

FYI Items

May 29, 2019

Mr. Chet Perry / Mr. Jim Schroeder
PacifiCorp

Mr. Bruce True
Portland General Electric

Mr. Jay Hiner / Jonathan Hart
Eugene Water & Electric

Mr. Paul Downey / Mr. Keith Hormann
City of Forest Grove

Mr. Rahul Venkatesh
Puget Sound Energy, Inc.

Mr. Matt Boast
Kittitas County PUD

Mr. Rick Applegate
Tacoma Power

Ms. Jaime Phillips
McMinnville Water & Light

Ms. Hina Arai
City of Seattle, City Light Dept.

Mr. Mike Watkins
City of Milton-Freewater

Mr. Steve Lentini
Avista Corp.

Mr. Bob Essex
Cowlitz PUD

Subject: Priest Rapids Project Highlights for April

UNIT STATUS: Unit availability for the projects is as follows:

Wanapum Generator Operations/Turbine Restoration:

W-1, 2, 3, 4, 5, 6, 8, 9, 10: Operational.

W-7 was removed from service December 11, 2018 for generator rotor rebuild and governor replacement. W-7 is scheduled to return to service July 12, 2019.

Transformer A was removed from service April 2, 2019 for low oil level relay replacement. Transformer A was returned to service April 3, 2019.

W-2 was removed from service April 29, 2019 for station service #1 watt hour meter replacement. W-2 was returned to service May 1, 2019.

Priest Rapids Generator Operations/Turbine Restoration:

P-1, 2, 3, 4, 5, 6, 7, 10: Operational.

P-8 was removed from service April 1, 2019 due to turbine/generator rehabilitation. P-8 is scheduled to return to service May 21, 2020.

Priest Rapids Project High lights
May 29, 2019

P-3 was removed from service April 22, 2019 for watt hour meter replacement. P-3 was returned to service April 26, 2019.

P-9 was removed from service April 23, 2019 for excessive oil head vibration. P-9 was returned to service May 4, 2019.

P-4 was removed from service April 24, 2019 for knocking noise in the air housing. P-4 was returned to service April 25, 2019.

GENERATION STATUS REPORTS : April Generation Reports are attached for your information and use.

ELECTRIC SERVICE INTERRUPTION REPORTS: April Electric Service Interruption Reports are attached for your information and use.

The regular monthly meeting of the Grant County P.U.D. Power Purchasers' Advisory Committee will be held on
Wednesday, June 26th

at 10:00 a.m. at the District's Ephrata Headquarters Building in Conference Room "E".

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The District representative is Phillip Law. Phillip's telephone number is: 509-754-5090.

Sincerely,



Dale Campbell, P.E.
Senior Manager of Power Production Engineering

DC:cec

Attachments

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C: HED Main Files 1.1.1.2 Tom Flint
Dale Walker Larry Schaapman Judy Wilson
Nelson Cox
Chief Operator/Wanapum
Chief Operator/Priest Rapids

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Kevin Marshall Rich Walen Dale Campbell Mark Beattie Ty Ehrman
Phillip Law Bonnie Overfield

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ADDRESS PO Box 878
Ephrata, WA 98823

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PHONE 509 754 5090 grantpud.org

Wanapum

Public Utility District of Grant County, Ephrata, Washington MONTHLY REPORT OF POWER OPERATIONS

April 2019

| | | | | | |
|----------------------------|-----------------|-----|--------------------------|-------------|------|
| Installed Capacity (A) | 1,111,800 | kW | Hours Plant Operated: | 720 | |
| Gross Generation (B) | 295,480,500 | kWH | Plant Use | 665,300 | kWH |
| Max. Hourly Generation (C) | 863,300 | kWH | Net Generation | 294,815,200 | kWH |
| Time of Max. Hourly Gen. | 04/01/2019 0700 | | Water for Generation (D) | 4,249,180 | A.F. |
| Plant Factor | 36.91% | | Water Bypassed (E) | 820,600 | A.F. |
| Utilization Factor | 77.65% | | Water for Fish (F) | 125,100 | A.F. |
| Water Factor: | 81.80% | | Average Hydraulic Head: | 78.5 | Feet |

UNIT SERVICE RECORD

| Unit No | Monthly Gen. (mWH) | Hrs. Operation | Hrs Down For Maint. | Availability Factor (G) | Nature of Maintenance |
|---------|--------------------|----------------|---------------------|-------------------------|---|
| W-1 | 20,228 | 266.85 | 25.37 | 0.96 | GSU Transformer Low Oil Level |
| W-2 | 33,408 | 461.85 | 66.83 | 0.91 | GSU Transformer Low Oil Level Replace Station Service #1 Watt Hour Meter |
| W-3 | 26,241 | 344.77 | 2.42 | 1.00 | GSU Transformer Low Oil Level |
| W-4 | 30,266 | 408.07 | 2.42 | 1.00 | GSU Transformer Low Oil Level |
| W-5 | 23,519 | 310.82 | 0.00 | 1.00 | |
| W-6 | 40,840 | 557.63 | 0.00 | 1.00 | |
| W-7 | 0 | 0.00 | 720.00 | 0.00 | Generator Rotor Replacement and Unit Governor Replacement |
| W-8 | 38,320 | 507.98 | 0.00 | 1.00 | |
| W-9 | 42,784 | 583.83 | 0.00 | 1.00 | |
| W-10 | 39,875 | 530.07 | 0.00 | 1.00 | |

(G) Availability Factor =

$\frac{\text{Hours in Month} - \text{Hours Down for Maint.}}{\text{Hours in Month}}$

$$\text{Plant Factor} = \frac{(B) * 100}{(A) * \text{Hours in Month}}$$

$$\text{Utilization Factor} = \frac{(C)}{(A)} * 100$$

$$\text{Water Factor} = \frac{(D)}{(D) + (E) + (F)} * 100$$

Plant Service Interruptions

Plant: WANAPUM

April, 2019

| Date | Time | Duration | | Unit | Circuit Breaker Tripped | Relays Operated | | Remarks |
|------------|------|----------|---------|------|-------------------------|-----------------|-------|---|
| | | Month | Total | | | Type | Cause | |
| 04/01/2019 | 0000 | 720:00 | 3375:49 | W-7 | W-732 | MAN | 11 | Generator Rotor Replacement and Unit Governor Replacement |
| 04/02/2019 | 1429 | 25:22 | 25:22 | W-1 | W-132 | OTH | 12 | GSU Transformer Low Oil Level |
| 04/02/2019 | 1429 | 25:22 | 25:22 | W-2 | W-232 | TRIP | 12 | GSU Transformer Low Oil Level |
| 04/02/2019 | 1429 | 2:25 | 2:25 | W-3 | W-332 | TRIP | 12 | GSU Transformer Low Oil Level |
| 04/02/2019 | 1429 | 2:25 | 2:25 | W-4 | W-432 | TRIP | 12 | GSU Transformer Low Oil Level |
| 04/29/2019 | 0632 | 41:28 | 41:28 | W-2 | W-232 | MAN | 11 | Replace Station Service #1 Watt Hour Meter |

Relay Types: MAN - Manual OC - Overcurrent DIFF - Differential FREQ - Frequency GRD - Ground V - Voltage THER - Thermal TRIP - 86E Trip OTH - Other

Causes: 1 Lightning 2 All other weather 3 Trees, etc. into line 4 Malicious damage 5 Line down 6 Defective equipment 7 Inadequate system 8 Trouble on another system 9 Operation error 10 Relay error 12 Cause unknown 11 Prearranged outage 13 Computer control 14 Other

**WANAPUM POWERPLANT GENERATION SUMMARY
APRIL 2019**

| UNIT | GENERATION (MWH) | | | MAINTENANCE HOURS | |
|------------------------|----------------------------------|----------------|------------------|-------------------|-----------------|
| | 100% RATED INSTALLED CAPACITY | CURRENT | YTD | CURRENT | YTD |
| W-1 | 112.00 | 20,228 | 140,424 | 25.37 (A) | 34.42 |
| W-2 | 112.00 | 33,408 | 187,566 | 66.83 (A, B) | 81.16 |
| W-3 | 112.00 | 26,241 | 133,687 | 2.42 (A) | 11.10 |
| W-4 | 103.80 | 30,266 | 157,565 | 2.42 (A) | 12.22 |
| W-5 | 112.00 | 23,519 | 91,216 | 0.00 | 11.60 |
| W-6 | 112.00 | 40,840 | 189,173 | 0.00 | 12.44 |
| W-7 | 112.00 | 0 | 0 | 720.00 (C) | 2,879.00 |
| W-8 | 112.00 | 38,320 | 172,222 | 0.00 | 7.90 |
| W-9 | 112.00 | 42,784 | 172,131 | 0.00 | 11.35 |
| W-10 | 112.00 | 39,875 | 163,321 | 0.00 | 9.22 |
| PROJECT TOTAL: | 1111.80 | 295,481 | 1,407,305 | 817.04 | 3,070.41 |
| PLANT USE: | | 665 | 2,937 | | |
| NET GENERATION: | | 294,816 | 1,404,368 | | |

PLANT RATING CURVE CAPACITY BASED ON 40 YR WATER

996,910

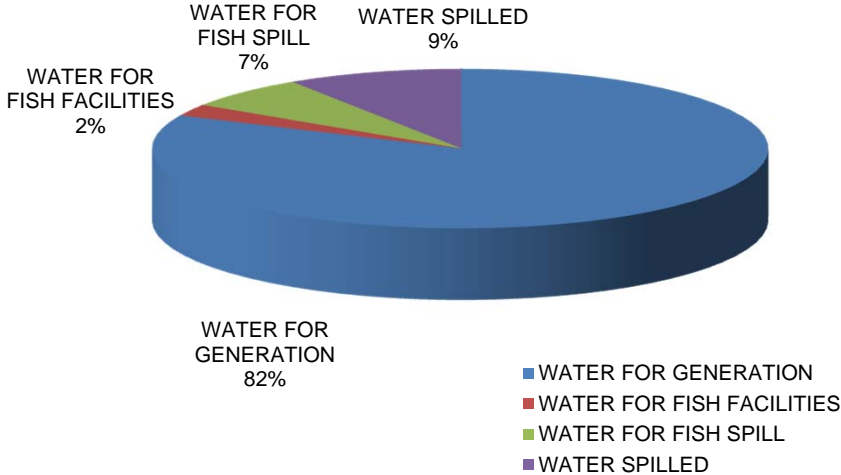
- (A) GSU Transformer Low Oil Level
- (B) Replace Station Service #1 Watt Hour Meter
- (C) Generator Rotor/Unit Governor Replacement

**WANAPUM POWERPLANT
WATER UTILIZATION
APRIL 2019**

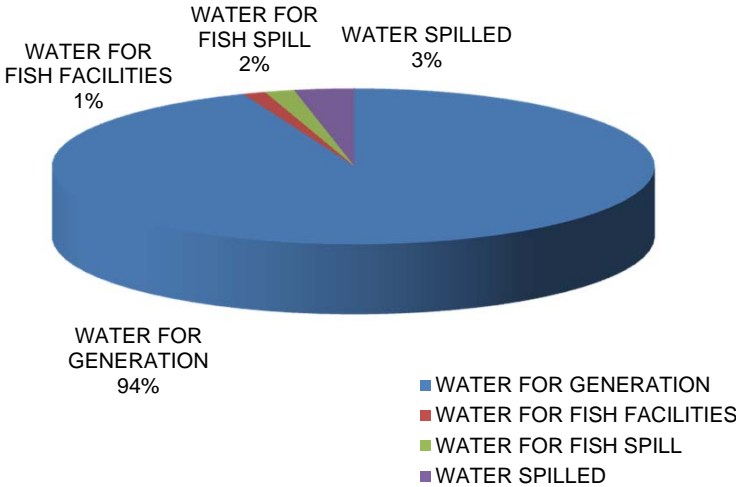
| | WATER UTILIZED (ACRE FEET) | EQUIVALENT ENERGY (MWH) |
|---------------------------|----------------------------|-------------------------|
| TOTAL RIVER FLOW | 5,194,880 | 361,243 |
| WATER FOR GENERATION | 4,249,180 | 295,481 |
| WATER FOR FISH FACILITIES | 125,100 | 8,699 |
| WATER FOR FISH SPILL | 341,555 | 23,751 |
| WATER SPILLED | 479,045 | 33,312 |

Wanapum Water Utilization Report April 2019

MONTHLY WATER USAGE



YEAR TO DATE WATER USAGE



Priest Rapids

Public Utility District of Grant County, Ephrata, Washington MONTHLY REPORT OF POWER OPERATIONS

April 2019

| | | | | | |
|----------------------------|-----------------|-----|--------------------------|-------------|------|
| Installed Capacity (A) | 955,600 | kW | Hours Plant Operated: | 720 | |
| Gross Generation (B) | 304,576,700 | kWH | Plant Use | 1,058,400 | kWH |
| Max. Hourly Generation (C) | 630,400 | kWH | Net Generation | 303,518,300 | kWH |
| Time of Max. Hourly Gen. | 04/30/2019 2200 | | Water for Generation (D) | 4,489,540 | A.F. |
| Plant Factor | 44.27% | | Water Bypassed (E) | 537,530 | A.F. |
| Utilization Factor | 65.97% | | Water for Fish (F) | 51,610 | A.F. |
| Water Factor: | 88.40% | | Average Hydraulic Head: | 77.7 | Feet |

UNIT SERVICE RECORD

| Unit No | Monthly Gen. (mWH) | Hrs. Operation | Hrs Down For Maint. | Availability Factor (G) | Nature of Maintenance |
|---------|--------------------|----------------|---------------------|-------------------------|---|
| P-1 | 20,405 | 306.62 | 0.00 | 1.00 | |
| P-2 | 49,828 | 720.00 | 0.00 | 1.00 | |
| P-3 | 38,753 | 611.78 | 106.82 | 0.85 | Unit maintenance. |
| P-4 | 15,882 | 247.13 | 31.90 | 0.96 | Knocking noise coming from air housing. |
| P-5 | 14,366 | 207.65 | 1.60 | 1.00 | Opportunity Outage to Retrieving Rotation Device (VanderWaal) |
| P-6 | 45,690 | 701.90 | 0.00 | 1.00 | |
| P-7 | 43,712 | 671.47 | 9.73 | 0.99 | Pulling Flex Links for Transformer D |
| P-8 | 0 | 0.00 | 713.72 | 0.01 | Turbine Replacement and Generator Upgrade. |
| P-9 | 36,658 | 542.48 | 177.50 | 0.75 | For Excessive Vibration |
| P-10 | 39,284 | 594.62 | 0.00 | 1.00 | |

(G) Availability Factor =

$$\frac{\text{Hours in Month} - \text{Hours Down for Maint.}}{\text{Hours in Month}}$$

$$\text{Plant Factor} = \frac{(B) * 100}{(A) * \text{Hours in Month}}$$

$$\text{Utilization Factor} = \frac{(C)}{(A)} * 100$$

$$\text{Water Factor} = \frac{(D)}{(D) + (E) + (F)} * 100$$

Plant Service Interruptions

Plant: PRIEST
RAPIDS

April, 2019

| Date | Time | Duration | | Unit | Circuit Breaker Tripped | Relays Operated | | Remarks |
|------------|------|----------|--------|------|-------------------------|-----------------|-------|---|
| | | Month | Total | | | Type | Cause | |
| 04/01/2019 | 0617 | 9:44 | 9:44 | P-7 | 732 | MAN | 11 | Pulling Flex Links for Transformer D |
| 04/01/2019 | 0617 | 713:43 | 713:43 | P-8 | 832 | MAN | 11 | Turbine Replacement and Generator Upgrade. |
| 04/03/2019 | 1221 | 1:36 | 1:36 | P-5 | 532 | MAN | 14 | Opportunity Outage to Retrieving Rotation Device (VanderWaal) |
| 04/22/2019 | 0605 | 106:49 | 106:49 | P-3 | 332 | MAN | 11 | Unit maintainance. |
| 04/23/2019 | 1430 | 177:30 | 177:30 | P-9 | 932 | MAN | 14 | For Excessive Vibration |
| 04/24/2019 | 0815 | 31:54 | 31:54 | P-4 | 432 | MAN | 14 | Knocking noise comming from air housing. |

Relay Types: MAN - Manual OC - Overcurrent DIFF - Differential FREQ - Frequency GRD - Ground V - Voltage THER - Thermal TRIP - 86E Trip OTH - Other

Causes: 1 Lightning 2 All other weather 3 Trees, etc. into line 4 Malicious damage 5 Line down 6 Defective equipment 7 Inadequate system 8 Trouble on another system 9 Operation error 10 Relay error 12 Cause unknown 11 Prearranged outage 13 Computer control 14 Other

**PRIEST RAPIDS POWERPLANT GENERATION SUMMARY
APRIL 2019**

| UNIT | GENERATION (MWH) | | | MAINTENANCE HOURS | |
|------------------------|----------------------------------|----------------|------------------|-------------------|-----------------|
| | 100% RATED INSTALLED CAPACITY | CURRENT | YTD | CURRENT | YTD |
| P-1 | 95.00 | 20,405 | 156,333 | 0.00 | 13.29 |
| P-2 | 97.80 | 49,828 | 74,832 | 0.00 | 1,838.52 |
| P-3 | 95.00 | 38,753 | 184,820 | 106.82 (A) | 119.05 |
| P-4 | 95.00 | 15,882 | 121,788 | 31.90 (B) | 43.22 |
| P-5 | 95.00 | 14,366 | 131,144 | 1.60 (C) | 109.07 |
| P-6 | 95.00 | 45,690 | 192,992 | 0.00 | 0.00 |
| P-7 | 95.00 | 43,712 | 168,920 | 9.73 (D) | 9.73 |
| P-8 | 95.00 | 0 | 105,618 | 713.72 (E) | 796.29 |
| P-9 | 97.80 | 36,658 | 123,813 | 177.50 (F) | 711.94 |
| P-10 | 95.00 | 39,284 | 143,103 | 0.00 | 9.08 |
| PROJECT TOTAL: | 955.60 | 304,578 | 1,403,363 | 1,041.27 | 3,650.19 |
| PLANT USE: | | 1,058 | 3,841 | | |
| NET GENERATION: | | 303,520 | 1,399,522 | | |

PLANT RATING CURVE CAPACITY BASED ON 40 YR WATER

912,300

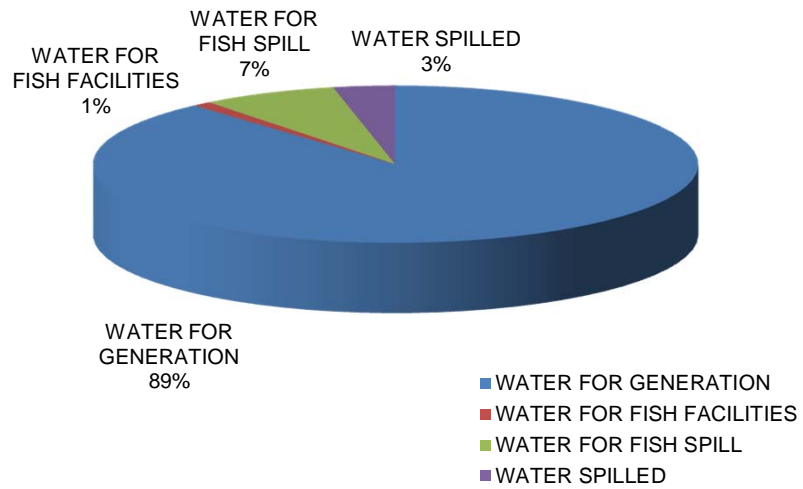
- (A) Unit Maintenance
- (B) Knocking Noise Coming From Air Housing
- (C) Retrieve Rotation Device
- (D) Pull Flex Links For Transformer D
- (E) P08 Turbine/Generator Rehabilitation
- (F) Excessive Vibration

**PRIEST RAPIDS POWERPLANT
WATER UTILIZATION
APRIL 2019**

| | WATER UTILIZED (ACRE FEET) | EQUIVALENT ENERGY (MWH) |
|---------------------------|----------------------------|-------------------------|
| TOTAL RIVER FLOW | 5,078,680 | 344,545 |
| WATER FOR GENERATION | 4,489,540 | 304,577 |
| WATER FOR FISH FACILITIES | 51,610 | 3,501 |
| WATER FOR FISH SPILL | 369,878 | 25,093 |
| WATER SPILLED | 167,652 | 11,374 |

PRIEST RAPIDS WATER UTILIZATION REPORT APRIL 2019

MONTHLY WATER USAGE



YEAR TO DATE WATER USAGE

