# Available Transfer Capability (ATC) Training

## November 12, 2019

# Agenda

| Time | Topic | Presenters |
|------|-------|------------|
| 9:30-9:40 | Welcome and safety moment | |
| 9:40-10:20 | Long-Term ATC Methodology & Short-Term ATC Methodology Documents | Abbey Nulph & Margaret Olczak |
| 10:20-11:00 | ATC Power-Flow Studies | Lacey Barnett & Kevin Johnson |
| 11:00-11:15 | Break | |
| | Long-Term Request Processing | |
| 11:15-12:00 | PTDF processes & *de minimis* | Tasha Bryan |
| 12:00-1:00 | Lunch | |
| 1:00-1:20 | CTP processes | Abbey Nulph |
| 1:20-1:30 | NT Dialogue | Toni Williams |
| 1:30-2:15 | Short-Term Request Processing | Mike Steigerwald |

# ATC Formulas

The firm ATC formula is:

$$ATC_F = TTC - ETC_F - CBM - TRM + Postbacks_F + Counterflows_F$$

The non-firm ATC formula is:

$$ATC_{NF} = TTC - ETC_F - ETC_{NF} - CBM_S - TRM_U + Postbacks_{NF} + Counterflows_{NF}$$

**Where:**
**ATC** is the firm Available Transfer Capability
**TTC** is the Total Transfer Capability
**ETC** is the sum of existing firm commitments
**CBM** is the Capacity Benefit Margin
**TRM** is the Transmission Reliability Margin
$TRM_U$ is the Transmission Reliability Margin that has not been released for sale as non-firm capacity
**Postbacks** are changes to firm Available Transfer Capability due to a change in the use of Transmission Service for that period, as defined in Business Practices.
**Counterflows** are adjustments to firm Available Transfer Capability as determined by the Transmission Service Provider and specified in their ATCID.
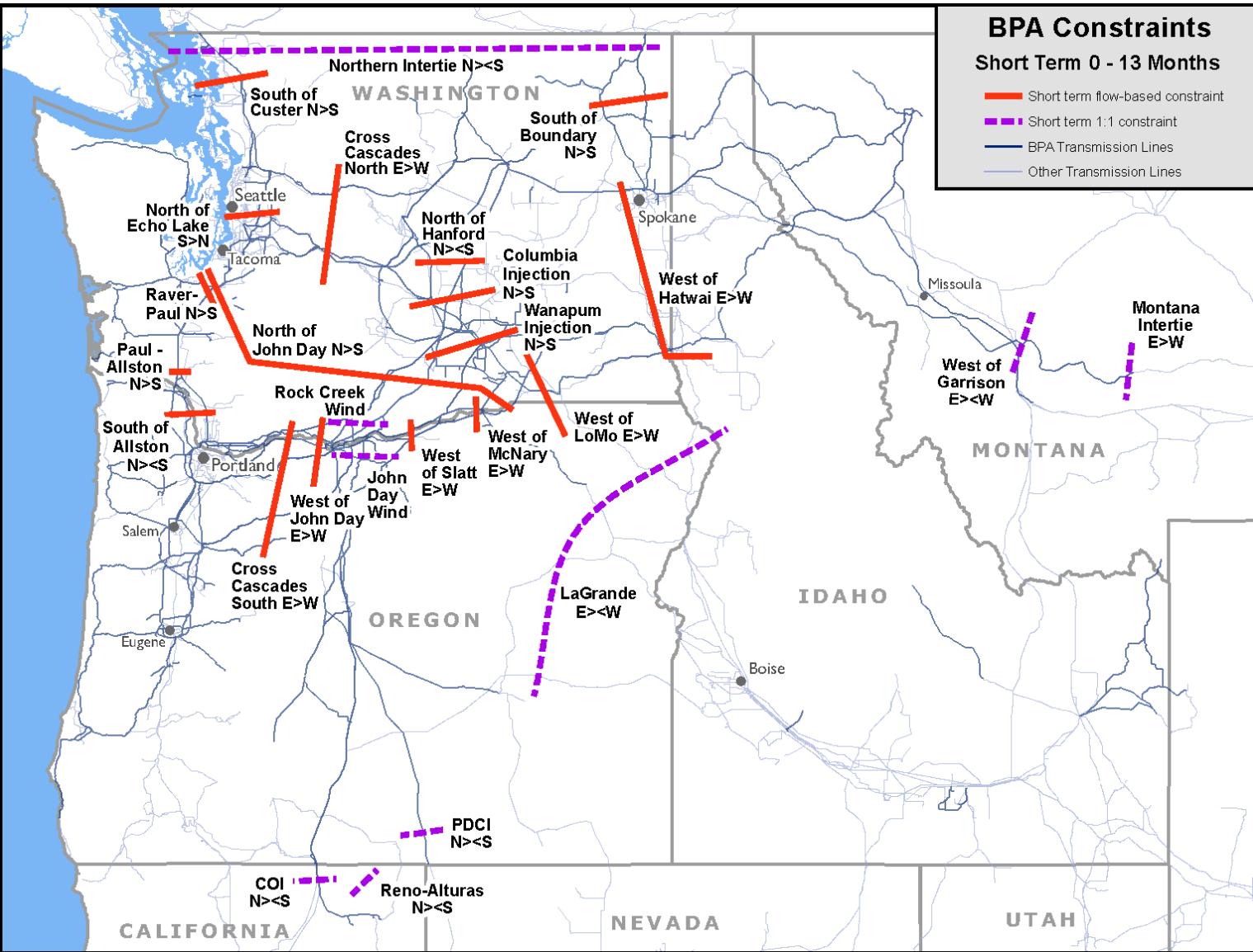**F subscript** refers to Firm; **NF subscript** refers to Non-Firm; **S subscript** refers to Scheduled

# ATC Long Term Constraints
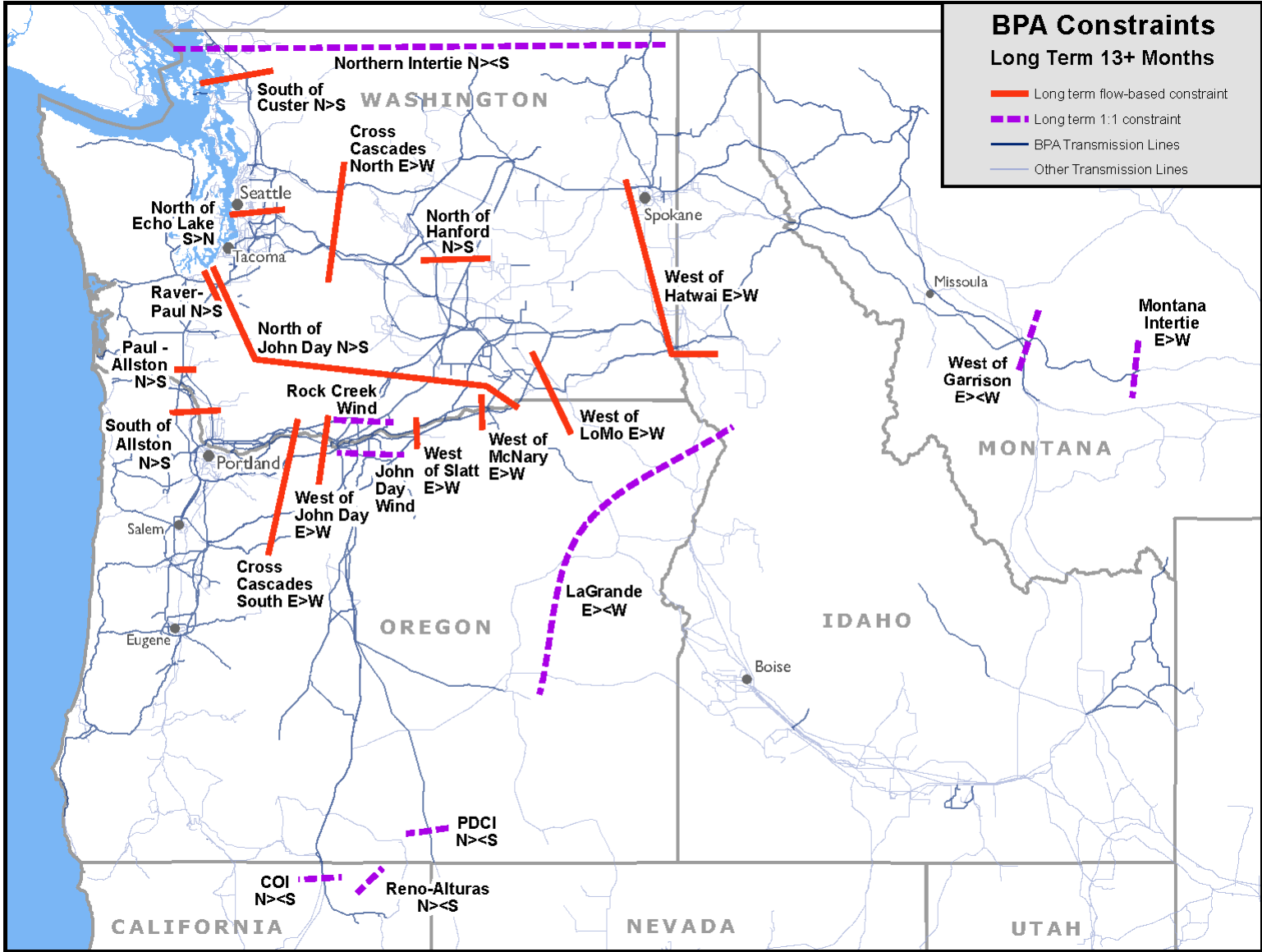
# ATC Short Term Constraints



Pre-decisional, for discussion purposes only

# Calculating ETC in the All Time Horizons

1. BPA uses a 1:1 methodology to calculate ETC on several constraints, in which each 1 MW of transmission service granted is deemed to have a 1 MW impact to ETC

2. BPA uses a flow-based methodology to calculate ETC across all other constraints

   a. This methodology sums base ETC and interim ETC to calculate a total ETC for each constraint

   b. Base ETC is derived from a power flow study

   c. Power Transfer Distribution Factors (PTDFs) are used to calculate interim ETC

   (Source/POR PTDF – Sink/POD PTDF) * MW = Interim ETC Impact

# Long-Term ATC Methodology

Impacting the Planning Time Horizon (beyond 13 months)

Abbey Nulph

# Resources for BPA's LT ATC Methodology

1. <u>ATC Methodologies for the Planning Time Period</u>

   a. §4: Describes methodology for the 1:1 constraints

   b. §5: Describes methodology for flow-based constraints

   c. §6-7: Describes TSR evaluation for the flow-based constraints

2. <u>De Minimis Impact Dead-Band for Network Flowgates</u>

   a. §2 describes the two tests applied to Transmission Service Requests (TSRs) of greater than one year

   b. §3-4 describe additional tests for small generators and Network Integration Transmission Service (NT) Designated Network Resources (DNRs)

# Resources for BPA's LT ATC Methodology cont.

3. These documents can be found on BPA's [ATC Methodology page](#)

    a. Provide details of BPA's ATC Methodologies and TSR evaluation processes for the Planning time horizon (beyond 13 months)

    b. Are updated, as needed, using the same process applied to BPA Business Practice updates

4. Memorandum of Agreement for the Management of Network Integration Transmission Service for Delivery of Federal Power to Network Customer Loads

    a. Referred to as the NT MOA

    b. Documents procedures used to model Federal Power delivery to NT Customer loads in ATC calculations

    c. This agreement between BPA Power Services and BPA Transmission Services is also available on the ATC Methodology page

# Resources for BPA's LT ATC Methodology cont.

5.  Additional information is posted on BPA's <u>Transmission Availability page</u>

    a.  ATC values and Conditional Firm Inventory are posted in a single spreadsheet

    b.  LT Pending Queue, with PTDF-impacts of each TSR

    c.  LT PTDF Calculator, which allows you to perform impact calculations for any combination of Source/POR, Sink/POD, and MW demand

# Calculating TTC for the Planning Time Horizon

1. The TTC for each constraint comes from studies performed by BPA's Transmission Planning group

2. Several studies are performed to establish the reliability limit

3. BPA studies each constraint and allocates TTC among owners of the constraint

4. Topology changes from new or retired facilities as well as updated load forecast assumptions are incorporated into the TTC studies

5. Long-Term sales are made using the all lines in service TTC, unless Planning has determined that TTC has been significantly reduced for specific months to accommodate long term outages or upgrades

6. These values do not change frequently

# Calculating ATC for the Planning Time Horizon

1. Firm reservations are used to calculate ETC

2. BPA does not use CBM, TRM, Counterflows or Postbacks in the Planning Time Horizon (beyond 13 months)

3. BPA does not calculate a non-firm ATC in the Planning Time Horizon

# Short-Term ATC Methodology

## Impacting the NERC Time Horizon
## (0-13 months)
## Margaret Olczak

# Resources for BPA's ST ATC Methodology

1. ST ATC methodology is documented in BPA's ATC Implementation Document (ATCID)

   a. The ATCID can be found on BPA's ATC Methodology page

2. Transmission Reliability Margin (TRM) methodology is documented in BPA's TRM Implementation Document (TRMID)

   a. The TRMID can also be found on BPA's ATC Methodology page

3. The ATCID and TRMID provide more in-depth information on BPA's TRM and ATC methodologies

4. BPA posts its ST ATC data, as well as other links related to doing business with BPA, to BPA's OASIS site.

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# Calculating TTC for the NERC Time Horizon

1. The TTC for each constraint comes from studies performed by BPA's Transmission Operations group

2. Several TTC studies are performed

    a. Seasonal TTC studies for each season, which assume all lines will be in service

    b. Outage-informed TTC studies for roughly the 0 to two week time horizon

3. BPA studies each constraint and allocates TTC among owners of the constraint

    a. BPA's share of each constraint is used in the ATC calculation as well as posted to OASIS.

    b. BPA share is located on OASIS → Sys. Data

    c. Total Path Rating is located in a number of places on OASIS but the best to view is OASIS → BPAT Home Page →Outage folder → Outage Summary or Hourly TTC's (best place to go for next day or real time)

# Calculating TTC for the NERC Time Horizon(cont.)

4.  The hourly TTC value is used in the TTC calculation for each hour

    a.  Hourly TTC calculated for each day becomes the Daily TTC

    b.  Daily TTC becomes the Monthly TTC

5.  TTC is calculated in accordance with MOD-029-2a and all other applicable reliability requirements

# Calculating Firm ATC for the NERC Time Horizon

1. Firm reservations are used to calculate ETC

2. BPA makes ETC adjustments across its paths if needed for encumbrances or releases not captured in the powerflow and PTDF accounting

3. BPA does not use CBM, Counterflows or Postbacks in ATC firm

4. TRM is applied to Northern Intertie N>S, Northern Intertie S>N and West of Garrison E>W

# ATC Non-Firm (Beyond Real-Time Horizon)

1. Firm and non-firm reservations are used to calculate ETC

2. Same ETC adjustments as for ATC Firm

3. Counterflow schedules are included except for Dynamic, Pseudo and Capacity tag types

4. $TRM_U$ is applied to Northern Intertie (both directions)

5. BPA does not use CBM or Postbacks

# ATC Non-Firm (Real-Time Horizon)

1. Real-time horizon begins at 22:00 the day prior to the delivery day

2. BPA sums firm schedules, non-firm schedules and unscheduled non-firm reservations to calculate ETC

3. BPA does not use CBM

4. Counterflow schedules are included except for Dynamic, Pseudo and Capacity tag types

5. Postbacks are used on COI N>S to account for any unused share of non-firm capacity available to BPA from capacity ownership agreements, to prevent curtailments

6. TRM is applied to Northern Intertie (both directions)

# ATC Power Flow Studies

## Flow-Based ETC Calculations

## Lacey Barnett & Kevin Johnson

# Base ETC for Flow-Based Constraints

- Base ETC is calculated from power flow studies
    a. These studies utilize the seasonal WECC base cases to calculate the flows of BPA's commitments across each flow-based constraint
    b. BPA only includes long-term firm reservations in the base ETC studies
    c. Counterflows are accounted for in power flow studies
- The seasonal base cases include various assumptions
    a. System topology
    b. Loads
    c. Generation patterns

# Base ETC for Flow-Based Constraints (cont.)

- Winter and Summer heavy load cases are utilized to calculate base ETC across almost all flow-based constraints

- For the Spring case, the Long Term uses a Spring light load case and the Short Term uses a Spring heavy load case

- West of Hatwai is the exception to using seasonal values:

    - The Long Term uses the Spring light load case as most limiting

    - The Short Term is currently utilizing a Winter light load case to calculate base ETC since it is new to the analysis

- The seasonal cases are then stressed under different scenarios to determine ETC

# Base ETC for Flow-Based Constraints (cont.)

| Season | Load Profile | Wind | Canadian Entitlement Return | Stressed Zones |
|---|---|---|---|---|
| Winter (January) | Peak | On On/Off **ST** | On | Upper Columbia Lower Snake Lower Columbia |
| Spring (May) | Off-Peak Peak **ST** | On/Off | On | Upper Columbia **ST** Lower Snake Lower Columbia |
| Summer (August) | Peak | On/Off | Off | Upper Columbia Lower Snake Lower Columbia |
| **Short Term** Winter (January) | Off-Peak | Default | On | Eastern Federal Hydro |

# Base ETC for Flow-Based Constraints (cont.)

The lowest ETC value from the scenarios for each season is used as the base ETC across each flow-based constraint.

The difference between seasonal min and max ETCs is held out as a commercial uncertainty margin. For short term, the margin is released as non-firm capacity at 4 months out.

Three seasonal values are used to calculate monthly values:
- Winter case feeds November, December, January, February
- Spring case feeds April, May and June
- Summer case feeds July, August
- March is an average of Winter and Spring cases
- October is an average of Winter and Summer cases
- September is 75% of Summer case and 25% of Winter case

Currently, the ETC values from the January light load case are used as base ETC across West of Hatwai for the entire 0 to 13 month NERC horizon

# Base ETC for Flow-Based Constraints (cont.)

**Long Term Only ---**

For every flow-based constraint:

- Each season calculated separately

- Minimum ETC for 5 and 10 year cases interpolated to calculate ETC for 2 years out

- Growth factor calculated, may be positive or negative

# Long Term TSR Processing

PTDF Evaluation of Transmission Service Requests

Tasha Bryan

# Long Term TSR Processing

- Customer submits TSR in OASIS at least 60 days prior to Service Commencement Date
- Required fields:
  - Source/POR
  - Sink/POD
  - Request Type
    - NT – Original and Renewal
    - PTP – Original, Renewal, Transfer, Deferral, Redirect
  - Start/Stop
    - Must be at least 1 year in duration and start at the beginning of a month
  - MW Requested
  - Service
    - LTF-Yearly NT
    - LTF Yearly PTP
  - Sale Ref:  Last 5 digits of transmission contract

# Long Term TSR Processing

- Once a long term TSR is QUEUED, Reservation Desk will validate the TSR to ensure there are no errors and that the service may be requested
  - If there are validation issues, the TSR status will be updated to INVALID

- Upon validation, the TSR status will be updated to RECEIVED
  - If there are fees or supplementary paperwork needed, customer will be notified by their AE at this time

# Long Term TSR Processing

- If the customer does not pay required fees or return supplementary paperwork, the TSR will be DECLINED

- If all requirements are met, the TSR status will be updated to STUDY

  - STUDY status in OASIS is used to describe TSRs that have submitted a completed application, but are not ready for a final state such as a CONFIRMED or removal from the queue due to not meeting contractual obligations

# Long Term TSR Processing

- Reservation Desk will perform an ATC analysis of the TSR (described in later slides)
- The planning team and Account Executives are notified of the result
    - If the TSR is not awardable from an ATC perspective, our planning group reviews from an engineering perspective to see if it can be awarded
    - TSRs that are not awarded service may end up participating in a Cluster or Individual study
    - TSRs in the queue are reviewed periodically to see if ability to offer has changed

# Long Term TSR Processing

- If the TSR is awardable from an ATC perspective, it will be further reviewed by planning to see if service may be authorized

- If service may be offered, the Reservation Desk creates the authorization to create the contract

- Upon contract draft, BPA performs an internal contract review

# Long Term TSR Processing

- Once the contract is tendered, the customer has 15 days to execute the contract
  - Lack of execution will result in a TSR status change to DECLINED
  - Upon execution, the TSR status will be updated to CONFIRMED

# Example Calculation for ATC Analysis

- PTDF method assesses impacts on the flow-based constraints simultaneously and is a representation of how power would flow
- The impact values will be less than the demand requested due to the nature of the calculation
- Impact Results:
  - Positive impact values require ATC
  - Negative or *de minimis* impact values do not require ATC
- Below is an example of a 100MW transaction from USCNDNBDRCNTGS to JOHNDAYINTI500
- This transaction would need ATC on several flow-based constraints as well as 100MW from Northern Intertie N>S

| | | SOA_NS | CCN_EW | WL_EW | CCS_EW | NOH_NS | NJD_NS | PA_NS | RP_NS | WOM_EW | WOS_EW | WJD_EW | SOC_NS | NOEL_SN |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POR | CUSTER W_500.00 | 0.0531 | -0.8131 | 0 | -0.0497 | -0.0479 | -0.0126 | 0.0419 | 0.035 | -0.0099 | -0.007 | -0.0166 | 0.844 | -0.4322 |
| POD | JOHN DAY_500.00 | -0.1742 | -0.1755 | -0.0794 | 0.1522 | -0.6011 | -0.7954 | -0.1424 | -0.1103 | -0.1727 | -0.1964 | 0.3516 | 0.0011 | 0.0349 |
| Path PUF | | 0.2273 | -0.6376 | 0.0794 | -0.2019 | 0.5532 | 0.7828 | 0.1843 | 0.1453 | 0.1628 | 0.1894 | -0.3682 | 0.8429 | -0.4671 |
| Impact | | 22.73 | -63.76 | 7.94 | -20.19 | 55.32 | 78.28 | 18.43 | 14.53 | 16.28 | 18.94 | -36.82 | 84.29 | -46.71 |
| | | | | | | | | | | | | | | |
| Impact Used | | 23 | 0 | 8 | 0 | 55 | 78 | 18 | 15 | 16 | 19 | 0 | 84 | 0 |

# Long Term Queue and ATC

- The long term queue calculates the ATC needs for each TSR

- The starting ATC inventory on all constraints is applied top down and encumbered for each TSR

- This means that a TSR at the bottom of the queue is evaluated using the starting ATC less any higher pending request needs

# *De Minimis* Tests for Long Term TSRs

– Two tests are applied to each Point to Point (PTP) long-term Transmission Service Request (TSR) to determine *de minimis* impact to the flow-based constraints.

– If the TSR passes either test, then the TSR will be deemed to have a *de minimis* impact on that flow-based constraint

- (Test 1) The positive net impact is less than or equal to 10 MW and less than or equal to 10 percent of the requested demand. Analysis is based on four decimal places.

- (Test 2) The positive net impact is less than or equal to 10 MW and the original impact divided by the new impact is greater than or equal to 80 percent.

# Long Term *De Minimis* Test Example



If the child passes de minimis test 1, no ATC is required

| Flowgate | Child Source: HATWAI230 | Child Sink: BIGEDDY500CELO | | Child Impact | Parent Source: NWMRKTHUB (NWH) | Parent Sink: BIGEDDY500CELO | | Parent Impact | Net Impact | Test 2 Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| PTDF #: | 40519 | 40111 | | | 41111 | 40111 | | | | |
| Flowgate | Source | Sink | Source - Sink | ChildImpactV | ParentSource | ParentSink | Source - Sink | ParentImpactW | NetImpact | ImpactRat |
| CROSS CASCADES NORTH E>W | -0.1162 | -0.1866 | 0.0704 | 7.0400 | -0.0438 | -0.1866 | 0.1428 | 14.2800 | 0.0000 | 0.0000 |
| CROSS CASCADES SOUTH E>W | 0.0669 | 0.1701 | -0.1032 | 0.0000 | 0.0440 | 0.1701 | -0.1261 | 0.0000 | 0.0000 | 0.0000 |
| NORTH OF HANFORD N>S | -0.4462 | -0.5899 | 0.1437 | 14.3700 | 0.0246 | -0.5899 | 0.6145 | 61.4500 | 0.0000 | 0.0000 |
| NORTH OF JOHN DAY N>S | -0.0749 | -0.7895 | 0.7146 | 71.4600 | -0.0413 | -0.7895 | 0.7482 | 74.8200 | 0.0000 | 0.0000 |
| PAUL TO ALLSTON N>S | -0.0662 | -0.1522 | 0.0860 | 8.6000 | -0.0369 | -0.1522 | 0.1153 | 11.5300 | 0.0000 | 0.0000 |
| RAVER TO PAUL N>S | -0.0517 | -0.1181 | 0.0664 | 6.6400 | -0.0277 | -0.1181 | 0.0904 | 9.0400 | 0.0000 | 0.0000 |
| SOUTH OF ALLSTON N>S | -0.0810 | -0.1863 | 0.1053 | 10.5300 | -0.0453 | -0.1863 | 0.1410 | 14.1000 | 0.0000 | 0.0000 |
| WEST OF JOHN DAY E>W | 0.0611 | -0.5240 | 0.5851 | 58.5100 | -0.0006 | -0.5240 | 0.5234 | 52.3400 | 6.1700 | 0.8945 |
| WEST OF SLATT E>W | 0.0278 | -0.1618 | 0.1896 | 18.9600 | 0.0038 | -0.1618 | 0.1656 | 16.5600 | 2.4000 | 0.8734 |
| WEST OF LOWER MONUMENTAL E>W | 0.4303 | -0.0777 | 0.5080 | 50.8000 | -0.0516 | -0.0777 | 0.0261 | 2.6100 | 50.8000 | 0.0000 |
| SOUTH OF CUSTER N>S | 0.0340 | 0.0002 | 0.0338 | 3.3800 | 0.0042 | 0.0002 | -0.0044 | 0.0000 | 0.0000 | 0.0000 |
| NORTH OF ECHO LAKE S>N | 0.0043 | 0.0356 | -0.0313 | 0.0000 | 0.0204 | 0.0356 | -0.0092 | 0.0000 | 0.0000 | 0.0000 |
| WEST OF MCNARY E>W | 0.1068 | -0.1572 | 0.2640 | 26.4000 | 0.0194 | -0.1572 | 0.1766 | 17.6600 | 8.7400 | 0.6689 |

De minimis test two is applied to long term TSRs when there is a net impact < =10MW and the parent impact/child impact >= 0.80

| Parent or Child Impact: | 0.##### | Indicates that impact passed De Minimis test 1 |
| Net Impact: | 0.##### | Indicates that impact passed De Minimis test 2 |

A parent that passes de minimis test 1, does not credit the ATC need of the child

# 11/14 *De Minimis* WebEx Information

- BPA will host a supplemental webinar to continue capturing and record customer feedback regarding the *de minimis* process.
  - Date: Thursday, November 14, 2019
  - Time: 10:05 A.M. – 11:00 A.M. PDT
  - Location: WebEx Only
  - Phone: 1-415-527-5035
  - Access code: 907 878 865
  - Password: hV7eGBM4
  - WebEx Address to join meeting: https://doe.webex.com/webappng/sites/doe/meeting/info/14214684 7059762784?MTID=mab4da7e4f731616919af177b1f486318

# Commercial Assessment Technical Panel (CTP)

Commercial Assessment Technical Evaluation of Transmission Service Requests

Abbey Nulph

# Commercial Assessment Technical Panel

- PTDF assessment of Source/Sink/Demand is not always a reflection of how a TSR will impact the system
- Panel of experts review each request to determine how impacts should be determined
  - Queue priority is honored
  - Study-based impacts must still have sufficient ATC or CF inventory to be accepted
- Described in:
  - §7.2 in <u>Available Transfer Capability (ATC) Methodologies for the Planning Time Period, Version 16</u>
  - B.1.a. in <u>Long-Term Firm Queue: Evaluation of Requests and Offer of Service, Version 17</u>

# Network Integration Transmission Service (NT) Planning Dialogue

## Evaluation of NT Forecasts

## Toni Williams

# NT Dialogue

- The NT Dialogue is an annual planning process where:
  - BPA and NT customers evaluate a 10 year period of load and non-Federal resource (resource) forecast data.
  - NT customers notify BPA of their resource forecast selection
    - New resources.
    - Modification to an existing reserved resource.

- BPA evaluates system capability before making a determination to accept, some or all, of the customer's NT resource forecast.
  - For accepted resource forecast amounts, BPA will reserve transmission up to the accepted resource forecasted amount.
  - For non-accepted resource forecast amounts, BPA will work with NT customers on other options for service.

Pre-decisional, for discussion purposes only

# Short Term TSR Processing
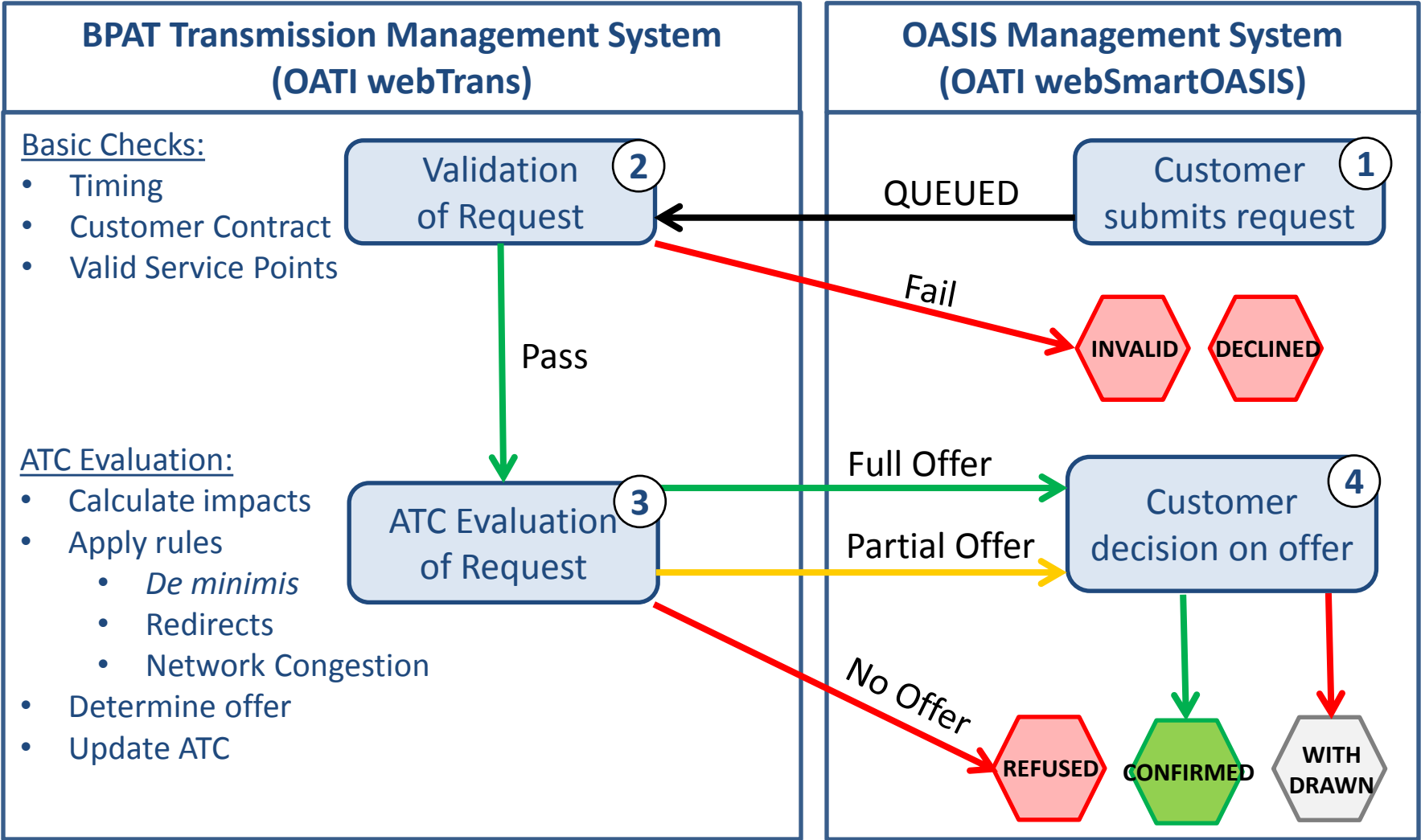
PTDF Evaluation of Transmission Service Requests

Mike Steigerwald

# Short-term TSR Processing Overview

– There is a single TSR queue for requests of all short-term products (firm, non-firm, PTP, NT, 1:1, flow-based, Original, Redirects, Resales, etc.).

  • NT short-term requests currently use PTP-like TSR's, so this process is equally applicable.

– Requests are processed in queue order, except those subject to the Simultaneous Submission Windows policy (discussed later).

– Processing of the queue is fully automated.

  • Manual intervention only occurs in the event of system errors.

  • Long-term requests also enter the same queue, but remain in a QUEUED status until acted upon manually by the Reservation Desk.

– The overall process is administered by industry-compliant software from vendor OATI.

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# Short-term TSR Process Basic Flow



**BPAT Transmission Management System (OATI webTrans)**

Basic Checks:
- Timing
- Customer Contract
- Valid Service Points

Validation of Request ②

ATC Evaluation:
- Calculate impacts
- Apply rules
  - *De minimis*
  - Redirects
  - Network Congestion
- Determine offer
- Update ATC

ATC Evaluation of Request ③

**OASIS Management System (OATI webSmartOASIS)**

QUEUED — Customer submits request ①

Fail → INVALID   DECLINED

Pass

Full Offer → Customer decision on offer ④

Partial Offer →

No Offer → REFUSED   CONFIRMED   WITH DRAWN

# Timing:  When can requests be made?

| Short-term Service | Market Window Open | Market Window Closes |
|---|---|---|
| Monthly Firm PTP and NT | Midnight 365 days prior to start of service | 20 minutes prior to the start of service |
| Weekly Firm PTP and NT | Midnight 14 days prior | 20 minutes |
| Daily Firm PTP and NT | Midnight 7 days prior | 20 minutes |
| Hourly Firm PTP and NT | 9:00am of the WECC pre-schedule day | 20 minutes* |
| Monthly Non-firm PTP and NT | Midnight 60 days prior | 20 minutes |
| Weekly Non-firm PTP and NT | Midnight 14 days prior | 20 minutes |
| Daily Non-firm PTP and NT | Midnight 2 days prior | 20 minutes |
| Hourly Non-firm NT and PTP, Non-firm Secondary Hourly PTP | 10:00am of the WECC pre-schedule day | End of the operating hour |

- *On 01/01/20, this will change to 20 minutes prior to the start of the operating day per the terms of the TC-20 Settlement (i.e., at 2340 the day before flow).
- The non-firm PTP timing is governed by the OATT.
- See BPAT Business Practice "Requesting Transmission Service" Section F2.

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Pre-decisional, for discussion purposes only

# Timing:  When must a request be acted upon?

| Class | Increment | Queued Prior to Start | TP Evaluation | Customer Response |
|---|---|---|---|---|
| Firm / Non-firm | Hourly | < 1 hour | Best Effort | 5 min |
| | | 1 to 24 hours | 30 min | 5 min |
| | | > 24 hours | 30 min | 30 min |
| Non-firm | Daily | Any | 30 min | 2 hours |
| Firm | Daily | < 24 hours | Best Effort | 2 hours |
| | | > 24 hours | < 30 days | 24 hours |
| Non-firm | Weekly | Any | 4 hours | 24 hours |
| Firm | Weekly | < 86 hours | 30 days | 2 hours |
| | | 86 to 110 hours | 30 days | 24 hours |
| | | > 110 hours | < 30 days | 48 hours |
| Non-firm | Monthly | Any | 2 days | 24 hours |
| Firm | Monthly | < 86 hours | 30 days | 2 hours |
| | | 86 to 110 hours | 30 days | 24 hours |
| | | 110 to 158 hours | 30 days | 48 hours |
| | | > 158 hours | > 30 days | 4 days |

- These timelines are governed by NAESB WEQ-001 Table 4-2.
- At minimum, BPAT must evaluate within 30 min.  Current median evaluation time is 37 seconds.
- See BPAT Business Practice "Requesting Transmission Service" Section F3.

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# Short-term ATC Evaluation Overview

- – Evaluation is made for all constraints.

- – Impacts on flow-based constraints are calculated using PTDFs that account for updated loads, generation, and outages.

- – PTDFs are updated in webTrans hourly as of 9/24/19.

- – Short-term ATC evaluation is made using PTDFs for POR/POD. Long-term ATC evaluation is made using Source/Sink.

- – Evaluations are made in queue order considering the impacts of all prior queued requests and reservations (including long term):

  - • Prior requests that are still "pending" are deducted from ATC when evaluating later queued requests.

- – Resales are not evaluated for ATC since they do not involve awarding new ATC from the Transmission Provider.

- – The final result of the ATC Evaluation is the composite result of the individual evaluation for each constraint.

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# Short-term ATC Evaluation Process

1. Calculate the impact of the TSR for each constraint.

2. Apply *De minimis* rules to further assess the impact of a TSR on each flow-based constraint.

3. Perform an additional impact analysis on Redirects as applicable.

4. Determine the ATC evaluation result for each constraint.

   ❑ Based on ATC

       OR

   ❑ Based on whether a Network Congestion (Stop Sales) event has been declared.

5. Aggregate the individual results into a final result.

6. Determine offer that can be made to the customer.

# Which Services undergo an ATC Evaluation?

| Short-term Service | 1:1 ATC Check | Flow-based ATC Check |
|---|---|---|
| Monthly Firm PTP and NT | Yes | Yes |
| Weekly Firm PTP and NT | Yes | Yes |
| Daily Firm PTP and NT | Yes | Yes |
| Hourly Firm PTP and NT | Yes | Yes* |
| Monthly Non-firm PTP and NT | Yes | Yes |
| Weekly Non-firm PTP and NT | Yes | Yes |
| Daily Non-firm PTP and NT | Yes | Yes |
| Hourly Non-firm NT and PTP, Non-firm Secondary Hourly PTP | Yes | No** |

- – * The ATC check for flow-based constraints was enabled for Hourly Firm on 07/01/19 per the terms of the TC-20 Settlement.
- – ** The only short-term services that do not undergo an ATC evaluation are the Hourly Non-firm products (PTP, NT, and Secondary Hourly PTP Redirects). This topic will be discussed in a future tariff proceeding.
- – Where enabled, the ATC evaluation is performed the same for all short-term products.

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# Calculate ATC Impacts of a TSR Request

– This calculation is the same for Original and Redirect requests.

– The impact of a given TSR is calculated <u>for each flow-based constraint</u> using the following formula:

$$\text{MW Impact} = (\text{POR}_{PTDF} - \text{POD}_{PTDF}) * \text{Requested Demand}$$

– Examples of a 100MW TSR on South of Allston

| POR | | POD | | Impact Factor | Impact (MW) |
|---|---|---|---|---|---|
| Name | PTDF | Name | PTDF | $(\text{POR}_{PTDF}-\text{POD}_{PTDF})$ | (Factor*MW) |
| BC.US.Border | .0528 | JohnDay | -0.1748 | .2276 | 22.76 |
| LaGrande | -0.1483 | MIDCRemote | -0.0203 | -0.128 | -12.8 |
| BPAPower | -0.0603 | Franklin | -0.1317 | .0714 | 7.14 |
| BC.US.Border | .0528 | BigEddy | -0.1867 | .2395 | 23.95 |
| BC.US.Border | .0528 | Clark | -0.3654 | .4182 | 41.82 |

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# ATC Evaluation Criteria and *De minimis*

– This ATC evaluation is done for both Original and Redirect requests.

– Redirects are evaluated at this point without regard for parent impacts.

| Request Type | If the calculated Impact on a given flow-based constraint is: | Then the ATC Evaluation Result for that constraint is: |
|---|---|---|
| Original & Redirect | Negative (provides counterflow) | Pass (regardless of ATC) |
| Original & Redirect | Zero (no impact) | Pass (regardless of ATC) |
| Original & Redirect | Positive but *De minimis* (Impact <= 10MW  AND  Factor <= 10% | Pass (Treat impact as zero) |
| Original | Significant Impact (i.e., not *De minimis*) (Impact > 10MW  OR  Factor > 10%) | Check against ATC |
| Redirect | | Perform net impact analysis |

Takeaways:

• The *De minimis* test is applied to Original and Redirect requests alike as part of the ATC evaluation at this point.

• The additional net impact analysis is <u>only</u> performed on Redirects and <u>only</u> if the calculated impact is not *De minimis*.

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# ATC Evaluation and *De minimis* Examples

– Consider the following TSR impacts for a flow-based constraint <u>with limited capacity</u> (ATC <= zero or a Network Congestion event has been declared).

| Request Type | Impact | Impact Factor | Criteria | ATC Result |
|---|---|---|---|---|
| Original | 0MW | 0% | No impact, so checking ATC is not needed. | Pass |
| Redirect | -12MW | -.120 | Counterflow, so checking ATC is not needed. | Pass |
| Original | 10MW | .10 | *De minimis* (<= 10MW AND <= 10%). Zero impact. | Pass |
| Redirect | 7MW | .0714 | *De minimis* on its own merits. Zero impact. | Pass |
| Original | 8MW | .2276 | Significant (< 10MW but > 10%). No offer. | Fail |
| Redirect | 51MW | .0850 | Significant (< 10% but > 10MW). A net impact analysis needed before an ATC result is returned. | TBD |

Takeaways:

• The *De minimis* test is applied equally to Original and Redirect requests at this point.

• Even though a Redirect may have a significant impact on a flow-based constraint, the ATC result is not an automatic failure. An additional net impact analysis is performed to determine the impact of the Redirect in relation to that of the parent.

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# Calculate the Net Impact of a Redirect

- Net impact is the incremental impact that a Redirect has on a flow-based constraint over and above the impact the parent has on the same constraint.
- This step is only needed if the impact of a Redirect is not *De minimis.*

**Net (Incremental) Impact = Redirect Impact – Parent Impact**

| Redirect | | Parent | | Net Impact | Comment |
|---|---|---|---|---|---|
| POR/POD | Impact | POR/POD | Impact | (MW) | |
| LaGrande / MIDCRemote | -12.0 | BC.US.Border / JohnDay | 22.76 | -34.76 | Redirect provides constraint relief. |
| BC.US.Border / JohnDay | 22.76 | BPAPower / Franklin | 7.14 (0) | 22.76 | *De minimis* parent counted as zero. |
| BC.US.Border / Clark | 41.82 | BC.US.Border / JohnDay | 22.76 | 19.06 | Redirect requires a lot of new ATC. |
| BC.US.Border / BigEddy | 23.95 | BC.US.Border / JohnDay | 22.76 | 1.19 | Redirect requires a bit of new ATC. |

# Net Impact of a Redirect Evaluation Criteria

– This secondary ATC evaluation of the Redirect is applied to the net (incremental) impact as follows.

| If the calculated net impact of a Redirect on a given flow-based constraint is: | Then the ATC Evaluation Result is: |
| --- | --- |
| Negative (Redirect provides relief) | Pass (regardless of ATC) |
| Zero (Redirect and parent impacts are the same) | Pass (regardless of ATC) |
| Positive* (Redirect needs new ATC) | Check against ATC |

*Note that there is no *De minimis* test considered in the evaluation of the net impact of a short-term Redirect. <u>Any</u> positive incremental impact will undergo an ATC check.

It is this specific criteria that differs in the ATC evaluation of Redirects between the short-term and long-term.  A separate *De minimis* test is applied to long-term Redirects that is not applied to short-term Redirects.

# Net Impact of a Redirect Evaluation Examples

Consider the following net impacts of a Redirect for a <u>flow-based constraint with limited capacity</u> (ATC <= zero or a Network Congestion event has been declared).

| Redirect | | Parent | | Net Impact | ATC Result |
|---|---|---|---|---|---|
| POR/POD | Impact | POR/POD | Impact | (MW) | |
| LaGrande / MIDCRemote | -12.0 | BC.US.Border / JohnDay | 22.76 | -34.76 | Pass |
| BC.US.Border / Clark | 41.82 | BC.US.Border / JohnDay | 22.76 | 19.06 | Fail |
| BC.US.Border / JohnDay | 22.76 | BC.US.Border / BigEddy | 23.95 | -1.19 | Pass |
| BC.US.Border / BigEddy | 23.95 | BC.US.Border / JohnDay | 22.76 | 1.19 | Fail* |

*There is no *De minimis* test applied to the <u>net</u> impact of a <u>short-term</u> Redirect. Even a very small positive net impact will fail the ATC evaluation on a flow-based constraint. This particular example would pass under the long-term *De minimis* rules.

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# Considerations for *De minimis* in Short-term ATC

- The difference between how *De minimis* is used in the short-term and long-term is related to how it is applied to the net (incremental) impacts of Redirects.

- The net impact analysis only applies to flow-based systems.

- The approach to the net impact analysis for short-term Redirects has been in effect and is unchanged since first introduced in BPAT webTrans (10+ years ago).

- This policy applies equally to all short-term Firm products.

- BPAT's approach to *De minimis* for short-term Redirects is consistent with other transmission providers:

  - *De minimis* rules are applied to the Redirect itself.

  - *De minimis* rules are <u>not</u> applied to the incremental (net) impact analysis.

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# Summary of Short & Long-term ATC Evaluation

| Request Type (Original, Redirect) | Individual or Net Impact | If the calculated impact on a flow-based constraint with limited capacity is: | Then the ATC evaluation result is: | Then the ATC evaluation result is: |
|---|---|---|---|---|
| | | | Short-term | Long-term |
| Both | Individual | Less than or equal to zero (provides counterflow) | Pass | Same |
| Both | Individual | Positive but *De minimis* (Impact <= 10MW  AND Impact Factor <= 10% | Pass | Same |
| Original | Individual | Positive and Significant (not *De minimis*) | Check ATC | Same |
| Redirect | Individual | Positive and Significant (not *De minimis*) | Calculate net impact | Same |
| Redirect | Net | Less than or equal to zero (Redirect does not need <u>any</u> more than the parent) | Pass | Same |
| Redirect | Net | Positive and Significant (not *De minimis)* (Redirect needs considerably more than the parent) | Fail | Same |
| Redirect | Net | Positive but *De minimis** (Redirect needs marginally more than the parent) | Fail | Pass |

- * A *De minimis* test is only applied to the net impact of <u>long</u>-term Redirects (not short-term).
- The net impact of a long-term Redirect is considered *De minimis* if:
  - The net impact <= 10MW     AND
  - (Parent MW / Redirect MW) >= 0.80

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# Network Congestion Validation

- – Purpose:  Mitigate forecasted or actual congestion on a flow-based constraint by denying new short-term requests (including Redirects) that impact that constraint.
- – Implemented via an OATI validation called Transmission Loading Relief (TLR) Avoidance.
- – Uses the same TSR impact calculation and *De minimis* rules as the short-term ATC evaluation discussed.
- – Can be triggered independently for firm and/or non-firm.
- – When triggered, applies to all short-term products of that class.
  - • Non-firm TLR events <u>will</u> impact Hourly Non-firm and Non-firm Secondary Hourly requests (which do not undergo the normal ATC evaluation).
- – When triggered, posted ATC for that constraint will be set to zero on OASIS.
- – TLR events are posted on OASIS.  Customers can sign up for OASIS alarms or WECCNet messages.
- – See BPAT Business Practice "Requesting Transmission Service" Section J.

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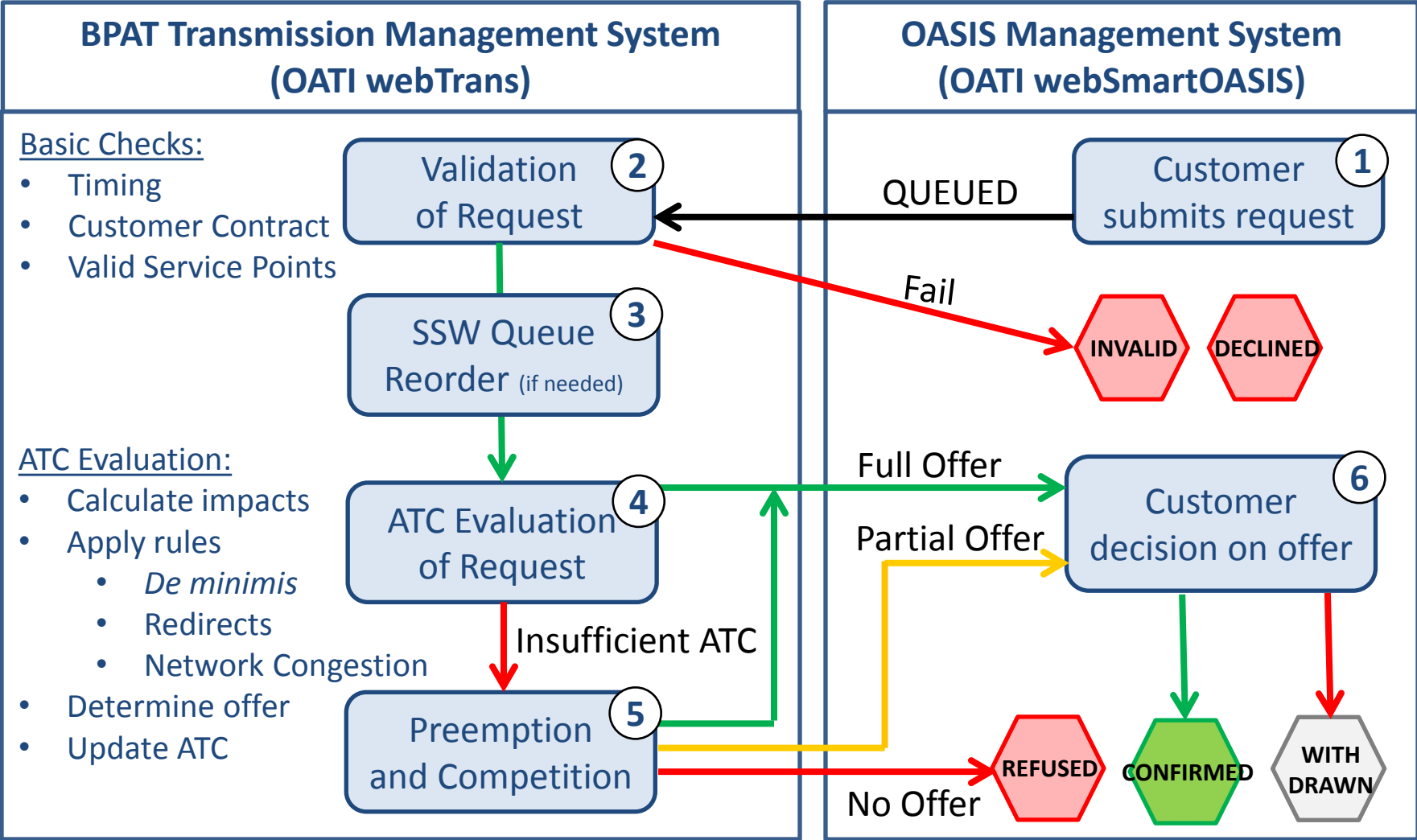# Simultaneous Submission Windows (SSW)

- Purpose:  How BPA processes any <u>short-term</u> <u>firm</u> request that is queued within the first 5 minutes of a market opening for that product.

- Short-term requests are processed in queue order, except those subject to SSW.  Instead of queue order, SSW requests are ordered by:

  1) Duration (longer duration has priority over shorter duration)

  2) Pre-confirmation Status (Pre-confirmed requests have priority over not Pre-confirmed)

  3) Random Lottery by customer

- SSW influences only the order in which short-term requests undergo the ATC evaluation.   The ATC evaluation itself is the same as non-SSW requests.

- See section 13.2 (iii) of the BPA OATT and the BPAT Business Practice "Simultaneous Submission Window Processing".

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# Short-term Preemption and Competition (P&C)

- – Purpose:  Manage the granting of short-term requests in the absence of sufficient ATC.

- – A customer reservation can be confirmed but <u>conditional</u>.   "Conditional" means that for a certain time (outlined in the BPA OATT), granted request and reservation capacity can be challenged by other higher-priority requests:
  - • Preemption:   Capacity is superseded without Right of First Refusal.
  - • Competition:   Capacity is only recalled following Right of First Refusal.

- – Once a reservation becomes "Unconditional", it is safe from P&C.

- – A short-term TSR is considered for P&C if the ATC evaluation fails. The final offer depends on the outcome of the P&C process.

- – Short-term P&C is administered by the OATI P&C Module (PCM).

- – BPAT has implemented short-term P&C for only Monthly and Weekly service. Daily and Hourly Original requests and all Redirects are currently excluded.
  - • BPA's full implementation is pending FERC and OATI adoption of related NAESB standards.

- – See section 13.2 (iv) of the BPA OATT and BPAT Business Practice "Preemption of Short-Term Requests and Reservations".
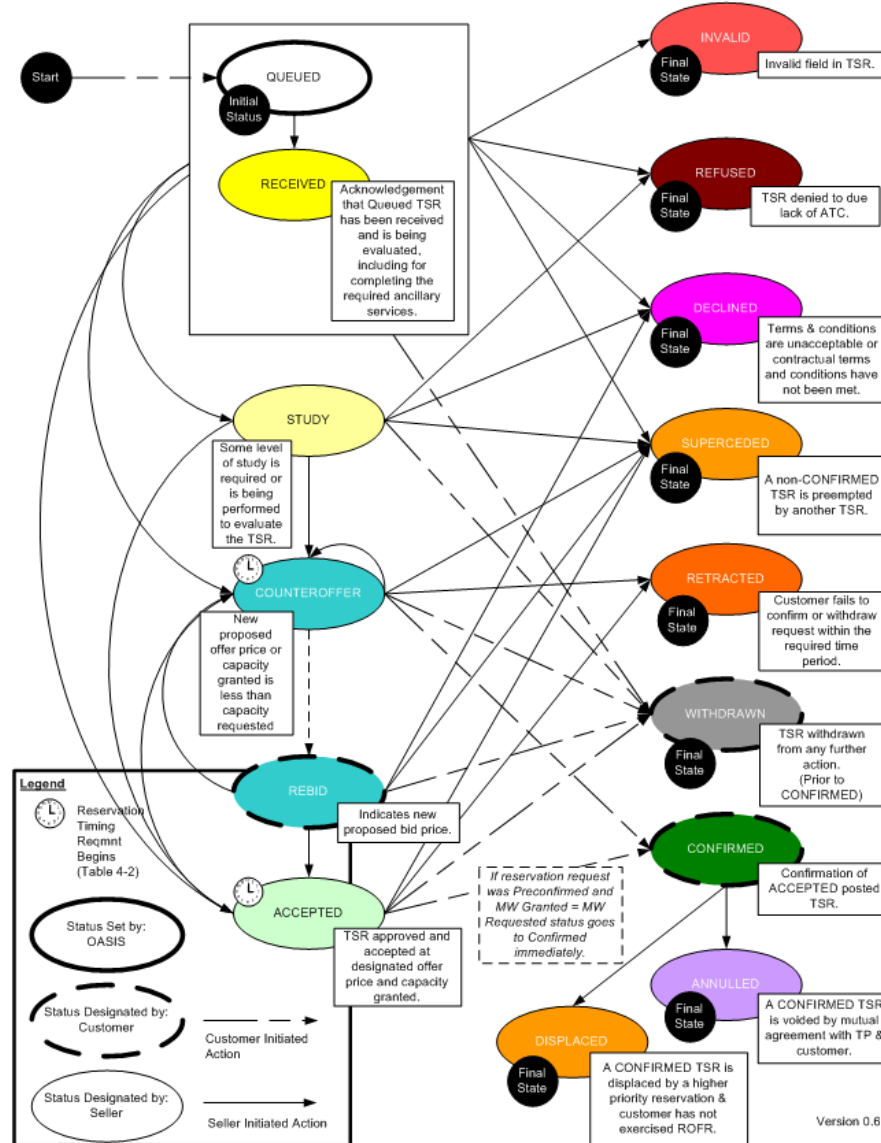
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# Short-term TSR Process Flow with PCM & SSW

*For Discussion Purposes Only*                    Pre-decisional, for discussion purposes only

# Appendix

TSR Processing

# Base ETC for Flow-Based Constraints (cont.)

**All values are for example only**

**Total FCRPS Big 10 Obligation:** 10,000 MW

**Distribution of obligation:**
UC: 50%      LC: 30%      LS: 20%
*Values vary by season and year*

**Stressed zone peak values:**
UC: 7000      LC: 6000      LS: 3500
*Forecasted values updated yearly*

**UC Stressed:**    UC = 7000
3000 remains → LC = 1800   LS = 1200

**LS Stressed:**    LS = 3500
6500 → UC = 4063   LC = 2437

**LC Stressed:**    LC = 6000
4000 → UC = 2857   LS = 1143

Upper Columbia:  Grand Coulee, Chief Joseph
Lower Snake:  Lower Granite , Little Goose, Lower Monumental, Ice Harbor
Lower Columbia:  McNary, John Day, The Dalles, Bonneville