

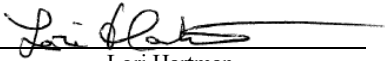
NTS Labs LLC Test Report for Environmental Testing of the FVT

Prepared For

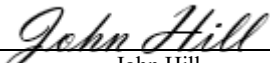
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Performed By

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Revision History

Rev.	Description	Issue Date
0	Initial Release	02/09/2023
1	Revised EUT description	02/09/2023
2	Added Transportation Vibration	04/25/2023

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1.0 Introduction

This document presents the test procedures used and the results obtained during the performance of an Environmental test program. The test program was conducted to assess the ability of the specified Equipment Under Test (EUT) to successfully satisfy the requirements listed in Section 2.0.

2.0 References

The following references listed below form a part of this document to the extent specified herein.

- Test Specification: See Table 5.0-1
- Pro V&V, Inc Purchase Order(s) 2022-020, dated 11/21/2022
- NTS Labs LLC Quote(s) OP0626349, dated 09/21/2022
- ISO/IEC 17025:2017(E) *General Requirements for the Competence of Testing and Calibration Laboratories*, dated 11/1/2017

3.0 Product Selection and Description

Pro V&V, Inc selected and provided the test sample(s) to be used as the Equipment Under Test.

Table 3.0-1: Product Identification - Equipment Under Test (EUT)

Item	Qty.	Name/Description	Part Number	Serial Number
1	1	FVT	None	UVS217250
2	1	FVT	None	UVS218214
3	1	FVT	None	UVS217252

3.1 Security Classification

Non-classified

4.0 General Test Requirements

4.1 Test Equipment

The instrumentation used in the performance of these tests is periodically calibrated and standardized within manufacturer's rated accuracies and are traceable to the National Institute of Standards and Technology. The calibration procedures and practices are in accordance with ISO 17025:2017. Certification of calibration is on file subject to inspection by authorized personnel.



5.0 Test Descriptions and Results

Table 5.0-1: Summary of Test Information & Results

Section	Test	Specification	Test Facility	Test Date	Part #	Serial #	Test Result
5.1	Humidity	MIL-STD_810D Method 507.2	Longmont	01/09/2023 - 01/23/2023	None	UVS217250	Customer Determination
5.2	Low Temp	MIL-STD_810D Method 502.2	Longmont	01/23/2023 - 01/24/2023	None	UVS217250	Customer Determination
5.3	High Temp	MIL-STD_810D Method 501.2	Longmont	01/24/2023 - 01/25/2023	None	UVS217250	Customer Determination
5.4	Bench Handling - Unit 2	MIL-STD_810D Method 516.3	Longmont	01/25/2023	None	UVS217250	Customer Determination
5.5	Temperature/Power Variation	MIL-STD-810D Method 502.2 & 501.2	Longmont	01/30/2023 - 02/02/2023	None	UVS217250, UVS218214, UVS217252	Customer Determination
5.6	Transportation Vibra- tion	MIL-STD-810D Method 514.3 Cate- gory I	Longmont	01/25/2023	None	UVS217250	No visual damage noted



5.1 Humidity

5.1.1 Test Procedure

The FVT was tested in accordance with MIL-STD_810D Method 507.2.

5.1.2 Test Result

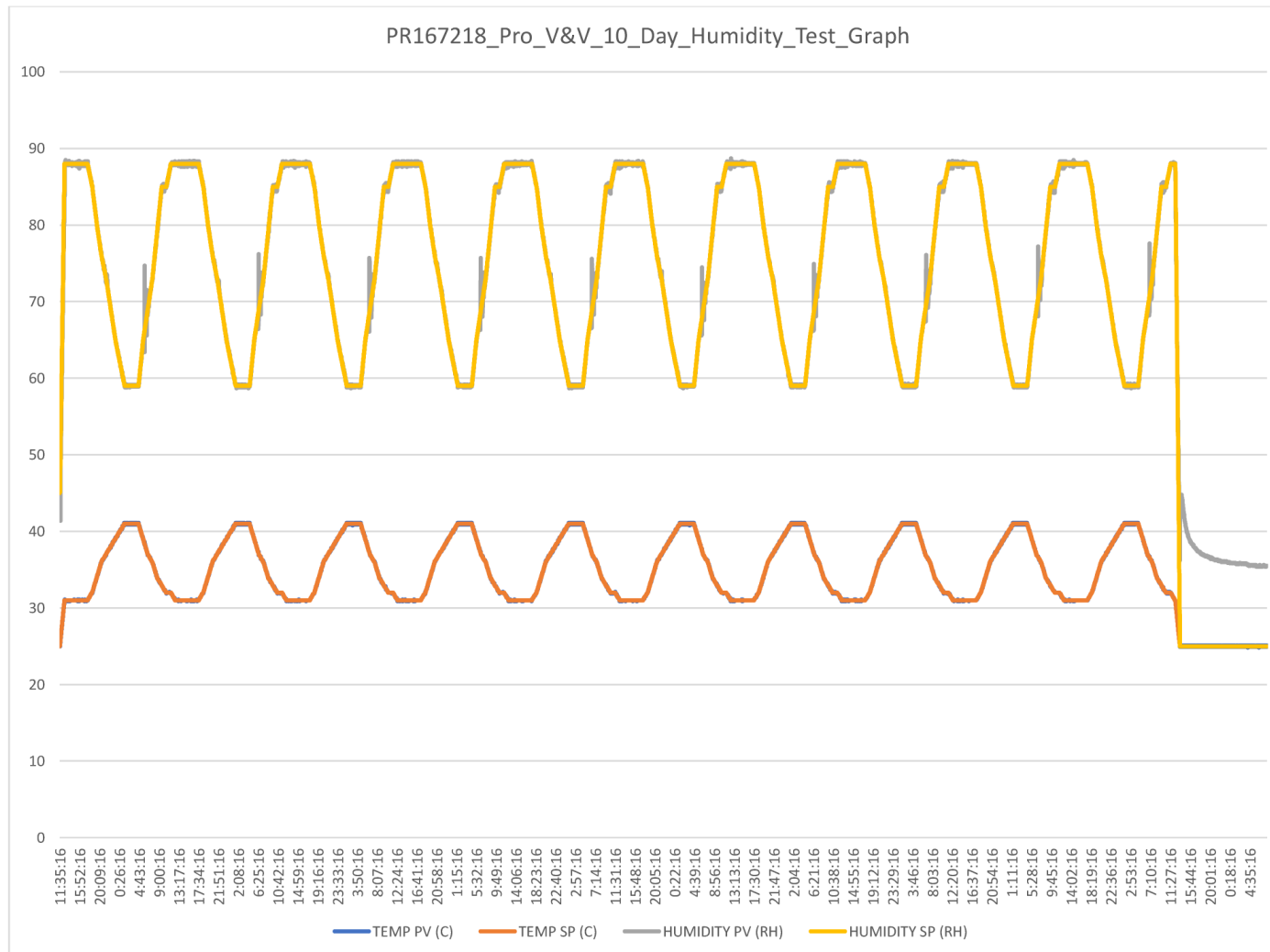
The EUT's results will be determined by Pro V & V, Inc.

5.1.4 Test Photographs



10_Day_Humidity_Test

5.1.5 Test Data





5.1.6 Test Equipment List

Table 5.1-1: Humidity Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC061626	Chamber (Temperature/Humidity)	Envirotronics	SH16 C	09/23/2022	09/23/2023
WC070559	Controller (Temperature)	Future Design Controls	FDC-9300	09/23/2022	09/23/2023

Calibration Abbreviations

CAL: Calibration

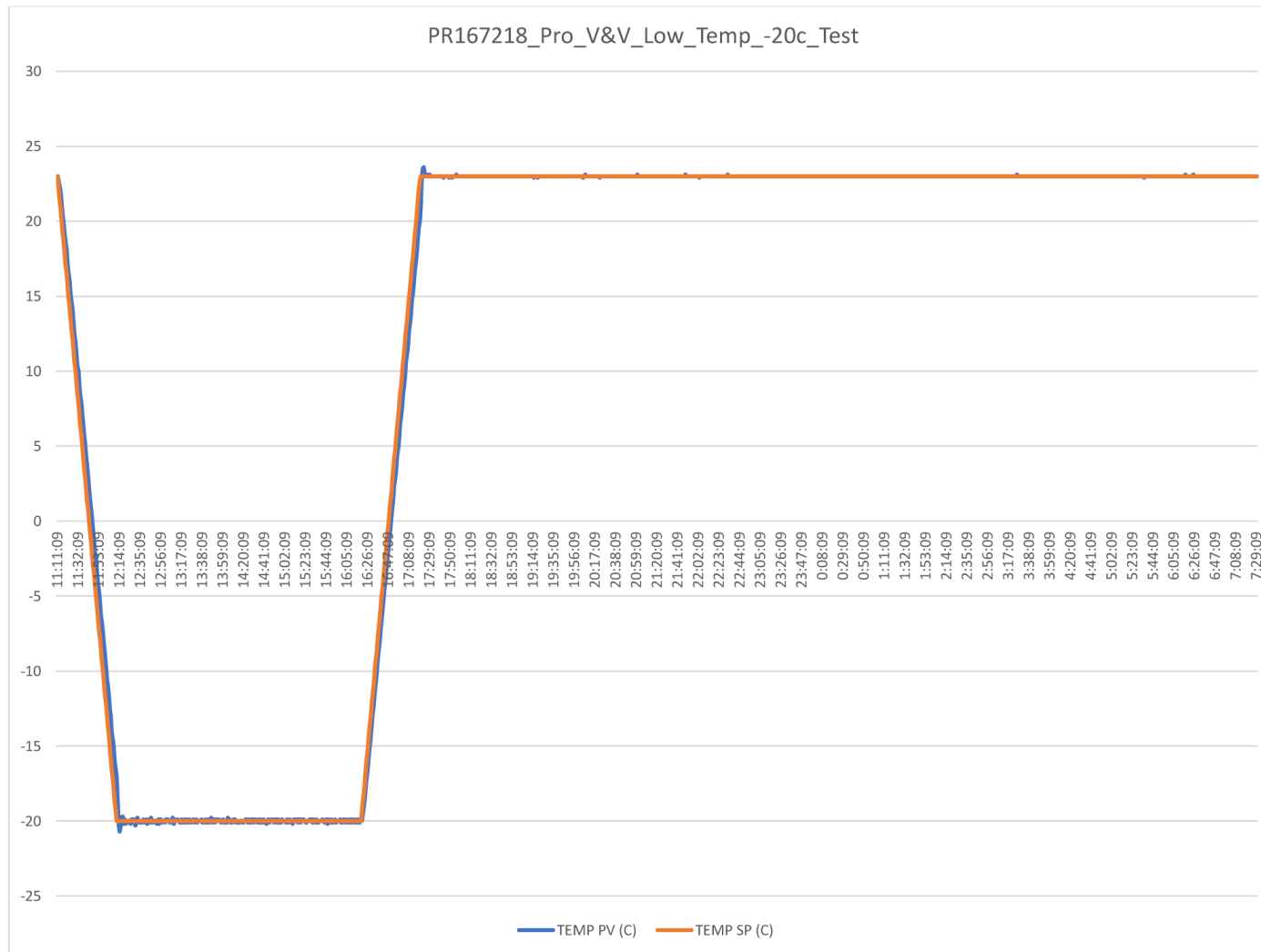
NCR: No Calibration Required

5.2.4 Test Photographs



Low_Temp_-20c_Test

5.2.5 Test Data





5.2.6 Test Equipment List

Table 5.2-1: Low Temp Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC061626	Chamber (Temperature/Humidity)	Envirotronics	SH16 C	09/23/2022	09/23/2023
WC070559	Controller (Temperature)	Future Design Controls	FDC-9300	09/23/2022	09/23/2023

Calibration Abbreviations

CAL: Calibration

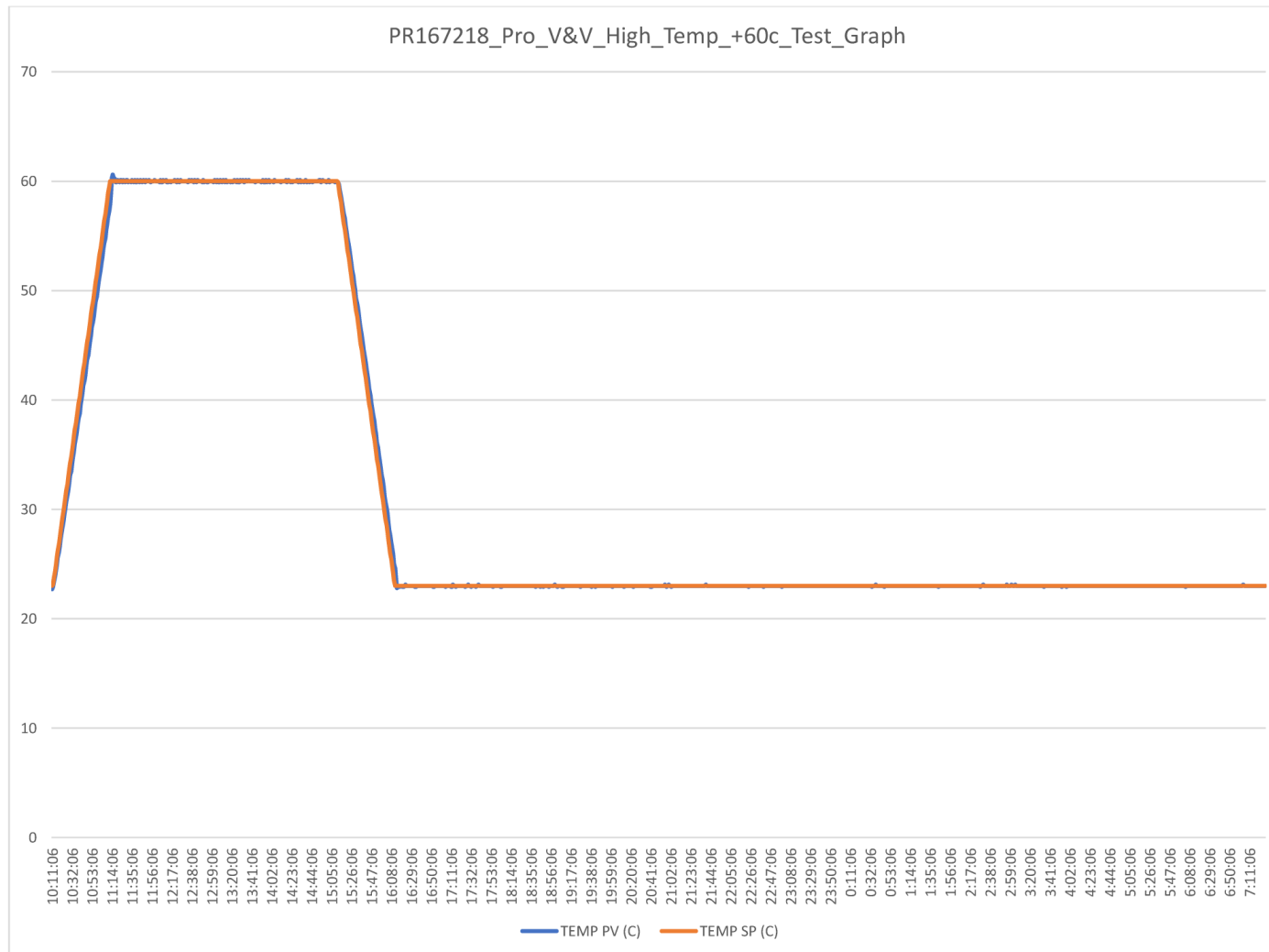
NCR: No Calibration Required

5.3.4 Test Photographs



_High_Temp_+60c_Test

5.3.5 Test Data





5.3.6 Test Equipment List

Table 5.3-1: High Temp Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC061626	Chamber (Temperature/Humidity)	Envirotronics	SH16 C	09/23/2022	09/23/2023
WC070559	Controller (Temperature)	Future Design Controls	FDC-9300	09/23/2022	09/23/2023

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



5.4 Bench Handling

5.4.1 Test Procedure

The FVT was tested in accordance with MIL-STD_810D Method 516.3.

5.4.2 Test Result

The EUT's results will be determined by Pro V & V, Inc.

5.4.4 Test Photographs



Bench_Handling_Test



Bench_Handling_Test



5.4.5 Test Equipment List

Table 5.4-1: Bench Handling Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC078513	Measurement Tools (Rule)	StorageTek	4 Inch Block	NCR	NCR

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

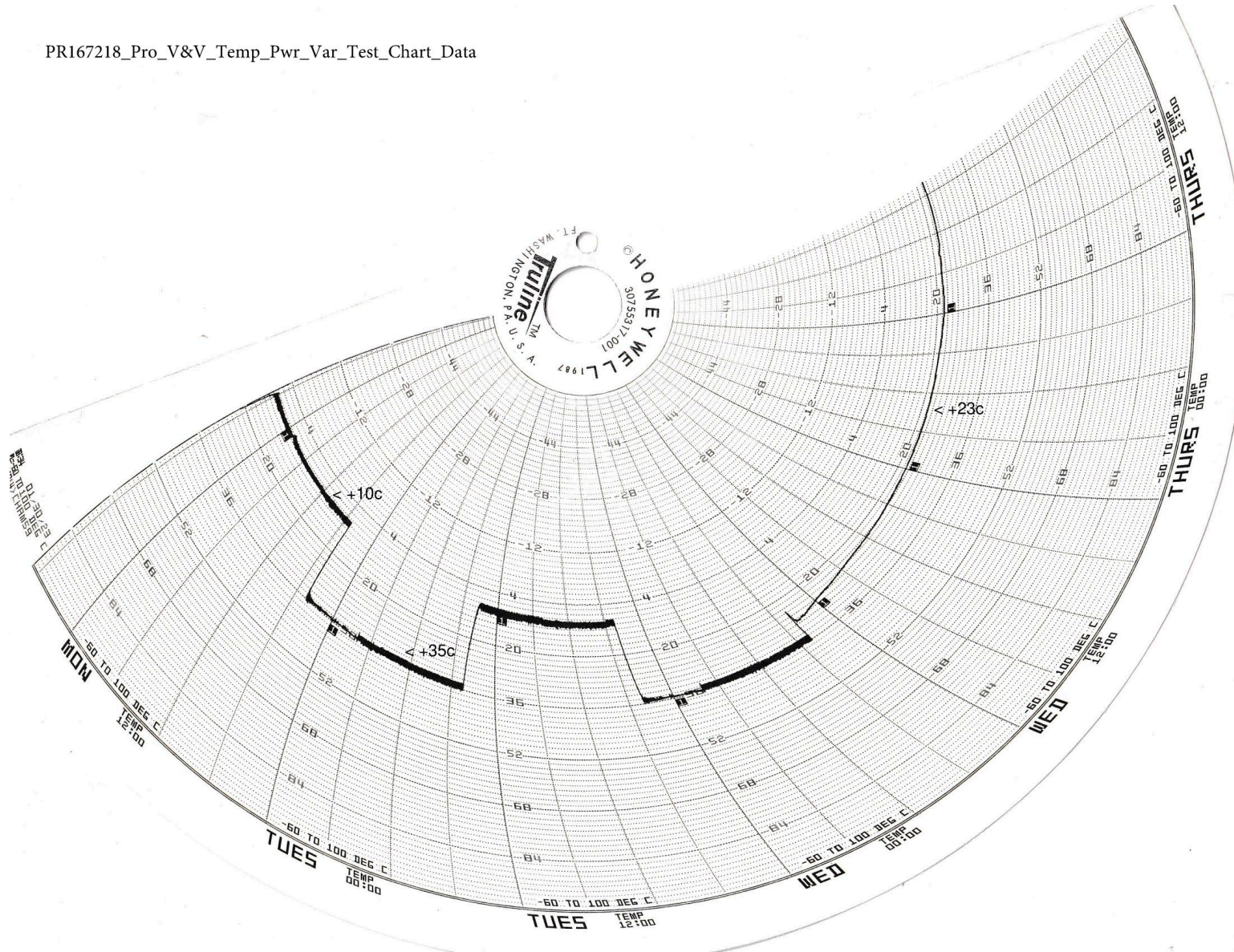
5.5.4 Test Photographs



Temperature_Power_Variation_Test

5.5.5 Test Data

PR167218_Pro_V&V_Temp_Pwr_Var_Test_Chart_Data





5.5.6 Test Equipment List

Table 5.5-1: Temperature/Power Variation Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC061559	Chamber (Temperature/Humidity)	StorageTek	Large Walk In	09/02/2022	09/02/2023
WC061560	Controller (Temperature)	Watlow	F4	09/02/2022	09/02/2023
WC061561	Recorder (Chart)	Honeywell	DR45AT	09/02/2022	09/02/2023

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



5.6 Transportation Vibration

5.6.1 Test Procedure

The FVT was tested in accordance with MIL-STD-810D Method 514.3 Category I.

5.6.2 Test Result

The EUT showed no visual damage noted after the test was completed..

5.6.3 Test Datasheets

Start Date: 1/25/23		End Date: 1/25/23		Project No: PR167218		
Test Engineer: Colton Prince			Customer Witness: n/a		Temp: 67° Humidity: 16%	
Date	Time	Axis	Plot No.	Serial No.	Remarks	Initials
1/25/23				UVS217250	Setup UUT on shaker HYD06 in the vertical axis	CP
	1351	Face 3	Run 1		Run 1.04 gRMS common carrier random vibration for 60 min	CP
	1511	Face 4	Run 2		Run 1.04 gRMS common carrier random vibration for 60 min	CP
	1614	Face 6	Run 3		Run 1.04 gRMS common carrier random vibration for 60 min	CP
					Testing complete, no damage noted	CP

5.1.4 Test Photographs



Vibration 1



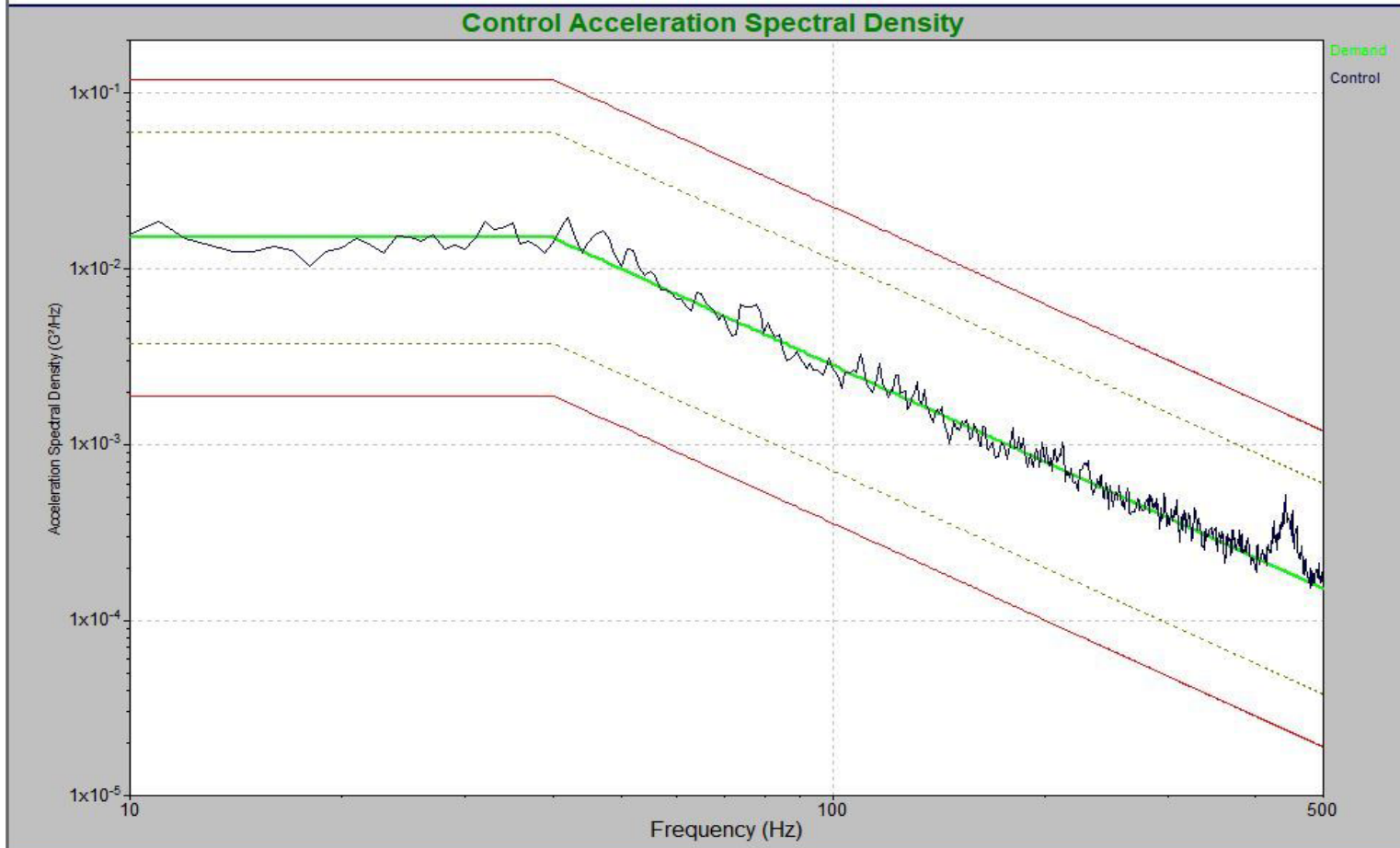
Vibration 2



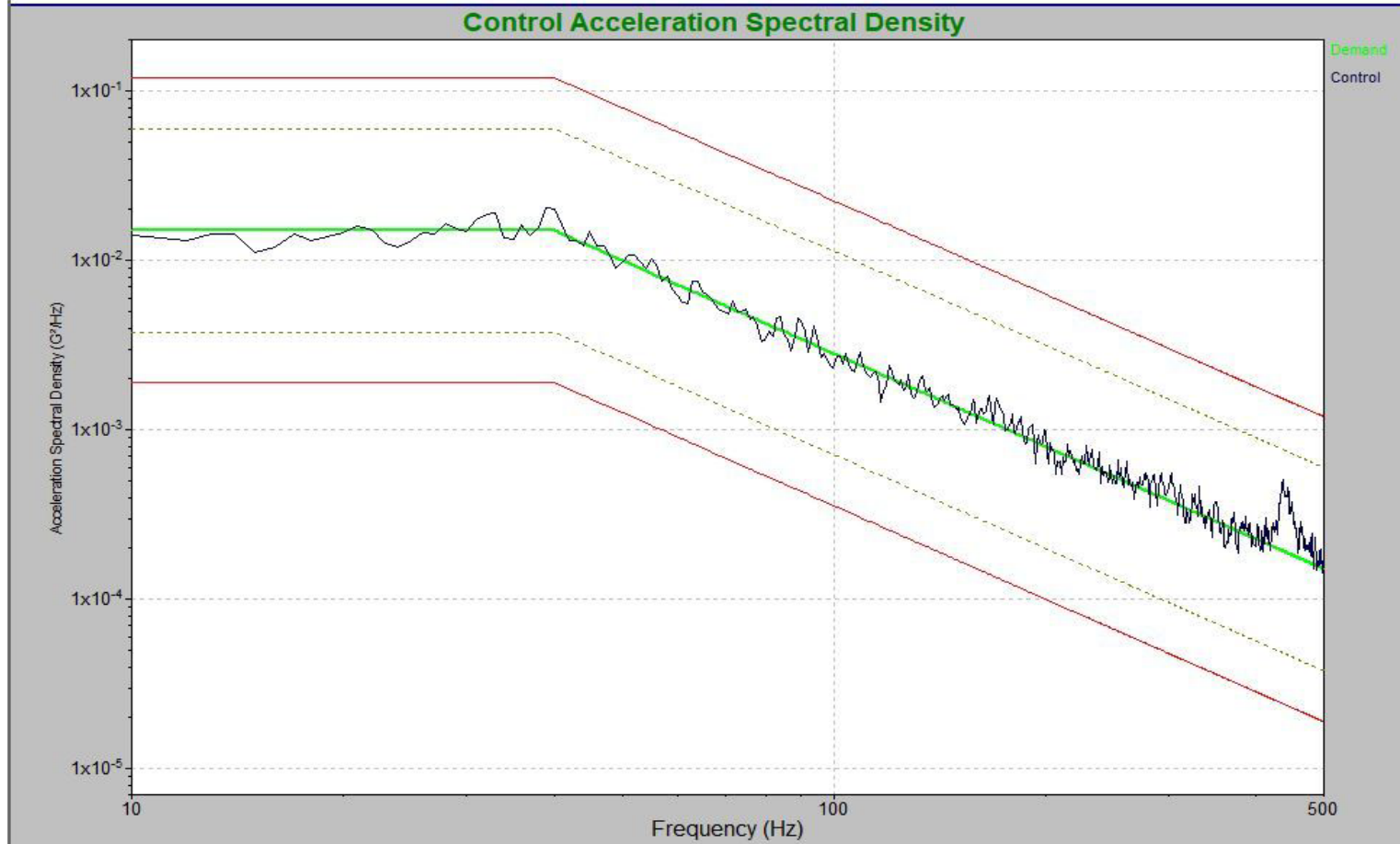
Vibration 3

5.1.5 Test Data

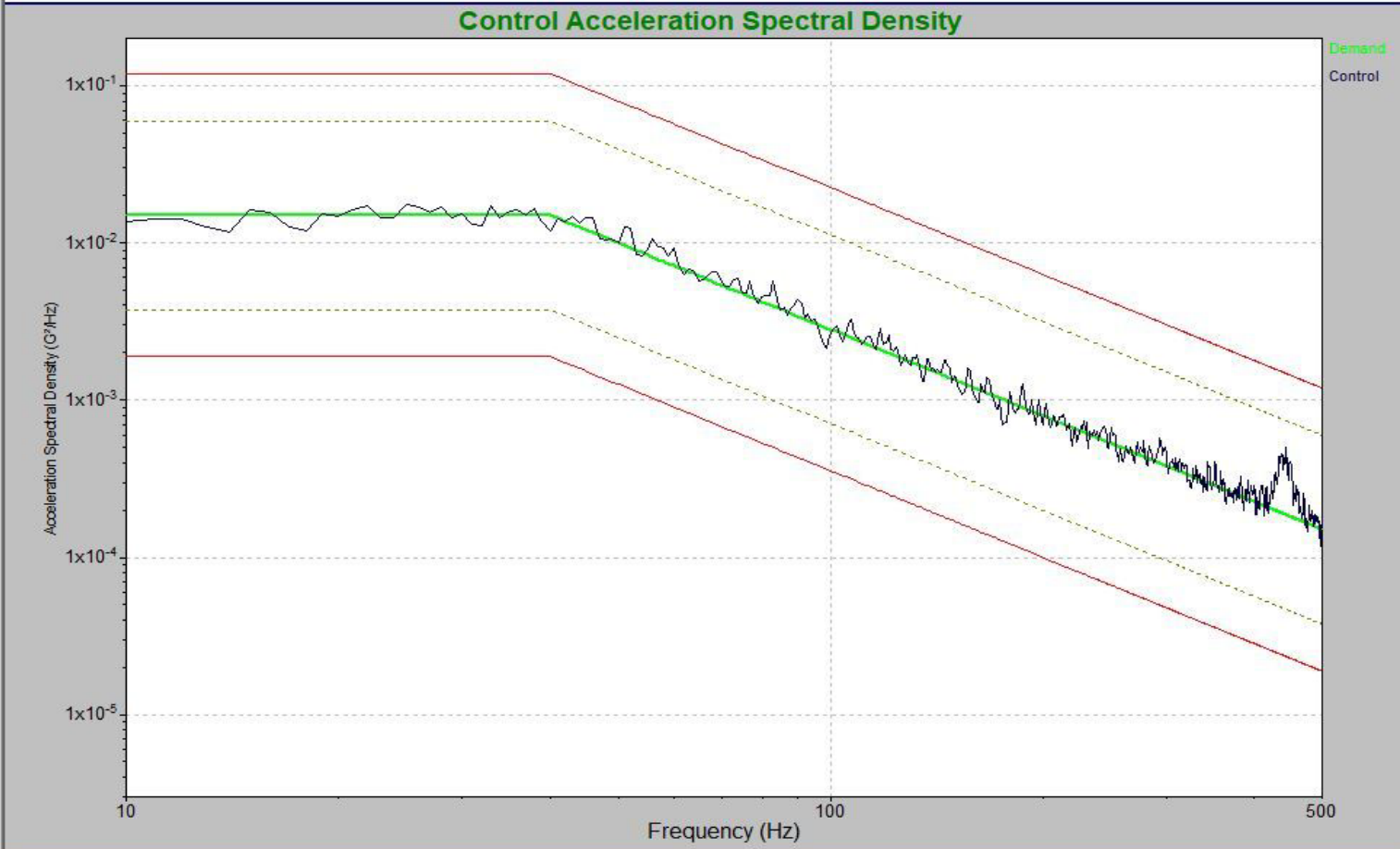
NTS Longmont, CO	Level Time: 1:00:00	Demand: 1.047 G RMS	Pro V&V
Job# PR167218	Total Time: 1:00:14	Control: 1.066 G RMS	UUT: FVT
Jan 25, 2023 13:51:09	Run 1	Test axis: Face 3/ Bottom	SN: UVS217250



NTS Longmont, CO	Level Time: 1:00:00	Demand: 1.047 G RMS	Pro V&V
Job# PR167218	Total Time: 1:00:26	Control: 1.06 G RMS	UUT: FVT
Jan 25, 2023 15:11:40	Run 2	Test axis: Face 4/ Side	SN: UVS217250



NTS Longmont, CO	Level Time: 1:00:00	Demand: 1.047 G RMS	Pro V&V
Job# PR167218	Total Time: 1:00:13	Control: 1.072 G RMS	UUT: FVT
Jan 25, 2023 16:14:18	Run 3	Test axis: Face 6/ Back	SN: UVS217250





5.1.6 Test Equipment List

Table 5.1-1: Transportation Vibration Test Equipment List

Asset Number	Asset Type	Manufacturer	Model	Calibrated	Due
WC061429	Shaker (Hydraulic)	Team Corporation	80/10.5	NCR	NCR
WC061505	Accelerometer (Vibration)	PCB Piezotronics	353B32	06/15/2022	06/15/2023
WC061706	Computer (Vibration Controller)	Vibration Research	VR9500	05/03/2022	05/03/2023
WC070243	Accelerometer (Vibration)	PCB Piezotronics	353B32	06/15/2022	06/15/2023
WC070466	Meter (Hygrometer)	Fluke	971	05/23/2022	05/23/2023

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required



End of Test Report