

# FRILING ENERGY

BIOMASS BOILERS • SERVICE • FUEL

June 1, 2018

Ms. Debra Howland, Executive Director  
New Hampshire Public Utilities Commission  
21 South Fruit Street  
Concord, NH 03301

NHPUC 25JUN18PM2:01

Dear Ms. Howland,

I am writing again on the behalf of Brian Boardman of Whelen Engineering, 99 Ceda Road in Charlestown, NH 03603. This time it is to request an alternative method of measuring thermal energy generated at a site referred to as "Whelen 1" by NEPOOL, during the first quarter of 2018. The NEPOOL Unit ID number of Whelen 1 is NON60530.

The original method of measuring the thermal energy generated at this site, from when it was first approved on February 1, 2016, was as was shown on the attached drawing: using a Clarksonic BTU meter in combination with a data logger which was built into the DCM Logic monitoring system. This set-up functioned well until about December 26, 2017 when the BTU meter ceased functioning. As a result, there was no recording of BTUs generated from the end of December through today at the Whelen 1 boiler site. We don't know why the meter failed. All we know is the meter is no longer functional. An Onicon System 10 BTU Meter has been ordered and will be installed at Whelen 1 by our crews before October 2017.

Our requested alternate method of measuring the thermal energy generated during Q1 2018 is to apply a conservative value of Thermal RECs per ton of PDC fuel delivered. We calculated this by comparing records of fuel deliveries to Whelen 1 during Q1 2018 to fuel deliveries and verified Thermal REC generation at Whelen 1 and Whelen 2 during the period beginning in January 2016 and running until the end of Q1 2018.

The boilers and silo systems at Whelen 1 and Whelen 2 are virtually identical: They both consist of 4 Froling TX-150 boilers each fed by 4 individual silos, each with a 36 ton capacity. See the attachment "FEPR Whelen Engineering Heats with PDCs". The NEPOOL Unit ID number of Whelen 2 is NON 60531.

The data which we are providing to support our alternative method includes two parts:

A: the delivery of fuel to the storage silos of Whelen 1 compared to the approved generation of Thermal RECs (megawatts of heat energy) during this period to other periods before this outage.

B: for comparison purposes, the delivery of fuel to the storage silos of Whelen 2 compared to the approved generation of Thermal RECs (megawatts of heat energy) the period starting July 1, 2017 through May 31, 2018.

Detail sheets including Approved Thermal REC generation entered into NEPOOL and PDC (semi-dry wood chips) delivery records from Froling Energy are attached. Whelen Engineering

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confirms that Froling Energy is the only company that has delivered fuel to Whelen 1 and Whelen 2 silos during the quarters discussed in this request.

The following table is a consolidation and restatement of the information attached:

## PART A: WHELEN 1 DETAILS

Quarter	Tons Del	T-RECs	T-RECs/Ton
2016 Q1	206.76	520	2.51
2016 Q2	20.87	134	6.42
2016 Q3	61.68	82	1.33
2016 Q4	143.89	556	3.86
<b>SUBTOTAL</b>	<b>433.2 0</b>	<b>1292</b>	<b>2.98</b>
2017 Q1	137.36	532	3.87
2017 Q2	0	116	
2017 Q3	91.44	202	2.21
2017 Q4	182.01	580	3.19
<b>TOTALS</b>	<b>1003.76 0</b>	<b>3232</b>	<b>3.22</b>

2018 Q1                      125.46                      TBD                      Appealed 5/1/2018

## PART B: WHELEN 2 DETAILS

Quarter	Tons Del	T-RECs	T-RECs/Ton
2016 Q1	91.34	215	2.35
2016 Q2	0	108	
<b>SUBTOTAL</b>	<b>91.34</b>	<b>323</b>	<b>3.54</b>
2016 Q3	40.12	47	1.17
2016 Q4	248.3	703	2.83
2017 Q1	266.71	833	3.12
2017 Q2	28.8	116	4.03
<b>SUBTOTAL</b>	<b>675.27</b>	<b>2022</b>	<b>2.99</b>
2018 Q1	256.69	730	2.84
<b>TOTALS</b>	<b>931.96</b>	<b>2752</b>	<b>2.95</b>

T-RECs not verified

2017 Q3                      78.11                      0                      0.00                      Not Appealed  
 2017 Q4                      247.02                      617                      2.50                      Appealed 3/2018

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The above figures show that prior to the failure of the meter, Whelen 1 was averaging 3.22 T-RECs per delivered ton of PDCs. During that same time Whelen 2 was averaging 2.95 T-RECs per delivered ton of PDCs.

For the Alternative Method, our calculation of T-REC generation for Q1 2018 at Whelen 1 using a very conservative factor of 2.5 T-RECs per ton:

**PART A: Whelen 1 Details**

**2017 Q4      125.46 Tons x 2.5 T-RECs/Ton      =      313 T-RECs Estimated**

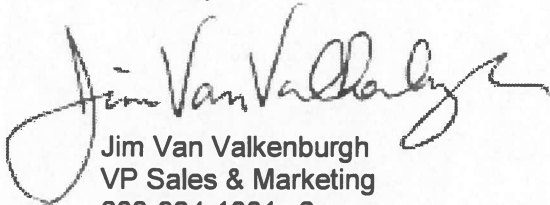
In requesting consideration of this method of calculating thermal RECs, we understand that this method is somewhat flawed in that fuel delivery and actual heat production are not tightly linked on a day to day, week to week or even month to month basis. Fuel is delivered and stored for future periods of fuel use and it is delivered again in rough but not direct correlation to actual fuel use. At various points of these cycles a silo can be absolutely full or nearly empty, making short term analysis of this data quite inconsistent. That is why a multiple quarter average should be most accurate. That is also why we are not looking to recover T-RECs from either Q4 2017 or Q2 2018

Thank you for considering this alternative method for confirming Thermal RECs for Whelen 1 during Q1 of 2018 for a total of 313 Class 1 NH Thermal RECs.

Please note that 26 tons of PDC wood chips were delivered during Q2 2018 when the meter was non-functional and we will not be requesting consideration of those chips for T-RECs.

I encourage you to contact me if additional information is required for the approval of this alternative method.

Sincerely,



Jim Van Valkenburgh  
VP Sales & Marketing  
603-924-1001 x2  
[Jim@FrolingEnergy.com](mailto:Jim@FrolingEnergy.com)

Cc: Brian Boardmann and Matt Dolloph of Whelen Engineering

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:57:26 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/1	NON60529	HMS 1	0.000	0.000	0.000
2016/2	NON60529	HMS 1	0.000	0.000	0.000
2016/3	NON60529	HMS 1	0.000	0.000	0.000
2016/2	NON60530	Whelen 1	284.000	0.000	284.000
2016/3	NON60530	Whelen 1	236.000	0.000	236.000
2016/2	NON60531	Whelen 2	68.000	0.000	68.000
2016/3	NON60531	Whelen 2	147.000	0.000	147.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:59:07 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/4	NON60529	HMS 1	0.000	0.000	0.000
2016/5	NON60529	HMS 1	0.000	0.000	0.000
2016/6	NON60529	HMS 1	0.000	0.000	0.000
2016/4	NON60530	Whelen 1	134.000	0.000	134.000
2016/4	NON60531	Whelen 2	108.000	0.000	108.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:59:59 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/7	NON60529	HMS 1	25.000	0.000	25.000
2016/8	NON60529	HMS 1	23.000	0.000	23.000
2016/9	NON60529	HMS 1	29.000	0.000	29.000
2016/9	NON60530	Whelen 1	80.000	0.000	80.000
2016/9	NON60531	Whelen 2	47.000	0.000	47.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:00:30 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/10	NON60529	HMS 1	63.000	0.000	63.000
2016/11	NON60529	HMS 1	102.000	0.000	102.000
2016/12	NON60529	HMS 1	137.000	0.000	137.000
2016/10	NON60530	Whelen 1	174.000	0.000	174.000
2016/11	NON60530	Whelen 1	163.000	0.000	163.000
2016/12	NON60530	Whelen 1	234.000	0.000	234.000
2016/10	NON60531	Whelen 2	182.000	0.000	182.000
2016/11	NON60531	Whelen 2	213.000	0.000	213.000
2016/12	NON60531	Whelen 2	294.000	0.000	294.000
2016/12	NON93900	Whelen 3	149.000	0.000	149.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:00:59 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/1	NON60529	HMS 1	152.000	0.000	152.000
2017/2	NON60529	HMS 1	138.000	0.000	138.000
2017/3	NON60529	HMS 1	146.000	0.000	146.000
2017/1	NON60530	Whelen 1	157.000	0.000	157.000
2017/2	NON60530	Whelen 1	139.000	0.000	139.000
2017/3	NON60530	Whelen 1	236.000	0.000	236.000
2017/1	NON60531	Whelen 2	268.000	0.000	268.000
2017/2	NON60531	Whelen 2	279.000	0.000	279.000
2017/3	NON60531	Whelen 2	286.000	0.000	286.000
2017/1	NON93900	Whelen 3	243.000	0.000	243.000
2017/2	NON93900	Whelen 3	231.000	0.000	231.000
2017/3	NON93900	Whelen 3	251.000	0.000	251.000



**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:01:25 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/4	NON60529	HMS 1	72.000	0.000	72.000
2017/5	NON60529	HMS 1	62.000	0.000	62.000
2017/6	NON60529	HMS 1	31.000	0.000	31.000
2017/4	NON60530	Whelen 1	115.000	0.000	115.000
2017/5	NON60530	Whelen 1	1.000	0.000	1.000
2017/4	NON60531	Whelen 2	123.000	0.000	123.000
2017/5	NON60531	Whelen 2	50.000	0.000	50.000
2017/4	NON93900	Whelen 3	172.000	0.000	172.000
2017/5	NON93900	Whelen 3	159.000	0.000	159.000
2017/6	NON93900	Whelen 3	23.000	0.000	23.000
2017/6	NON95026	Froling PDC1	0.000	0.000	0.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:01:51 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/7	NON60529	HMS 1	29.000	0.000	29.000
2017/8	NON60529	HMS 1	24.000	0.000	24.000
2017/9	NON60529	HMS 1	29.000	0.000	29.000
2017/9	NON60530	Whelen 1	202.000	0.000	202.000
2017/7	NON60531	Whelen 2	0.000	0.000	0.000
2017/8	NON60531	Whelen 2	0.000	0.000	0.000
2017/9	NON60531	Whelen 2	0.000	0.000	0.000
2017/8	NON93900	Whelen 3	10.000	0.000	10.000
2017/9	NON93900	Whelen 3	66.000	0.000	66.000
2017/7	NON95026	Froling PDC1	0.000	0.000	0.000
2017/8	NON95026	Froling PDC1	0.000	0.000	0.000
2017/9	NON95026	Froling PDC1	0.000	0.000	0.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:02:15 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/10	NON60529	HMS 1	47.000	0.000	47.000
2017/11	NON60529	HMS 1	107.000	0.000	107.000
2017/12	NON60529	HMS 1	118.000	0.000	118.000
2017/10	NON60530	Whelen 1	122.000	0.000	122.000
2017/11	NON60530	Whelen 1	264.000	0.000	264.000
2017/12	NON60530	Whelen 1	194.000	0.000	194.000
2017/10	NON60531	Whelen 2	0.000	0.000	0.000
2017/11	NON60531	Whelen 2	0.000	0.000	0.000
2017/12	NON60531	Whelen 2	0.000	0.000	0.000
2017/10	NON93900	Whelen 3	161.000	0.000	161.000
2017/11	NON93900	Whelen 3	211.000	0.000	211.000
2017/12	NON93900	Whelen 3	367.000	0.000	367.000
2017/10	NON95026	Froling PDC1	156.000	0.000	156.000
2017/11	NON95026	Froling PDC1	139.000	0.000	139.000
2017/12	NON95026	Froling PDC1	175.000	0.000	175.000

4000 Gallon ASME Buffer Tank  
w/ Sensor Wells and 4" Perimeter Insulation

Mixed Heating Water Supply Z1 & Z2

BTU Meter  
ClarkSonic (Clark Solutions) CSEMB20  
with 440-00 Pyromation Temp Sensors

Zone 1 Pumps  
2x(3x3x40 Wilo Stratos D)

Zone 2 Pump  
2x (3x3x40 Wilo Stratos D)

Z1 3 Way Mixing Valve

Z2 3 Way Mixing Valve

Heating Water Return

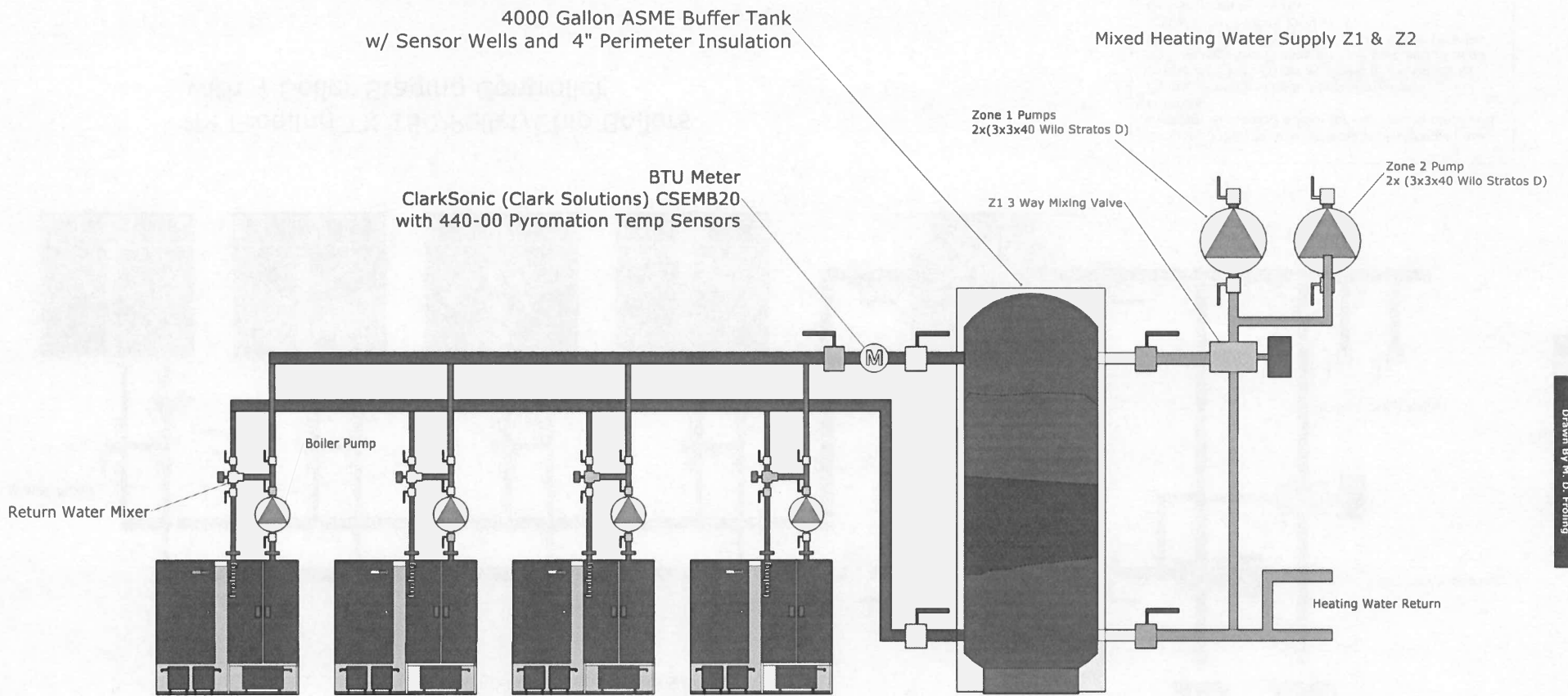
Return Water Mixer

Boiler Pump

4x Froeling TX 150 Pellet/Chip Boilers  
with 4 Boiler Staging Controller

Simplified Mechanical Schematic; Not shown are:  
Venting, expansion equipment, pressure relief and  
controls.  
Piping Systems: Welded and Victaulic  
Insulation: 1.5" FG on all pipes, 4" FG on tanks  
PVC Jackets and fittings on all Piping and Fittings  
Monitoring: DCM Logic, Web Based Boiler Browser  
Installation: Froeling Energy  
Design: Froeling Energy  
Engineering Froeling Energy and OES

Drawn By M. D. Froeling



4x Froeling TX 150 Pellet/Chip Boilers with 4 Boiler Staging Controller

Simplified Mechanical Schematic; Not shown are:  
 Venting, expansion equipment, pressure relief and controls.  
 Piping Systems: Welded and Victaulic  
 Insulation: 1.5" FG on all pipes, 4" FG on tanks  
 PVC Jackets and fittings on all Piping and Fittings  
 Monitoring: DCM Logic, Web Based Boiler Browser  
 Installation: Froeling Energy  
 Design: Froeling Energy  
 Engineering Froeling Energy and OES

Drawn By M. D. Froeling

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:01:51 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/7	NON60529	HMS 1	29.000	0.000	29.000
2017/8	NON60529	HMS 1	24.000	0.000	24.000
2017/9	NON60529	HMS 1	29.000	0.000	29.000
2017/9	NON60530	Whelen 1	202.000	0.000	202.000
2017/7	NON60531	Whelen 2	0.000	0.000	0.000
2017/8	NON60531	Whelen 2	0.000	0.000	0.000
2017/9	NON60531	Whelen 2	0.000	0.000	0.000
2017/8	NON93900	Whelen 3	10.000	0.000	10.000
2017/9	NON93900	Whelen 3	66.000	0.000	66.000
2017/7	NON95026	Froling PDC1	0.000	0.000	0.000
2017/8	NON95026	Froling PDC1	0.000	0.000	0.000
2017/9	NON95026	Froling PDC1	0.000	0.000	0.000

**CURRENT QUARTERLY GENERATION**

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Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/10	NON60529	HMS 1	47.000	0.000	47.000
2017/11	NON60529	HMS 1	107.000	0.000	107.000
2017/12	NON60529	HMS 1	118.000	0.000	118.000
2017/10	NON60530	Whelen 1	122.000	0.000	122.000
2017/11	NON60530	Whelen 1	264.000	0.000	264.000
2017/12	NON60530	Whelen 1	194.000	0.000	194.000
2017/10	NON60531	Whelen 2	0.000	0.000	0.000
2017/11	NON60531	Whelen 2	0.000	0.000	0.000
2017/12	NON60531	Whelen 2	0.000	0.000	0.000
2017/10	NON93900	Whelen 3	161.000	0.000	161.000
2017/11	NON93900	Whelen 3	211.000	0.000	211.000
2017/12	NON93900	Whelen 3	367.000	0.000	367.000
2017/10	NON95026	Froling PDC1	156.000	0.000	156.000
2017/11	NON95026	Froling PDC1	139.000	0.000	139.000
2017/12	NON95026	Froling PDC1	175.000	0.000	175.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:57:26 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/1	NON60529	HMS 1	0.000	0.000	0.000
2016/2	NON60529	HMS 1	0.000	0.000	0.000
2016/3	NON60529	HMS 1	0.000	0.000	0.000
2016/2	NON60530	Whelen 1	284.000	0.000	284.000
2016/3	NON60530	Whelen 1	236.000	0.000	236.000
2016/2	NON60531	Whelen 2	68.000	0.000	68.000
2016/3	NON60531	Whelen 2	147.000	0.000	147.000



**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:59:07 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/4	NON60529	HMS 1	0.000	0.000	0.000
2016/5	NON60529	HMS 1	0.000	0.000	0.000
2016/6	NON60529	HMS 1	0.000	0.000	0.000
2016/4	NON60530	Whelen 1	134.000	0.000	134.000
2016/4	NON60531	Whelen 2	108.000	0.000	108.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 6:59:59 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/7	NON60529	HMS 1	25.000	0.000	25.000
2016/8	NON60529	HMS 1	23.000	0.000	23.000
2016/9	NON60529	HMS 1	29.000	0.000	29.000
2016/9	NON60530	Whelen 1	80.000	0.000	80.000
2016/9	NON60531	Whelen 2	47.000	0.000	47.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:00:30 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2016/10	NON60529	HMS 1	63.000	0.000	63.000
2016/11	NON60529	HMS 1	102.000	0.000	102.000
2016/12	NON60529	HMS 1	137.000	0.000	137.000
2016/10	NON60530	Whelen 1	174.000	0.000	174.000
2016/11	NON60530	Whelen 1	163.000	0.000	163.000
2016/12	NON60530	Whelen 1	234.000	0.000	234.000
2016/10	NON60531	Whelen 2	182.000	0.000	182.000
2016/11	NON60531	Whelen 2	213.000	0.000	213.000
2016/12	NON60531	Whelen 2	294.000	0.000	294.000
2016/12	NON93900	Whelen 3	149.000	0.000	149.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:00:59 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/1	NON60529	HMS 1	152.000	0.000	152.000
2017/2	NON60529	HMS 1	138.000	0.000	138.000
2017/3	NON60529	HMS 1	146.000	0.000	146.000
2017/1	NON60530	Whelen 1	157.000	0.000	157.000
2017/2	NON60530	Whelen 1	139.000	0.000	139.000
2017/3	NON60530	Whelen 1	236.000	0.000	236.000
2017/1	NON60531	Whelen 2	268.000	0.000	268.000
2017/2	NON60531	Whelen 2	279.000	0.000	279.000
2017/3	NON60531	Whelen 2	286.000	0.000	286.000
2017/1	NON93900	Whelen 3	243.000	0.000	243.000
2017/2	NON93900	Whelen 3	231.000	0.000	231.000
2017/3	NON93900	Whelen 3	251.000	0.000	251.000

**CURRENT QUARTERLY GENERATION**

Print Date: 3/26/2018 7:01:25 PM

Month of Generation	Unit ID	Generator Plant-Unit Name	Generation	MMA	Adjusted Generation
2017/4	NON60529	HMS 1	72.000	0.000	72.000
2017/5	NON60529	HMS 1	62.000	0.000	62.000
2017/6	NON60529	HMS 1	31.000	0.000	31.000
2017/4	NON60530	Whelen 1	115.000	0.000	115.000
2017/5	NON60530	Whelen 1	1.000	0.000	1.000
2017/4	NON60531	Whelen 2	123.000	0.000	123.000
2017/5	NON60531	Whelen 2	50.000	0.000	50.000
2017/4	NON93900	Whelen 3	172.000	0.000	172.000
2017/5	NON93900	Whelen 3	159.000	0.000	159.000
2017/6	NON93900	Whelen 3	23.000	0.000	23.000
2017/6	NON95026	Froling PDC1	0.000	0.000	0.000