

Stakeholder Comment Form

TCM: Rule 9.4 AUC Re-Filing Proposal Paper

Date of Request for Comment: December 3, 2009
 Period of Consultation: December 3, 2009- January 15, 2010

Stakeholder: ENMAX

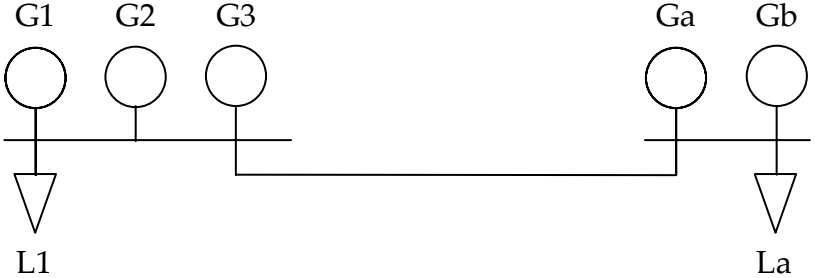
Section of Paper	Description	Stakeholder Comments
1 Executive Summary	An overview of the key discussion points and proposals contained in the paper.	ENMAX’s comments with respect to the following Executive Summary statements are provided below: <ul style="list-style-type: none"> • <i>The AESO does not recommend using any pay as bid protocol;</i> • <i>Severe market distortions are not constraint management issues and should be dealt with using other appropriate actions;</i> • <i>The definition of “local load pocket.”</i>
2 Introduction	A brief history of Quick Hits rule development and reason for the paper.	No comments.
3 Purpose	A brief history of TCM Rule 9.4 development and reason for the paper.	No comments.
4 Background		No comments.
5 Recap of Commission Findings in the TCM Decision	A review Commission FEOC and public interest	<i>[T]he AESO believes that it would be useful to review the Commission findings related to objections on the grounds of public interest and FEOC... to put the discussion of Commission directions in context.</i>

Section of Paper	Description	Stakeholder Comments
	findings.	<p>According to s. 8(9)(a) of the <i>Electric Utilities Act</i>, a member of the Independent System Operator must act honestly, in good faith, and in the public interest. In ENMAX’s view, the requirement to act in the public interest implies that the AESO must give significant weight to cost minimization in developing the constraints management rules. Loads pay the bills at the end of the day, and the economic welfare of the public is an important component of the public interest. The public interest should generally receive more weight than other considerations, such as administrative simplicity or a desire to preserve a single price for all generators (provided, of course, that there are FEOC-preserving alternative rules that meet Alberta’s legislative requirements).</p> <p><i>In the AESO view, the ruling supported the recommended rule design related to TCM as a real time protocol, relying mainly on economic dispatch of the merit order following the dispatch of TMR, and did not see a requirement for compensation for constrained down generation under regulation.</i></p> <p>ENMAX agrees with the AESO’s interpretations that TCM is a real-time protocol and that constrained-down payments are not required, but notes that there are viable alternatives to the AESO’s proposals around economic dispatch of the merit order in the presence of congestion, as discussed in section 6.3 below.</p>
5.1(1) Economic Dispatch	AESO use of merit order for dispatch is discussed.	<p><i>The Commission ruling on this item clearly permits the use of reverse merit order to dispatch upstream generation as consistent with and permitted under regulation.</i></p> <p>ENMAX agrees that the merit order should determine dispatch, subject of course to reliability requirements. “Reverse” merit order is nothing more than dispatching down the merit order, as the AESO does during every demand down-ramp.</p> <p>ENMAX has no objection to the use of generator-funded DDS as an alternative to RMO assuming DDS payments are very small, but cautions that in many cases DDS actually</p>

Section of Paper	Description	Stakeholder Comments
		<p>constitutes a second subsidy from downstream generators to upstream ones. (The first subsidy arises from the downstream generators' loss of competitive advantage on the <u>delivered</u> cost of energy [energy + transmission], which results from the fact that generators make no material contribution to bulk transmission costs.) Generators located where their output helps alleviate transmission constraints contribute to DDS payments to generators located where their output would exacerbate congestion but for those payments. DDS payments therefore constitute a perverse incentive (albeit a small one so far) to locate generation in the wrong place. DDS would be fairer and would send a better price signal if upstream generators were required to pay for it.</p> <p>ENMAX notes that, if the pool price is established by the intersection of the unconstrained merit order and the demand curve, as discussed in greater detail below, "price reconstitution" becomes unnecessary because TMR will not affect the market price. Consequently, DDS could (at least in theory) be eliminated. Should generators wish to continue to use DDS to manage their risk of being constrained down, it would make sense to have it paid for by generators located upstream of binding constraints.</p>
<p>5.1(2) Pool Price Impact</p>	<p>Transmission constraint impact on market is discussed</p>	<p><i>The AESO notes the Commission recognizes that the TCM Rule use of the energy market merit order to constrain downstream generation impacts the market price and such impact is expected and is acceptable so long as the AESO strives to minimize the price impact.</i></p> <p>It should be noted that congestion necessarily affects the total cost of providing energy (though congestion-related costs are often less than the cost of the additional wires that would be needed to relieve it), but it need not affect the "market price." Indeed, the <i>Transmission Development Policy</i> dated December 22, 2003 states (p.15) that, "In principle, real-time congestion or constraints should not alter or distort market prices." Since methods of resolving congestion are available that do not alter the "market price" at all and that result in lower congestion costs than the AESO's currently proposed TCM approach, those alternative methods should be favoured over the AESO's currently</p>

Section of Paper	Description	Stakeholder Comments
		<p>proposed TCM approach.</p> <p><i>The AESO interprets the Commission findings to mean that the price impact of the TCM Rule is reasonable under current and anticipated market conditions.</i></p> <p>Stakeholders have too little information about “anticipated market conditions” in the context of transmission congestion to evaluate whether this statement is valid or not.</p>
5.1 (3) Compensation	A review of the requirement for compensation for being constrained down	No comments.
5.1(4) Transmission “rights”	Generator’s “right” to access the AIES is discussed	No comments.
5.1(5) Use of TMR/DDS	AESO use of TMR/DDS is discussed.	No comments.
5.2(1) Long term investment impact	TCM impact on long term investment decisions is reviewed.	No comments.
5.2(2) Use of business practices	AESO use of business practices for constraint management is discussed	No comments.
6 Discussion of Commission Directions in the TCM Decision		No comments.
6.1 Clarify the Scope of the		ENMAX agrees with having one rule for real time and a separate rule for the planning

Section of Paper	Description	Stakeholder Comments
TCM Rule		stage. Clearly, the real-time rule must account for whatever congestion management mechanisms are arranged at the planning stage.
6.2 Clarify the TMR/TCM Rule relationship		<p><i>Contracted TMR is used when it is available and effective in managing the constraint. ... Use of TMR is either foreseeable or unforeseeable ... Use of directed TMR is unforeseeable ... The AESO considers foreseeable TMR to be TMR that is required to meet forecast reliability criteria...</i></p> <p>ENMAX suggests that the rules employ the terms “contracted TMR” and “uncontracted TMR.” The main question associated with TMR types in the TCM context is, “Which providers will be dispatched first?” and the answer is that contracted TMR should always be used before uncontracted TMR. The terms “foreseeable” and “unforeseeable” are less clear because the AESO may foresee a need for TMR but in an unpredictable set of hours, or may foresee a need for TMR too short a time in advance to negotiate a contract.</p> <p><i>A local load pocket refers to a load that is somewhat isolated from the rest the system in that it is better served by local generation.</i></p> <p>Can the definition of “local load pocket” be made more explicit? This definition appears to be subjective and somewhat situation-dependent.</p>
6.3 Consider ENMAX Pay as Bid Approach		<p>Before providing comments on section 6.3 of the TCM paper, ENMAX will provide a simple example of the pay-as-bid approach. We will also provide a slightly modified approach that addresses some of the concerns the AESO raised about the pay-as-bid approach; this modified approach still meets the requirements of the Commission’s TCM decision and of Alberta’s overall regulatory framework. ENMAX will also present its views on the resulting allocation of costs between energy and transmission. The examples make use of the following diagram, which shows generators and loads in western and eastern regions connected by a transmission path.</p>

Section of Paper	Description	Stakeholder Comments																																
		<div style="text-align: center;">  </div> <p>For the remainder of ENMAX’s comments, the pay as bid approach will be referred to as “PAB,” the modified approach will be referred to as “DCP” (for “downstream clearing price”), and the AESO’s proposed protocol will be referred to as “TCM” (not to be confused with the more generic “transmission constraints management.”)</p> <p>Under all constraint management approaches, the merit order and generation dispatch for the entire system in the unconstrained case is as follows:</p> <table border="1" data-bbox="892 917 1822 1068"> <thead> <tr> <th>ENTIRE SYSTEM</th> <th>G1</th> <th>G2</th> <th>Ga</th> <th>G3</th> <th>Gb</th> <th>L1</th> <th>La</th> </tr> </thead> <tbody> <tr> <td>Unconstrained MW</td> <td>1000</td> <td>500</td> <td>500</td> <td>50</td> <td>0</td> <td>1050</td> <td>1000</td> </tr> <tr> <td>Offer/Bid</td> <td>0</td> <td>25</td> <td>50</td> <td>60</td> <td>80</td> <td></td> <td></td> </tr> <tr> <td>Max MW</td> <td>1000</td> <td>500</td> <td>500</td> <td>300</td> <td>200</td> <td></td> <td></td> </tr> </tbody> </table> <p>The total load is 2050 MW, the west-to-east flow on the transmission path is 500 MW, and the pool price is \$60/MWh as set by the marginal generator (G3). Under the PAB approach, \$60/MWh is the pool price <i>regardless of what adjustments are required to alleviate any congestion that may arise</i>. The total cost to consumers for this hour, excluding wires costs, is \$60/MWh × 2050 MW = \$123,000.</p> <p>Now assume that the transmission path is constrained to 400 MW, so that 100 MW of upstream generation must be curtailed and 100 MW of downstream generation must be</p>	ENTIRE SYSTEM	G1	G2	Ga	G3	Gb	L1	La	Unconstrained MW	1000	500	500	50	0	1050	1000	Offer/Bid	0	25	50	60	80			Max MW	1000	500	500	300	200		
ENTIRE SYSTEM	G1	G2	Ga	G3	Gb	L1	La																											
Unconstrained MW	1000	500	500	50	0	1050	1000																											
Offer/Bid	0	25	50	60	80																													
Max MW	1000	500	500	300	200																													

Section of Paper	Description	Stakeholder Comments																																												
		<p>constrained on (there is no change in demand). At this point the generation dispatch changes to that shown in the next two tables, which deal with the upstream (west) and downstream (east) regions, respectively. The <i>X</i> in the “upstream merit order” is the export from the region, while the <i>I</i> in the “downstream merit order” is the import into that region; both are shown simply to demonstrate supply/demand balance in each region.</p> <table border="1" data-bbox="1012 500 1705 656"> <thead> <tr> <th>UPSTREAM SIDE</th> <th>G1</th> <th>G2</th> <th>G3</th> <th>L1</th> <th>X</th> </tr> </thead> <tbody> <tr> <td>Constrained MW</td> <td>1000</td> <td>450</td> <td>0</td> <td>1050</td> <td>400</td> </tr> <tr> <td>Offer/Bid</td> <td>0</td> <td>25</td> <td>60</td> <td></td> <td></td> </tr> <tr> <td>Max MW</td> <td>1000</td> <td>500</td> <td>300</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1054 730 1663 886"> <thead> <tr> <th>DOWNSTREAM SIDE</th> <th>Ga</th> <th>Gb</th> <th>I</th> <th>La</th> </tr> </thead> <tbody> <tr> <td>Constrained MW</td> <td>500</td> <td>100</td> <td>400</td> <td>1000</td> </tr> <tr> <td>Offer/Bid</td> <td>50</td> <td>80</td> <td></td> <td></td> </tr> <tr> <td>Max MW</td> <td>500</td> <td>200</td> <td></td> <td></td> </tr> </tbody> </table> <p>On the upstream side, regional supply and demand balance with G2 as the marginal generator, so in isolation the region would have an energy price of \$25/MWh. However, because Alberta has a single-price market, under PAB both G1 and G2 would still receive the unconstrained price of \$60/MWh. From a price perspective, therefore, the upstream generators in the same position they would have been had the transmission system been unconstrained. From a volume perspective, G2 and G3 produce less than they otherwise would have, but as noted in the Commission’s congestion management decision, Alberta’s regulatory framework provides generators with a reasonable opportunity, not an unconstrained opportunity, to access the transmission system. Note that nothing in the PAB model would preclude the use of DDS to assign the constraints among upstream generators.</p> <p>At the other end of the transmission path, the “downstream” merit order is used to dispatch</p>	UPSTREAM SIDE	G1	G2	G3	L1	X	Constrained MW	1000	450	0	1050	400	Offer/Bid	0	25	60			Max MW	1000	500	300			DOWNSTREAM SIDE	Ga	Gb	I	La	Constrained MW	500	100	400	1000	Offer/Bid	50	80			Max MW	500	200		
UPSTREAM SIDE	G1	G2	G3	L1	X																																									
Constrained MW	1000	450	0	1050	400																																									
Offer/Bid	0	25	60																																											
Max MW	1000	500	300																																											
DOWNSTREAM SIDE	Ga	Gb	I	La																																										
Constrained MW	500	100	400	1000																																										
Offer/Bid	50	80																																												
Max MW	500	200																																												

Section of Paper	Description	Stakeholder Comments
		<p>generators on (taking account of any TMR contracts that may exist). This is exactly the process proposed by the AESO in its TCM protocol, since it amounts to nothing more than moving up the whole-system merit order and dispatching only those generators that are able to relieve the constraint.</p> <p>One possible approach to paying downstream generators is “pay as bid,” under which generators would receive the higher of pool price or their offer price. In this example, Ga would get the pool price of \$60/MWh (which, as noted previously, is determined by the intersection of the whole-system demand and unconstrained-supply curves), while Gb would get its offer price of \$80/MWh. In another approach, all downstream generators would receive the “downstream clearing price” (“DCP”) of \$80/MWh. In either case, ENMAX suggests that all payments to generators that occur above the unconstrained pool price be added to the transmission tariff as congestion charges. Doing so avoids any change to the pool price and correctly allocates costs between energy and transmission.</p> <p>Under the PAB approach, the total cost to consumers (excluding wire costs) would be $\\$60/\text{MWh} \times 1450 \text{ MW} = \\$87,000$ for the upstream generators, plus $\\$60/\text{MWh} \times 500 \text{ MW} = \\$30,000$ for Ga, plus $\\$80/\text{MWh} \times 100 \text{ MW} = \\$8,000$ for Gb, for a total of \$125,000. Since the energy charge does not change from the unconstrained case (it remains, by definition, at $\\$60/\text{MWh} \times 2050 \text{ MW} = \\$123,000$), the \$2,000 difference gets treated as a congestion charge and gets recovered through transmission rates.</p> <p>Under the DCP approach, the total cost to consumers would be \$87,000 for the upstream generators (as before), plus $\\$80/\text{MWh} \times 600 \text{ MW} = \\$48,000$ for <i>all</i> downstream generators, for a total of \$135,000. In this case the difference between the actual cost and the unconstrained cost is $\\$135,000 - \\$123,000 = \\$12,000$, which amount would be added to the transmission tariff as a congestion charge.</p> <p>Note that under the AESO’s proposed TCM approach, the total cost to consumers would be $\\$80/\text{MWh} \times 2050 \text{ MW} = \\$164,000$.</p>

Section of Paper	Description	Stakeholder Comments
		<p>Despite some similarities, neither PAB nor DCP constitute locational marginal pricing (“LMP”). Under LMP, the upstream generators would receive \$25/MWh, the clearing price established by the upstream supply and demand curves, as opposed to the \$60/MWh they would receive under either PAB or DCP. (In effect, the unconstrained price becomes the <i>floor price</i> for generators.) Also, under LMP the upstream loads would pay \$25/MWh and the downstream loads would pay \$80/MWh, rather than both paying \$60/MWh under PAB and DCP, in accordance with Alberta’s single-price model.</p> <p>It should be noted that demand response could also be used to eliminate the congestion. Since the benefits of demand response could include the deferral or elimination of the need for a new transmission line costing millions or billions of dollars, ENMAX submits that that deferral value should be reflected in prices paid for demand response.</p> <p>In summary, under PAB or DCP:</p> <ul style="list-style-type: none"> • the pool price (or more correctly the system marginal price) is set by the intersection of the total system supply and total system demand curves; • the resulting generation dispatch is the same as it would be under the AESO’s TCM protocol; • upstream generators would receive pool price for their actual production, but would not be compensated (other than possibly through DDS payments) for being constrained down; • downstream generators would receive either: (a) the higher of pool price or their offer price [the PAB model]; or (b) the “downstream clearing price” [the DCP model]; • the energy cost for the hour would be <i>pool price</i> × <i>total system demand</i>; • all generation costs in excess of the energy cost [i.e., the sum, over all constrained-on generators, of (<i>actual output</i>) × (<i>generator price</i> – <i>pool price</i>)] are allocated to transmission as a congestion charge.

Section of Paper	Description	Stakeholder Comments
		<p>Having provided the example, we will now return to commenting on the AESO’s constraints management document.</p> <p><i>The energy market design depends upon a single clearing price which reflects market conditions including supply and demand on the entire system, supply scarcity and congestion.</i></p> <p>PAB and DCP both result in a single clearing price that reflects supply and demand on the entire system. Scarcity costs—which are <i>transmission</i> scarcity costs, not generation scarcity costs—are correctly reflected in transmission charges. The pool price is not affected by congestion (as required by the <i>Transmission Development Policy</i>), and the correct energy and transmission price signals are sent. In the TCM approach, transmission scarcity masquerades as supply scarcity.</p> <p><i>The Transmission Development Policy recognizes that a congestion free transmission system is a necessary part of the current market design. However, it also recognizes that congestion will occur and that a congestion management plan is necessary. Under regulation, some congestion is anticipated to be part of a normally functioning “unconstrained” electricity market.</i></p> <p>ENMAX fully agrees that congestion is part of a normally functioning market, and notes that it is only when congestion costs exceed wires costs that new lines should be contemplated.</p> <p><i>Congestion, by definition results in otherwise in-merit energy being constrained and the potential for price impacts.</i></p> <p>Under PAB and DCP, congestion does not affect the energy price. Congestion has, of course, an impact on consumers’ total costs.</p>

Section of Paper	Description	Stakeholder Comments
		<p><i>The TCM protocol should be robust enough to manage any constraint regardless of duration or size and allow the normal functioning of market fundamentals to occur in a manner consistent with market design. The TCM protocol is not intended to deal with situations where the constrained event leads to market distortions which prevent the market price from reflecting underlying market fundamentals. As in any case where this unlikely event might occur, other mitigating out of market actions would be taken to manage the event such as using OPP 801 Supply Shortfall, market suspension or in the case where non-competitive behavior is suspected, discussing the event with the MSA.</i></p> <p>PAB and DCP allow the normal functioning of the market to occur in a manner consistent with market design. As these protocols rely on the energy market merit order, they do not prevent the market from reflecting underlying market fundamentals. ENMAX agrees that cases involving non-competitive behaviour should be dealt with by the MSA.</p> <p><i>The proposed TCM protocol provides a practical, effective in-market solution to a market issue and causes a minimal amount of market price impact.</i></p> <p>The proposed TCM protocol actually produces the <u>maximal</u> amount of market price impact, because it prices the maximum MW (total system demand) at the maximum price (the highest bid or offer). PAB and DCP are market-based because they rely entirely on energy market bids and offers.</p> <p><i>The proposed TCM protocol manages constraints seamlessly within the current market framework. Any solution must work within the current framework of a single clearing price for the market and common transmission price for the province. While no method being considered is perfect, this method is effective because it:</i></p> <ul style="list-style-type: none"> • <i>causes the least market distortion</i> • <i>encourages the proper market responses in most cases, e.g., encourages action by imports and price responsive load and discourages exports through the market price signal</i>

Section of Paper	Description	Stakeholder Comments
		<ul style="list-style-type: none"> • <i>discourages generation in the constrained area through volumetric curtailments, and</i> • <i>minimizes the AESO's direct involvement in the market while allowing participants to respond to the price signal.</i> <p>As noted above, the AESO's proposed approach actually causes the maximal market distortion. While raising the system-wide price in a downstream region may encourage the proper market response, raising the price in the upstream region exacerbates the problem by bringing more upstream generation into merit and possibly causing upstream load to get off the system. Under PAB and DCP, the upstream price does not change but the downstream price still encourages the correct market response. No AESO involvement in the market, other than dispatching from the appropriate merit orders, is required.</p> <p><i>The proposed TCM protocol provides the best price signal. The use of EMMO provides the most appropriate directional price signal to market participants in all existing congestion circumstances. The price will be set by dispatching the merit order and, where competition exists, the highest priced dispatched offer or bid will set the price. It is possible that lower priced imports will displace higher priced Alberta generation and this is an appropriate outcome. The AESO does not view the pool price as being artificially elevated. It is appropriate for the pool price to rise since less supply is available to the market during congestion. Participants that can relieve the congestion will respond to the price signal and participants that cannot are constrained.</i></p> <p>ENMAX believes that it is more appropriate, in the case of a shortage of transmission, that transmission congestion costs rise. Higher congestion costs, rather than higher energy costs, provide a more direct signal that investment in wires <i>may</i> be appropriate.</p> <p><i>The proposed TCM protocol is aligned with policy. The AESO notes that the Transmission Policy stipulates that real time congestion shall not alter or distort prices. The AESO believes that the proposed TCM protocol will result in the least amount of price distortion</i></p>

Section of Paper	Description	Stakeholder Comments
		<p><i>and the most practical application given the alternatives and is most in line with policy intent.</i></p> <p>ENMAX does not believe that a protocol that results in maximal pool price impact is in keeping with policy. Both PAB and DCP produce zero change in pool price from the unconstrained case.</p> <p><i>The proposed TCM protocol is practical and effective. The TCM protocol makes practical, effective use of the energy market merit order and participant offers to the market. Effective upstream generation is dispatched off in reverse merit order and effective downstream generation is dispatched on according to relative economic merit. This establishes the real time market clearing price in a transparent manner. Downstream dispatch is undertaken in a manner which is consistent with the anticipated price impact of congestion events on demand and imports.</i></p> <p>PAB and DCP will result in the same generation dispatch but much lower costs for consumers. Under PAB, the downstream price is no lower than it would have been absent congestion, and if higher prices are needed to attract additional downstream supply, they are available. The same is true under DCP, the only difference being that all—rather than some—of the downstream resources have access to the higher price.</p> <p><i>The proposed TCM protocol is an in-market solution. The market can provide for a price that reflects the “scarcity” created by transmission congestion – there is no need to go out of market. Scarcity pricing also leads to loads facing the full price of transmission congestion since the cost of congestion is reflected in prices.</i></p> <p>Both PAB and DCP are in-market since they make use of the energy market merit order, and they reflect the true cost of congestion through transmission charges.</p> <p><i>The AESO would prefer to use “in market” solutions first before going to “out of market”</i></p>

Section of Paper	Description	Stakeholder Comments
		<p><i>solutions. As an example, the AESO considers dispatching the merit order and using it to set SMP to be an “in market” solution. ... The pay as bid protocol is an administrative, non-transparent, “out of market” solution. This is at odds with the current market design which centers on a single pool price.</i></p> <p>Both PAB and DCP use the same dispatch process as TCM, they just set the pool price and generator payments differently. Neither uses “out of market” solutions and both result in a single pool price.</p> <p><i>A form of this pay as bid approach was implemented in a the previous version of OPP 521 and during a May 2007 constraint event resulted in setting posted prices which failed to signal the need for economic imports and downstream demand response despite the fact that the SC was close to initiating supply shortfall procedures under OPP 801. ... An analysis of the static merit order for the hour indicated that an hourly price of \$17.06 / MWh would have been the unconstrained price absent the congestion. Imports did not respond given the Mid C price at the time of \$55 /MWh, probably would not have responded to the “unconstrained” price either.</i></p> <p>Under both PAB and DCP, the price paid for energy in the downstream region rises above the unconstrained price. The difference between the price actually paid to generators and the pool price shows up as a congestion charge. There is nothing to prevent the price paid from rising to signal the need for additional supply in the downstream region.</p> <p><i>The AESO would note however that our analysis of more recent SOK events indicate that the payments to “constrained on” generators under a pay as bid model would result in similar hourly payments as the TCM protocol in all but the highest priced hours.</i></p> <p>It is mathematically impossible for payments under PAB or DCP to exceed those under TCM. Admittedly, under some circumstances, they may be close. Often, however, PAB and DCP payments would be much less than TCM payments.</p>

Section of Paper	Description	Stakeholder Comments
		<p><i>In the May 2007 example, imports may have responded to the higher price signal because the mid-C price at the time was \$55 /MWh. Using a \$10 /MWh transportation cost for delivery to Alberta, the delivery price of \$65 may have been attractive enough for imports to be scheduled placing downward pressure on market price.</i></p> <p>Nothing in PAB or DCP would prevent such a response.</p> <p><i>The pay as bid protocol could lead to further out of market responses or market suspension. The proposed unconstrained pool price does not send the appropriate real time price signal to market participants to reflect changed market conditions.</i></p> <p>Neither PAB nor DCP are “out of market.” Both send real-time <i>transmission</i> price signals and have no greater risk of leading to market suspension than TCM. A real-time price signal can be sent quite easily because the AESO could post the real-time “downstream” price as well as the real-time SMP and hourly pool price. (In fact, the real-time ancillary services price could be added to the list.) The real-time downstream price is easily derivable from the energy market merit order and the real-time dispatch.</p> <p><i>The pay as bid protocol is unfair and may encourage a race to the top. Consider a situation where two identical and adjacent downstream generators are both dispatched to full. Generator A offered its energy below the unconstrained price and therefore receives the unconstrained price while Generator B offers above the unconstrained price and receives its offer price. The two generators receive different payments for their energy, and Generator A is encouraged to offer its energy at a higher price above the unconstrained price. The result is that the price increases with the potential for perverse offer behavior in addition to the side payments. To avoid a race to the top, additional rules mitigating this perverse offer behavior may be needed, such as locking down offers at the end of the T-2 period. This may result in other potential undesirable market impacts.</i></p>

Section of Paper	Description	Stakeholder Comments
		<p>ENMAX does not agree that PAB is any more unfair than paying certain generators TMR-related prices under contracts or Article 11. With respect to a “race to the top,” it would work in congested hours only, and would certainly attract the attention of the MSA. Using DCP instead of PAB would eliminate this concern altogether.</p> <p><i>Transmission constraints may occur when new generation is added to the system, until new transmission facilities are built. Under the pay as bid protocol, the unconstrained merit order produces a lower market price since it assumes that all new generation is unconstrained and available to be dispatched. The same situation would occur in a supply area like KEG when transmission lines are down for planned maintenance. In both these cases there is less incentive for load to accelerate transmission build or to minimize planned outages. Load already receives the benefit of unconstrained transmission through the lower market price under the pay as bid protocol.</i></p> <p>PAB and DCP would start with the same merit order that TCM would use. Thus, any generator that is unavailable for acceptable operational reasons—such as being at the end of a line that is down for maintenance—would be unavailable under TCM, PAB, and DCP. Since this loss of supply results in a higher price in all cases, loads <i>do</i> have an incentive to ensure the timely construction and maintenance of transmission lines that connect generators whose presence lowers the <i>delivered</i> cost of energy.</p> <p><i>Transmission constraints may occur during outages at cogeneration facilities even though the transmission system was not designed nor intended to handle these facilities at full output. Constrained cogeneration supply would lower the market price generated from the unconstrained merit order even though a transmission solution was not warranted or appropriate. There are cases where cogeneration facilities built to primarily serve local load will offer their full electrical output to the AIES during unplanned periods of reduced onsite oil production. This increase in availability may result in a constraint. In this case, the market price would be impacted under the pay as bid proposal.</i></p>

Section of Paper	Description	Stakeholder Comments
		<p>ENMAX agrees that the existing market design can lead to situations in which there are signals to build even when a transmission solution is neither warranted nor appropriate. The simplest (partial) resolution under the current rules is to use DCP. Consider the following simple example. A single generating unit—either a new unit or the cogen unit that is temporarily producing excess energy—is at the upstream end of a constrained path, while the “rest of the system” is at the downstream end. While the upstream generator would receive the unconstrained price, the rest of the generators would receive the downstream clearing price, which is equal to the price that would have arisen had the upstream generator not existed; this is the outcome one would expect. The difference between the downstream price and the unconstrained price, times the downstream volume, would show up as a congestion charge, which it should since it provides an accurate reflection of the cost of congestion in that hour. Given that this situation would arise in a small number of hours and that the impact of a single generator should be small enough that the “whole system” and “downstream” supply curves should not be materially different, the total congestion charge in respect of the line would be far less than the cost of an upgrade. Thus, there would be no (economic) signal to build where none is warranted. If the congestion cost in respect of a new generator remains below the cost of a transmission upgrade, it means that the generator is poorly located and actually provides a negative benefit to loads.</p> <p><i>In order to avoid such situations under the pay as bid protocol, criteria would have to be developed to distinguish these temporary or permanent situations from more “normal” constraints so that the market price is not unduly impacted. The more exceptions that there are to a protocol, the more difficult it is to understand and implement.</i></p> <p>ENMAX sees no greater need for exceptions to PAB or DCP than to TCM.</p> <p><i>Pay as bid has operational implementation issues...</i></p> <p>Any congestion management rule will have operational implications. The AESO’s paper</p>

Section of Paper	Description	Stakeholder Comments
		<p>cited a case in which the TCM protocol would have cost \$2.3 million compared to \$0.1 million for PAB, which suggests that some expenditures on operational issues is warranted. In any case, PAB and DCP send better price signals with respect to both energy and transmission, so that whatever incremental operational impact there is over TCM (and ENMAX does not expect it to be large) is worth addressing. ENMAX notes again that generation dispatch should be the same under PAB, DCP, and TCM.</p> <p><i>...Requires multiple merit orders (new systems) which distinguish different types of dispatch (energy, pay as bid, TMR, DDS)</i></p> <p>There is no change in dispatch between TCM, PAB, and DCP; only the resulting prices and payments change.</p> <p><i>...Need to determine whether downstream demand opportunity service (DOS) gets curtailed before you begin to dispatch downstream generation on a pay as bid basis.</i></p> <p>ENMAX believes that, regardless of what the congestion management rules are, the handling of DOS must be addressed. Further, as an <i>opportunity</i> service, it should only be available when there is sufficient transmission capacity to support it, so it should be curtailed before any transmission congestion costs are incurred.</p> <p><i>...Multiple constraints may not be easily or accurately handled.</i></p> <p>ENMAX sees no reason why multiple constraints should be difficult to handle. If the SC can figure out which generators contribute to or alleviate constraints—as clearly he must do to dispatch generation—then the tools necessary to handle multiple constraints can be developed. As noted previously, the proposed TCM protocol produces the maximal cost impact for loads, so expending the resources to get this right is well worth the investment.</p> <p><i>...Potential for an artificial price cap below \$1000 being created during a supply shortfall</i></p>

Section of Paper	Description	Stakeholder Comments
		<p><i>if transmission constraints are also present.</i></p> <p>As discussed, prices in constrained regions are allowed to rise sufficiently to allow supply to meet demand. There is no artificial price cap.</p> <p><i>...Incompatible with current TMR and DDS systems and procedures</i></p> <p>Please see the above comments on implementation issues.</p> <p><i>... Separation of dispatch from SMP could cause transparency issues for market participants.</i></p> <p>Dispatch under PAB and DCP will be the same as under TCM, but the former provide better energy market and congestion price signals.</p> <p><i>...Imports are [a] significant portion of peak supply and can be scheduled hourly to address extended constraint events. AESO is not a participant in the market and therefore does not have a mechanism to procure imports for the market in the absence of the proper price signal. Most market participants including loads can procure and schedule imports if there is an appropriate price signal in the market.</i></p> <p>PAB and (particularly) DCP allow prices to rise as needed to attract imports. The AESO need not act as a market participant.</p> <p><i>The AESO believes the price signal is the appropriate method of attracting supply to the market and encouraging fair, efficient, and openly competitive behaviors. Out-of-market actions should be avoided whenever possible and their impacts minimized when they are necessary. The pay as bid protocol creates out of market payments and may lead to perverse offer behavior.</i></p>

Section of Paper	Description	Stakeholder Comments
		<p>Energy prices affected by congestion costs do not provide a good method of attracting supply to the market because it can be difficult to determine what prices will be once certain transmission constraints are relieved. As noted previously, neither PAB nor DCP are “out of market.”</p> <p><i>The AESO believes that the adopted protocol should be effective, practical and work within the current market framework. The TCM Rule is compatible with OPP 801 Supply Shortfall in that the pool price rises as undispached and available supply diminishes and the top of the energy market merit order is reached. Once this happens out of market actions are used as set out in OPP 801. OPP 801 has provision for acquiring imports and other supply along with various steps to mitigate supply shortfall. All transmission limits and requirements are respected to ensure the transmission system is not placed at risk. The pay as bid proposal fails to signal scarcity conditions during supply shortfall events which could lead to further out of market actions.</i></p> <p>ENMAX is not aware of anything in PAB or DCP that would preclude the use of OPP 801 if it’s needed. The price in the constrained area is allowed to rise sufficiently to avoid supply shortfall events (provided, of course, that supply is physically available), so no more out-of-market actions are required with PAB or DCP than with TCM. Since PAB and DCP use the same dispatch as TCM, the transmission system would not be placed at risk.</p> <p><i>The AESO believes that a single protocol to deal with congestion is appropriate. Congestion may occur for many reasons such as planned maintenance or forced outages of transmission facilities or critical generation units or inadequate transmission. The pay as bid protocol is not appropriate in all instances of transmission constraints and has implementation issues.</i></p> <p>ENMAX agrees that a single protocol to deal with congestion is appropriate. Because TCM creates the maximal cost impact for consumers, it is not appropriate to deal with</p>

Section of Paper	Description	Stakeholder Comments
		<p>large or long-duration congestion events. ENMAX agrees that there <i>may</i> be circumstances in which special rules are required, though it does not see this as any more likely with PAB or DCP than with TCM. Please see ENMAX’s previous comments on addressing planned maintenance or forced outages of transmission facilities.</p> <p><i>It is the AESO view that the TCM protocol minimizes the price impact and the level of market distortion:</i></p> <ul style="list-style-type: none"> • <i>Prices are allowed to reflect market economics for other system congestion cases wherein a market response is appropriate.</i> • <i>While allowing prices to rise may in some instances be more costly than the pay as bid model, the resulting price is a result of market economics and sends correct signals. The AESO has looked in detail at a past SOK event and determined that the cost to load of using the TCM protocol would actually have [been] comparable to using the pay as bid approach.</i> • <i>Pay as bid mechanisms create out of market payments to specific generators which has the effect of unnecessarily distorting the price signal which is contrary to government policy.</i> <p>ENMAX submits that PAB and DCP create a lower cost impact than TCM, more appropriately reflect (energy and transmission) economics, and do not rely on out-of-market payments.</p> <p><i>The AESO notes that any TCM protocol should be robust enough to manage any constraint regardless of duration or size and allow the normal functioning of market fundamentals to occur in a manner consistent with market design. The TCM protocol is not intended to deal with situations where the constrained event leads to market distortions which prevent the market price from reflecting underlying market fundamentals. These situations, should they arise, will be dealt with appropriately through other means.</i></p> <p>ENMAX submits that PAB and DCP are superior to TCM because they accomplish the</p>

Section of Paper	Description	Stakeholder Comments
		<p>same thing at lower overall cost.</p> <p><i>Severe market distortions are not constraints management issues and should there be a need these situations will be dealt with appropriately through other means.</i></p> <p>ENMAX agrees that severe market distortions that arise through anticompetitive behaviour must be appropriately dealt with through other means, but severe market distortions introduced by constraints management rules must be dealt with by the AESO at the rule-making stage.</p>
6.4 Define Key Terms		<i>Real time:</i> Is there merit in defining “real time” to be the period within the T-2 window?
6.5 Clarify TCM Rule Process Steps		No comments.
7 Next Steps		ENMAX appreciates the opportunity to provide comments on this subject.