AESO Market Services
Stakeholder Session

May 26, 2010
Guiding Principles for 2010

Clear Interpretation of Policy Framework

Share our Research & Learnings from Other Markets

Review Progress Against Objectives 12 – 18 months

Definition of the Problem

Share our Data & Analysis

Iterative Consultation if New Ideas, New Concerns, New Data

STEP 1: Consultation: reason for Rule amendment/Inclusion
STEP 2: Consultation: narrow scope of possible solutions
STEP 3: Consultation continues
STEP 4: Consultation: commence ISO Rule drafting process
STEP 5: Finalize ISO Rule
STEP 6: AUC Process

AESO issue paper identifying reason for rule change
AESO issue discussion paper
AESO issue recommendation paper
AESO issue draft rule
AESO issue final rule and submit to AUC
8:30 – 8:50 a.m. • Update on Market Services 2010 Priorities
8:50 – 9:00 a.m. • FEOC Regulation – AESO Implementation Update
9:00 – 9:30 a.m. • Wind Integration
  • Status of WPF Technical Rule
  • Short Term Mitigation Plans
  • Forecasting
9:30 – 9:40 a.m. • Supply Surplus
9:40 – 10:00 a.m. • OR Market Redesign – 1st stage of implementation
10:00 – 10:15 a.m. • Coffee Break
10:15 – 10:45 a.m. • Market Suspension
10:45 – 11:15 a.m. • Interties
  • Restoration
  • Framework
11:15 – 11:45 a.m. • Q&A
11:45 – 11:50 a.m. • Closing Remarks
Fair, Efficient and Open Competition Regulation
AESO Implementation Update

Ron Smith
Market Services Stakeholder Session
May 26, 2010
Completed AESO Obligations

- Revised ISO Rules
  - 1.8 – Appointment of an Agent
  - 1.10 – Market Participant Behaviour Guidelines
  - 10.10 - Load Outage Reporting
- Published Load Outage Report and the Energy Market, DDS and AS Merit Order Reports
- Refined Long Term Critical Outage and System Coordination Plan-Approved Outages Reports
Impending AESO Obligations

• Section 6(2)(a) of the FEOC Regulation requires the AESO to develop IT systems capable of identifying and tracking the market participant that holds the offer control for each offer made to the power pool

• The offer control information will augment the Merit Order Reports

• Initial scoping of the implementation requirements is underway
Impending AESO Obligations

• The AESO will publish a Recommendation Paper that outlines the proposed implementation plans at the end of Q2 2010

• The goal of the AESO is to develop processes, IT systems, etc. that will facilitate as seamless transition for market participants as possible

• The AESO welcomes all stakeholder input
Preferential Information Sharing

• Section 3(2) of the FEOC Regulation provides a one year exemption for all AESO approved agency agreements

• Exemption expires August 31, 2010

• On or before the expiry date, the AESO requires:
  • ‘order’ from the Alberta Utilities Commission, or
  • confirmation that ‘order’ is not required

• The AESO posted a letter May 26
Next Steps

- AESO will publish and seek feedback on the Recommendation Paper
- Input from stakeholders will be factored into the implementation plans for the offer control reporting requirements
- The AESO will provide periodic project updates
Questions?

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Wind Integration Program

Jacques Duchesne
Market Services Stakeholder Session
May 26, 2010
Agenda

• Overview of the Wind Integration Program
• Status of Wind Technical Rule
• Wind Power Forecasting
• Short Term Integration Plans
Wind Integration – 2010 Objectives

- Short term wind integration management plan designed and implemented to safely integrate 1100 MW of wind by end of 2011
- Long term wind integration plan designed for 4000 MW of wind by 2013
Wind Technical Rule – Status

- 2nd draft of rule issued for consultation – May 6th
- Comments back on 2nd draft – May 21st
- AESO responses to comments – June 10th
- AUC filing – June 28th
Wind Technical Rule – Objective

- Power limiting
- Add to applicable wind power facilities
  - ramp rate limiting and
  - over frequency control
- Add wind power forecasting requirements to all wind power facilities
The Wind Technical Rule is:

- Applicable to all wind power facilities; any considerations for existing and new facilities will be addressed in the Rule.
- In most cases the technical intent remains the same as in the predecessor standard.
- Primarily to add requirements for physical infrastructure at wind power facilities for wind power forecasting capability, power limiting, ramp rate limiting and over-frequency control.
- Proposing effective date of 180 days post AUC approval to provide existing facilities a reasonable period of time to add or modify equipment at wind generating facilities.
Wind Power Forecast – Status

• Contract signed with WEPROG – Jan 15
• Wind power forecast based on global weather data available on AESO website – June 03
• Communicate with wind farms owners with specific requirements (IT protocol) – June 2010
• Combined wind forecast data from individual wind farms and global weather data – Nov 2010
• Integrate wind power forecast into AESO’s systems – early 2011
Wind Power Forecasting – Benefits

- Reliable system operation – allows the System Controller to incorporate wind power forecast into operations
- Fair and efficient market operation – minimize the invoking of wind power management (i.e. curtailment)
- Efficient use of reserve – use additional reserve only when high wind power variability is forecast
Short Term Integration Plans – Status

• Discussion paper posted – May 6
• Comments due back – May 28 (extended one week)
• Recommendation paper – target June 30
• Implementation of short term solution – ongoing
• Issue long term Discussion Paper – Q4 2010
Draft Principles

• Any potential suite of wind integration tools must ensure the safe and reliable operation of the system
• Market solutions are preferable to administrative solutions
• The energy market merit order is the primary tool for balancing energy requirements on the system
• All generation should be treated fairly while recognizing their unique characteristics
• Ancillary services are a tool to protect the system from events that cannot be reasonably controlled
Short Term Integration

Wind must offer incremental ancillary services. Wind must comply with over dispatch and EMMO.

Wind must forecast (wind pays) and A/S purchased to accommodate forecast wind production.

Wind Power Management (WPM) as a last resort and A/S purchased to minimize WPM.

WPM used to manage wind ramp ups, A/S for ramp down.

Wind must offer firming service when required.
Three tools can be implemented for use by 2011:

1. Incremental operating reserve such as regulating reserve and contingency reserve can be used to help manage wind variability

2. Wind power management can be used to limit wind generation when the power cannot be accommodated on the system

3. The energy market merit order can be ramped up and down to balance the system
Short term mitigation – Next steps

- Ancillary services
  - Is there a role for incremental volumes of Ancillary Services? Regulating and Contingency Reserve are useful tools. Both Active and Standby Reserve can be used to mitigate wind.
  - If there is a role for incremental Ancillary Services, develop a procurement plan. It may be based on the wind power forecast or near real-time operational considerations. Active and Standby Reserve may play a role in the plan.
Short term mitigation – Next steps

- Wind Power Management (WPM)
  - Determine the conditions that trigger WPM and reflect these in an ISO WPM rule
  - Develop a WPM tool to distribute wind power limits and curtailment across facilities. The tool must be in place and operational by 2011. Lack of a tool and protocol would likely result in more wind curtailment than required in order to ensure reliability.

- Integrate the wind power forecast into the overall integration package
Questions?

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Supply Surplus Initiative Update

Ruppa Minhas
Market Services Stakeholder Session
May 26, 2010
Update

- Supply Surplus Discussion Paper posted for stakeholder comment on April 29, 2010
- Stakeholder comments due May 28, 2010 (extended from original date of May 20, 2010)
Supply Surplus Paper Components

- Provides a background and assessment of:
  - Existing rules and procedures
  - Previously proposed protocols
  - Options for managing supply surplus conditions

- Paper proposes a short term solution and initiates discussion on the long term options
Purpose of Rule Review

- Supply Surplus was originally included as part of the Market and Operational Framework for Wind (“MOF”)
- Stakeholder comments on the MOF recommendation paper for wind suggested that further and broader consultation was required
- To ensure that the rules and procedures are updated so that all generators are treated fairly
- To ensure the rule is positioned properly to consider future changes
Factors that Contribute to Supply Surplus Conditions

- Low levels of:
  - Demand
  - Exports

- High levels of:
  - Base-load generation
  - Imports
  - Wind Generation
  - Hydro availability during spring run-off
Options for Consideration

• Short term:
  • No exemption for wind
  • No exemption for co-generators
  • Scheduling of exports within T-2 or within the delivery hour
  • Voluntary Generator Curtailment Request (VGCR)

• Long term:
  • Market rules for wind generation
  • Voluntary Generator Curtailment Program (VGCP)
MOL vs. MSG

- The MOF recommendation paper for wind proposed a new term: Minimum Operating Level (MOL)
- Both MOL and Minimum Stable Generation (MSG) are physical limits, determined by the participant
- The current definition of MSG may benefit from some refinement
- AESO questions the need for both MSG and MOL
Risks if Supply Surplus Conditions are Not Managed Appropriately

- Challenges maintaining supply-demand balance
- Potential for control area violations
- Impact on generators and load from over-supply
Questions?

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Operating Reserve Market Redesign – 1st Stage of Implementation

Daniel Clark
Market Services Stakeholder Session
May 26, 2010
• Status update on current Operating Reserve (OR) market re-design initiatives

• Review phase 1 implementation strategy
  • Full D-1 procurement
  • Improved OR market reporting
Status Update

- OR re-design overview – March 4, 2010
- OR re-design revised Recommendation Paper
- Response to comments – May 27th, 2010
OR Re-design Implementation – Phase 1

- Multi-day procurement to be eliminated – All volume procured on a day ahead basis (D-1)
- All other market aspects will remain unchanged
- Improved OTC reporting
Volume Changes

- All ACTIVE & STAND-BY volume will be procured on D-1
- Example: Our volume forecast indicates we will require 250MW of active spinning reserve on-peak

**BEFORE**
- D-5: 40 MW
- D-4: 24 MW
- D-3: 14 MW
- D-2: 9 MW
- D-1: 163 MW

**AFTER**
- D-1: 250 MW
Procurement Schedule

- On Monday  
  D-1 is Tuesday
- On Tuesday  
  D-1 is Wednesday
- On Wednesday  
  D-1 is Thursday
- On Thursday  
  D-1 is Friday
- On Friday  
  D-1 is Saturday, Sunday and Monday

- On holidays D-1 is the last business day before the holiday. If a holiday occurs in conjunction with a weekend, then the holiday is procured in addition to the weekend.

- No volume will be procured on D-2 through D-5, although this option still exists if chronic D-1 problems are encountered.
General D-1 Timeline

WATT-EX
9:00 a.m. All markets open – AESO posts bids
9:40 a.m. Active Regulating Reserve market closes
9:50 a.m. Active Spin Reserve market closes
10:00 a.m. Active Supplemental Reserve market closes
10:10 a.m. Stand-by Regulating Reserve market closes
10:20 a.m. Stand-by Spin Reserve market closes
10:30 a.m. Stand-by Supplemental Reserve market closes

OTC*
10:10 a.m. Required volumes email sent to participants
10:30 a.m. Deadline to receive OTC offers from participants
11:15 a.m. Volumes awarded to participants

*All OTC times are approximate
Improved OTC reporting

• Currently two OTC reports available on AESO website
  • Daily OTC transactions report
  • Weekly Market Report
• Updates to the existing daily OTC transactions report
  • Volume weighted average of trade price for each product by on-peak and off-peak
  • Consistency with other reports
### ASP Daily OTC Transactions

#### ACTIVE RESERVES

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<td>350.00</td>
<td>666.67</td>
<td>680.00</td>
<td>700.00</td>
<td>700.00</td>
<td>380.00</td>
<td>639.19</td>
<td>177.94</td>
</tr>
<tr>
<td></td>
<td>Volume (MW)</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>25</td>
<td>15</td>
<td>35</td>
<td>50</td>
<td>26</td>
<td>54</td>
</tr>
<tr>
<td>Off Peak</td>
<td>Premium ($/MWh)</td>
<td>3.43</td>
<td>7.00</td>
<td>6.00</td>
<td>6.00</td>
<td>6.00</td>
<td>10.00</td>
<td>10.00</td>
<td>7.92</td>
<td>3.94</td>
</tr>
<tr>
<td></td>
<td>Activation ($/MWh)</td>
<td>80.00</td>
<td>40.00</td>
<td>30.00</td>
<td>30.00</td>
<td>30.00</td>
<td>30.00</td>
<td>30.00</td>
<td>33.98</td>
<td>51.67</td>
</tr>
<tr>
<td></td>
<td>Volume (MW)</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>
Implementation Timeline

• Go live date: Monday July 5, 2010
  • D-1 on July 5th will include all remaining volumes
  • D-1 volumes will incrementally increase each day
  • Full D-1 volume – Friday July 9, 2010
• Updated OTC report to be available online – July 5, 2010
Questions?

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Market Suspension Rule Review

Ruppa Minhas
Market Services Stakeholder Session
May 26, 2010
Agenda

- Background
- Purpose of discussion paper
- Guiding principles of market suspension rule review
- Pricing methodology
- When market suspension is considered
- Market management tool failure
- AIES system failure
- Non-competitive outcomes
- Next steps
- Discussion/Questions
Background

• Market suspension rule in place since 1999
• Rule in place today is similar to original rule, minor updates in early 2000
  • Rule review and update to the rule is required
• Issued Identification paper published for stakeholder comment in July 2009
Purpose of Market Suspension Discussion Paper

• Outline options for updating the market suspension rule

• Update pricing methodology
Guiding Principles of Market Suspension Review

- Market suspension must be used as a last resort
- The market should not be suspended for normal market activity
- The market price should be visible and transparent to all competitors
- Rules should be fair and reasonable for all market participants
- Market suspension rule changes must balance design complexity and implementation simplicity
• Under the current rule 6.9.4, the price when a market suspension is declared is:
  • System Marginal Price (SMP) will be $50/MWh in the event of a blackout
  • SMP will be set at the last block receiving an energy market dispatch prior to the energy market suspension
  • If AUC declares a market suspension, SMP is set at the price ordered by the AUC
<table>
<thead>
<tr>
<th>Similar day demand patterns</th>
<th>The Pool Price would be set at an administrative price, which compares demand patterns using historical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 day rolling average</td>
<td>The Pool Price would be set equal to the 30 day rolling average</td>
</tr>
<tr>
<td>Reference Price</td>
<td>The Pool Price would be set equal to the Transmission Must Run reference price</td>
</tr>
<tr>
<td>Status Quo</td>
<td>No change to the market suspension pricing methodology from today</td>
</tr>
<tr>
<td>Same day of the week</td>
<td>The Pool Price would be set using the weighted average of the four most recent same day of the week prices</td>
</tr>
</tbody>
</table>
Market Management tool failure

- Continue to operate the market if possible
- Options: limited market operation or market suspension upon failure of tool
- Limited market operation upon failure of tool
  - Energy market operates using last merit order prior to the outage
    - Paper merit order
  - DDS market suspended
    - Relies on automated systems
  - Generators operating in Ancillary Services (AS) market continue to operate
    - If additional AS required, System Controller (SC) would direct assets using the last AS merit order
- Payments to suppliers on the margin suspended
  - Relies on automated systems
Market management tool failure (cont’d)

• Suspend all markets upon failure of tool – not a preferred option
  • SC would still be using the last merit order prior to the outage as a starting point for the energy and AS markets

• Primary difference between limited market operation and this option:
  • Price is set administratively if market is suspended
  • SC is not required to follow the merit order if market is suspended
• Stakeholders generally supported the relevance of the current market suspension rules related to reliability, such as:
  • Blackout
  • SC forced to abandon the workplace
  • AIES breaks up into two or more electrical islands

• Appropriate to handle on a case by case basis
Non-competitive outcomes

• The AESO questions the need to have rules to suspend the market for non-competitive outcomes

• There are measures already in place for insufficient energy supply or supply surplus over an extended period of time and non-competitive conditions as a result of a system failure

• AESO seeks stakeholder feedback
Next Steps

- Discussion paper will be out for comment soon
- Consultation will follow the normal stakeholder consultation process
Questions?

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Intertie Restoration Update

Kris Aksamitis
Market Services Stakeholder Session
May 26, 2010
Discussion Paper Released

- Transmission Regulation obligates AESO to restore existing interconnections
- AESO Discussion Paper identified options
  - LSSi and GRAS
- Stakeholder Comments Received April 16, 2010
  - AESO responses should be complete early June
AESO Workgroups Formed

• LSSi workgroup formed to develop product for import restoration
  • First meeting held May 11
  • Product design workshops scheduled for June 1 in Calgary and June 8 in Edmonton
  • Full workgroup meeting scheduled for June 15
• Forthcoming deliverables Include:
  • Product design
  • AESO Recommendation Paper for LSSi implementation
  • Procurement process and ISO Rule changes where required
AESO Workgroups Formed

• GRAS workgroup formed for export restoration
  • First meeting held May 17
  • Workgroup agreed to examine a range of possible options for increasing export capacity (including GRAS)
  • Next meeting scheduled for June 4

• Forthcoming deliverables include:
  • List of options and a ranking protocol to assess priorities
  • AESO Recommendation Paper for export restoration implementation
  • Procurement process and ISO Rule changes where required
Questions?

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Intertie Framework

Darren McCrank
May 26 Stakeholder Session
May 26, 2010
- Principles of design
- Real-time dispatch/scheduling (priced bids and offers)
- Transmission rights
- Product priority
- Available Transfer Capability (ATC) allocation tiebreaker
• Current practice is Last In, First Out (LIFO) on each intertie at hh:45

• New rule required when you have multiple interties to/from multiple jurisdictions sharing ATC (Sask & B.C. interties)

• Proposed options (stakeholder feedback requested):
  • LIFO at xx:yy before the hour
  • AESO cuts off submissions once shared ATC is met
  • Pro-rata between scheduling participants at xx:yy
  • Pro-rata between lines at xx:yy
• Comments due May 28
• Short Term Plan – ATC allocation tiebreaker
  • Issue draft rule for consultation June 2010
  • File rule with AUC August 2010
• Long Term Plan – Intertie Framework
  • Respond to stakeholder comments June 2010
  • Issue recommendation paper September 2010
  • Consult on recommendation paper Q4
  • Implement recommendation 2011
    • Rule/product/tariff development
    • System tool upgrades as required
Process

**Short term plan draft**
- Rule – ATC allocation
- Tie breaker

**Long term plan –**
- Intertie framework

**Steps:**
- **STEP 1:** Consultation: reason for Rule amendment/Inclusion
- **STEP 2:** Consultation: possible options and solutions
- **STEP 3:** Consultation: narrow scope of possible solutions
- **STEP 4:** Consultation continues
- **STEP 5:** Consultation: commence ISO Rule drafting process
- **STEP 6:** Finalize ISO Rule
- **STEP 7:** AUC Process

AESO issue paper
- Identifying reason for rule change

AESO issue discussion paper

AESO issue recommendation paper

AESO issue draft rule

AESO issue final rule and submit to AUC

Long term plan – Intertie framework

Short term plan draft rule – ATC allocation tie breaker
Questions

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Questions?