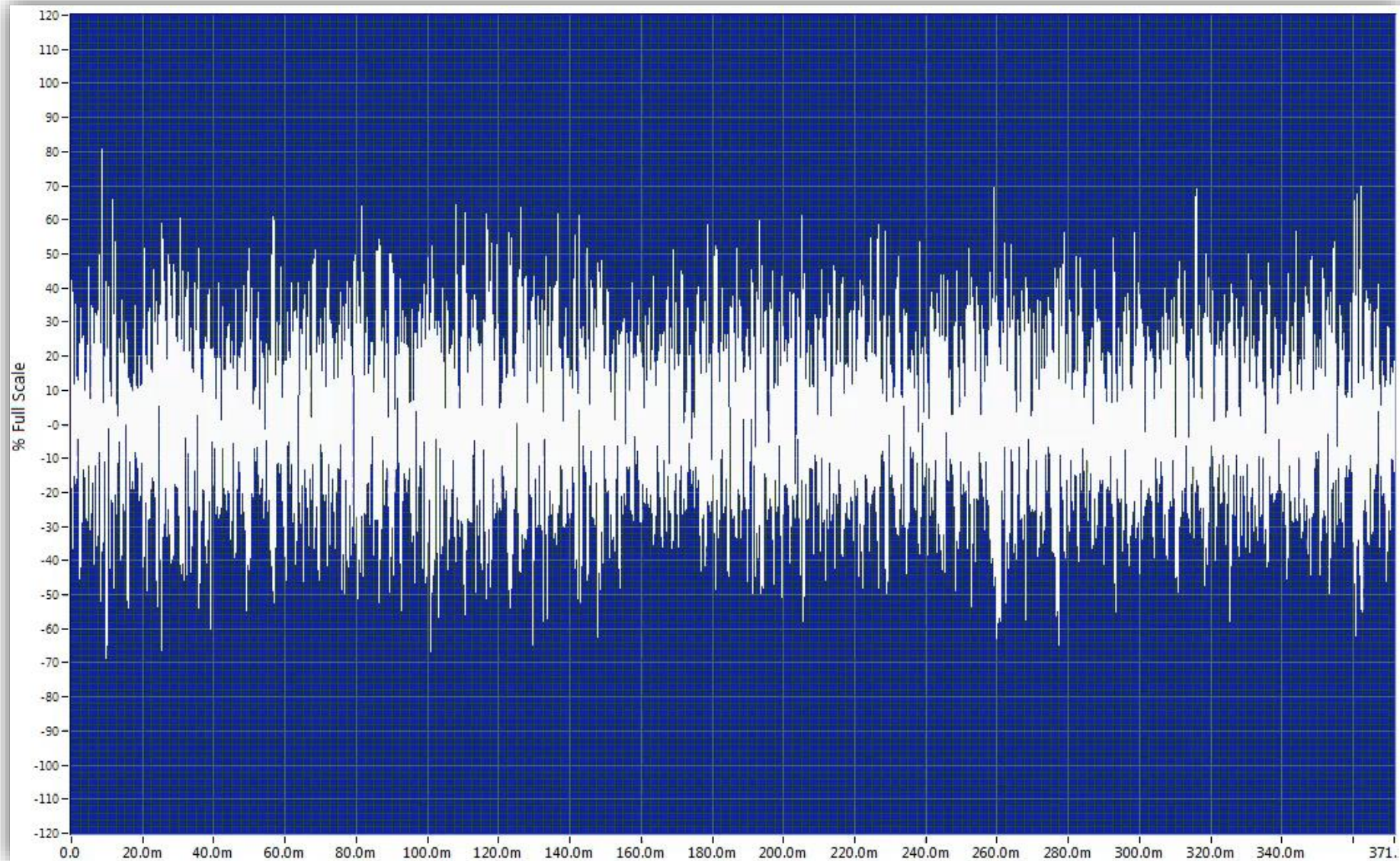
Primary Switch



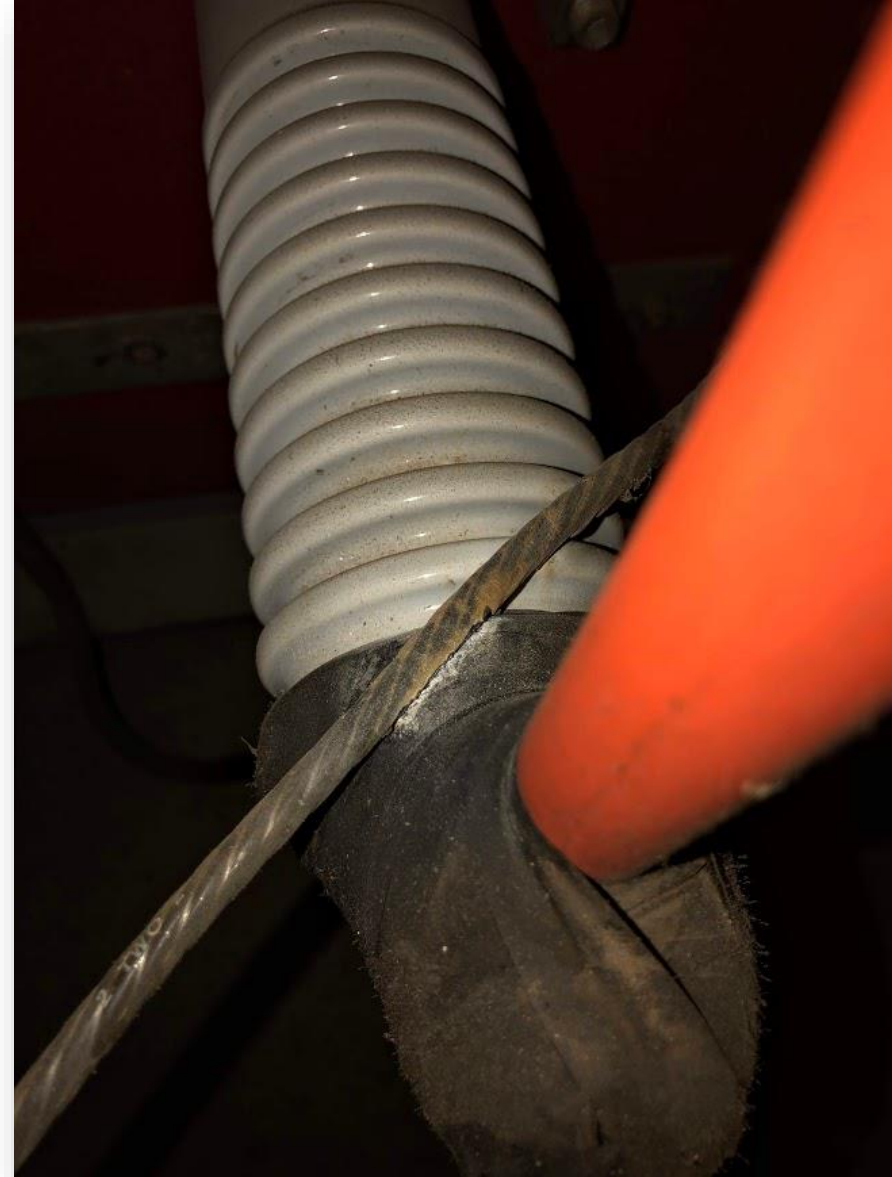
Primary Switch - Tracking



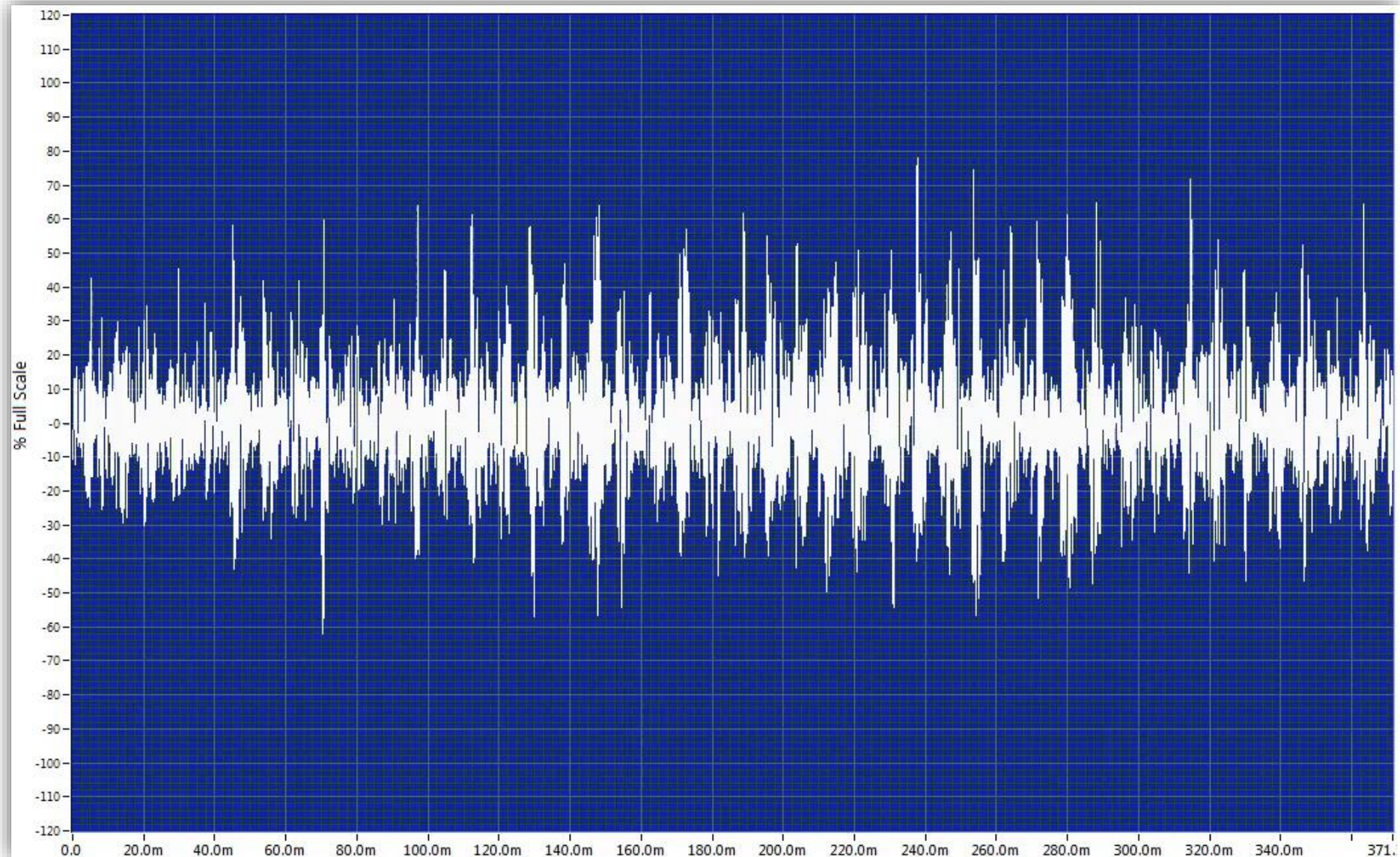
Primary Switch



Primary Switch - Tracking



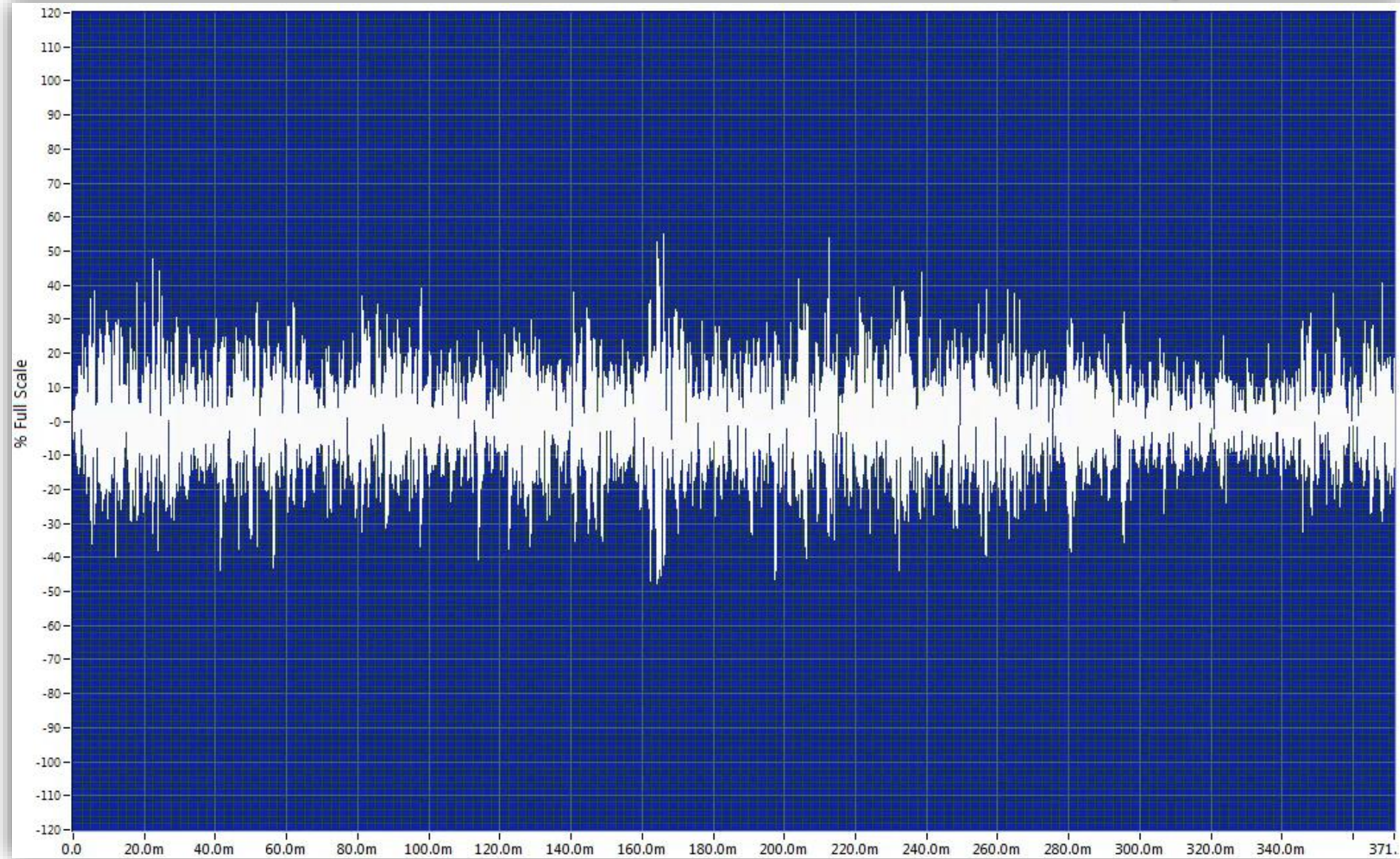
Primary Switch



Primary Switch - Tracking Rubbing due to Cable Contact and Overcrowding



Feeder Breaker



Feeder Breaker – Arcing

