



Grid West

Module 3a Discussion Scheduling

Layer 1 Draft – Last Updated on November 1, 2004

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The Scheduling discussion will cover the following topics:

- Objectives
- Assumptions
- Challenges & Considerations
- Service Descriptions
- Process Overview
- Timeline
- Key Concepts
- Capability Summary
- Open Issues

The objectives of the Beginning State Scheduling design are:

- **Develop the Scheduling Processes**
- **Develop a high-level scheduling protocol**
- **Identify seams issues**

The Beginning State Scheduling discussion assumes the following:

- Participating control areas will have a Regional Transmission Service agreement with Grid West
- The Day-Ahead redispatch market will be implemented after both the Reconfiguration Service and Real-Time Energy Market are in operation
- Injection/Withdrawal points and POR/POD external to GW's footprint are defined and published by Grid West
- Grid West will perform check-out for the CCA and with other control areas
- Grid West will perform the Interchange Authority responsibilities for the CCA.
- Grid West will perform the Reliability Authority responsibilities for the CCA.
- Non-consolidated control areas may continue to perform the Reliability Authority responsibilities (under consideration)

The Beginning State Scheduling design must address the following challenges and considerations:

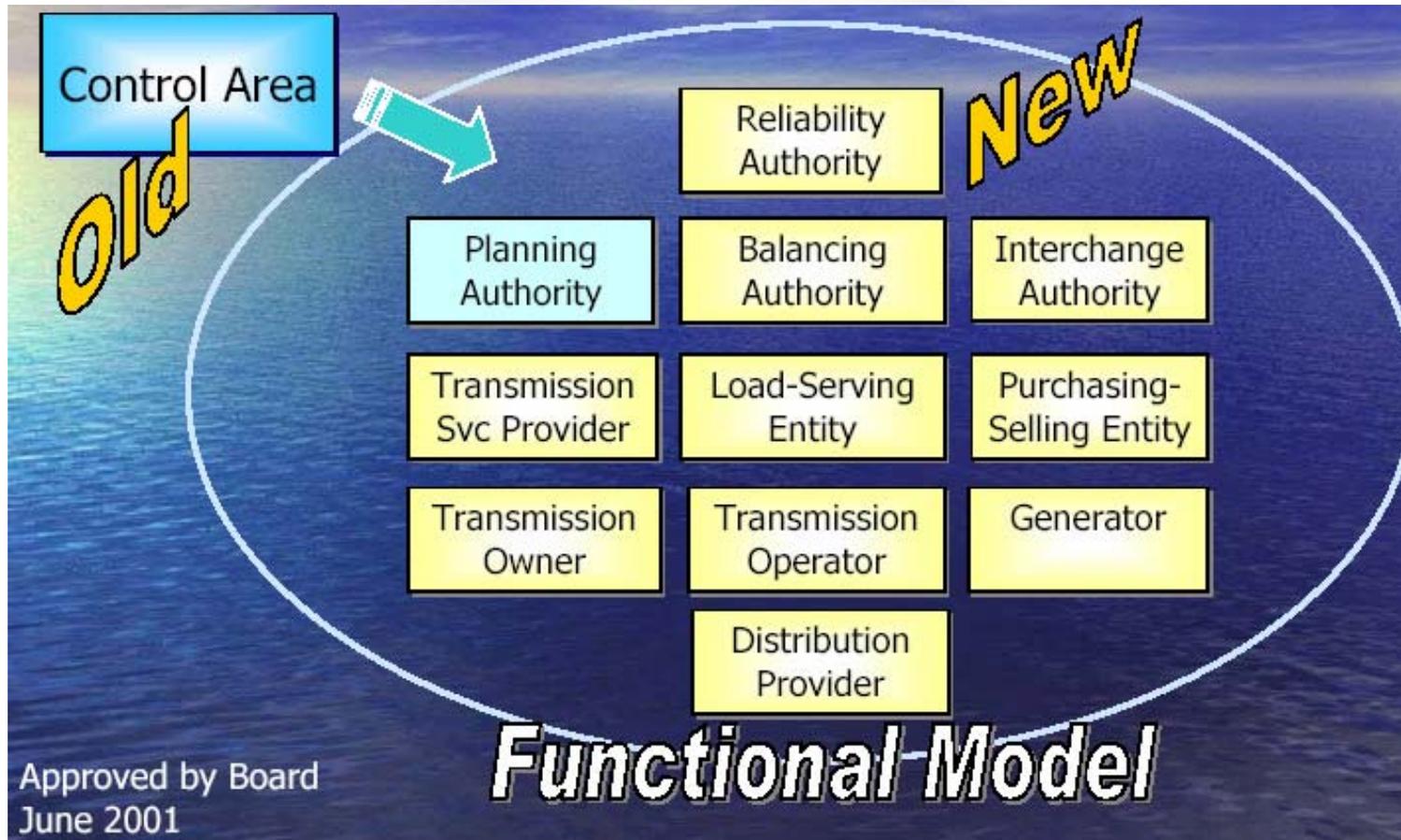
- The scheduling process for Grid West is complicated by the interactions between CCA and non-consolidated control areas
- Market services (Reconfiguration, Reserves) and control area services (Reliability, Interchange and Balancing functions) need to be integrated.
- Business processes need to be developed to manage the information flow and develop and implement the final energy and reserve schedules.

The Beginning State Scheduling discussion assumes the following:

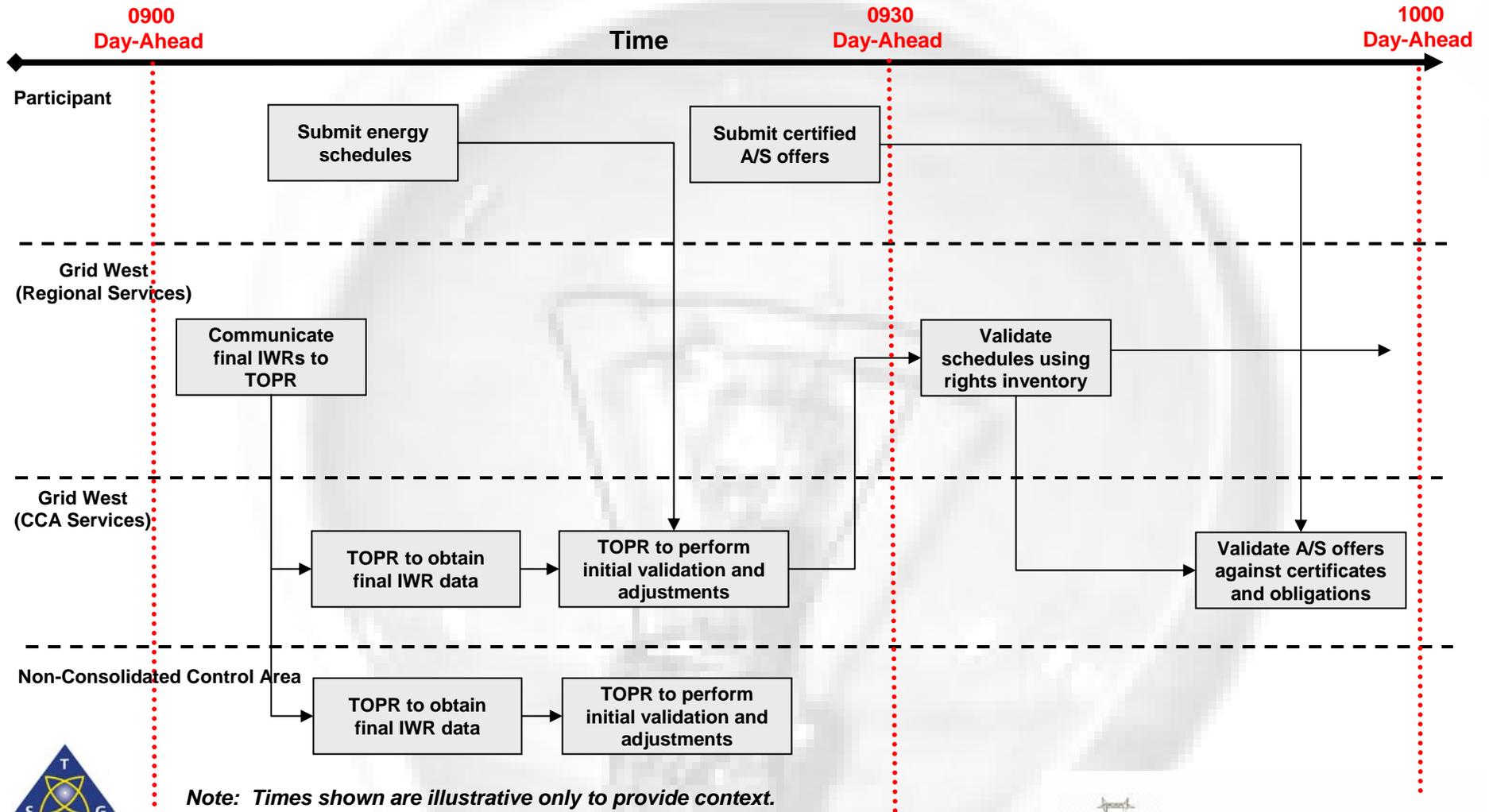
- Participants submit balanced schedules
- E-Tags not required for schedules within the CCA
- Grid West will perform check-out for the CCA and with other control areas
- Grid West will calculate and control Net Schedule Interchange for the CCA and non-CCAs

Grid West will perform the following scheduling activities:

| | |
|---------------------------------------|---|
| Outage Coordination Service | <ul style="list-style-type: none">• Coordinate (approve and publish) transmission outages.• Coordinate generation outages (these may not be published) |
| Interchange Scheduling Service | <ul style="list-style-type: none">• Interchange scheduling for CAs within the Grid West footprint• Interchange scheduling for the CCA with CAs outside the Grid West footprint |
| Checkout Service | <ul style="list-style-type: none">• Confirm and handoff the schedules for energy and ancillary services to control areas and participants |
| E-Tagging Service | <ul style="list-style-type: none">• Work with CAs and Participants to create and approve necessary tags |
| OASIS Service | <ul style="list-style-type: none">• Publish Grid West market information• Publish AFC and Path Utilization Factors (PUFs) for Grid West footprint |

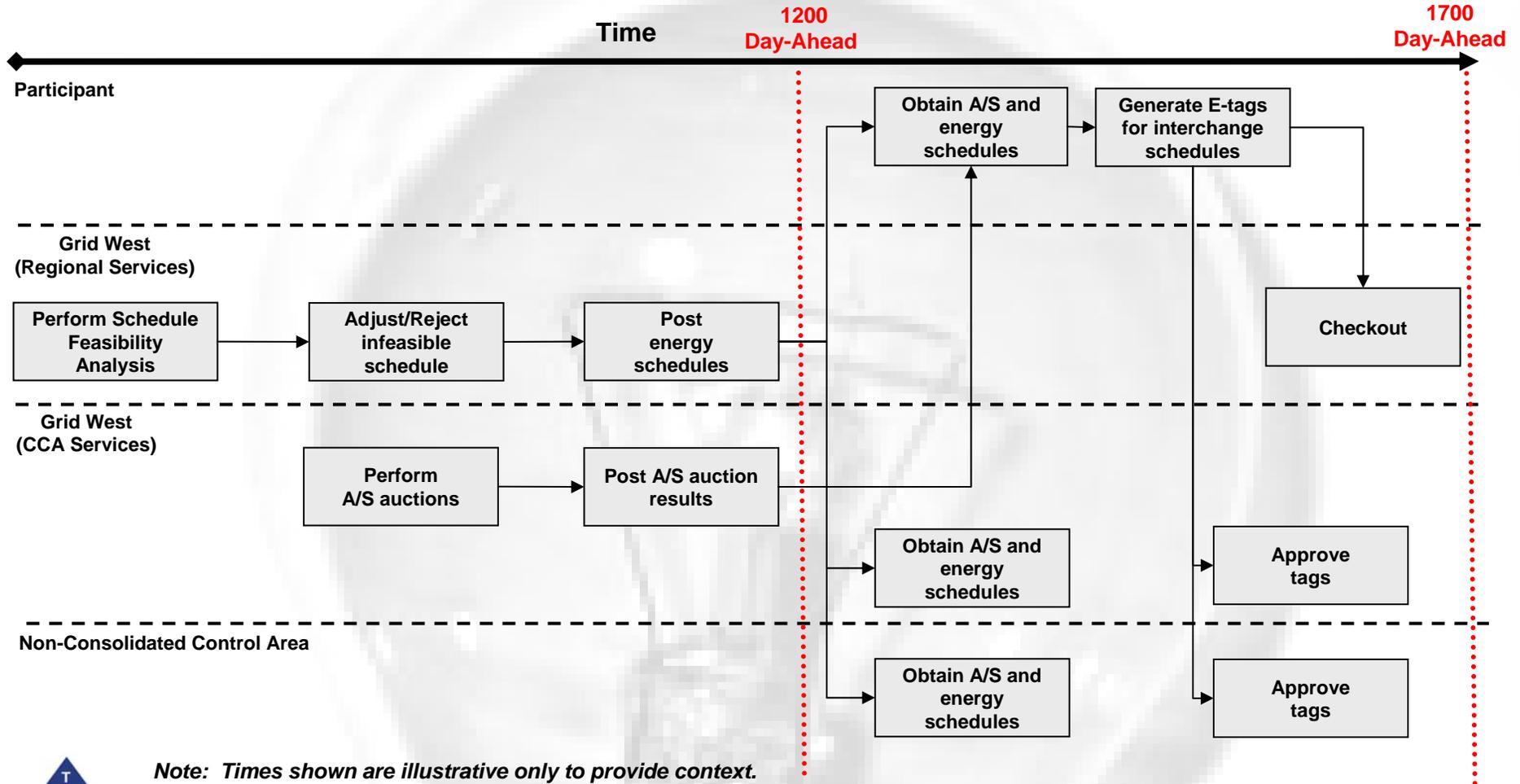


| Period | Participant Action | Grid West Action | Coverage |
|----------------|--|---------------------------------------|----------|
| Pre-Day Ahead | • Submit Outages | • Approve Outages | Regional |
| | | • Post Auction Information | Regional |
| | • Submit Annual RCS Offers/Bids | • Clear Annual RCS Auction | Regional |
| | • Submit Monthly RCS Offers/Bids | • Clear Monthly RCS Auction | Regional |
| Day-Ahead | | • Publish Updated System Information | Regional |
| | | • Post Market Information | Regional |
| | • Submit Intra-monthly RCS Offers/Bids | • Clear Intra-Monthly RCS Auction | Regional |
| | • Submit Daily RCS Offers/Bids | • Clear Daily RCS Auction | Regional |
| | • Submit Balanced Schedules | • Evaluate Schedules | Regional |
| | • Submit Reserve Market Offers | • Clear Reserve Market | CCA |
| | | • Perform Checkout | Regional |
| Adjustment | • Submit Real-Time Offers | • Evaluate Offers | Regional |
| | • Submit Adjusted Schedules | • Evaluate Schedules | Regional |
| Operating Hour | | • Perform Dispatch • Calculate NSI | CCA |
| | • Ramp Unit | • Monitor performance | CCA |



Note: Times shown are illustrative only to provide context.





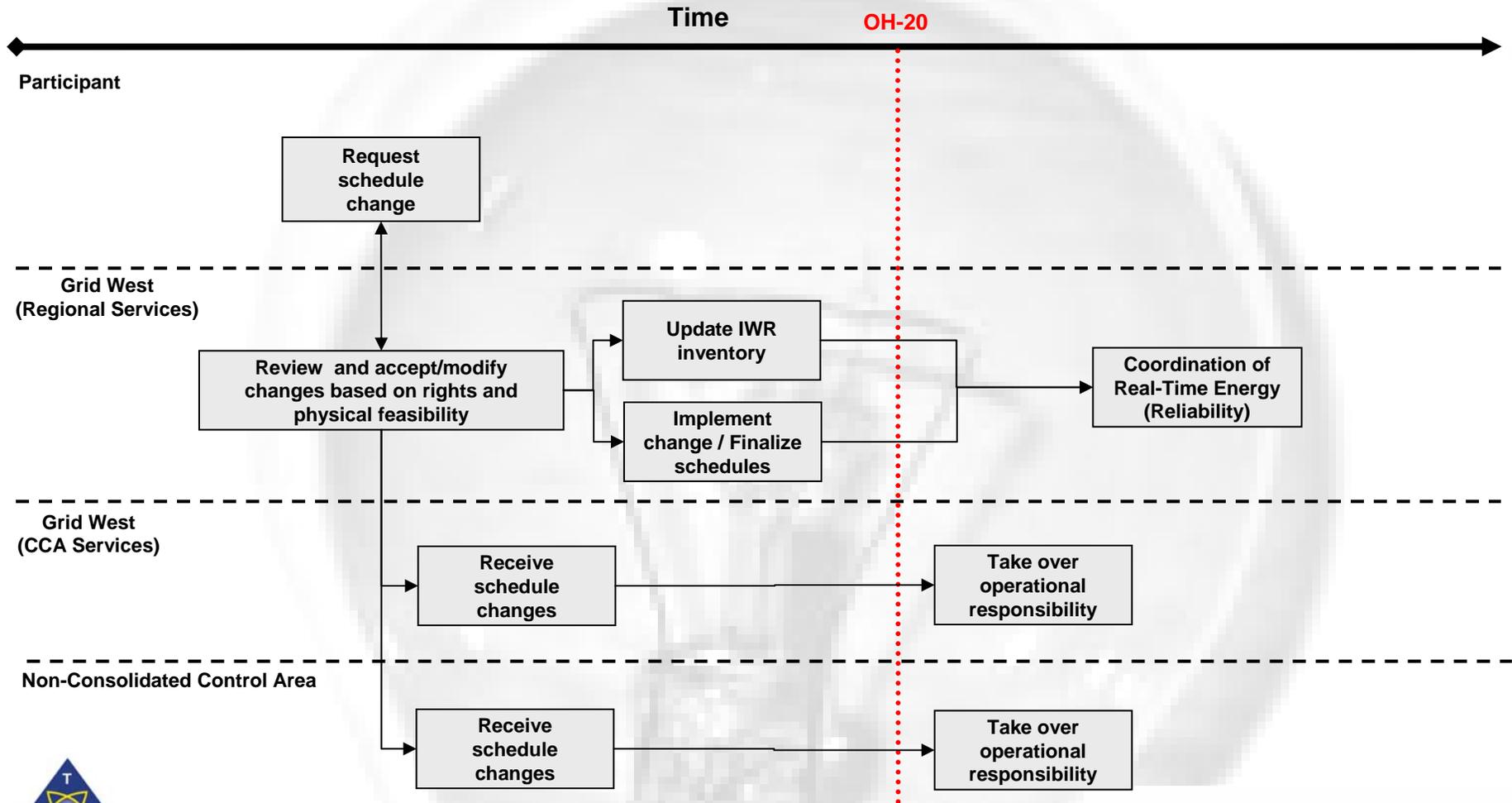
Note: Times shown are illustrative only to provide context.

* IWS: Injection/Withdrawal Schedule



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Note: Times shown are illustrative only to provide context.



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The following Scheduling key concepts are explained:

Pre-Day Ahead

Day-Ahead

Adjustment Period

Scheduling
Module 3a

- Rights Data Management
- Roles & Responsibilities
- Interchange Schedule Tags
- Schedule Adjustments
- Losses
- OASIS and ATC

Grid West will manage Injection & Withdrawal Rights (IWRs) for scheduling and market operation purposes:

- IWR Ownership Registry
 - Track initial rights ownership
 - Update rights ownership after reconfiguration auctions
 - Track rights positions and transactions

- IWR Modeling
 - Rights release time
 - Priority, if any
 - Scheduling locations (Injection/Withdrawal Points)
 - MW quantity

The proposed scheduling process assumes Grid West performs the following:

- Operate OASIS
- Accept and validate day-ahead schedules
- Administer interchange scheduling
- Administer reserve markets
- Provide day-ahead transmission information
- Respond to schedule adjustment request after day-ahead
- Perform control area Reliability/Balancing Authority responsibilities for the CCA

Day-ahead Scheduling:

- Participants submit balanced schedules according to their IWRs
- Grid West validates the submitted schedules
 - Match usage with rights ownership (performed initially by TOs)
 - Load/resource balance
- Grid West resolves over-subscription, if any
 - If the submitted schedules are infeasible, schedule adjustment/rejection is determined and implemented as necessary
 - Do TOs get the opportunity to provide necessary redispatch?
 - Pro-rata?
 - Least amount?
 - Priority?
- Resource schedules are communicated to control areas and Participants

Interchange and Checkout Basics:

- An interchange schedule has POD (Point-of-Delivery) and PORs (Point-of-Receipt) in different control areas
- The relationship of PODs/PORs and IPs/WPs (injection and withdrawal points) is as follows (subject to confirmation):
 - IPs/WPs stop at the boundary of the Grid West footprint
 - PODs/PORs can be outside the Grid West footprint
 - IPs/WPs and PODs/PORs can be the same for most locations within the Grid West footprint (should we make them the same?)
 - If IPs/WPs and PODs/PORs are not the same for some locations, a translation from IPs/WPs to PODs/PORs, and vice versa, will be provided by the Grid West
- Grid West has the necessary information to coordinate and create all E-tags
- Grid West has the necessary information to approve E-tags for schedules within the footprint
 - Need coordination of all CAs
- If available, the Western Interchange Tool (WIT) tool can be used to automate the checkout process

There is a need for tight coordination between control areas and Grid West:

- Grid West will handover all schedule evaluation responsibility to CA (including CCA) at T-S time (S to be determined)
- Grid West and CA communicate on data and evaluation model
- Grid West will be receiving change request before T-S and the host CA will after T-S

Schedule changes during the Adjustment Period:

- Requests are granted, adjusted, or denied based on rights and reliability considerations
- The reliability evaluation is based on the impact of the requested change on the transmission system.
 - AFC, PUF, IWRs
- Each request is evaluated independently and sequentially based on the request timestamp.
- Validation of rights ownership will be initially performed by TOs
 - If request is denied, requester can resubmit if time permits
- The evaluation response time is undefined. The mechanism limiting the changes needs to be defined

Can a loss methodology minimize cost shifting, be flexible enough to accommodate the status quo, yet be simple enough so that it is workable?

- Grid West will define a loss methodology under its tariff for all new service and IWRs acquired through RCS
- Losses will not impact the RCS solution

Grid West will operate a Regional OASIS service:

- Single scheduling interface
- Evaluation is based on the AFC and PUF
- Transmission requested outside of the RCS market is processed (see adjustment period)
- Public info will be posted. Examples include:
 - Loss factors, Reserve requirements and congestion regions, Forecasted system conditions (AFC, PUF, Loads), Pricing info
- Market information will be posted. Examples include:
 - RCS auction, RCS trading, Reserve auction, Reserve trading

AFC and PUFs information will be published on OASIS:

- Grid West will publish available flowgate capacity
- Grid West will publish path utilization factors
- The ATC is evaluated based the impact to Flowgate AFC:
(POD PUF for Flowgate – POR PUF for Flowgate) * MW
(Grid West will evaluate the simultaneous impacts to all flowgates.)
- AFC information will be updated periodically to reflect new commitments
- Publish PUF calculator similar to BPA

The following matrix summarizes the Beginning State design for Regional Scheduling Service:

| Description | Current Practice | Proposed Change | Opportunities/ Value |
|------------------------------------|--|---|---|
| OASIS | <ul style="list-style-type: none"> • Multiple OASIS. | <ul style="list-style-type: none"> • Single OASIS across the entire GWF. | <ul style="list-style-type: none"> • Process efficiency through Region-wide OASIS services. • Added information on the value of congestion. |
| Interchange Scheduling & E-Tagging | <ul style="list-style-type: none"> • E-Tags required for all interchange schedules (transactions) across multiple control areas. | <ul style="list-style-type: none"> • No E-Tags for internal (within the CCA) schedules. • Single E-Tags for Grid West transactions. | <ul style="list-style-type: none"> • Better E-Tag coordination across the GWF. • Reduced E-Tag volume and errors. |
| Checkout | <ul style="list-style-type: none"> • Multiple and “uncoordinated” checkout processes and players. | <ul style="list-style-type: none"> • Single checkout process administrated by Grid West. | <ul style="list-style-type: none"> • Process efficiency and reduced errors. |
| Flexibility | <ul style="list-style-type: none"> • Participants can modify schedules up to 20 minutes before the Operating Hour without financial consequences. | <ul style="list-style-type: none"> • No change required. • May “sell” flexibility in RCS. | <ul style="list-style-type: none"> • Better utilization of AFC through central coordination. |

The following issues have been identified during the initial round of design:

- **OATT Service Requests** - Can the scheduling proposal accommodate OATT-type services requests prior to the Day-Ahead Period?
- **Schedule adjustment/rejection**– What are the details of the schedule adjustment/rejection protocol? What are the mechanisms of limiting the number of requests?
- **Outage Coordination**– What roles do the CA and PNSC perform in outage coordination? What information should be published?
- **Losses** – Can a loss methodology minimize cost shifting, be flexible enough to accommodate the status quo, yet be simple enough so that it is workable?
- **Dynamic Schedule implementation**– How are non-energy products be tagged? How are transfer schedules from non-CCA to CCA and vice versa implemented?

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