# Transmission Service Liaison Group
# Grid West Implementation Options Report

– Draft –

– For Discussion Purposes Only –

July 26, 2005

## 1.0 EXECUTIVE SUMMARY

The Grid West conceptual design developed by the Transmission Service Liaison Group (TSLG) includes a plan for the turn-key implementation of all the regional and control area services that Grid West will provide as part of its Basic Features. This plan currently assumes a 24-month phased implementation starting immediately after Decision Point 4 (DP4), which will make these services available to the region in the middle to the later part of 2009.

Considering the anticipated value that the proposed services will provide to the region and the lead time required for the proposed implementation, the TSLG has begun to evaluate some activities that could start soon after Decision Point 2 (DP2) so as to more quickly realize the value that Grid West will bring to the region. Many Grid West functions are probably best implemented as part of the comprehensive package of functions that comprise the Basic Features of the conceptual design. Also, the functions that provide transmission services, will likely require a negotiated and signed Transmission Agreement for implementation, and therefore will be difficult to implement before DP4. However, there are certain activities related to the proposed transmission planning and control area services that could begin soon and would bring value to the region on a stand-alone basis. These activities are not dependent upon subsequent implementation of all the Basic Features proposed for Grid West services but they do represent a logical transition to some of them.

While TSLG did not try to investigate all potential near-term activities, it did identify some activities in the areas of planning and control area operations that appear to be good candidates for early implementation. The planning activities include the collection/coordination of planning data and conducting regional concept studies such as those recently done by the Rocky Mountain Area Transmission Study (RMATS). A more advanced planning activity could be consolidating service request queues and conducting certain service request related studies on behalf of transmission owners. The control area activities included Area Control Error (ACE) pooling for improved efficiency in the regulation function and possibly a way of facilitating markets for reserves and balancing energy.

In addition to beginning some transmission planning and control area related activities in the near-term, Grid West should also consider how to support or coordinate its near-term activities with other efforts under way in the region. Potential efforts include those of the Northwest Power Pool (NWPP), Seams Steering Group – Western Interconnection (SSG-WI) and Transmission Improvements Group (TIG) initiatives, OASIS consolidation and the WECC's Western System Model initiative. All these efforts have potential to shape the

future of northwest grid operations, and it is best for Grid West to be a cooperative and positive agent for change.

## 2.0 PURPOSE

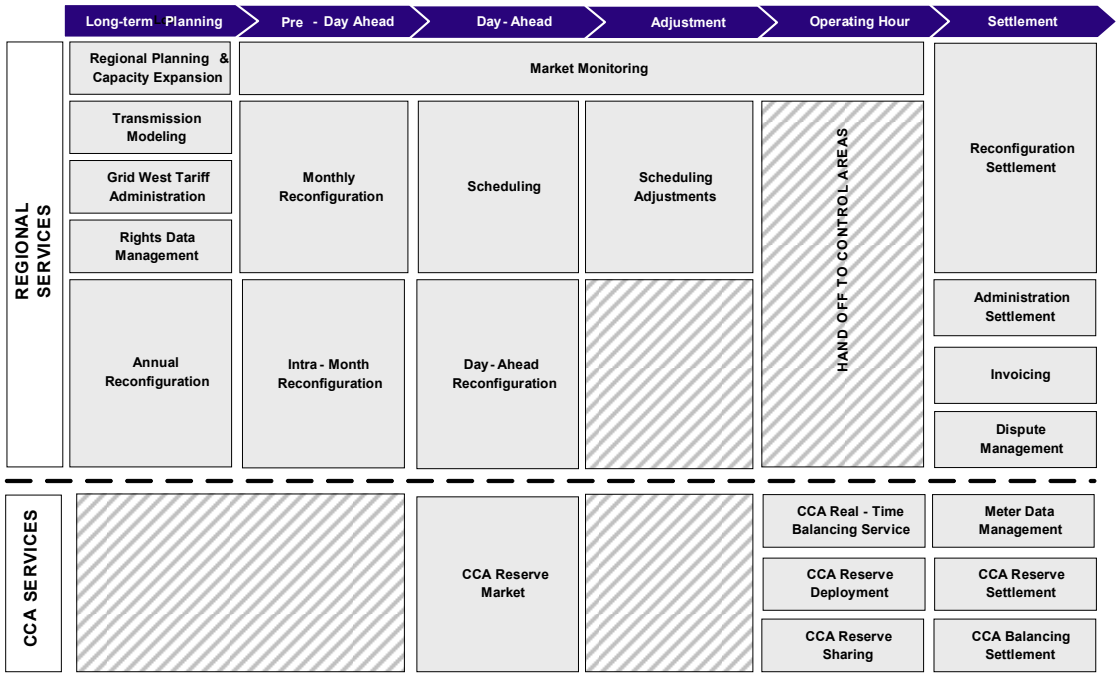
The purpose of this document is to describe an approach under which Grid West could engage in certain activities soon after DP2. These activities, related to the transmission planning and control area operations, will provide early value to the region and represent part of a logical transition to the ultimate implementation of the Grid West Basic Features. The proposed approach would be cost-effective, easily implemented, and would require limited infrastructure and staffing.

The document also identifies ongoing efforts in the region that Grid West should monitor and, as appropriate, should support, help to facilitate or integrate into its near-term activities.

## 3.0 GRID WEST NEAR-TERM ACTIVITIES

Based on the conceptual design developed by the TSLG, Grid West will provide the Regional and Consolidated Control Area Services illustrated in Figure 1 below when operational.

Figure 3.1 Grid West Basic Features



The Grid West conceptual design calls for a turn-key implementation of the above Basic Features over a two year period starting immediately after DP4. Based on the proposed phased implementation plan, services associated with these Basic Features may not commence until mid to late 2009. This paper explores the means for Grid West to begin activities that would realize the value of these services before DP4

In order to advance the availability of some of these services to the region, the TSLG has evaluated the potential to undertake some activities as soon as practical after DP2. These activities will bring immediate value to the region on a stand-alone basis and/or will be part of a logical transition to the implementation of the ultimate Grid West operational services.

The following activities have been identified as potential candidates for implementation soon after DP2:

- Transmission planning
  - Development of regional base cases and coordinated transmission planning studies
  - Centralized processing of long-term transmission service requests

- Control Area Functions
  - ACE Pooling
  - Facilitated bilateral trading of certain ancillary services

## 4.0 TRANSMISSION PLANNING ACTIVITIES

### *4.1 Activity Description*

When fully operational, Grid West will be responsible for the planning and expansion of the entire Grid West Managed Transmission system (GWMT) to comprehensively meet the needs of regional transmission users (for load growth, delivery of new generation sources, etc.) and maintain or improve existing reliability levels. The full transmission planning and capacity expansion services will include conducting transmission planning studies, approving expansion projects and conducting studies to analyze the impact of transmission service requests.

To facilitate the implementation of Grid West's Basic Features in this area, some near-term activities/functions are being proposed to begin soon after DP2. These activities/functions should provide immediate value to the region while at the same time serving as a step toward implementation of the Basic Features. The activities/functions that have been identified include:

- Development of regional planning base cases and coordination of transmission planning studies

- Administration of a centralized queue for processing of long-term transmission service requests on behalf of transmission owning utilities.

### *4.2 Value Proposition*

The near-term functions proposed here are expected to provide the following benefits to the region:

- Consolidate/coordinate the development of regional planning base cases.

- Coordinate transmission planning studies

- Centralized processing of long-term service requests by an independent entity

### *4.3 Major Activities*

Two major activities will be undertaken for the implementation of the Transmission planning functions proposed here:

- Development of regional planning base cases and coordination of transmission planning studies

- Centralized processing of long-term transmission service requests

These activities could start immediately after DP2. Development of the regional planning base cases would likely start first as these cases are a prerequisite for the other activity

### *4.4 Development of Regional Planning Base Cases and Coordinated Transmission Planning Studies*

#### *4.4.1 Overview*

The development of regional planning base cases, as well as transmission planning studies, is currently somewhat fragmented with several entities and groups involved in these efforts. Model development is performed by several entities including BPA, Idaho Power Company, PacifiCorp, NorthWestern Energy and Sierra Pacific Power Company. These entities develop models for their areas and the resulting models

are submitted to the WECC which uses them to create a model for the entire Western Interconnection.

Transmission planning studies are currently performed under multiple forums, e.g., the Northwest Transmission Assessment Committee (NTAC), the Rocky Mountain Area Transmission Study (RMATS), SSG-WI and BPA.

The proposed activities will help consolidate the model development efforts as well as coordinate the transmission planning studies listed above. These activities will continue through the full operation of Grid West as they are part of Grid West's Basic Features.

### *4.4.2 Timing*

The implementation of the activities proposed here could start immediately following DP2. The development of regional planning base cases should start first as the resulting cases will be required for the coordinated transmission planning studies.

### *4.4.3 Activity Mechanics*

The proposed activities will start with the creation of the Planning Committee and the hiring of a dedicated Grid West planning staff to develop the regional base cases and conduct the required studies. The Planning Committee will be organized in accordance with the Grid West Operational Bylaws. A total of 3 FTEs are expected to be sufficient to support these proposed initial activities.

The Planning Committee will undertake the following activities:

- Initiate work on the first annual transmission plan
- Help set the stage for the transition of these ongoing cooperative activities into Grid West sponsored activities.
- May provide assistance or advice in resolving transmission request disputes

The dedicated Grid West planning staff will perform the following tasks:

- Acquire and implement required tools:
  - Power Flow Tool – Powerworld, GE PSLF, PTI PSS/E

  - Production Simulation Tool – Grid View, MAPPS, Plexus, Couger
- Create and maintain a transmission planning data repository
- Development of base case models for submittal to the WECC
- Share transmission planning data repository with Transmission Owners and others as appropriate.
- Participate in joint transmission planning activities such as NTAC, RMATS, etc., while the first Grid West plan is being developed.
- Conduct transmission planning studies as requested by Planning Committee
- May provide assistance or advice in resolving transmission request disputes

### *4.4.4 Authority*

Grid West will need to be authorized to collect data, build and maintain a transmission planning data repository, and participate in joint study activities.

### *4.4.5 Cost Implications*

The primary cost drivers for undertaking the activities proposed here are summarized in Table 4.1 below.

**Table 4.1 Cost Drivers: Development of Regional Base Cases and Coordinated Transmission Planning Studies**

| Cost Category | Description |
|---|---|
| Labor | • Planning Committee<br>• 3 FTEs |
| Facilities | • No special facility requirements<br>• Minimal building space (~1,000 sq ft. total) |
| Systems | • Power flow tool<br>  • Powerworld, GE PLSF, PTI PSS/E<br>• Production simulation tool<br>  • Grid View, MAPPS, Plexus, Couger |
| Infrastructure | • Minimal telecom/network requirements<br>  ○ T1 line<br>  ○ GW voice<br>• Minimal corporate infrastructure |

| | |
|---|---|
| Outside Services | • Production costing – outsourced?<br>• HR (confirm) – general overhead<br>• Other staff |
| Other | • None |

## *4.5 Centralized Processing of Long-Term Transmission Service Requests*

### *4.5.1 Overview*

Transmission service requests are currently received and processed by individual Transmission Owners (TOs) in their capacity of Transmission Service Provider for their own facilities. When operational, Grid West will serve as the Transmission Service Provider for the GWMT for new service which inherently creates a centralized queue for receiving and processing transmission service requests.

A key benefit of having one entity process transmission service requests is to minimize the difficulty of making a set of requests to multiple providers for what is in effect a single request. Additionally, having one entity process the requests centrally provides a wider view of the overall impact of the request on the transmission system.

The proposed activities will allow Grid West to oversee and/or conduct impact and facility studies for long-term transmission service requests on behalf of the individual TOs. Service requests will continue to go to the individual TOs separately but the ability to make a single request will be investigated if the existing functionality can be leveraged to allow for a single request to be made.

### *4.5.2 Timing*

The implementation of the activities proposed here should start after the development of regional base cases and when coordinated transmission planning studies activities are under way (about 6 months later) as those activities will put in place the necessary tools, skills and data.

### *4.5.3 Activity Mechanics*

The implementation of the proposed activities will involve the following tasks:

- Hire the dedicated Grid West staff responsible for the proposed activities. 5 FTEs are expected to be required. These FTEs are in addition to the FTEs required for the development of the regional base cases and performing coordinated transmission planning studies identified in Section 4.4.
- Provide or contract for conducting impact and facility studies related to transmission service requests. At this point, Grid West would not be a provider of service but will perform these studies acting as an agent of the individual TOs who would still be obligated by their tariffs to provide studies.
- Develop procedures for conducting impact and facility studies using a standardized contract path ATC methodology.
- Implement facilities for accessing long-term transmission service requests from individual TOs who will continue to receive these requests.
- Create and maintain a regional long-term transmission service request database containing the requests obtained from individual TOs.
- Provide assistance in dispute resolution of transmission service and generation interconnection requests.

### *4.5.4 Authority*

In addition to being authorized to collect data and build and administer a transmission planning data repository, Grid West will also need to be authorized to have access to and process long-term transmission service requests from individual TOs, and conduct impact and facility studies for individual requests.

Individual TOs will continue to serve as the Transmission Service Provider under their existing OATTs[1].

### *4.5.5 Cost Implications*

The primary cost drivers for undertaking the activities proposed here are summarized in Table 4.2 below.

[1] Until Grid West becomes operational for scheduling of GWMT, it will not be in a position to issue IWR on a system-wide basis. Prior to that time, service would have to be provided under owner tariffs.

**Table 4.2 Cost Drivers: Centralized Processing of Long-Term Transmission Service Requests**

| Cost Category | Description |
|---|---|
| Labor | • Planning Committee<br>• 5 incremental FTEs (8 total FTEs) |
| Facilities | • No special facility requirements<br>• Minimal building space (~2,000 sq ft. total) |
| Systems | • Tools for accessing transmission service requests and/or creating centralized repository<br>• Additional licenses for power flow and simulation tools<br>• Transient stability tool<br>  • TSAT, EMTP<br>• Fault analysis tool |
| Infrastructure | • Minimal telecom/network requirements<br>• May required increase bandwidth for accessing transmission service requests |
| Outside Services | • Studies |
| Other | • None |

## 5.0 CONTROL AREA ACTIVITIES

### *5.1 Activity Description*

A key component of the Regional Proposal is voluntary consolidation of existing utility control areas into a single control area operated by Grid West. Establishing Grid West as an independent control area operator responsible for the Consolidated Control Area (CCA) will facilitate its ability to assume much broader reliability responsibilities for all of the GWMT as well as provide the following benefits:

- Reduced regulating reserve requirements

- Imbalance energy and ancillary service provision via markets
- Broader optimization of generation and transmission use
- More effective and efficient congestion management

To facilitate the implementation of Grid West's ultimate operational responsibilities in this area and to advance the realization of some of the benefits that will be associated with the consolidation of control area operations, some near-term control area activities are being proposed as candidates for implementation soon after DP2. These activities would provide immediate value to the region and at the same time help lay the foundation for Grid West to assume its ultimate operational responsibilities.

The control area activities that have been identified include:

- Area Control Error (ACE) Pooling
- Facilitated bilateral trading of contingency reserve, regulating reserve and imbalance energy

### *5.2 Major Activities*

The following major tasks will be undertaken for the implementation of the control area activities proposed here:

- Implementation of the ACE Pooling function described below
- Investigate viability/feasibility of facilitating bilateral trading of contingency reserve, regulating reserve and imbalance energy products.
- If appropriate, implementation of a means to facilitate bilateral trading of the above products.

Implementation of the regional ACE Pooling function will be undertaken independently of the facilitated bilateral trading activities. The facilitated bilateral trading activities will start with a viability/feasibility study to determine the value as well as the implementation logistics. The results of this study will be used to decide whether to proceed with implementation.

## 5.3 ACE Pooling Function

### 5.3.1 Overview

This activity involves the implementation of ACE Pooling based on the ACE Diversity Interchange (ADI) methodology. ADI is an established method [2] that offers a straightforward approach for pooling of the regulation requirements of participating control areas without adversely affecting system reliability. This is intended to provide benefits through a reduction in both the amount of regulating reserve required and the associated "wear and tear" on generators associated with excessive control action.

### 5.3.2 Value Proposition

The ACE Pooling function proposed here is expected to provide the following benefits:

- For participating control areas:
  - Reduction in regulating reserve requirements
  - Improvements in Control Performance Standard (CPS2) compliance
  - Reduction in "wear and tear" on generators as a result of reduced required control action. May also lead to lower performance penalties to generators.
- For region/customers:
  - Lower prices as a result of reducing participating control area costs described above
  - Step toward wider ancillary services markets with more participants and lower costs
  - Step toward making independent AS suppliers available to small LSEs
- For Grid West:
  - Establishes basic infrastructure for next steps (communication, computers, etc.)
  - Builds staff and skill as platform for future control area service stages
  - Establishes customer relationships

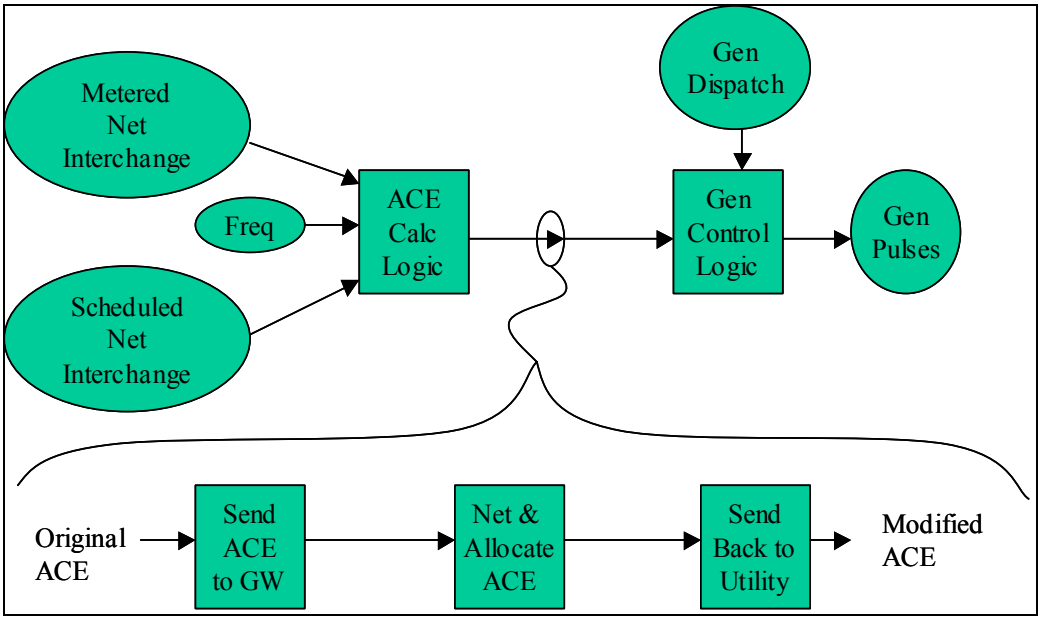
[2] ADI is currently implemented in the NPCC/PJM regions. Participating control areas include NYISO, ISO-NE and PJM.

### *5.3.3 Timing*

The implementation of the ACE Pooling function could start immediately after DP2. Operation of this function would continue through full operation of the CCA and may continue after full CCA operations if there are participants that do not join the CCA.

### *5.3.4 Activity Mechanics*

Grid West will develop the ability to receive ACE signals, apply appropriate modifications, and return a modified ACE to each participant representing the minimum control action required after taking into consideration the ACE diversity of all participants. The modified ACE would be limited to a range between the raw ACE and zero. Each participant could measure its control performance using the modified (smaller) ACE rather than its original raw ACE, resulting in improved compliance.




The top half of the above diagram depicts today's implementation of the regulation function for a single utility control area. The insert in the bottom half of the diagram depicts the additional steps that will be implemented as part of the proposed ACE Pooling function. The original (raw) ACEs produced by participating control areas are transmitted to

Grid West. An algorithm tests all ACEs for diversity and makes any modifications (reductions) as appropriate. In the absence of diversity, no adjustments are made. Then the modified ACEs are sent back to the control areas providing regulation. All control areas can utilize the modified ACE and pulse their generators assigned to provide regulation accordingly. Or, if preferred, they may control to the raw ACE to minimize inadvertent energy accumulation. In either case, control performance can be measured using the modified ACE, enhancing compliance.

The detailed logic for this pooling will need to be researched and developed and may include limits on the adjustment any control area's ACE can receive (likely based on $L_d$).

Following are some features of ACE Pooling using the ADI approach:[3]

- GW separately sums the positive and negative ACE values of all participants, and nets these sums
    - If zero, all modified ACEs are set to zero
    - Otherwise the modified ACEs of those in the smaller group are set to zero, and those in the larger group are allocated a pro rata share of the difference
- Participants' control performance is measured using the modified smaller ACE
- The interchange associated with ADI becomes a part of inadvertent interchange for each participant
    - Since inadvertent is managed under a separate agreement, no settlement is required; but
    - Any settlements deemed to be appropriate would be between participants and not involve GW other than its determination of ADI interchange

[3] IEEE Transaction on Power Systems, Vol. 10, No. 2, May 1995

- GW tracks ADI in order to inform the utilities what their energy movements were that may need bilateral settlement

Since no price data is utilized to influence ACE Pooling, an economic optimization would not occur. Each participant would retain individual responsibility for meeting the NERC Control Performance Standards (CPS1 and CPS2) and the Disturbance Control Standard (DCS).

Consideration may also be given to implementing a "feed forward" approach to AGC, under which control response can be reduced—further reducing overall regulating reserve requirements—without compromising the ability to meet NERC standards. This would be based on a "forward look" at system requirements based on scheduled load and resource movement.

### *5.3.5 Cost Implications*

The implementation of the ACE Pooling function begins with establishing communication channels between the participants and Grid West to exchange ACE data and the required control signals in real-time. This infrastructure is already in place at Dittmer, the proposed primary site for Grid West operations, to support the Pacific Northwest Security Coordinator (PNSC). Once implemented, the function could be performed automatically, with no staffing required (system failure mode would be failsafe, resulting each participant following its raw ACE). The exact nature of the implementation will determine any additional resources and cost.

The primary cost drivers for the implementation of the ACE Pooling function are summarized in Table 5.1 below.

**Table 5.1 Cost Drivers: ACE Pooling Function**

| Cost Category | Description |
|---|---|
| Labor | • Potential administrative staff, I/T support<br>  • BPA staff may provide IT support if PNSC system is used.<br>  • PNSC staff may have to be augmented to monitor/administer operations. |
| Facilities | • Same as PNSC facilities |
| Systems | • Computer platform (PNSC) with application running ADI |

| | |
|---|---|
| Infrastructure | • Communication system (capable of sending/receiving dynamic signals (PNSC) |
| Outside Services | • May require Areva to implement ADI application |
| Other | • Small changes to participant systems |

## *5.4 Facilitated Bilateral Trading of Contingency Reserve, Regulating Reserve and Imbalance Energy Products*

### *5.4.1 Overview*

Grid West Basic Features will include the operation of reserve and imbalance energy markets for the CCA. These markets are expected to provide significant benefits to CCA participants as well as will allow non-CCA participants the ability to provide ancillary service resources to the CCA.

In order to advance the realization of some of the benefits that the reserve and imbalance energy markets are expected to provide, it is proposed that Grid West consider potential means to facilitate bilateral trading of contingency reserve (spinning and non-spinning), regulating reserve and imbalance energy products. Grid West should undertake viability/feasibility studies to determine the value that this capability would provide and the implementation logistics. These studies will define the types of contingency reserve, regulating reserve and imbalance energy products that may be supported and should evaluate whether there will be enough interest among potential participants to justify the implementation.

A decision to facilitate bilateral trading capabilities would be made based on the results of the above viability/feasibility studies.

### *5.4.2 Value Proposition*

The facilitated bilateral trading activities proposed here would improve the ability to meet contingency reserve, regulating reserve and imbalance energy requirements efficiently, providing net benefits to both buyers and sellers of these products. The expected benefits can be summarized as follows:

- For participating control areas:
  - Access to additional sources of supply or demand for contingency reserve, regulating reserve and imbalance energy
  - Increased liquidity of reserve and energy imbalance products
  - Better economic information (price transparency) on reserve and imbalance energy costs
- For region/customers:
  - Lower prices because of reducing ancillary service costs
  - More participants and competition in selling ancillary services should lower costs
  - New access to ancillary service markets for Generators
  - Step toward independent ancillary services supplier available to small LSEs
  - Establishes certification processes, performance measures, etc. that allow broader participation in system control
- For Grid West:
  - Establishes basic infrastructure for next steps (communication, computers, etc.)
  - Builds staff and skill as platform for future control area services stages
  - Broader customer relationships

### *5.4.3 Timing*

Activities associated with the facilitation of bilateral trading of contingency reserve, regulating reserve and imbalance energy products could start immediately after DP2. These activities should start with the proposed viability/feasibility study to determine the value of the proposed activity as well as the implementation logistics. A decision regarding whether to implement should be made based on the results of the study. Implementation could follow immediately after that decision.

### *5.4.4 Activity Mechanics*

The first step in this activity should be to perform a viability/feasibility study to establish the following:

- Definition of standard products - standard contingency reserve, regulating reserve and imbalance energy products will be defined to facilitate trading activities.

- Determine any transmission requirements for trading the products – Will the products be traded at established locations, or can Grid West facilitate trades between control areas using ATC (as is done under the NWPP Pro Rata Reserve Sharing program)?

- Determine interest among potential participants – a key consideration to facilitated bilateral activities is the level of participation. Low levels of participation may not justify implementation. Interest in the different types of products will be determined separately as the level of interest as well as implementation costs for each type of product will differ.

- Determine the most effective trading platform – could be an electronic bulletin board but will depend the degree of market participation.

- Determine fees to access the trading platform – this will likely be based on a subscription agreement and fee.

- Determine Grid West role – Grid West may act as a broker of the bilateral transactions.

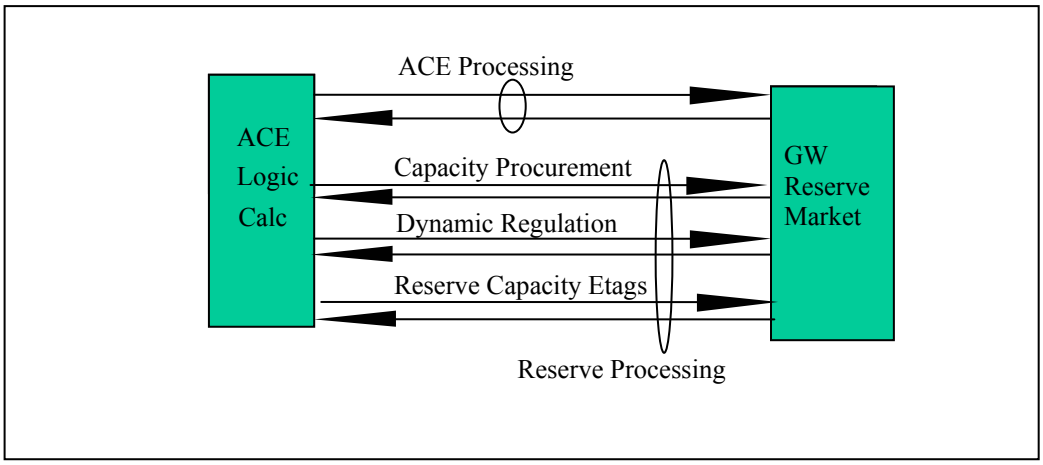
- Determine technical and commercial protocols for trading activities and related operation logistics – commercial protocols will define standard products and address contractual items between Grid West and transaction counterparties. Technical protocols will address operations issues associated with the implementation of the different types of transactions.

A decision regarding the implementation of the proposed facilitated bilateral trading capabilities will be made based on the results of the above viability/feasibility studies. This decision will depend on the anticipated level of participation and costs/complexity of implementation of the proposed products.

The implementation of contingency and regulating reserve products are quite distinct. Regulating reserve requires continuous (every 4 seconds) real-time signals which result in dynamic generator movement to meet the regulation requirement of control areas. The implementation of contingency reserve is triggered by a contingency of significant proportion, resulting in generators providing this type of reserve having to take action based upon either a binary or ramp request. The characteristics and certification of generators providing these reserves

are also different as those providing regulating reserve are required to respond immediately to a signal while those providing contingency reserve have ten minutes to achieve the desired value.

Both types of reserve products are generally traded prior to the operating hour and the generators providing them would commit for a minimum of one hour. Purchasing one of these reserve products would result in a two-stage acquisition/settlement which Grid West would track. In addition to tracking the initial purchase before the hour, Grid West could also track and verify the energy requested/delivered during an hour.




Grid West could facilitate bilateral trading of reserve products by accepting and processing (perhaps through an electronic bulletin board)reserve bids and offers. Providers could offer and control areas could bid for the regulating and contingency reserve products. Grid West could broker trades based on criteria that would aim to maximize benefits subject to relevant transmission constraints. Should transmission constraints become active (and transmission is not available for the service), the result would be that the reserve market would bifurcate into multiple markets. Energy settlement associated with regulation will be determined, and could be monetary or in kind (it could be handled in the same fashion as in the ACE Pooling function if settlement is determined to be appropriate for ADI.) In any case, Grid West would not take possession of any capacity or energy.

Trading of imbalance energy products involves trades of energy for portions of an hour to satisfy energy imbalance requirements. Trading of this type of product could be introduced as either a brokered bilateral market (relatively simple) or a market in which Grid West buys and sells

energy (as it will in performing the RBS for its CCA). The trading could initially be brokered, and evolve to allow Grid West a more direct role as it is given more control over the use of transmission in real-time. The evolution would culminate in the use of a security constrained economic dispatch (SCED), setting the stage for full consolidation of control areas under Grid West and implementation of the TSLG Real-time Balancing Service (RBS). This activity could facilitate earlier implementation of a more efficient real-time dispatch, reducing costs for all who choose to participate.

The implementation of all proposed products will have to be evaluated carefully with special consideration given to the cases where the party providing the product is outside the host control area where the product is being used. Implementation in these cases will require coordination between both control areas in order to implement the transaction. For the contingency reserve and energy imbalance products, implementation could perhaps use tags to communicate adjusted interchange schedules between the control areas and/or the parties providing the service. Implementation for the regulating reserve products will be a little more difficult as this type of product requires a continual real-time signal to move the generator providing the reserve in response to the regulation requirements of the control area using the product.

### *5.4.5 Cost Implications*

The implementation of capabilities to facilitate bilateral trading of the proposed products will require new systems to accept bids and offers from buyers and sellers (probably an electronic bulletin board), monitor credit restrictions, create and document trades, inform parties appropriately, and generate settlement and billing statements. The implementation/operation of all transactions can leverage existing EMS systems but changes may be required to these systems to support special requirements particularly for the implementation of regulating reserve products.

The implementation of the reserve products could perhaps be incorporated into the PRRS function currently implemented in the PNSC system. The proposed implementation of the ACE Pooling function would allow Grid West to facilitate bilateral trading of regulating reserve between participants; regulating reserve trades would be incorporated into the ACE Pooling program whereby control signals to the participants

involved in the trade would be appropriately modified, per the terms of the trade.

The facilitated bilateral trading activities will require one real-time (24x7) monitoring position requiring a staff of six to oversee the operation of the trading activities, performance monitoring, and backup support of the market. Grid West system failure mode would be failsafe, with suspension of Grid West service when necessary. A billing and administration staff would also be necessary. A total of 2 to 3 FTEs may be sufficient.

The implementation of the imbalance energy products may require a much greater commitment to infrastructure if it is decided that the implementation will be based on a RBS function such as the one proposed for the Grid West operational responsibilities. The key here will be the implementation of a robust State Estimator function as well as a SCED function.

The primary cost drivers for the implementation of the facilitated bilateral trading capabilities proposed here are summarized in Table 5.2 below. These cost drivers will be refined as the implementation of the proposed capabilities is better defined.

**Table 5.2 Cost Drivers: Facilitated bilateral trading of contingency reserve, regulating reserve and imbalance energy products**

| Cost Category | Description |
|---|---|
| Labor | • 6 Market Operator FTES<br>• 2-3 Billing/Admin FTEs |
| Facilities | • Minimal office space (temporary)<br>• PNSC facilities (?) |
| Systems | • Bulletin Board / Messaging system<br>• Incremental changes to existing TO EMS systems<br>• State Estimator and RBS functions<br>• Settlement system (?) |
| Infrastructure | • Redundancy |
| Outside Services | • Market Monitor (?) |
| Other | |

## 6.0 OTHER EARLY ACTIVITIES

In addition to the proposed transmission planning and control area activities identified above, Grid West should also be involved with other compatible efforts under way in the region. All these efforts are either related or can represent a means for Grid West to establish its presence in the region and develop the ultimate functionality required to provide the Basic Features.

The Grid West transmission owners intend to support continuing work on market monitoring. For example, the Seams Steering Group - Western Interconnection (SSG-WI) has been working on a proposal for a pilot program to demonstrate that it would be feasible to implement West-wide market monitoring in manner that is cost-effective and beneficial.

Relevant activities include:

- TIG initiatives – TIG is evaluating similar near-term activities. To the extent possible and practical, Grid West may look to integrate its efforts with the efforts of TIG to avoid duplication.
- BPA's flow-based scheduling activities – BPA is evaluating flow based methodologies similar to the ones that will be ultimately required for the implementation of Grid West's Basic Features. Grid West should monitor BPA's experience with these methodologies as it may be able to leverage, and use as guidance, BPA's experience for its own implementation.
- WECC initiatives – the WECC is sponsoring the development of a Western Network System Model (WSM). This model could be the foundation for the model needed for the implementation of Grid West's Basic Features. Grid West should monitor this activity and perhaps participate.
- Common OASIS