Sarah Walsh
Director, Regulatory Affairs

Gas Regulatory Affairs Correspondence
Email: gas.regulatory.affairs@fortisbc.com

Electric Regulatory Affairs Correspondence
Email: electricity.regulatory.affairs@fortisbc.com

FortisBC
16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (778) 578-3861
Cell: (604) 230-7874
Fax: (604) 576-7074
www.fortisbc.com

May 23, 2024

Industrial Customers Group
c/o Robert Hobbs
2206 Happy Valley Road
PO Box 1552
Rossland, BC
V0G 1Y0

Attention: Robert Hobbs

Dear Robert Hobbs:

Re: FortisBC Inc. (FBC)

Application for a Certificate of Public Convenience and Necessity for Approval of the Fruitvale Substation Project (Application)

Response to the Industrial Customers Group (ICG) Information Request (IR) No. 1

On February 29, FBC filed the Application referenced above. In accordance with the amended regulatory timetable established in British Columbia Utilities Commission (BCUC) Order G-100-24 for the review of the Application, FBC respectfully submits the attached response to ICG IR No. 1.

FBC is requesting that Attachment 3.1 be filed on a confidential basis and held confidential by the BCUC in perpetuity, pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-72-23. The information contains operationally sensitive details pertaining to the Company's assets which, if disclosed, could impede FBC's ability to work safely and reliably operate its electricity system assets and could increase the risk to the safety of both its workers and the public and/or jeopardize the safety, security, and operation of FBC's systems. FBC is unable to foresee a time when the information may no longer be confidential and, therefore, requests that the information remains confidential in perpetuity. A confidential version has been provided to the BCUC and Interveners who have signed a Confidentiality Declaration and Undertaking.

For convenience and efficiency, if FBC has provided an internet address for referenced reports instead of attaching the documents to its IR responses, FBC intends for the referenced documents to form part of its IR responses and the evidentiary record in this proceeding.

If further information is required, please contact the undersigned.

Sincerely,

FORTISBC INC.

Original signed:

Sarah Walsh

Attachments

cc (email only): Commission Secretary
Registered Interveners

Project Need

1. Reference: Exhibit B-1, Section 3.3.2, Reliability of Electricity Supply for Fruitvale and Surrounding Area, pp. 22-24

1.1 Further to BCUC IR 3.1, please provide a graph and table of the annual peak winter and summer loads served by each of the FRU and HER substations over the last 10 years, and specify if any peaks at one station include loads transferred from the other station.

Response:

FBC provides the requested information in the table below and in Attachment 1.1. FBC notes the following with respect to the information provided:

- The "FRU T1 Winter Peak (MW)" considers the winter season spanning from November to February. Therefore, the peak values provided in the table could have occurred at any time from November of the listed year to February of the following year. For example, the 2014 peak load data below considers the range November 2014 to February 2015.
- Load data is not available for HER as there is no metering at the HER substation. Metering has not been installed at HER as the substation was planned to be decommissioned, and the maximum capacity of the substation is only 1.875 MVA.
- Temporary load transfers due to planned outage work are not considered when determining peak load. The table below does not consider load transfers to FRU T1 when determining the summer and winter peak load values.

Table 1: FRU Summer and Winter Peak Loads 2014-2023

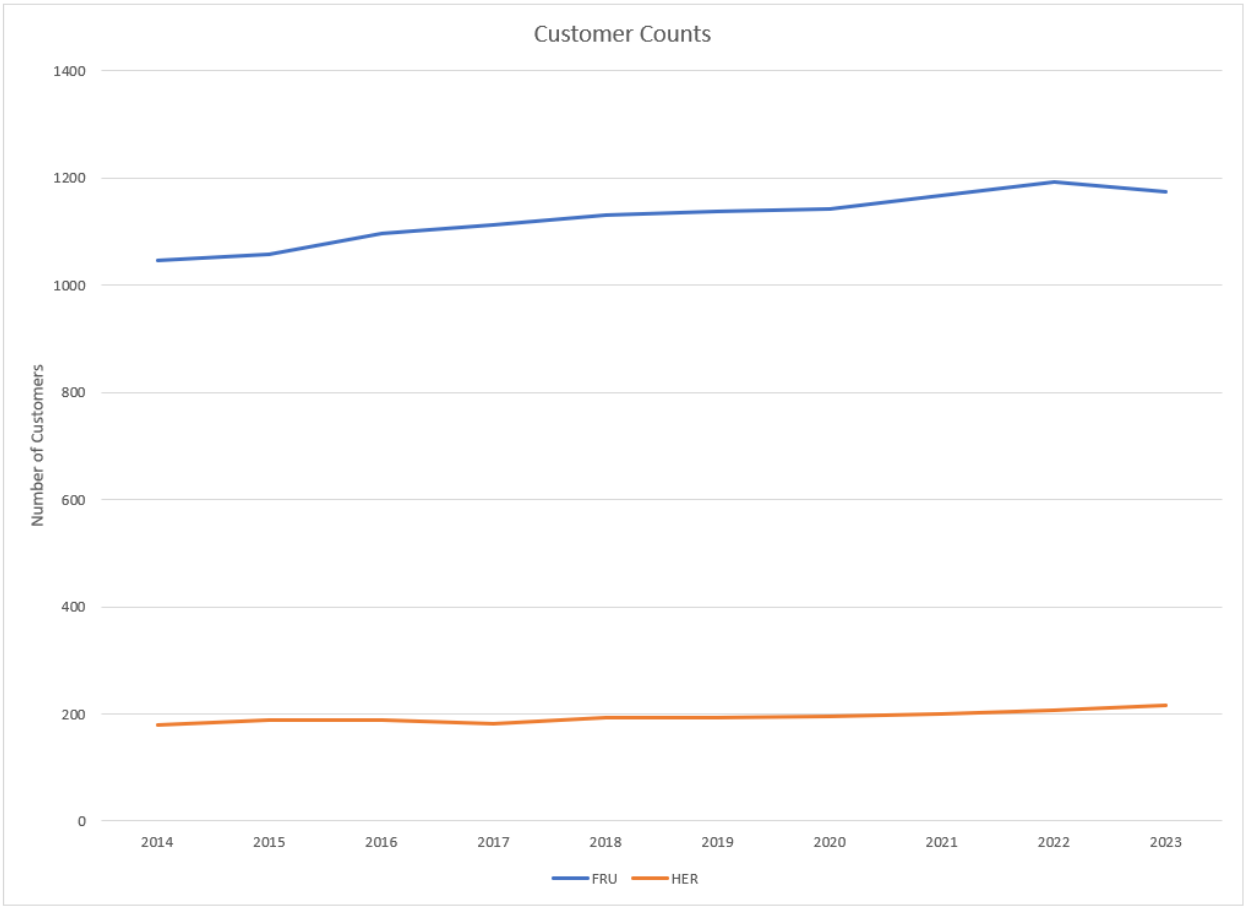
Year	FRU T1 Summer Peak (MW)	FRU T1 Winter Peak (MW)
2014	4.13	4.87
2015	4.19	5.37
2016	3.95	6.03
2017	4.07	5.40
2018	3.65	5.47
2019	4.21	5.57
2020	4.12	5.92
2021	4.90	5.49
2022	4.77	6.18
2023	5.00	5.88

1.2 Please provide a graph and table of the customers served annually by each of the FRU and HER substations over the last 10 years.

Response:

FBC provides the requested information in the following table and graph. While responding to this IR, FBC discovered an error in the customer counts served by the FRU and HER substations and has corrected these customer counts in the table and graph below. In the Application (page 13), FBC stated that the FRU substation supplies electricity to 1,140 customers. This figure was slightly understated and should have been 1,175. With regard to HER, on page 17 of the Application, FBC stated that the HER substation supplies electricity to 226 customers. The correct number is 216.

Station	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Fruitvale (FRU)	1,047	1,058	1,096	1,112	1,131	1,138	1,143	1,168	1,192	1,175
Hearns (HER)	180	189	189	182	193	194	196	201	208	216



1.3 Please describe the constraints at the BEP substation and on the distribution system that prevent connecting the 439 customers that would be without service from BEP in the event of a failure at FRU. Please provide the details of the BEP substation, including the peak loading on the transformer(s) for the time frames requested above.

Response:

Please refer to the response to Lenardon IR1 10.

1.4 Please explain the reliability considerations that require two transformers at the proposed new substation. Have the reliability considerations been reviewed and endorsed by the BCUC?

Response:

Please refer to the response to BCOAPO IR1 1.1.

1.5 Please provide the number of customers and locations served by a non-redundant HV transformer or breaker in the FortisBC system.

Response:

The number of customers served by stations with a non-redundant transformer is provided in the table below. Of these stations, those that also have a high voltage breaker (or circuit switcher) are also identified.

However, the existence of these stations does not mean that a non-redundant HV transformer is not needed at FRU. In addition to being built with no redundant transformer, some legacy FBC stations were built with no oil containment, no provision for mobile installation, no future expansion considerations, and little space for maintenance. FBC's standards necessarily evolve over time based on industry knowledge and safety practices, and any required changes are incorporated when FBC undertakes station rebuilds and/or refurbishment, thus ensuring that FBC's stations are being upgraded to current standards. Thus, as substations are rebuilt due to growth or

sustainment needs, FBC considers the addition of a second transformer, along with other current standard requirements such as oil containment.

FBC also notes that substations with a non-redundant HV transformer in higher density areas typically have multiple distribution ties, allowing for more load to be offloaded to neighboring substations. Other substations with a non-redundant HV transformer are sited near a mobile transformer storage location, which could be installed at a substation for planned or emergency work when it is required. The FRU substation is in a lower-density area and is not in close proximity to a mobile transformer storage location. The New FRU Substation (and the installation of the second transformer) will provide FBC more flexibility to use its mobile transformer at other substations when needed, thus improving the reliability of FBC's system.

There are a number of recent examples where substations have required rebuilding due to nearing end of life, and as part of the rebuild, FBC added a second transformer for reliability, including the Salmo, Beaver Park and Playmor substations. As FBC continues to move towards rebuilding existing substations with two transformers, its reliance on a mobile transformer will continue to decrease, further decreasing the risk of long outages and improving flexibility for planned maintenance at the remaining substations with non-redundant HV transformers. The table below identifies distribution substations where the installation of a second transformer has been proposed in the recently filed FortisBC Energy Inc. (FEI) and FBC (collectively FortisBC) Application for Approval of a Rate Setting Framework for 2025 through 2027.

Station	Region	FBC Customer Count	Non-Redundant HV Transformer	HV Breaker (or Circuit Switcher)	2nd Transformer proposed in Recently Filed 2025-2027 Rate Framework Application
CHR	BND	1,547	X		X
GFT	BND	1,635	X	X	
RUC	BND	409	X	X	
AAL1	KOT	2,621	X	X	
BLU	KOT	2,044	X	X	X
CAS	KOT	2,505	X		
COF	KOT	368	X		
COT	KOT	20	X		
CSC	KOT	2,651	X	X	
FRU	KOT	1,175	X		
GLM	KOT	3,080	X		
HER	KOT	216	X		
KAS	KOT	1,087	X		
OOT	KOT	2,299	X	X	
PAS	KOT	784	X		
STC	KOT	2,399	X		X
TAR	KOT	1	X		

Station	Region	FBC Customer Count	Non-Redundant HV Transformer	HV Breaker (or Circuit Switcher)	2nd Transformer proposed in Recently Filed 2025-2027 Rate Framework Application
AWA	SOK	1,325	X		
HED	SOK	1,234	X	X	
HUT	SOK	369	X	X	
KAL	SOK	1,235	X		X
KER	SOK	3,128	X	X	
NKM	SOK	2,406	X	X	
OKF	SOK	2,330	X		
OLI	SOK	2,402	X	X	
PRI	SOK	2,301	X	X	
RGA	SOK	144	X	X	
TRC	SOK	4	X	X	
WEB	SOK	1,183	X		
BEV	NOK	6,893	X	X	
BLK	NOK	5,907	X	X	
BWS	NOK	2,216	X		
DGB	NOK	5,018	X	X	X
DUC	NOK	2,010	X	X	X
ELL	NOK	4,177	X	X	
JOR	NOK	496	X	X	
SAU	NOK	7,119	X	X	X

1.6 Please explain whether any reliability criteria require N-1 redundancy at the 63 kV level. If such reliability criteria exist, have they been reviewed and endorsed by the BCUC?

Response:

Please refer to the response to BCOAPO IR1 10.1.

p.24: "In the event of a HER T1 unplanned transformer outage, HER load can currently be offloaded to FRU2 as HER loading is low due to limited station capacity (1.875 MVA). However, to offload HER T1, field personnel must manually

reconfigure the system, so customers must wait until the reconfiguration is complete before restoration can occur."

1.7 Please provide details of the available distribution interconnection between FRU and HER.

Response:

The FRU and HER substations are interconnected through a single distribution tie between Fruitvale Feeder 2 (FRU2) and Hearns Feeder 1 (HER1). To transfer load from HER to FRU, field personnel must manually close the normal open point switch between the two feeders and open the HER1 low voltage breaker at the substation.

1.8 Please describe whether remote controlled switches could be used to switch HER distribution customers.

Response:

FBC does not have remote-controlled switches on distribution line infrastructure. However, FBC confirms that a remote-controlled switch could be used for these purposes.

Field personnel must also manually open the HER substation breaker; it cannot be operated remotely by the System Control Centre.

Alternatives and Justification

2. Reference: Exhibit B-1, Section 4.3.2.1, Replacing FRU Substation at Current Location Not Feasible, p. 27

2.1 Please provide the layout and dimensions of the substation FBC installed for the Waneta Expansion Project. Did it have an HV breaker?

Response:

The Waneta Expansion substation was not installed by, nor is it owned by FBC. Therefore, FBC is not able to provide the requested information.

2.2 Please describe the factors FBC would consider in order to depart from its standard one transformer substation configuration. What are the least impactful changes that would have to be made in order for a new single transformer substation at the existing FRU site?

Response:

Please refer to the response to BCUC IR1 7.4.

2.3 Please provide a listing of the existing FBC 63 kV substations, identifying the number of transformers and the footprint area of each substation.

Response:

Please see the table below providing the requested information.

FBC notes that the size of the station is not only related to the number of transformers and number of pieces of equipment. Some legacy FBC stations were built with no redundancy, no oil containment, no provision for mobile installation, no future expansion considerations, and little space for maintenance.

FBC's standards evolve over time based on industry knowledge and safety practices, and any required changes are incorporated when FBC undertakes station rebuilds and/or refurbishment, thus ensuring that FBC's stations are being upgraded to current standards.

63 kV Substation Name	No. of Transformers	Substation Footprint (m^2)[1]
Arawana	1	2,200
Beaver Park	1	3,100
Blueberry	1	1,000
Cascade Substation	1	1,800
Castlegar	1	1,000
Christina	1	700
Coffee Creek	3 single phase units	3,500
Cottonwood	1	1,500
Crawford Bay	2	3,500
Creston	2	1,700
Fruitvale	1	640
Glenmerry	1	1,000
Grand Forks	1	9,200
Hearns	3 single phase units	800
Huth	1	5,400
Kaleden	1	800
Kaslo	1	1,700
Nk'mip Substation	1	4,900
OK Falls	1	1,000
Oliver	1	7,600
Ootischenia	1	4,700
Osoyoos	2	1,400
Passmore	1	1,000
Pine St	2	2,500
Playmor	2	2,200
Ruckles	1	3,500
Salmo	2	1,700
Stoney Creek	1	1,100
Summerland	1	900
Tarrys	1	900
Trout Creek	1	1,300
Valhalla	2	1,500
Waterford	1	1,400
Westbench	1	500
Westminster	1	2,000

[1] The substation footprint can vary from the land parcel size. For example, as shown in Attachment 5.5 provided in the response to BCUC IR1 5.5, the total land parcel size for the Hearns property is 4,519 m^2, and, as explained in Section 3.2 of the Application, the total land parcel size for the Fruitvale property is 1,400 m^2.

2.4 Please describe what constraints limit FortisBC to a minimum transformer size of 20 MVA, and the compromises that would have to be made for a smaller transformer size.

Response:

The minimum size for standard transformers installed for new station builds is 20 MVA. FBC has standardized to a minimum standard transformer size to gain efficiencies with procurement, mitigate supply chain issues, provide flexibility within the system, and limit equipment sizes required for spare parts.

As described in the response to BCUC IR1 3.1, the New FRU Substation will combine both FRU and HER loading, and the forecast values do not currently consider potential new large loads, electrification, or electric vehicles. Additionally, the purpose of the second transformer is for redundancy, which means that either transformer must be able to carry all of the load, limiting the New FRU Substation maximum load to 20 MVA.

Given these factors, FBC considers the 20 MVA units are a suitable size for the New FRU Substation.

3. Reference: Exhibit B-1, Section 3.3.1.1, Fruitvale Substation Condition Issues, p. 20

3.1 Please provide photos and nameplates of the FRU switchgear, as well as an electrical schematic for the substation.

Response:

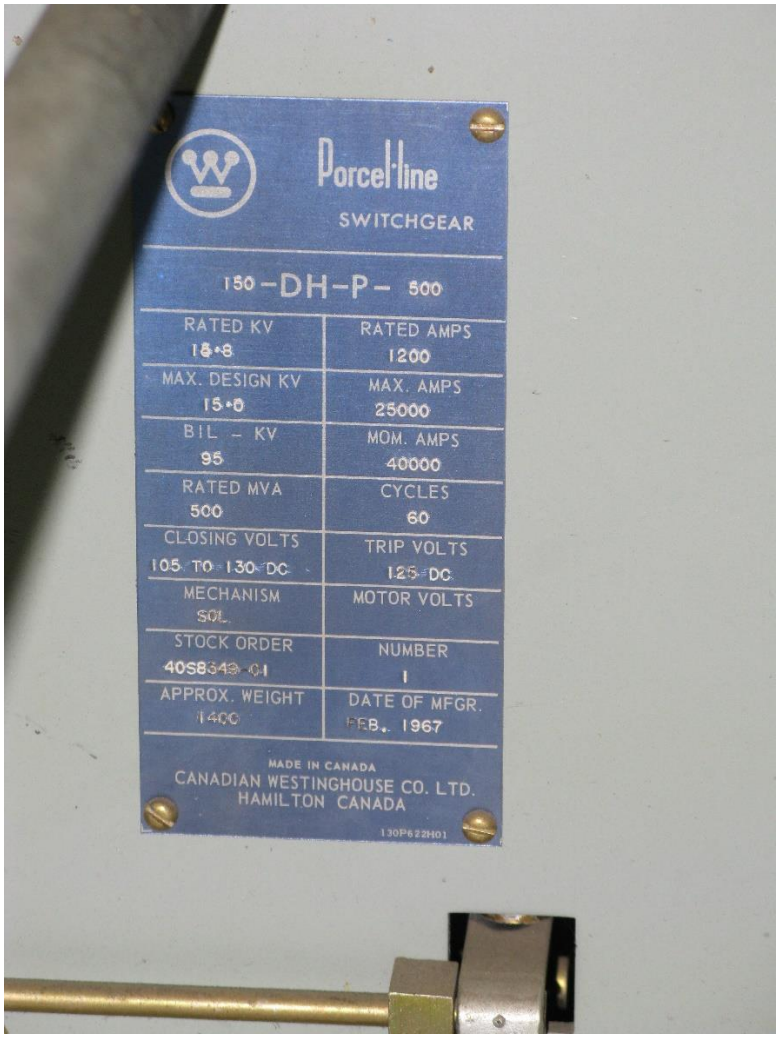
The electrical schematic for the existing Fruitvale substation is included as Confidential Attachment 3.1.

FBC is requesting that Attachment 3.1 be filed on a confidential basis and held confidential by the BCUC in perpetuity, pursuant to Section 18 of the BCUC's Rules of Practice and Procedure regarding confidential documents, as set out in Order G-72-23. The information contains operationally sensitive details pertaining to the Company's assets which, if disclosed, could impede FBC's ability to work safely and reliably operate its electricity system assets and could increase the risk to the safety of both its workers and the public and/or jeopardize the safety, security, and operation of FBC's systems. FBC is unable to foresee a time when the information may no longer be confidential and, therefore, requests that the information remains confidential in perpetuity. A confidential version has been provided to the BCUC and Interveners who have signed a Confidentiality Declaration and Undertaking.

Please find below the photos and nameplate of the FRU switchgear.

1

1



3.2 Please describe any investigations FBC has conducted into third party retrofit breakers for the FRU Westinghouse switchgear.

Response:

Equipment refurbishment at FRU is not possible. FBC has determined that retrofit/refurbishment of the FRU breakers and switchgear would not be cost effective, extend the life of the electrical equipment, or improve safety and reliability, for the following reasons:

- While retrofit breakers might improve individual equipment condition, due to the station design this will not provide substantial improvements to overall station reliability.

- Retrofits will not improve FRU switchgear arc flash resistance and will not provide additional hazard protection to the operators. The proposed outdoor station design for the New FRU Substation eliminates arc flash hazards.
- Switchgear breaker retrofits are costly when compared to purchasing new breakers. A switchgear breaker retrofit was commissioned in 2019 for approximately $74 thousand, while a new outdoor MV breaker was priced in 2023 at approximately $37 thousand.
- Retrofit breakers do not have a proven reliability track-record.
- Since no spare breaker is currently available for the FRU switchgear, FBC would have to pay for a built-from-scratch third retrofit breaker or operate with reduced reliability for the duration of the retrofit.

3.3 Please explain whether arc flash PPE is a requirement in all FBC substations. Please identify those locations in the FBC system where arc flash PPE is required similar to that required at FRU.

Response:

Low level arc flash rated PPE is a requirement at all FBC substations. However, FBC requires higher arc flash rated PPE at FBC substations with medium voltage metalclad switchgear, station service supplied via switchgear equipment connected to transmission transformers, or station service with 125VDC supply.

Stations similar to FRU with medium voltage metalclad switchgear are listed below:

Region	Station Name	Operating Voltage (kV)
OK	HOL – Hollywood	13
OK	OKM - OK Mission	13
OK	REC – Recreation	13
OK	SAU – Saucier (indoor, outdoor)	13
OK	DGB - (D.G.) Bell Terminal	13
OK	SEX – Sexsmith	13
OK	DUC - Duck Lake	13
OK	HUT - Huth (13kV, 8kV)	13
OK	PIN - Pine Street (T1, T2)	13
KT	GLM – Glenmerry	13
KT	CRA - Crawford Bay	13

Region	Station Name	Operating Voltage (kV)
KT	BLU – Blueberry	13
OK	JOR - Joe Rich	26
OK	BWS – Big White	25
KT	TAR – Tarrys	13
KT	STC - Stoney Creek	13
KT	CRE – Creston	13
KT	CAS – Castlegar	13
KT	FRU – Fruitvale	13

*OK = Okanagan
*KT = Kootenay

3.4 Please provide the size and cost of a dedicated spare or mobile transformer to be kept at FRU.

Response:

Please refer to the response to CEC IR1 4.3.

3.5 Please provide the cost of replacing the 63 kV transmission switches at FRU.

Response:

FBC has not estimated the cost of replacing only the transmission switches, as they would be replaced by breakers with the new design. An order of magnitude estimate for replacing the switches is approximately $150,000.

3.6 If the FRU switchgear and transmission switches could be cost effectively replaced, please describe whether there is room in the 1400 square meter FRU substation property to add a 63 kV breaker. Please also describe the remaining condition issues at FRU that would need to be addressed. Please provide the cost of such a retrofit.

Response:

Please refer to the response to BCUC IR1 7.4.

4. Reference: Exhibit B-1, Appendix A

4.1 The METSCO 2017 Comprehensive Condition Assessment is merely a capital plan summary and does not provide any detail regarding the specific conditions that result in FRU having a Health Index of 31.25%, nor having an effective age of 95 years. Please provide the detailed condition assessment information that yielded these results for the FRU substation.

Response:

Please refer to the response to CEC IR1 2.2.

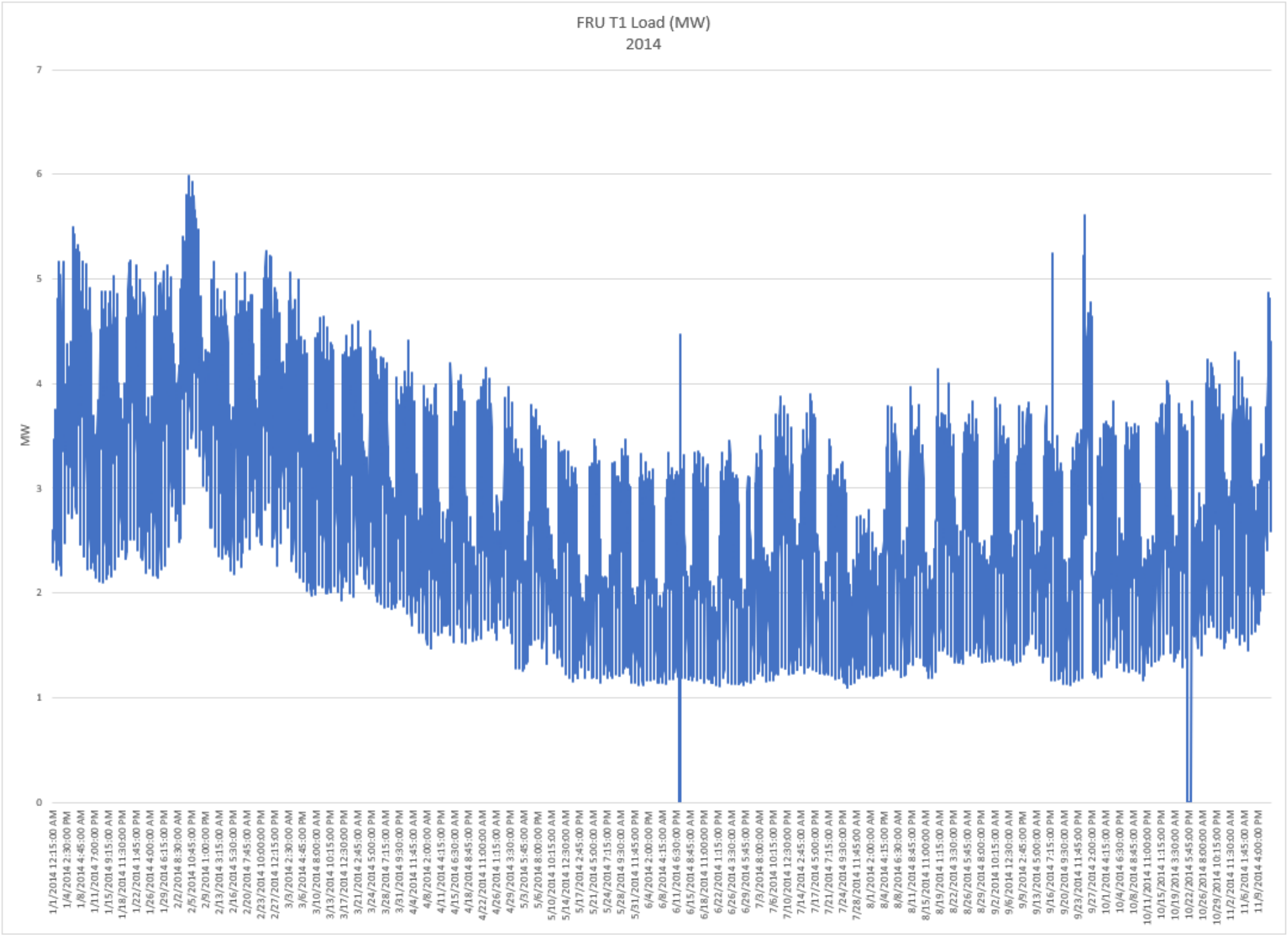
4.2 The Projected Replacement/Refurbishment Cost for the FRU switchgear in the METSCO 2017 Comprehensive Condition Assessment report is $147,610. Please provide the cost estimate for the switchgear in the proposed substation. Please also provide FBC's current estimate for replacing the FRU switchgear.

Response:

The New FRU Substation will not have indoor switchgear for the feeder breakers; FBC will use standard outdoor breakers which are easier to maintain and do not subject the maintenance crew to an arc flash hazard. The cost of a feeder breaker, installed with protective relaying, foundations, conduit, wiring, etc. is approximately $125,000, including supporting infrastructure. The New FRU Substation will have four breakers with an estimated total cost of $500,000.

FBC did not prepare an estimate for replacing the switchgear at the FRU substation. However, relying on Metsco's 2017 estimate and adding cost escalation and inflation, FBC estimates a cost of approximately $335,000 to replace the FRU switchgear.

Attachment 1.1


FRU T1 Load (MW)
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1/1/2014 12:15:00 AM
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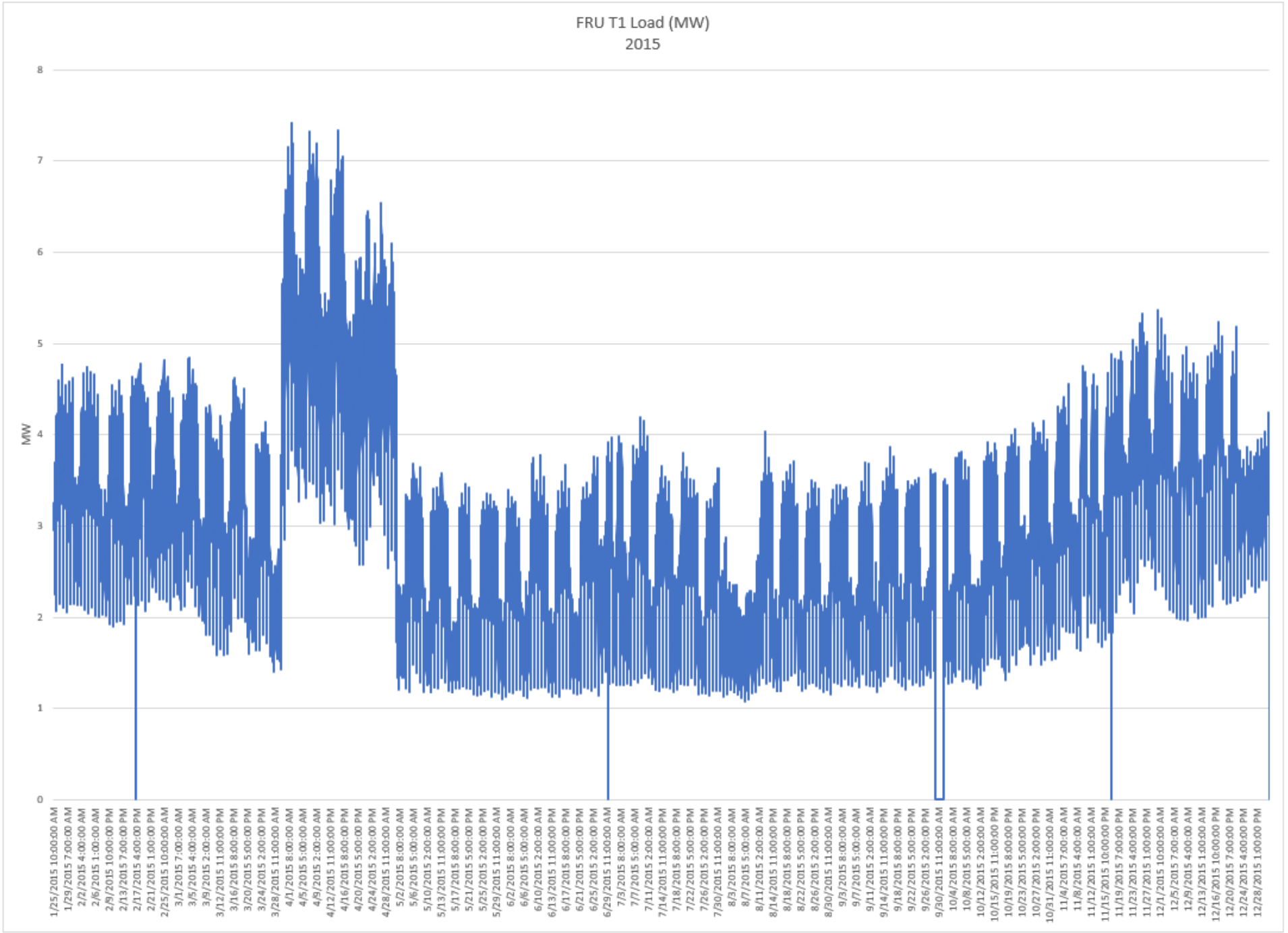
FRU T1 Load (MW)
2015
MW
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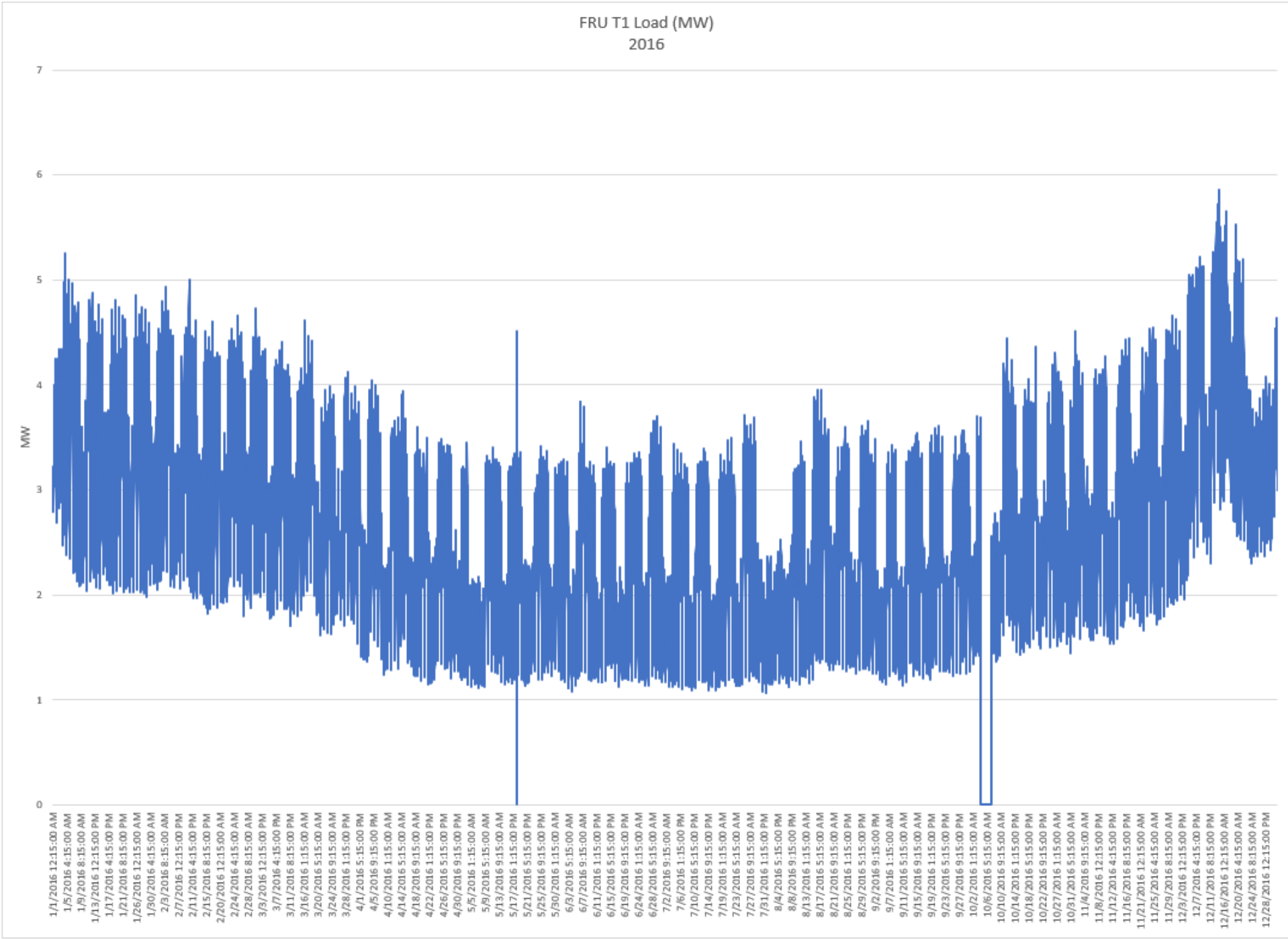
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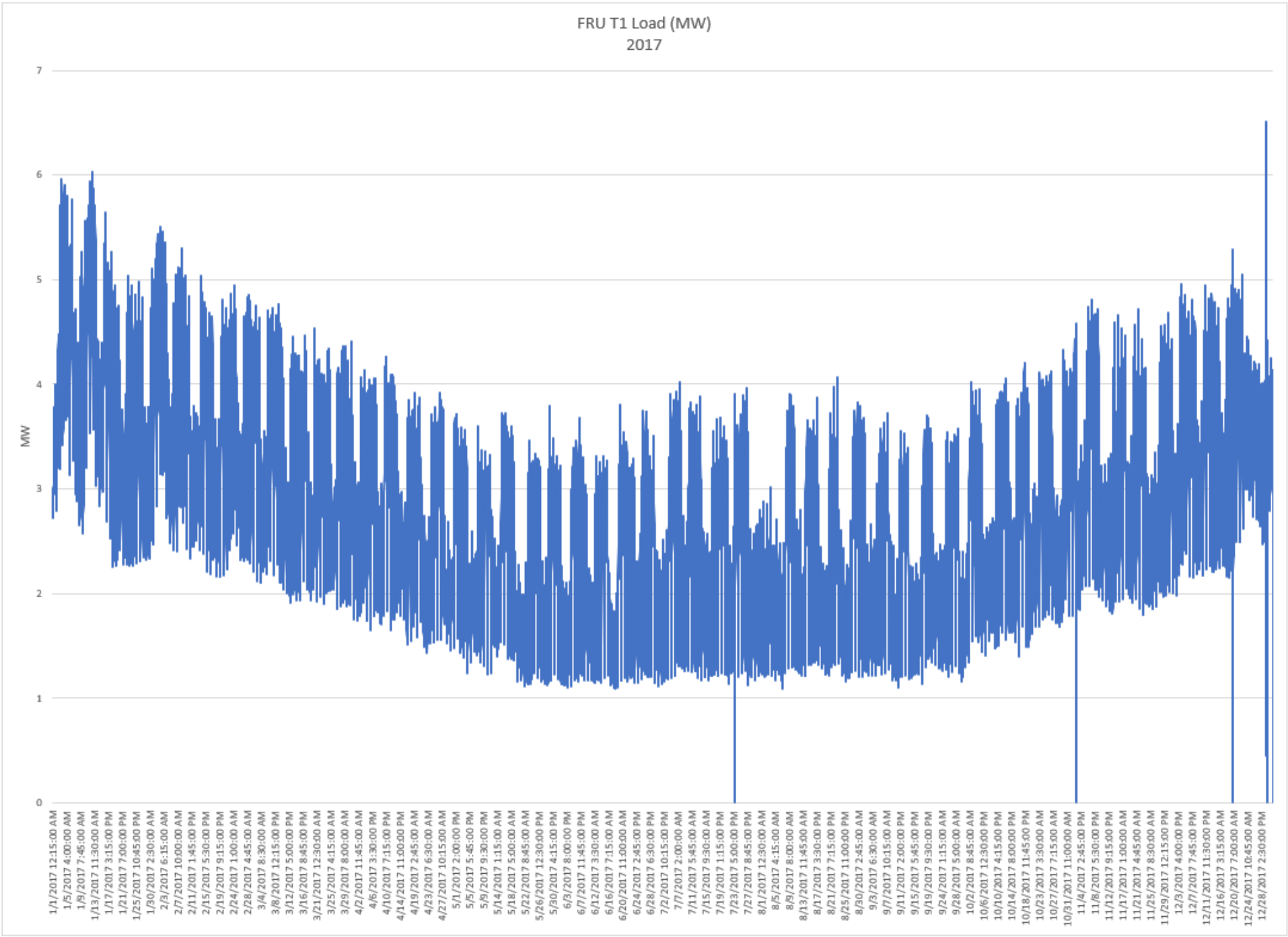
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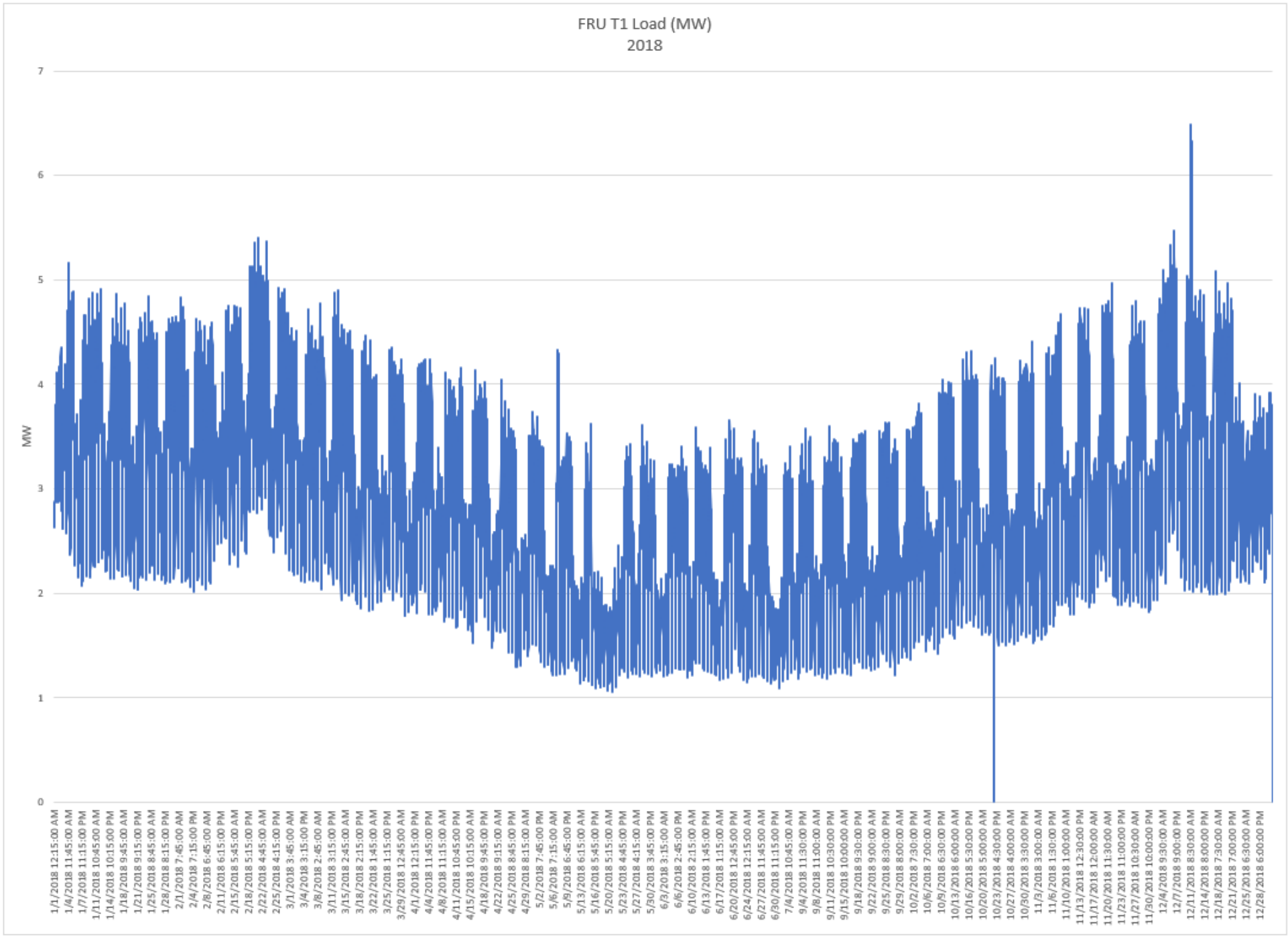
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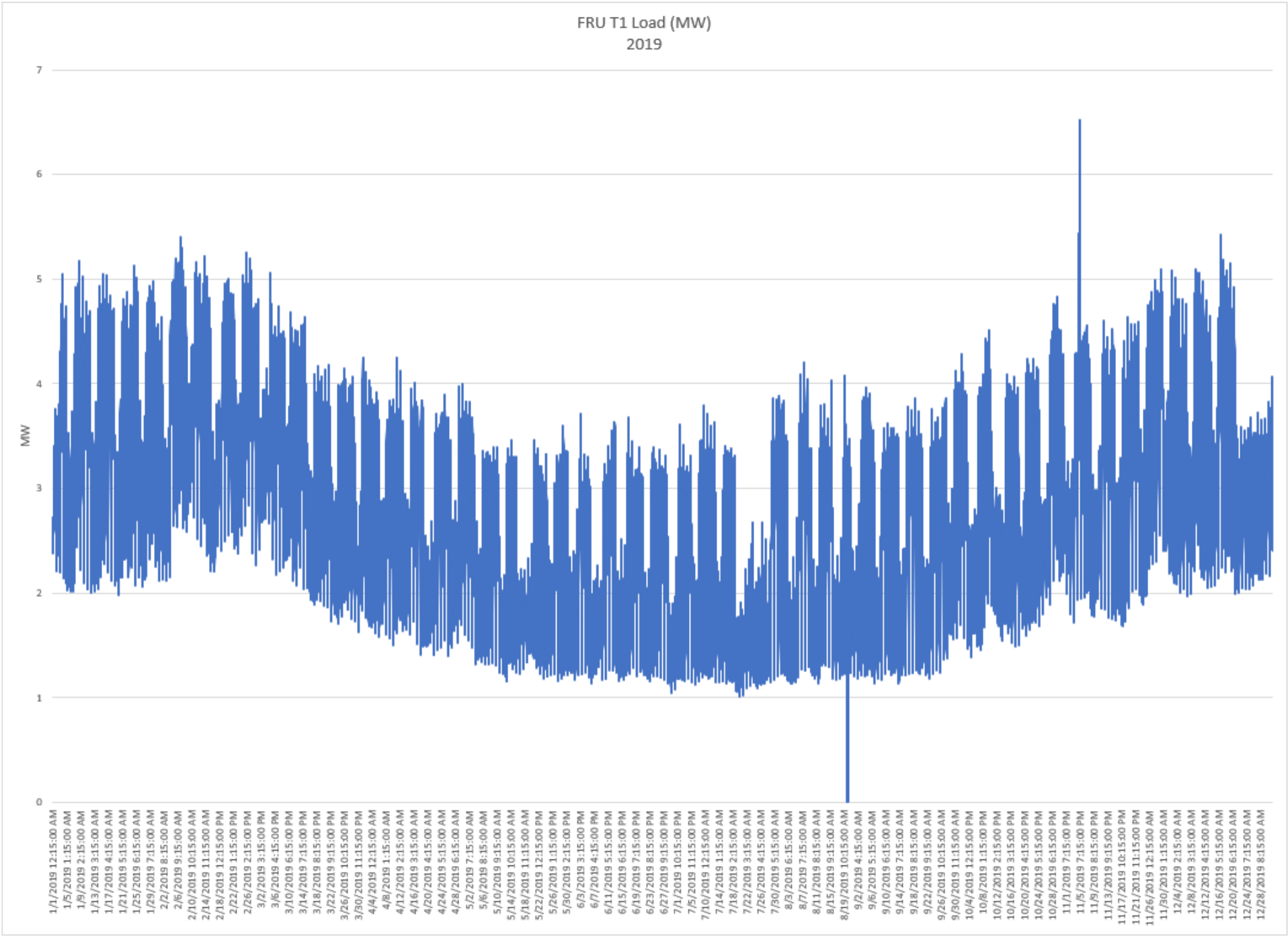
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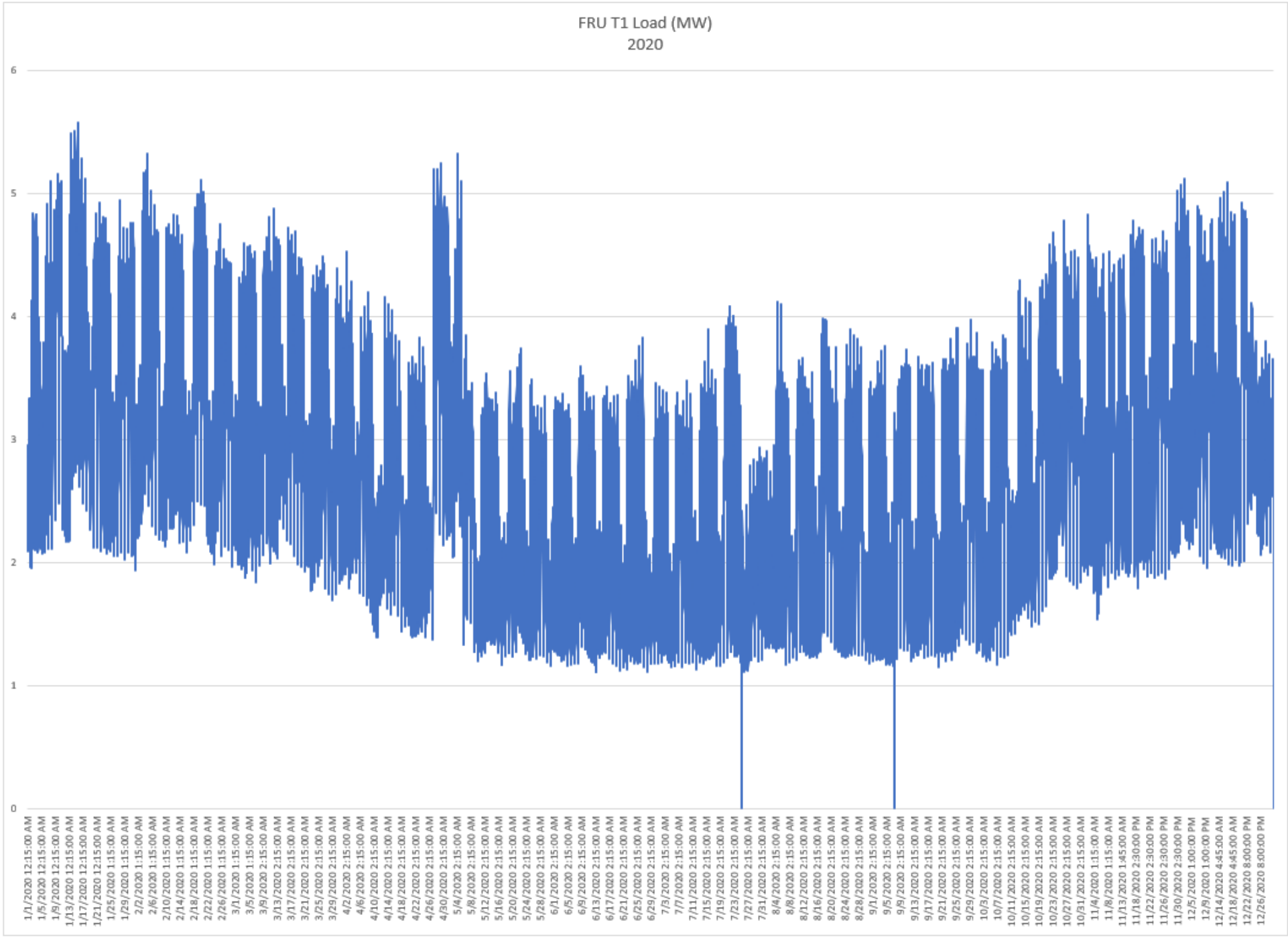
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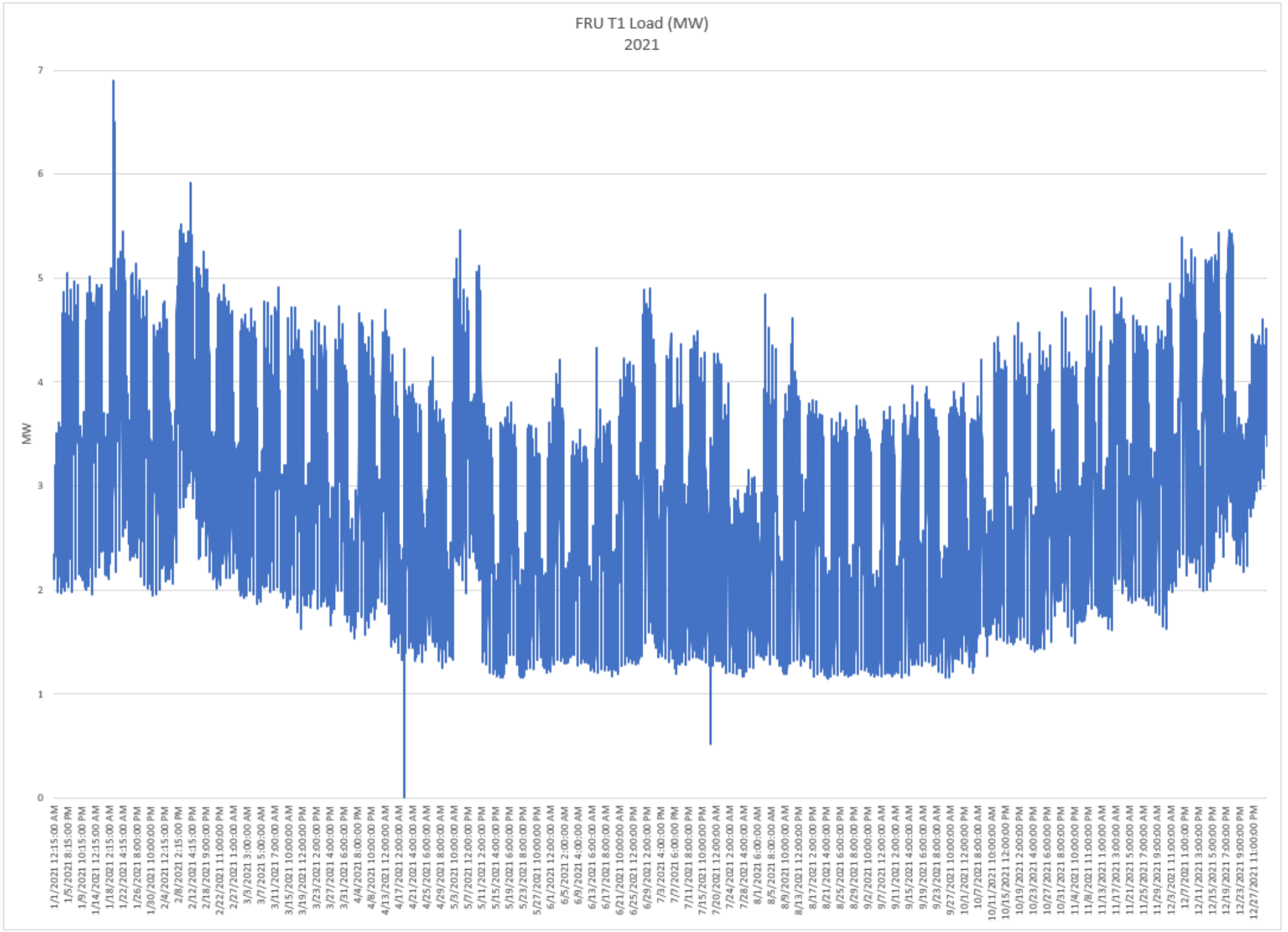
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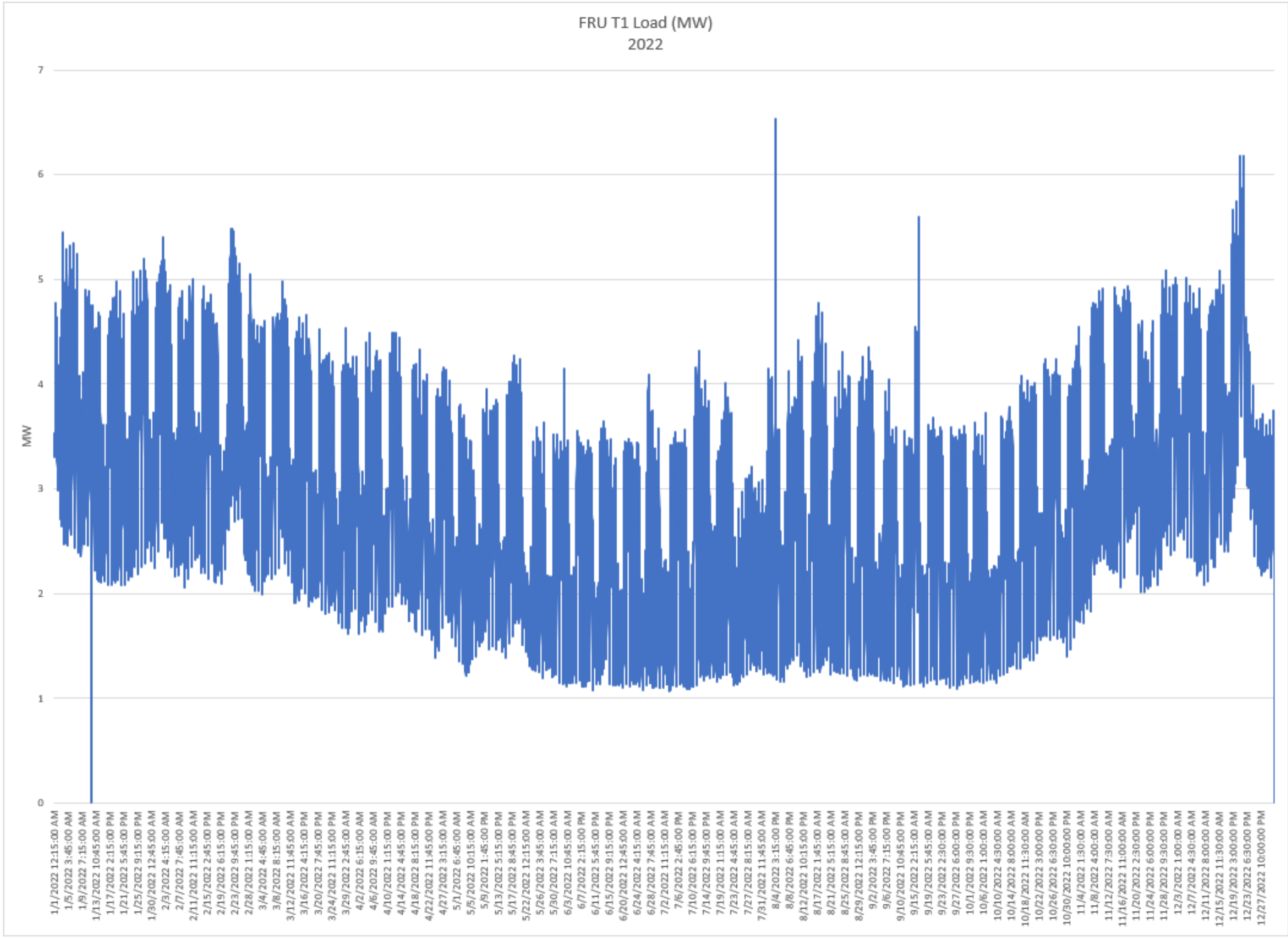
12/27/2021 11:00:00 PM


FRU T1 Load (MW)
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1/1/2022 12:15:00 AM
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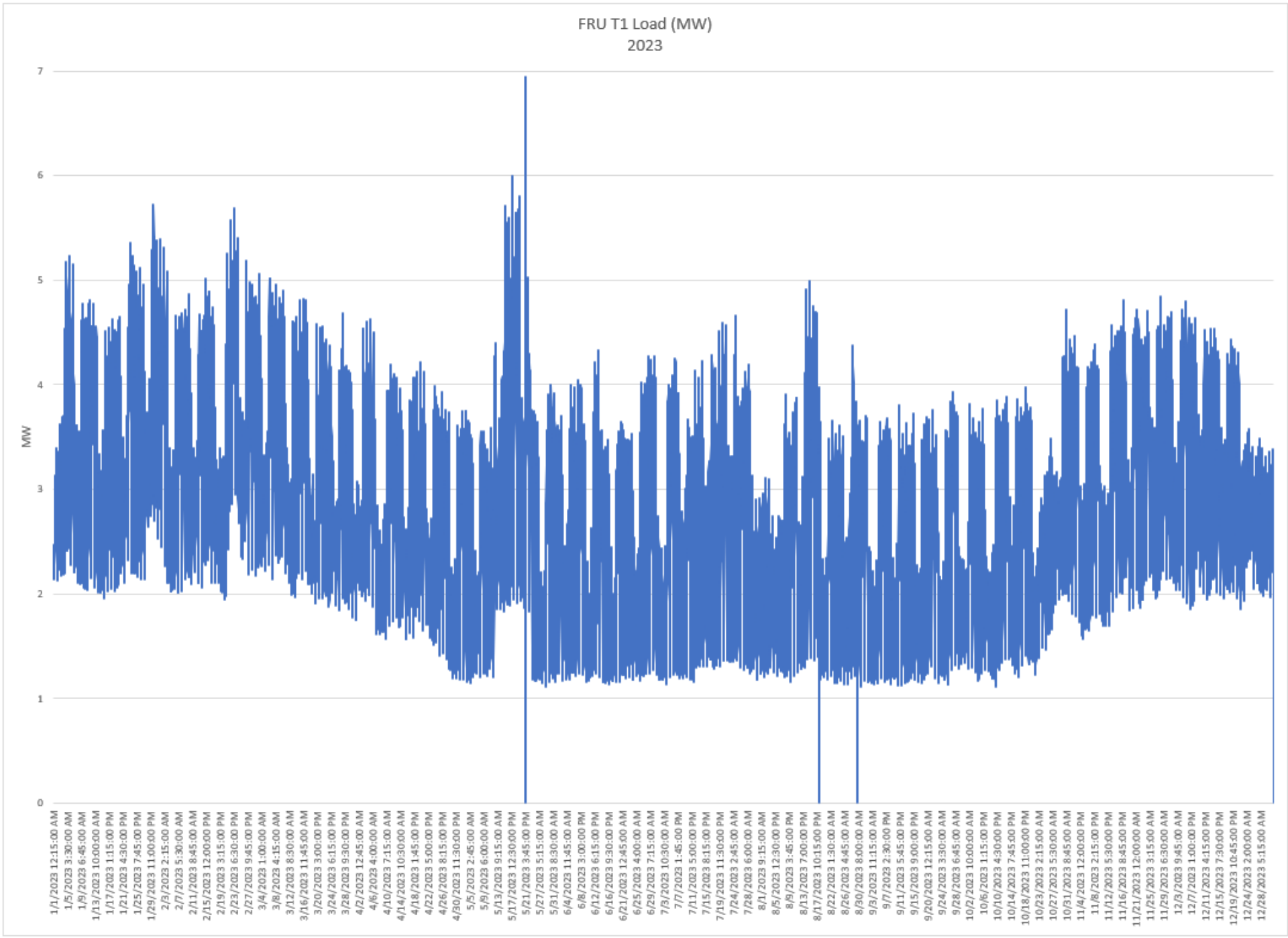
FRU T1 Load (MW)
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1/1/2023 12:15:00 AM
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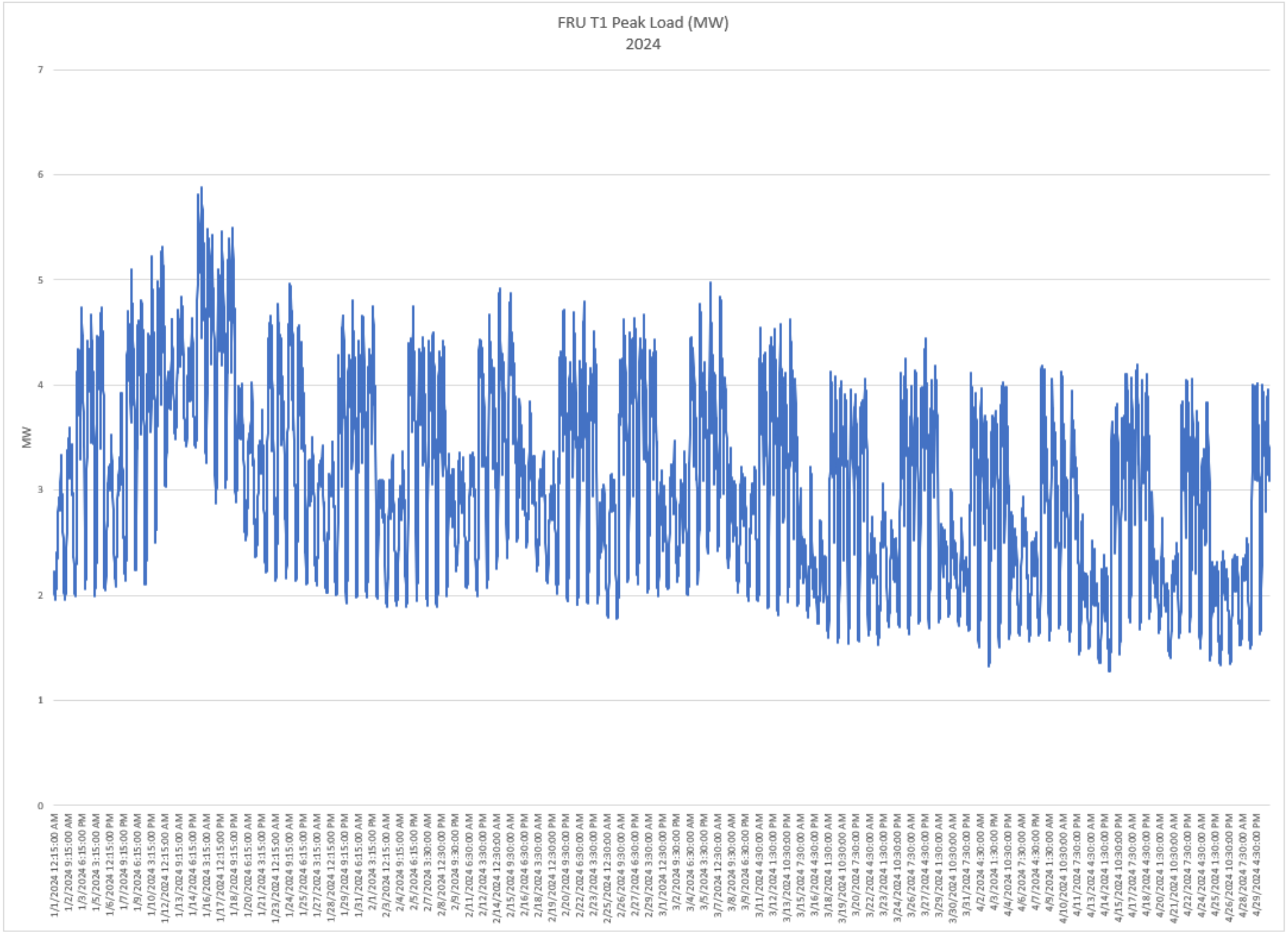
FRU T1 Peak Load (MW)
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Attachment 3.1

FILED CONFIDENTIALLY