



CUSTOMER SERVICE



EMPLOYEE COMMITMENT



ENVIRONMENTAL RESPECT



**BERKSHIRE
FINANCIAL STRENGTH
OWNERSHIP**



REGULATORY INTEGRITY

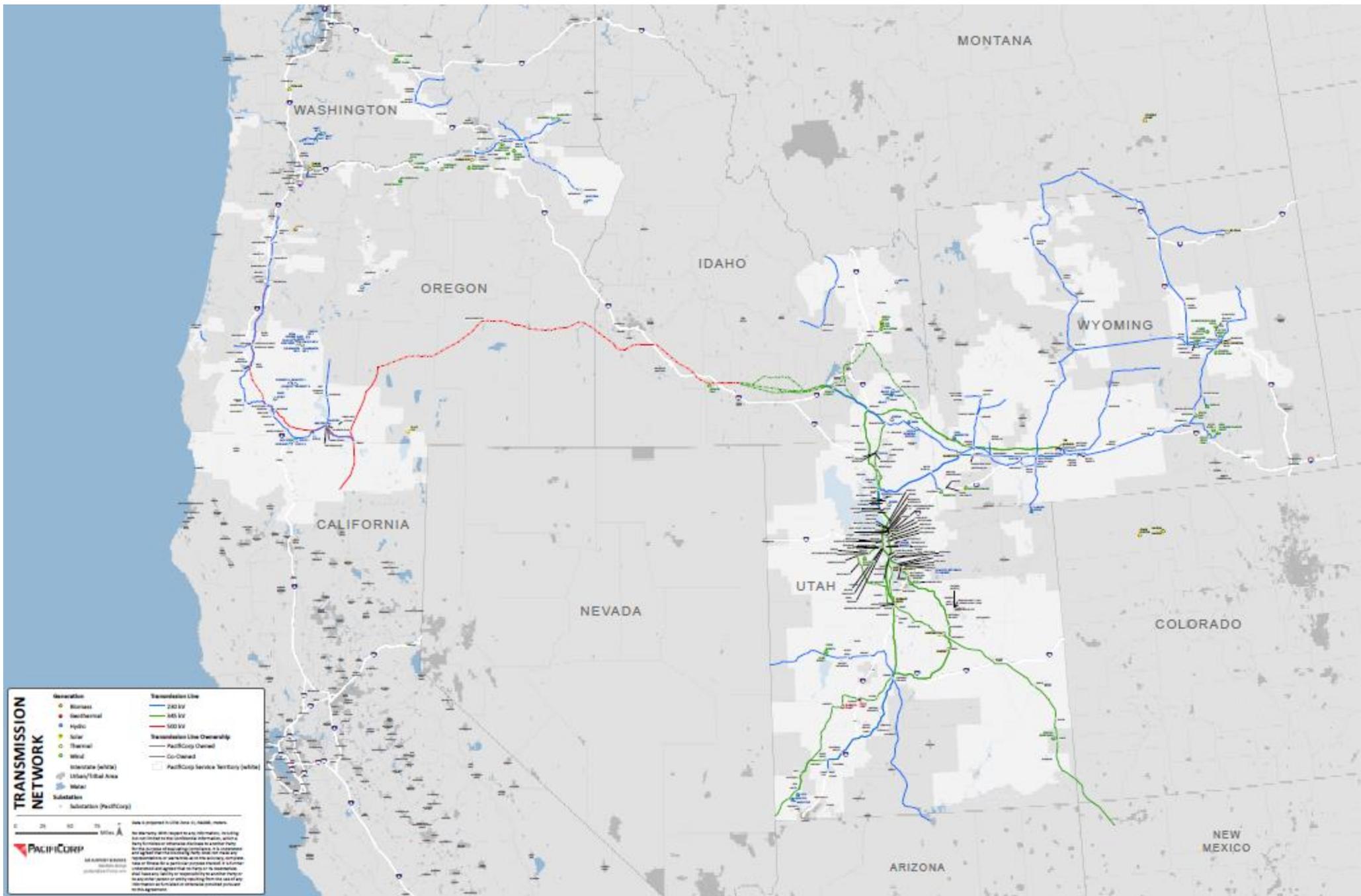


OPERATIONAL EXCELLENCE



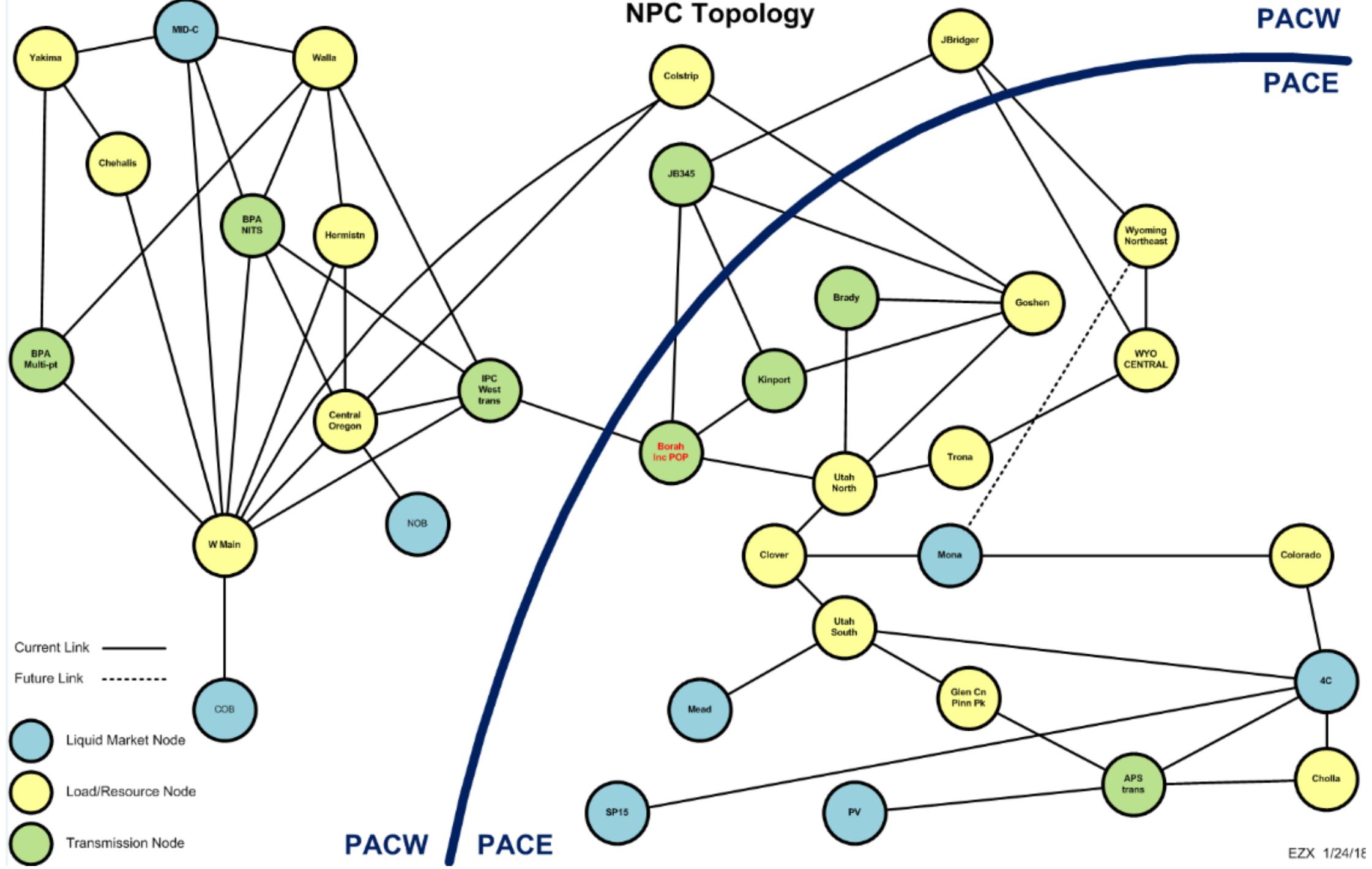
OPUC Presentation 4/11/19





NPC Topology

PACW
PACE



Merchant Function

- The Merchant group at a utility works together to ensure the balance between the company's power resources and power load in the most economic manner for any given hour. The merchant function at PacifiCorp is referred to as Energy Supply Management (ESM). ESM balances the company's energy position by managing these energy resources, adjusting purchases, and backing off or stepping up generation as needed. Balancing the company's position also means buying and selling energy as needed.
- ESM receives input from and has impact on generation, transmission and distribution operations.

Merchant Function

- Merchant groups are subdivided into functional units that operate in different time horizons.
 - Real Time trades intra-day and usually focuses on next hour's operational needs and makes trades one hour at a time. Primarily concerned with making hourly firm and non-firm transmission arrangements.
 - Day Ahead trades for the WECC Pre-Schedule day (usually the next day or next two days). Generally trades occur in a heavy load (16 hours) or light load (8 hours) block of energy. Will also be responsible for balancing the monthly position. Focused on daily, weekly and monthly firm and non-firm transmission reservations, almost exclusively point-to-point.
 - Term trades are for months to three years in advance. Usually trades occur in monthly or quarterly increments. Focused on monthly and yearly transmission reservations. Will utilize firm and conditional firm point-to-point and network reservations.
 - Origination focuses on resource sufficiency at least a month out up to several years out the curve. Will transact by buying energy products and energy resources. Primarily utilizes network transmission.

Transmission Overview

- Common Transaction Points
 - Northwest
 - Mid-C
 - California Oregon Border
 - Utah
 - Borah
 - Mona
 - Red Butte
 - Southwest
 - Four Corners
 - Pinnacle Peak
 - Palo Verde
 - Mead
 - Wyoming
 - Dave Johnson
- Merchants analyze market price, market depth, transmission availability, and unit costs to best optimize the system and daily, monthly and yearly market opportunities.
- Merchant transmission desks manage and optimize transmission rights, analyze and optimize the purchase of new transmission rights, and provide guidance in the sale and remarketing of merchant transmission rights.
- The merchant also manages network, point-to-point, and legacy transmission agreements on a daily, monthly, and yearly basis.

Transmission Products

- Point-to-Point Transmission (PTP) Service
 - Most commonly used for making off-system sales (exports) or for wheeling through other Transmission Provider service areas; can also be used to serve native load.
 - Firm PTP service is not specific to a resource or load, it is specific to a Point of Receipt (POR) and Point of Delivery (POD).
 - PTP service can be redirected and reassigned.
 - Billed based on reservation capacity.
 - Terms vary from as short as one hour to as long as multiple years.
 - Wide array of curtailment priority options including firm, non-firm and conditional firm.

Transmission Products

- Network Transmission Service
 - Used for delivering network resources and serving network load.
 - Firm network service is resource/load specific.
 - Cannot be redirected or reassigned.
 - Because resources are designated to specific loads, redirects are not applicable to this product.
 - If the resource needs to go to a different network load, non-firm network service can be procured.
 - Billed based on peak monthly demand.
 - Should generation exceed load, resources can be undesignated on a short term basis and the output can be sold in the market. However, this releases the reserved transmission capacity to the market.

Transmission Reservations

- Reserving Transmission Service
 - Transmission providers post available transmission capacity (ATC) on an open access same-time information system (OASIS) where transmission customers can submit transmission service requests (TSRs) on a first come, first served basis.
 - No customer is treated preferentially; PacifiCorp merchant is treated just like every other transmission customer by PacifiCorp Transmission.
 - Transmission reservation windows vary by transmission provider.
 - T-20 is the WECC standard, however, individual TPs will accommodate shorter timeframes when feasible
- Transmission Reservation Duration
 - Anything a year or longer is considered long-term.
 - Transmission Customers with long-term reservations of five years or longer have rights of first refusal which can be renewed or “rolled over” when the service agreement term expires.
 - Typically transmission customers make long-term reservations with five-year terms to preserve rollover rights.
 - Anything less than a year is considered short-term.
 - Short-term transmission reservations are generally for scheduling around outages or economic purposes.

Hourly Path Offering Summary

Filtered By: TP: PPW Show: MW POR: PACE POD: FOURCORNE345 Active - Next Day: 03/26/2019 Display: 24 Hours Show Active Data: true

Path	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
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PathName: W/PPW/PACE-AZPS/PACE-FOURCORNE345/

HOURLY_FIRM	MW	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
HOURLY_NON-FIRM_LOSSES	MW	552.0	552.0	552.0	552.0	567.0	612.0	606.0	596.0	585.0	587.0	583.0	551.0	575.0	571.0	585.0	586.0	612.0
HOURLY_NON-FIRM	MW	552.0	552.0	552.0	552.0	567.0	612.0	606.0	596.0	585.0	587.0	583.0	551.0	575.0	571.0	585.0	586.0	612.0
HOURLY_SEC_NETWORK	MW	552.0	552.0	552.0	552.0	567.0	612.0	606.0	596.0	585.0	587.0	583.0	551.0	575.0	571.0	585.0	586.0	612.0
HOURLY_NON-FIRM_REDIRECT	MW	552.0	552.0	552.0	552.0	567.0	612.0	606.0	596.0	585.0	587.0	583.0	551.0	575.0	571.0	585.0	586.0	612.0

Daily Path Offering Summary

Filtered By: TP: PPW Show: MW POR: PACE POD: FOURCORNE345 Active - Monthly: 04/2019 Show Active Data: true

Path	1	2	3	4	5	6	7
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PathName: W/PPW/PACE-AZPS/PACE-FOURCORNE345/

DAILY_FIRM	MW	95.0	95.0	95.0	95.0	95.0	95.0
DAILY_NON-FIRM	MW	625.0	625.0	625.0	625.0	625.0	625.0
DAILY_SEC_NETWORK	MW	625.0	625.0	625.0	625.0	625.0	625.0

Monthly Path Offering Summary

Filtered By: TP: PPW Show: MW POR: PACE POD: FOURCORNE345 Active - This Year: 2019 Show Active Data: true

Path	Jan	Feb	Mar	Apr	May	Jun
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PathName: W/PPW/PACE-AZPS/PACE-FOURCORNE345/

MONTHLY_FIRM	MW			95.0	95.0	95.0	95.0
MONTHLY_NON-FIRM	MW			413.0	625.0	625.0	625.0
MONTHLY_SEC_NETWORK	MW			413.0	625.0	625.0	625.0

Transmission Reservations

- Redirecting Transmission Service
 - PTP service can be redirected to different POR/POD combinations assuming there is available transmission capacity on the new path.
 - Redirects allow merchants the flexibility to displace its own generation with market purchases without additional transmission charges.
 - Allows unused long-term transmission reservations to be monetized by avoiding short-term transmission purchases.
- Reassigning Transmission Service
 - Transmission customers have the opportunity to reassign their transmission rights to another transmission customer and recoup some of the transmission cost.
 - Reassignments are made bilaterally between transmission customers similar to power trades.
 - Reassigned transmission rights can be redirected by the holder of the reassigned service.

Reservation Summary

(All times are in PD)



Filtered By:

Provider: **BPAT**Req Type: **RESALE**Time - Active Today Forward: **03/25/2019 - 01/01/3000**

Status	Assign Ref	TP	Customer	Seller	MW Req	MW Grant	Source:	Sink	POR	POD
CONFIRMED	88819583	BPAT	PWX	PWX	600	600			COB	JOHNDAY
CONFIRMED	88819581	BPAT	TEMU	SNPD	30	30	GRNDCULEECNTGS	SNOHOMISHCNTGS	BPAPOWER	SNOHOMISH
CONFIRMED	88819456	BPAT	TEMU	SCLM	50	50			BOUNDARY	BPAT.SCL
DECLINED	88819376	BPAT	PPMI	PPMI	50				BPAT.AVRN	CENTRALIA
CONFIRMED	88818927	BPAT	EXGN	SNPD	13	13	GRNDCULEECNTGS	SNOHOMISHCNTGS	BPAPOWER	SNOHOMISH
CONFIRMED	88818717	BPAT	TEMU	SCLM	25	25			BOUNDARY	BPAT.SCL
CONFIRMED	88818531	BPAT	EXGN	SNPD	13	13	GRNDCULEECNTGS	SNOHOMISHCNTGS	BPAPOWER	SNOHOMISH
CONFIRMED	88818437	BPAT	TEMU	SCLM	25	25			BOUNDARY	BPAT.SCL
CONFIRMED	88818431	BPAT	TEA	FCPD	20	20	GRNDCULEECNTGS	FRANKLINCNTGS	BPAPOWER	FRANKLIN
CONFIRMED	88818350	BPAT	TEMU	PGEM	78	78			TROJAN	BPAT.PGE
CONFIRMED	88818265	BPAT	TEA	SNPD	52	52	SNOHMSH115		SNOHOMISH	COLUMBIAMKT
CONFIRMED	88818149	BPAT	PPMI	SNPD	50	50	GRNDCULEECNTGS	SNOHOMISHCNTGS	BPAPOWER	SNOHOMISH
CONFIRMED	88818065	BPAT	EXGN	SNPD	11	11	GRNDCULEECNTGS	SNOHOMISHCNTGS	BPAPOWER	SNOHOMISH
CONFIRMED	88817953	BPAT	TEMU	PGEM	22	22			TROJAN	BPAT.PGE
CONFIRMED	88817952	BPAT	TEA	FCPD	25	25	GRNDCULEECNTGS	FRANKLINCNTGS	BPAPOWER	FRANKLIN
CONFIRMED	88817777	BPAT	NWDS	SCLM	20	20			BOUNDARY	BPAT.SCL
CONFIRMED	88817765	BPAT	TEA	BCPD	7	7	GRNDCULEECNTGS	KENNEWICKCNTGS	BPAPOWER	BENTON
CONFIRMED	88817741	BPAT	TEMU	PGEM	25	25			SLATT	BPAT.PGE
CONFIRMED	88817602	BPAT	NWDS	SCLM	15	15			BOUNDARY	BPAT.SCL
CONFIRMED	88817600	BPAT	TEA	BCPD	35	35	GRNDCULEECNTGS	KENNEWICKCNTGS	BPAPOWER	BENTON
CONFIRMED	88817592	BPAT	TEMU	SCLM	23	23			BOUNDARY	BPAT.SCL
CONFIRMED	88817431	BPAT	TEMU	PGEM	22	22			SLATT	BPAT.PGE
CONFIRMED	88817274	BPAT	TEMU	SCLM	25	25			BOUNDARY	BPAT.SCL
CONFIRMED	88817234	BPAT	TEMU	PGEM	23	23			SLATT	BPAT.PGE
CONFIRMED	88816990	BPAT	PWX	PWX	227	227			BC.US.BORDER	JOHNDAY
CONFIRMED	88816988	BPAT	PWX	PWX	150	150			BC.US.BORDER	JOHNDAY
CONFIRMED	88815021	BPAT	PWX	PWX	252	252			BC.US.BORDER	JOHNDAY
CONFIRMED	88803832	BPAT	TEMU	SNPD	0	0	SNOHMSH115		SNOHOMISH	COLUMBIAMKT

Transmission Curtailment Priority

- Transmission reservations are assigned a curtailment priority between 0 and 7 at the time they are reserved.
- A 7 priority level is the most firm, 0 the least firm.
 - Firm capacity is derived from the physical rating of the transmission line. Non-firm capacity is more discretionary but can consider system conditions and counterflows.
- Both PTP and network transmission service can be a 7 curtailment priority.
 - Non-firm network transmission is automatically a 6, while non-firm PTP transmission is assigned a different curtailment priority based on its term. Hourly PTP non-firm transmission has the lowest priority of 1 while monthly non-firm transmission has a priority of 5.
- During times of congestion, a transmission operator will curtail schedules starting with the 0 level priority and moving up the priority level until the condition is mitigated.
- The decision to procure firm vs. conditional firm vs. non-firm service comes down to the customer's risk tolerance and understanding of the transmission system
 - Examples;
 - A customer may feel conditional firm or non-firm transmission on a specific path is unlikely to be curtailed and feel comfortable using the product.
 - A customer may only be using the transmission to displace more expensive generation.

Transmission Service Reservation Priorities

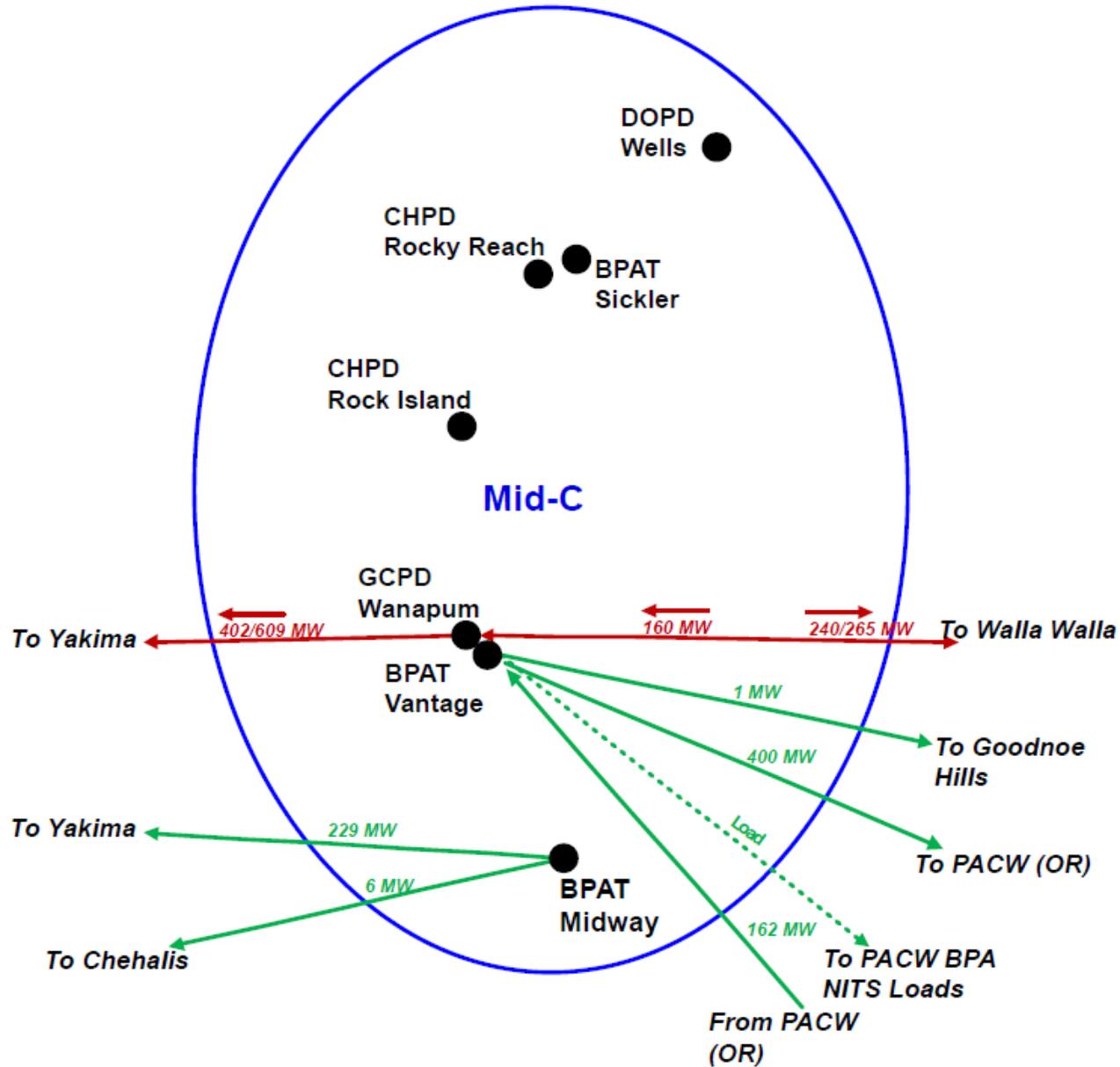
Priority	Acronym	Name
0	NX	Next-hour Market Service
1	NS	Service over secondary receipt and delivery points
2	NH	Hourly Service
3	ND	Daily Service
4	NW	Weekly Service
5	NM	Monthly Service
6	NN	Network Integration Transmission Service from sources not designated as network resources
7	F	Firm Point-to-Point Transmission
	FN	Network Integration Transmission Service from Designated Resources

Scheduling Transmission

- Transmission can be tagged differently depending on the attributes of the energy transfer it is facilitating.
 - Static Scheduling
 - The scheduled energy is not flexible. The schedule cannot be changed unless curtailed by a transmission provider.
 - Dynamic Scheduling
 - Schedules are flexible and can change intra-hour with no updates to the tag
 - Tags must be updated after the fact
 - Frequently associated with transfers between balancing authority areas or between transmission constrained areas within the same balancing authority.
 - Requires specific approval from the transmission provider, generally only for long-term reservations.
 - Pseudo Tie Scheduling
 - Similar to dynamic schedules.
 - Flexible and can change intra-hour with no updates to the tag.
 - Commonly used for integrating generators to a different balancing authority than the one they are physically interconnected to.
 - Capacity Scheduling
 - Used for carrying reserves, generally doesn't have an energy profile

Bonneville Power Administration Transmission

- Bonneville Power Administration (BPA) Transmission makes up the majority of the third party transmission rights PacifiCorp owns.
 - PacifiCorp also owns transmission rights from Idaho Power Company, Arizona Public Service and Deseret Generation and Transmission to name a few others.
- PacifiCorp owns 3,211 MW of long-term PTP transmission rights and about 400 MW of network transmission capacity on BPA's transmission system.
 - For context, PacifiCorp owns 2,500 MW of long term PTP transmission rights and about 10,500 MW of network transmission capacity on its own transmission system.
 - The PTP capacity is primarily for moving generation to load.
 - PTP provides PacifiCorp with the flexibility to economically displace generation and replace in the market at a lower energy cost.
 - PacifiCorp is active in the secondary PTP transmission market for BPA transmission.
- Merchants also have legacy contracts with BPA that don't fit in either PTP or network classifications.
 - Before FERC Order 888, which created the open access transmission market and standardized transmission products, contracts for transmission service weren't standardized. Many of the contracts executed prior to the order have been converted to standard PTP or Network service agreements but some don't fit into either category, or are between parties that aren't willing to convert.



- BPAT NT ⋯→
- BPAT PTP →
- PPW NT →

Values on transmission paths indicate multiple reservations.
Any split ratings are Summer/Winter.

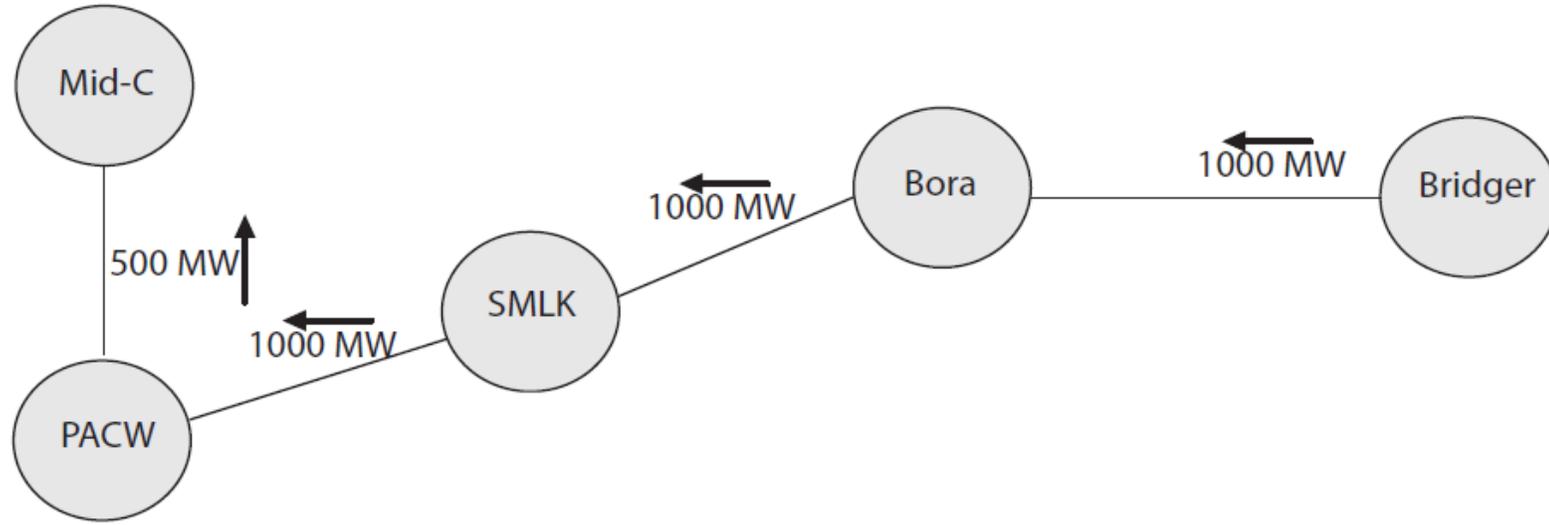
Mid-C Interface

- Mid-C is made up of Douglas County PUD, Chelan PUD and Grant PUD generating units, and BPA's Midway, Vantage and Sickler substations.
- Transmission is scheduled as if the Mid-C were one continuous bus instead of several distinct locations and substations.
 - This allows joint owners in the Mid-C generators to trade with one another with no transmission charge.
- This construct creates a liquid trading hub in the Northwest.

Mid-C Interface

- PacifiCorp has both loads and resources directly interconnected to the Mid-C.
- PacifiCorp trades day ahead at Mid-C for balancing.
- Hourly procurement of transmission to move excess energy from Mid-C to PacifiCorp's West Main system on an hour ahead basis.
- PacifiCorp has 400 MW of southbound and 162 MW of northbound transmission rights from BPA for integration of load and resource deviations from schedule at Mid-C into the greater PACW BAA.

System Normal



Idaho Transmission Outage

