CHAR SYSTEM
OPERATION & TRAINING

Module 5
Data Reporting

LEARNING OBJECTIVE

- Create basic CHAR Reports:
  - Instant: All data for one attachment
  - Comparison: Compares two attachments
  - Summary: Summarizes data for all records selected
  - Custom: Special report for equipment type
  - Statistical: Compares identical equipment types
  - Excel Export: Export data to spreadsheet

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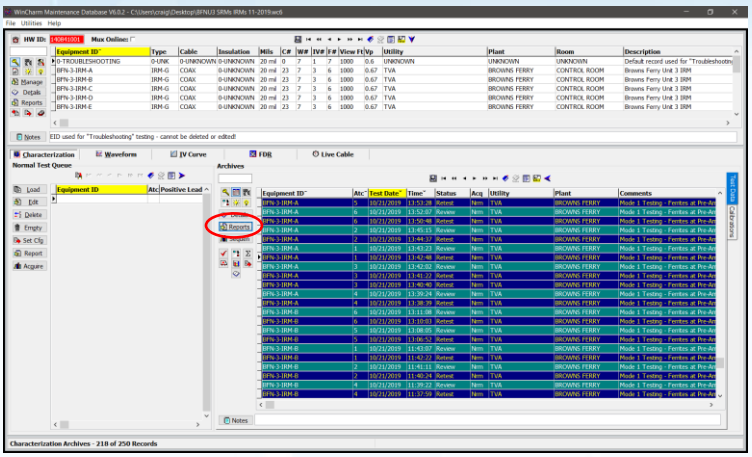
CREATE REPORTS FROM ARCHIVE TAB



Select Reports button to see available report types

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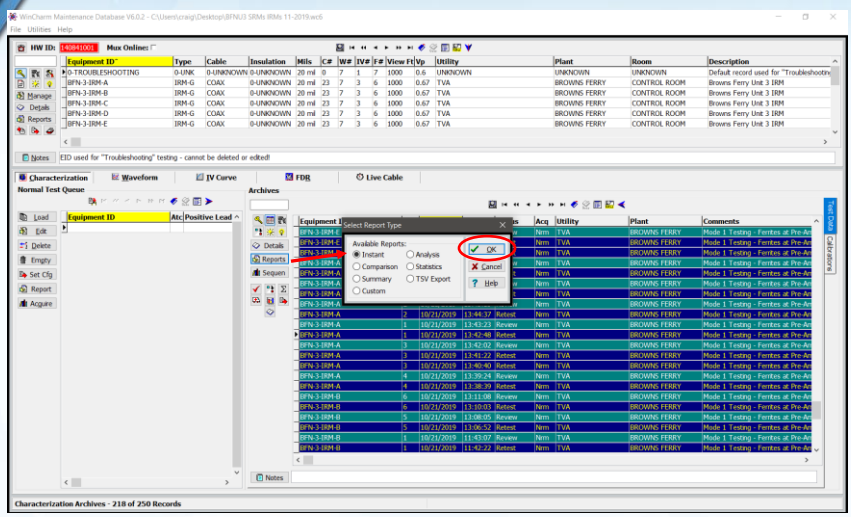
CREATING AN INSTANT REPORT



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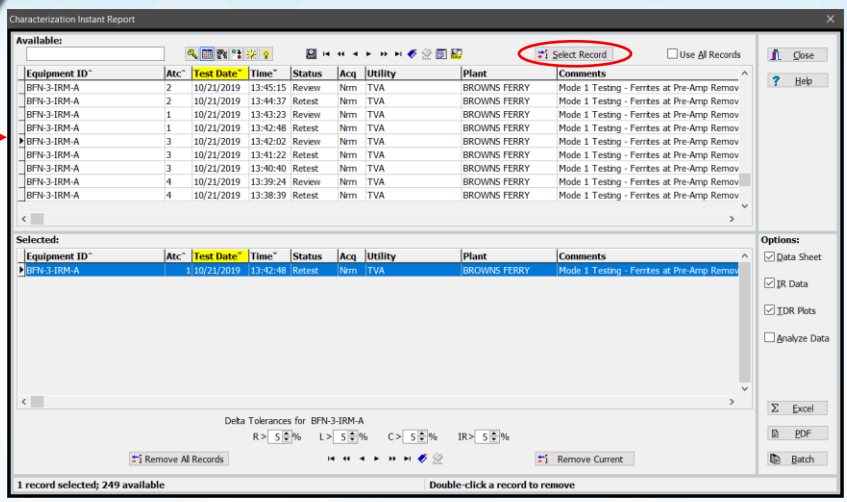
CREATING AN INSTANT REPORT



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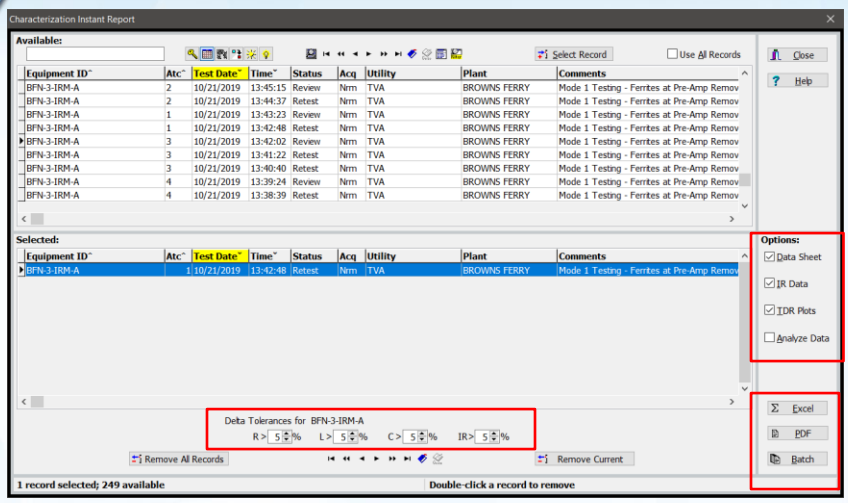
SET TOLERANCES, REPORT OPTIONS, AND CREATE REPORT



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INSTANT REPORT EXAMPLE

Characterization Instant Report

CURRENT TEST			
Equipment ID	BFN-3-IRM-A	Test Date	10/21/2019
Attachment	1	Test Time	13:42:48
Room - Cabinet	CONTROL ROOM	Terminal Board	
Attachment Type	High Impedance	Voltage	Yes
System ID	190341003	TDR - DTDR	Yes - Auto
Device Type	IRM-G	Impedance	Yes
Cable Type	COAX	IR - Volts @ Time	No - 15 @ 0.25
Positive Lead	HV Cable Center Conductor		
Negative Lead	HV Cable Shield		
Description	Browns Ferry Unit 3 IRM		
Comments	Mode 1 Testing - Ferrites at Pre-Amp Removed		

BASELINE TEST			
Equipment ID	BFN-3-IRM-A	Test Date	10/21/2019
Attachment	1	Test Time	13:42:48
Room - Cabinet	CONTROL ROOM	Terminal Board	
Attachment Type	High Impedance	Voltage	Yes
System ID	190341003	TDR - DTDR	Yes - Auto
Device Type	IRM-G	Impedance	Yes
Cable Type	COAX	IR - Volts @ Time	No - 15 @ 0.25
Positive Lead	HV Cable Center Conductor		
Negative Lead	HV Cable Shield		
Description	Browns Ferry Unit 3 IRM		
Comments	Mode 1 Testing - Ferrites at Pre-Amp Removed		

DATA			
	Current Test	Baseline Test	% Change
Voltage Check	80.86 mV	80.86 mV	IN RANGE
DC Resistance (Ohms)	5.12 M	5.12 M	IN RANGE
1 KHz Resistance (Ohms)	27.39 k	27.39 k	IN RANGE
1 KHz Capacitance	1.80 nF	1.80 nF	IN RANGE
1 KHz Dissipation	309.94 m	309.94 m	IN RANGE
Insulation DCR (Ohms)			N/A
Polarization Ratio			N/A
TDR Time Base	62.5ns	62.5ns	N/A
Test Lead Delay	84.92 nS	84.92 nS	IN RANGE
Test Lead Length	26.71 Ft	26.71 Ft	IN RANGE
Tolerances			
R <5.00 %	L <5.00 %	C <5.00 %	IR <5.00 %

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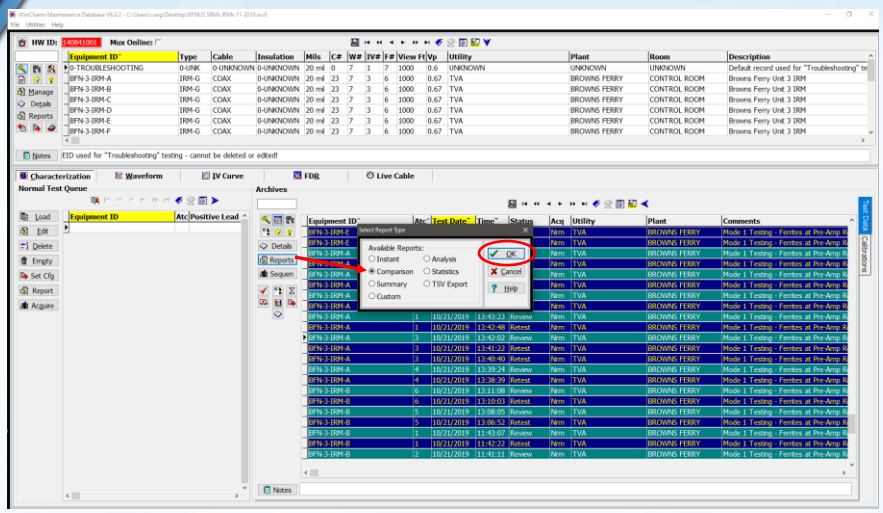
CREATING A COMPARISON REPORT



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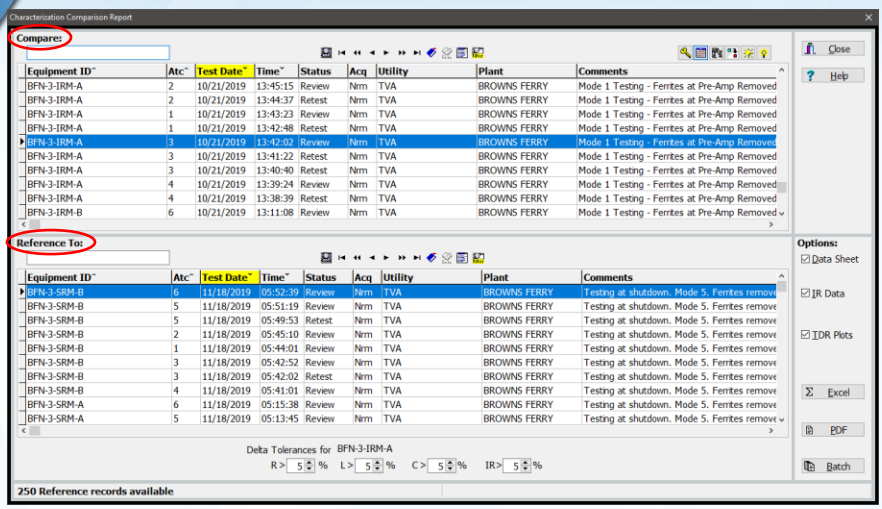
SELECT TEST TO COMPARE AND TEST TO REFERENCE WITH



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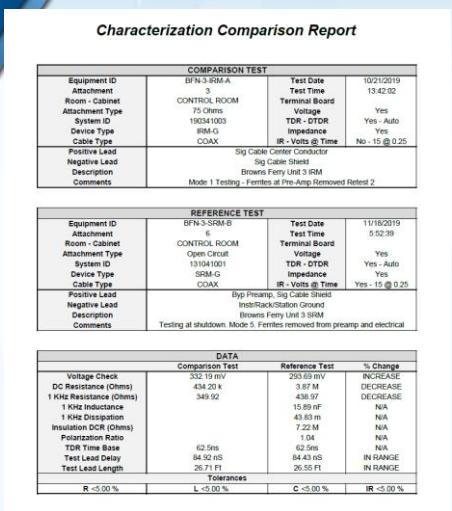
COMPARISON REPORT EXAMPLE

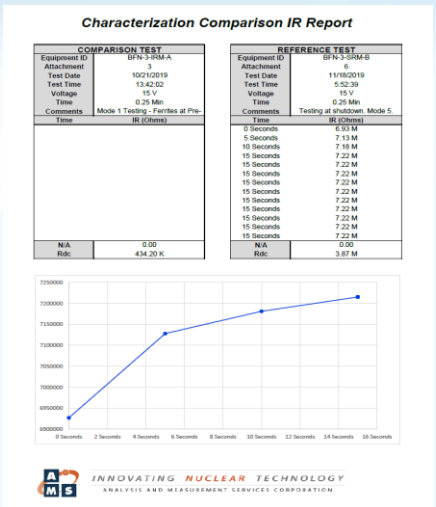


Characterization Comparison Report

COMPARISON TEST			
Equipment ID	BFN-3-IRM-A	Test Date	10/21/2019
Attachment	3	Test Time	13:42:02
Room - Cabinet	CONTROL ROOM	Terminal Board	
Attachment Type	75 Ohms	Voltage	Yes
System ID	190341003	TDR - DTDR	Yes - Auto
Device Type	IRM-G	Impedance	Yes
Cable Type	COAX	IR - Volts @ Time	No - 15 @ 0.25
Positive Lead	Sig Cable Center Conductor		
Negative Lead	Sig Cable Shield		
Description	Browns Ferry Unit 3 IRM		
Comments	Mode 1 Testing - Ferrites at Pre-Amp Removed Retest 2		

REFERENCE TEST			
Equipment ID	BFN-3-SRM-B	Test Date	11/18/2019
Attachment	6	Test Time	5:52:39
Room - Cabinet	CONTROL ROOM	Terminal Board	
Attachment Type	Open Circuit	Voltage	Yes
System ID	131041001	TDR - DTDR	Yes - Auto
Device Type	SRM-G	Impedance	Yes
Cable Type	COAX	IR - Volts @ Time	Yes - 15 @ 0.25
Positive Lead	Byp Preamp, Sig Cable Shield		
Negative Lead	Instr/Rack/Station Ground		
Description	Browns Ferry Unit 3 SRM		
Comments	Testing at shutdown. Mode 5. Ferrites removed from preamp and electrical		

DATA			
	Comparison Test	Reference Test	% Change
Voltage Check	332.19 mV	293.69 mV	INCREASE
DC Resistance (Ohms)	434.20 k	3.87 M	DECREASE
1 KHz Resistance (Ohms)	349.92	438.97	DECREASE
1 KHz Inductance		15.89 nF	N/A
1 KHz Dissipation		43.83 m	N/A
Insulation DCR (Ohms)		7.22 M	N/A
Polarization Ratio		1.04	N/A
TDR Time Base	62.5ns	62.5ns	N/A
Test Lead Delay	84.92 nS	84.43 nS	IN RANGE
Test Lead Length	26.71 Ft	26.55 Ft	IN RANGE
Tolerances			
R <5.00 %	L <5.00 %	C <5.00 %	IR <5.00 %



Characterization Comparison IR Report

COMPARISON TEST	
Equipment ID	BFN-3-IRM-A
Attachment	3
Test Date	10/21/2019
Test Time	13:42:02
Voltage	15 V
Time	0.25 Min
Comments	Mode 1 Testing - Ferrites at Pre-
Time	IR (Ohms)
N/A	0.00
Rdc	434.20 K

REFERENCE TEST	
Equipment ID	BFN-3-SRM-B
Attachment	6
Test Date	11/18/2019
Test Time	5:52:39
Voltage	15 V
Time	0.25 Min
Comments	Testing at shutdown. Mode 5.
Time	IR (Ohms)
0 Seconds	6.93 M
5 Seconds	7.13 M
10 Seconds	7.18 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
15 Seconds	7.22 M
N/A	0.00
Rdc	3.87 M

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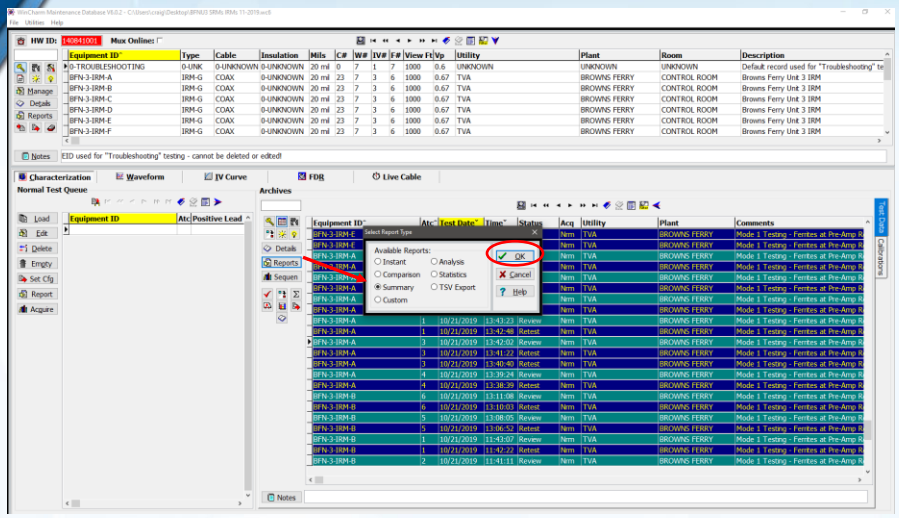
CREATING A SUMMARY REPORT



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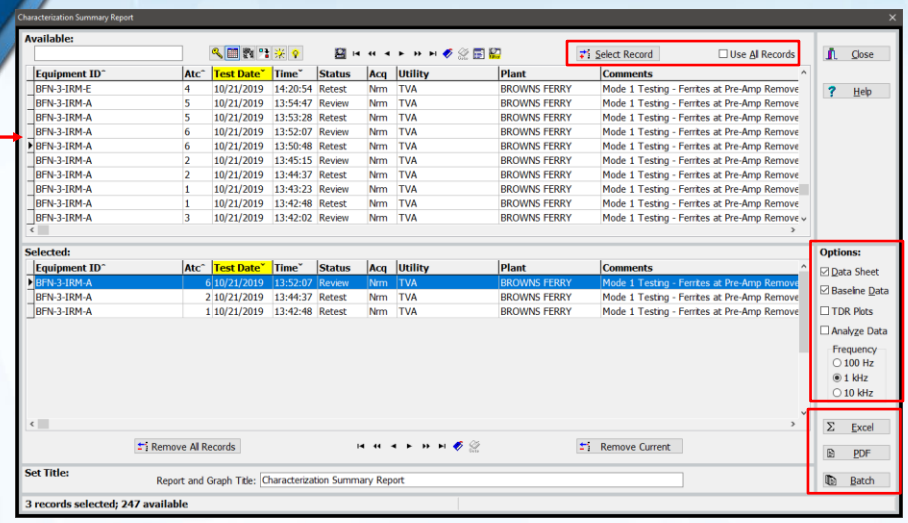
CREATING A SUMMARY REPORT



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SUMMARY REPORT EXAMPLE

Characterization Summary Report

L/C: Inductance / Capacitance Q/D: Quality / Dissipation IR: Insulation Resistance P.R.: Polarization Ratio V Ck: Voltage Check

Equipment ID: BFN-3-IRM-A **Device Type:** IRM-G **Cable Type:** COAX **Sequence:** 23
Description: Browns Ferry Unit 3 IRM **Frequency:** 1 KHz

Atc	Test Date	Time	Type	Rac	L/C	Q/D	Rdc	IR	P.R.	V Ck	Positive Lead	Negative Lead
[C] 1 [B]	10/21/2019	13:42:48	High Impedance	27.39 k	1.80 nF	309.94 m	5.12 M			80.86 mV	HV Cable Center Conductor	HV Cable Shield
[C] Comment: Mode 1 Testing - Ferrites at Pre-Amp Removed										**[B] Comment:**		
[C] 2 [B]	10/21/2019	13:44:37	High Impedance	315.15	28.43 nF	56.29 m	59.03 M			16.30 mV	HV Cable Shield	Ground
[C] Comment: Mode 1 Testing - Ferrites at Pre-Amp Removed										**[B] Comment:**		
[C] 6	10/21/2019	13:52:07	High Impedance	643.61	16.70 nF	87.52 m	60.71 M			46.73 mV	Byp Preamp, Sig Cable Shield	Ground
[B] 6	10/21/2019	13:50:48	High Impedance	644.53	16.70 nF	67.63 m	59.77 M	71.19 M	1.15	16.09 mV	Byp Preamp, Sig Cable Shield	Ground
[C] Comment: Mode 1 Testing - Ferrites at Pre-Amp Removed Retest No IR										**[B] Comment:** Mode 1 Testing - Ferrites at Pre-Amp Removed		

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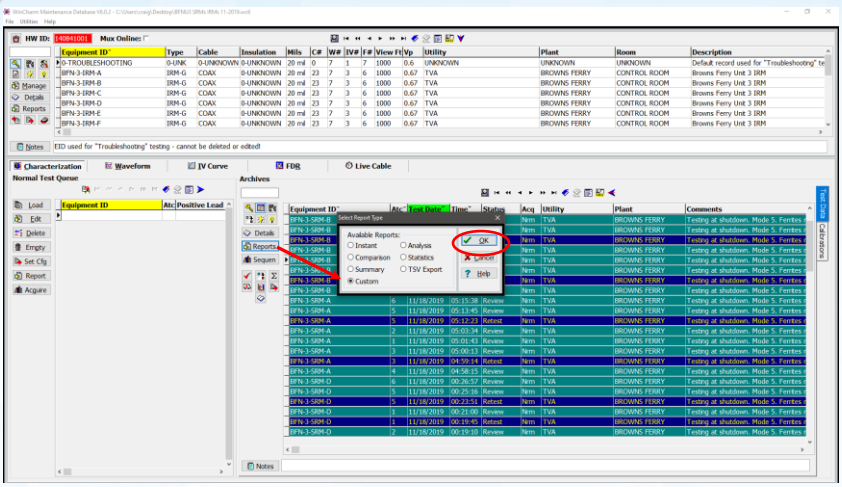
CREATING A CUSTOM REPORT



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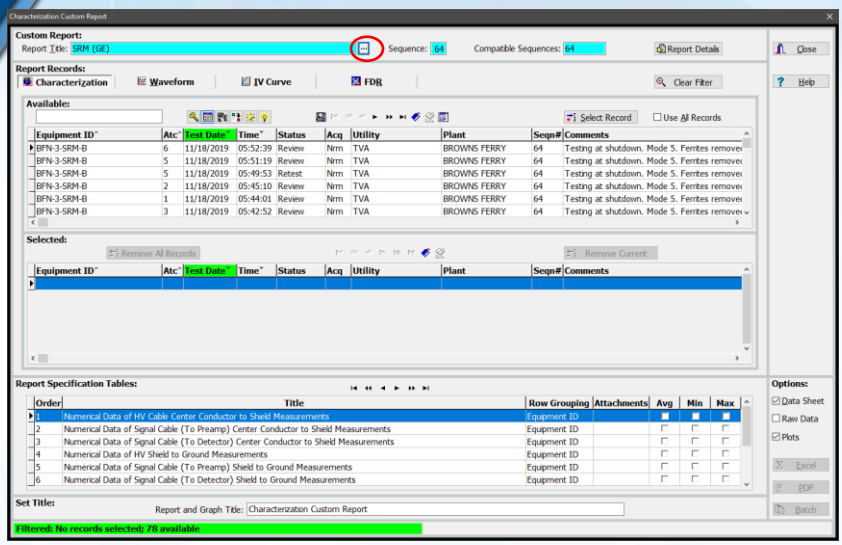
SELECTING A CUSTOM REPORT



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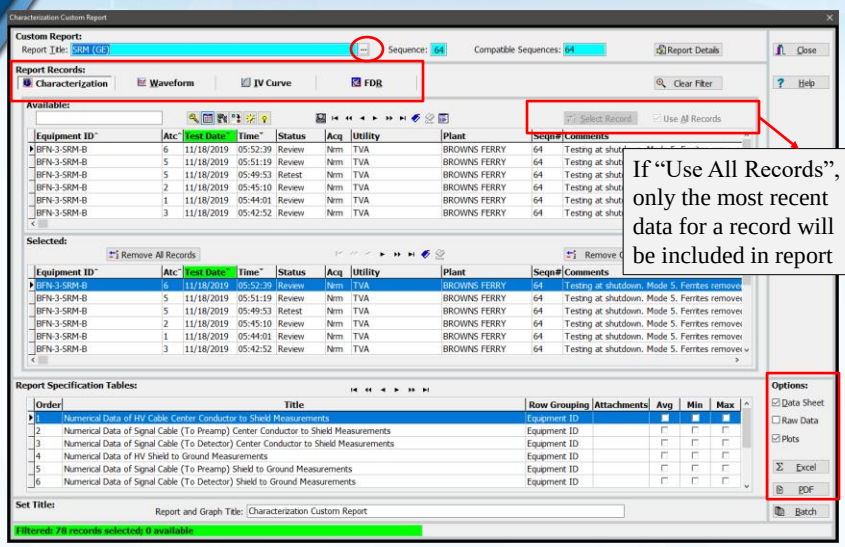
SELECTING AVAILABLE RECORDS TO REPORT



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CUSTOM REPORT EXAMPLE

Characterization Custom Report

Numerical Data of HV Cable Center Conductor to Shield Measurements

Item	SRM Channel	Capacitance @ 1 kHz
1	BFN-3-SRM-A	8.35 nF
2	BFN-3-SRM-B	8.40 nF
3	BFN-3-SRM-C	9.02 nF
4	BFN-3-SRM-D	9.10 nF

Numerical Data of Signal Cable (To Preamp) Center Conductor to Shield Measurements

Item	SRM Channel	Capacitance @ 1 kHz
1	BFN-3-SRM-A	N/A
2	BFN-3-SRM-B	N/A
3	BFN-3-SRM-C	N/A
4	BFN-3-SRM-D	N/A

Numerical Data of Signal Cable (To Detector) Center Conductor to Shield Measurements

Item	SRM Channel	Capacitance @ 1 kHz	Insulation Resistance (Ohms)	DC Resistance (Ohms)
1	BFN-3-SRM-A	6.86 nF	N/A	9.66 M
2	BFN-3-SRM-B	6.69 nF	N/A	6.66 M
3	BFN-3-SRM-C	7.46 nF	44.40 M	7.20 M
4	BFN-3-SRM-D	7.65 nF	N/A	8.87 M

Numerical Data of HV Shield to Ground Measurements

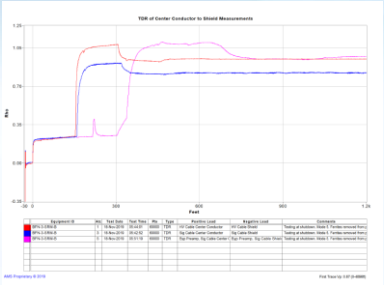
Item	SRM Channel	Inductance @ 1 kHz
1	BFN-3-SRM-A	108.62 uH
2	BFN-3-SRM-B	103.33 uH
3	BFN-3-SRM-C	122.92 uH
4	BFN-3-SRM-D	144.62 uH

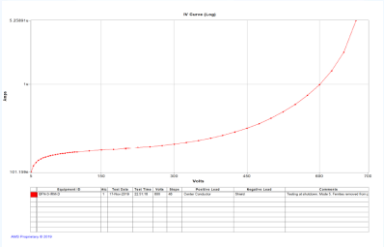
Numerical Data of Signal Cable (To Preamp) Shield to Ground Measurements

Item	SRM Channel	Inductance @ 1 kHz
1	BFN-3-SRM-A	73.88 uH
2	BFN-3-SRM-B	74.69 uH
3	BFN-3-SRM-C	95.86 uH
4	BFN-3-SRM-D	95.61 uH

Numerical Data of Signal Cable (To Detector) Shield to Ground Measurements

Item	SRM Channel	Capacitance @ 1 kHz	Insulation Resistance (Ohms)	DC Resistance (Ohms)
1	BFN-3-SRM-A	15.73 nF	152.05 M	136.78 M
2	BFN-3-SRM-B	15.89 nF	7.22 M	3.87 M
3	BFN-3-SRM-C	17.70 nF	N/A	7.32 M
4	BFN-3-SRM-D	18.80 nF	62.74 M	56.63 M





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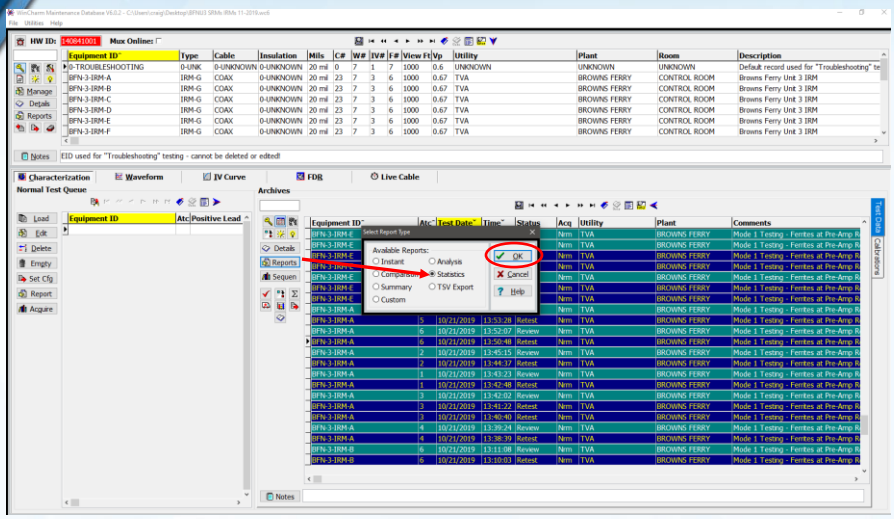
CREATING A STATISTICS REPORT



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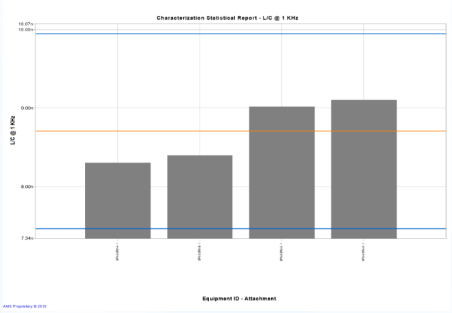
Statistics Reports are Great Tools

- Statistical bar charts compare a large group of similar test data to quickly identify outliers



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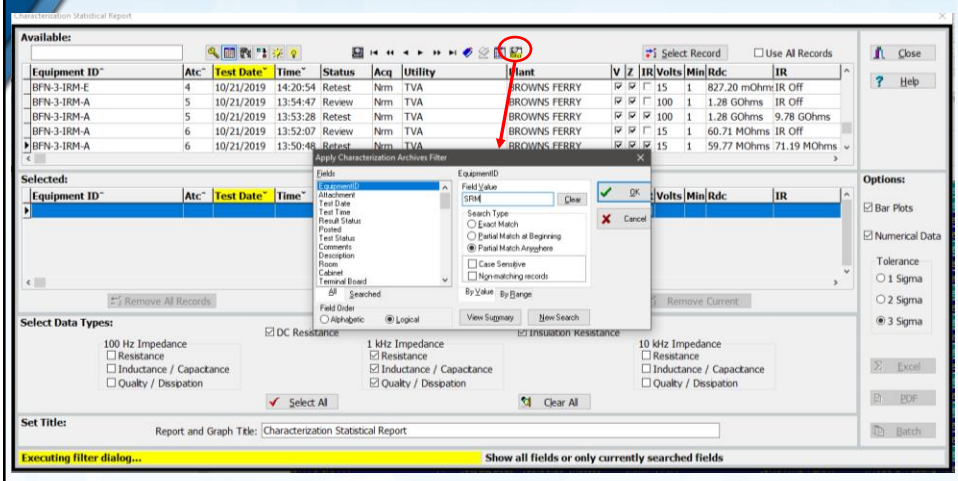
SELECT THE FILTER TO REDUCE THE NUMBER OF RECORDS



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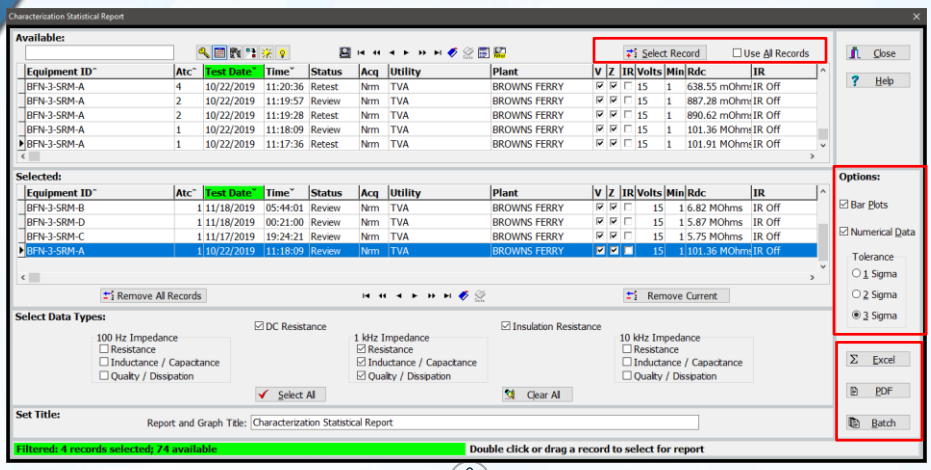
SELECT SAME TYPE ATTACHMENTS FOR REPORT



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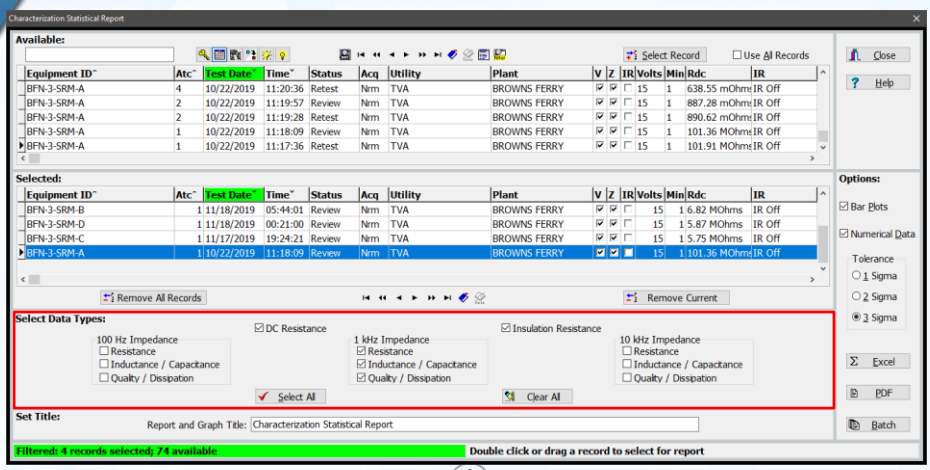
Slide 28 of 44

SELECT ATTACHMENTS, DATA TYPES, TOLERANCES, AND REPORT OPTIONS



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STATISTICAL REPORT - NUMERICAL DATA EXAMPLE

Characterization Statistical Report

Pt	Equipment ID	Atc	Date	Time	Rdc(Ohms)		1 KHz L/C		
1	BFN-3-SRM-A	1	10/22/2019	11:16:09	101.36 M		8.30 nF		
2	BFN-3-SRM-B	1	11/18/2019	5:44:01	6.82 M		8.40 nF		
3	BFN-3-SRM-C	1	11/17/2019	19:24:21	5.75 M		9.02 nF		
4	BFN-3-SRM-D	1	11/18/2019	8:21:00	5.87 M		9.10 nF		

Statistical Overview		Rdc(Ohms)		L/C		
	Count:	4		4		
	Maximum Value:	101.36 M		9.10 n		
	Minimum Value:	5.75 M		8.30 n		
	Statistical Average:	29.95 M		8.71 n		
	Standard Deviation:	47.61 M		413.46 p		
	3 Sigma Value:	142.83 M		1.24 n		
	Maximum Allowed:	172.78 M		9.95 n		
	Minimum Allowed:	-112.68 M		7.47 n		

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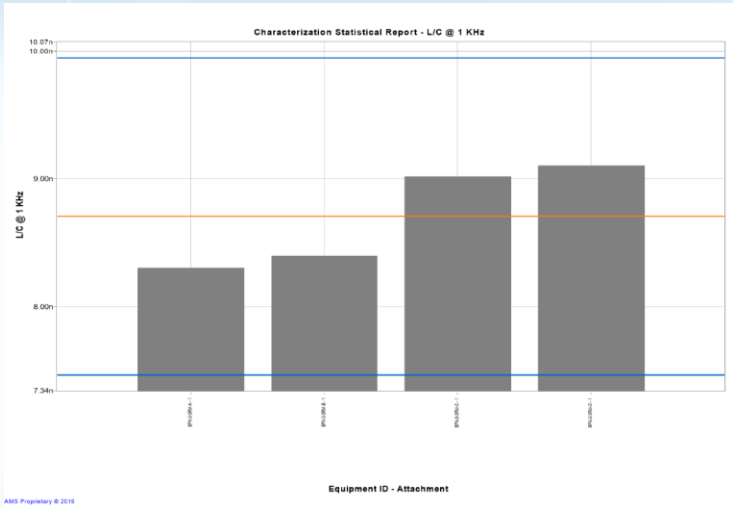
STATISTICAL REPORT - BAR PLOT EXAMPLE



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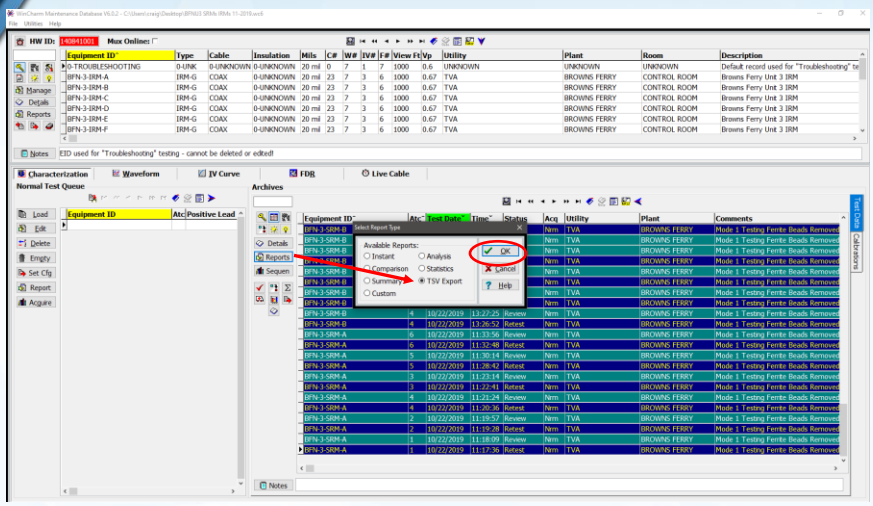
CREATING A TSV (EXCEL) EXPORT



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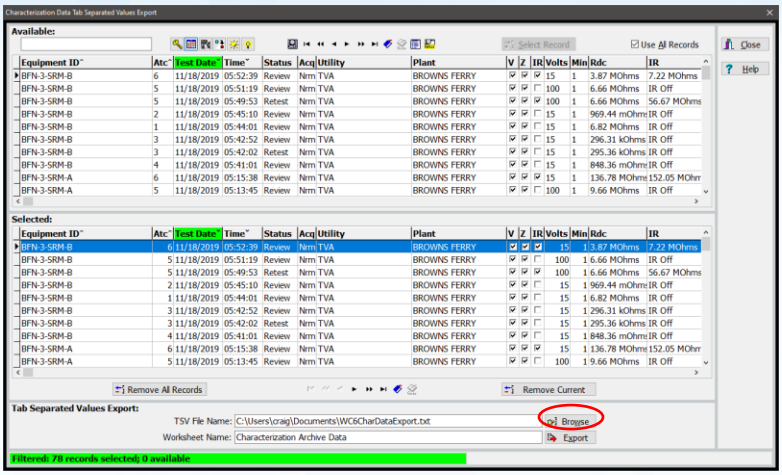
CLICK BROWSE THEN SELECT DESTINATION TO SAVE FILE



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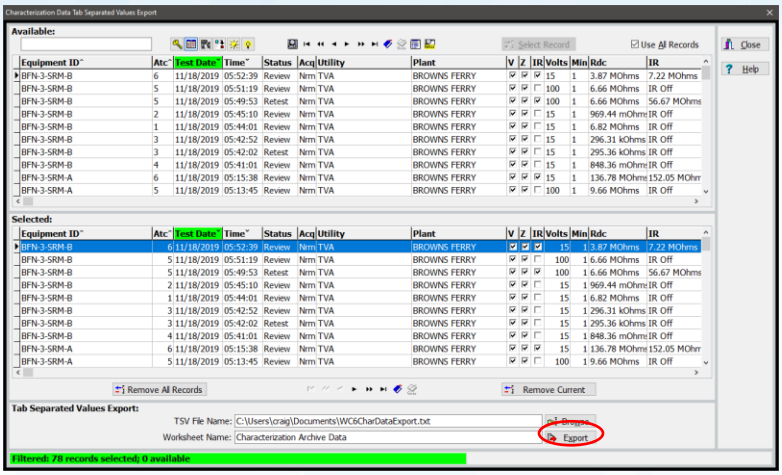
CLICK EXPORT



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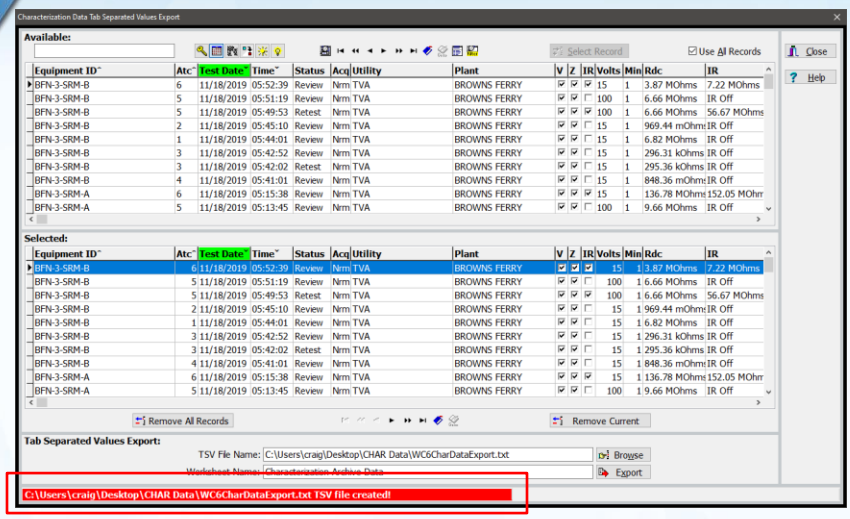
FILE IS SAVED IN SELECTED LOCATION



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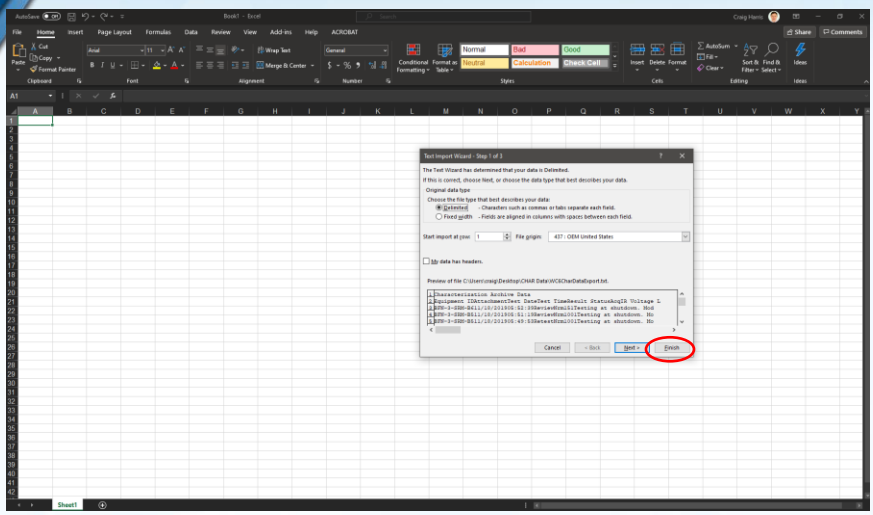
OPEN TSV FILE TO VERIFY EXPORT



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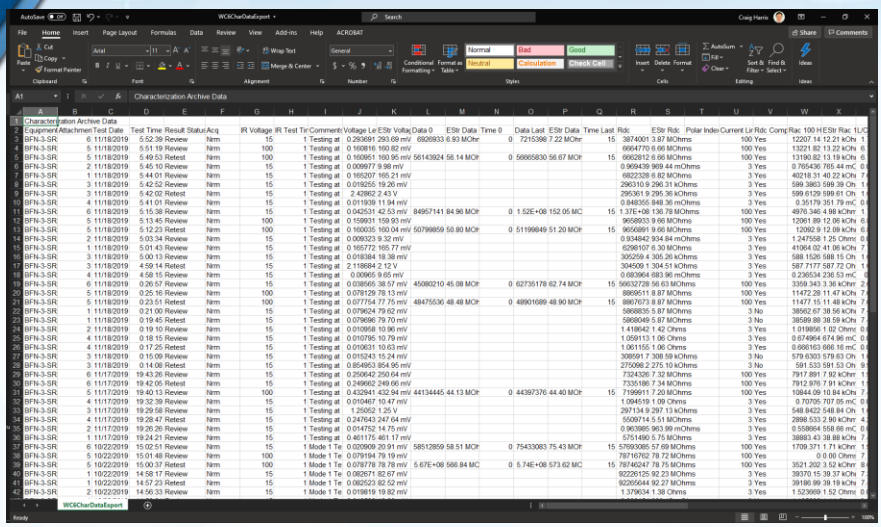
OPEN TSV FILE TO VERIFY EXPORT



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EXPORTING TDR PLOTS

The TDR plot can be exported for inserting into standard graphics viewers:

- Convenient to insert TDR plots into documents or e-mail messages.
- PowerPoint and Word have features to easily annotate TDR plots.

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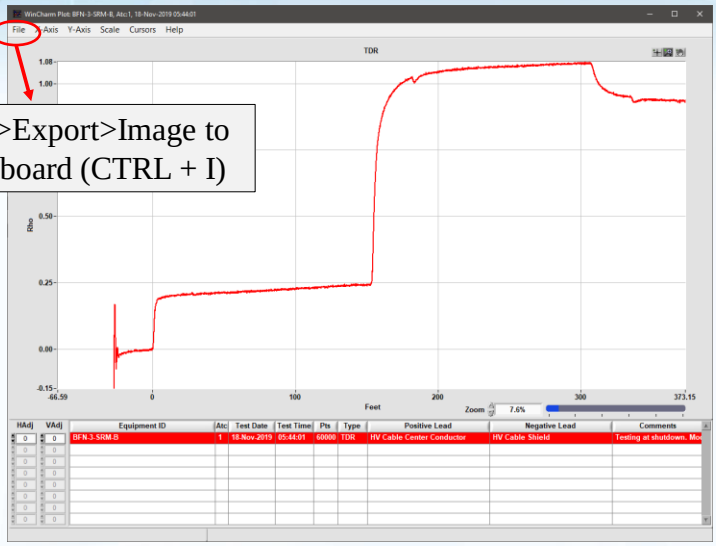
SELECT TDR PLOT THEN EXPORT IMAGE TO CLIPBOARD



File>Export>Image to Clipboard (CTRL + I)

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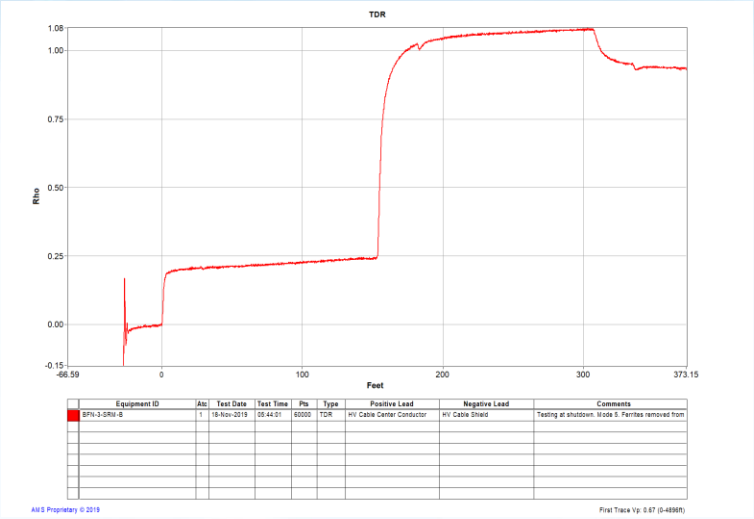
EXPORTED TDR PLOT EXAMPLE



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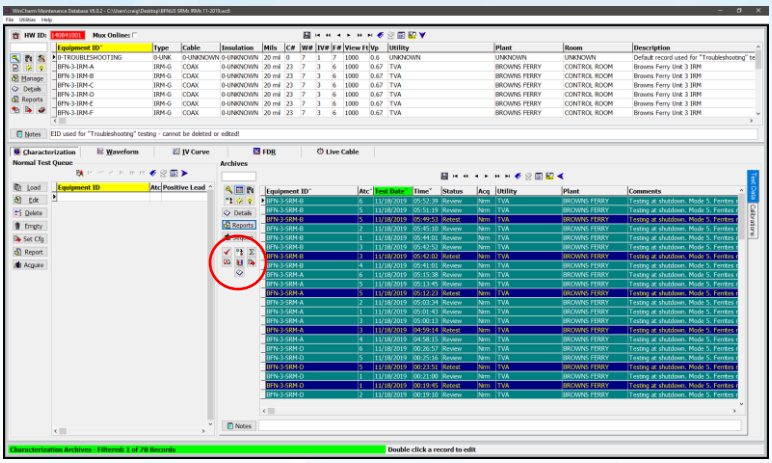
REVIEW OF REPORT TYPES



The user can identify report type by the Icons

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OBJECTIVES

The student should now be able to create the following reports and exports:

1. Instant
2. Comparison
3. Summary
4. Custom
5. Statistical
6. Export TSV (Excel) Files
7. Export TDR Plots

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QUESTIONS

- What would determine the type of report needed?
- Can you use a different channel for a baseline or comparison?

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Thank You!
Questions?