

**Response of Ontario Power Generation to the  
Market Surveillance Panel's Paper on  
Constrained Off Payments**

March 31, 2003

## **I) Introduction and Summary**

In February 2003, the Market Surveillance Panel (MSP) of the Ontario Independent Electricity Market Operator (IMO) released a paper discussing congestion management settlement credit (CMSC) payments, particularly constrained off payments, and seeking comments from market participants. The MSP paper questions the desirability of retaining constrained off payments to generators and imports.<sup>1</sup> Ontario Power Generation (OPG) has prepared this document to respond to the issues raised and questions asked in the MSP paper.

OPG is opposed to ending constrained off payments. The presence of constrained off units in the market (unconstrained) schedule benefits consumers by lowering market prices. Ending constrained off payments to these units will tend to raise market prices. The MSP's own simulations support this conclusion, suggesting that "the operation of constrained off payments in the May-December [2002] period may have reduced the wholesale market price by between \$1.32 and \$6.73 per MWh on average." (MSP paper, p.12 and Appendix A)

Some constrained off payments arise from IMO actions undertaken to increase reliability and reduce price volatility. These actions include the use of twelve times ramp rate and the scheduling of energy limited resources into peak periods. The constrained off payments that result from these IMO actions are the cost of providing substantial benefits to consumers. Continuing to undertake these actions, but eliminating the constrained off payments that result from them would be illogical and unfair.

Eliminating constrained off payments will not improve the transmission planning process as suggested by the MSP. Ownership of the network transmission expansion process rests jointly with the IMO, Hydro One and the OEB. Realistically, market participants, be they consumers or generators, cannot influence this process until it is initiated by the IMO. With respect to improved transmission network utilization through better coordination of transmission and generation outages, this will not occur until Hydro One has an incentive to coordinate its outages with generators (i.e. rewards for successful coordination or penalties for failing to coordinate).

Constrained off payments are an integral component of the current uniform price formation method. In view of the many more substantial issues facing the Ontario market today, OPG fails to see the need to deal with constrained off payments as a priority, particularly given the fact that they will be substantially addressed by the planned movement to location-based marginal pricing (LBMP). Moreover, proposing such a drastic change now, given the long-standing decision to evaluate LBMP, increases regulatory uncertainty and thus inhibits investment in the Ontario market. If specific types of constrained off payments represent a consistent problem, they should be investigated and, if warranted, addressed, but it is neither necessary nor desirable to completely eliminate them, particularly when to do so will reduce supply and increase prices for Ontario consumers.

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<sup>1</sup> In the MSP's view, constrained off payments to exports and dispatchable load are clearly beneficial because they "contribute to reliability in the same way as constrained on payments to generators and imports." (MSP Paper, p.8)

## **II) Background**

### **A. History**

The current rules for constrained on and constrained off payments have their origins in the work of the Market Design Committee (MDC). In both its second interim and final reports, the MDC discussed various options for managing congestion due to transmission constraints and other reliability related operational issues. The MDC's clear preference was to use LBMP to address congestion.<sup>2</sup> When fully implemented, this approach would have generators receive payment and loads pay based on the clearing price at the node (or in the zone) in which they are located. Price differences between nodes (or zones) would indicate congestion and provide economic incentives to eliminate it through additional generation, transmission solutions, load reductions or some combination of these approaches.

As a transitional approach, the MDC recommended that uniform pricing be used during the first 18 months of market operation. During this initial period, the MDC recommended that the IMO develop nodal prices, in order to collect information on congestion within Ontario, and also examine the operation of LBMP in other jurisdictions. (MDC Final Report pp.3-7 to 3-9) Ultimately, the MDC recommended that the IMO Board implement some form of LBMP after the initial 18-month period ended.

Having decided to recommend a uniform pricing approach for the first 18 months of market operation, the MDC faced the question of how this price should be developed. (MDC Final Report, p.3-7) Two approaches were considered. The first was to use the load-weighted average of the nodal prices. The second was to create a uniform price using an unconstrained dispatch and then pay market participants who were constrained off or on because of transmission or other limits. This later approach was chosen primarily for reasons of simplicity. (MDC Final Report, p.3-8) In making this recommendation, the MDC was very aware of the potential for gaming these payments, particularly by parties outside Ontario. To minimize this risk, the MDC recommended that the uniform price determination explicitly consider the capacity and security constraints of the interties. (Id.)

### **B. The Future of LBMP**

The MSP paper asks respondents to consider how a move to LBMP would impact CMSC payments. While the specific impacts will depend on the precise form of LBMP implemented, in general, the use of locational prices should eliminate most CMSC payments that arise from transmission congestion. The resulting locational prices should also more clearly identify the extent, frequency and duration of persistent transmission bottlenecks and create an economic benchmark against which the cost of reducing or eliminating these bottlenecks can be judged.

To the extent that CMSC payments arise from IMO actions, however, the move to LBMP will not eliminate them. The twelve times ramp rate issue exemplifies this type of constrained off payment and is discussed more fully below in section III D.

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<sup>2</sup> At the time of the MDC this was known as "locational marginal pricing" or LMP.

The MSP paper also asks respondents to indicate whether efforts should be made to identify the cause of CMSC payments such as the specific reason a given unit was constrained off or on, and the physical location of persistent transmission constraints. Given that the move to LBMP will not completely eliminate CMSC payments, developing the capability to understand the reason for each payment would seem to be worthwhile. Without knowing the cost or resources required for such an effort, however, it is difficult to evaluate its merits. As far as developing more information on specific transmission constraints, this should only be undertaken if and when it becomes clear that the adoption of LBMP will be significantly delayed.

The anticipated move to LBMP also answers another question asked by the MSP – “should new generators receive constrained off payments?” OPG believes that any generator considering building in Ontario would logically factor the nodal prices published by the IMO into its locational decision because it would expect that some form of LBMP will be adopted relatively soon. To the extent that a generator is able to construct its facility before LBMP is introduced, that generator should receive constrained off payments exactly like any existing generator. Only if it becomes clear that LBMP is not going to be adopted in the near future should methods of influencing generators’ siting decisions be considered. Even in that case, however, it is far from clear that eliminating constrained off payments for new generators would be the most efficient or equitable method.

### **C. The Current Size of CMSC Payments**

The MSP paper contains information about the costs of various types of CMSC payments. While these figures are substantial, they should be viewed against the overall size of the Ontario electricity market. The IMO website shows the weighted average hourly energy price for the period from May through December 2002 as \$55.92/MWh. Given that Ontario domestic energy demand was approximately 103 TWh, the total cost of energy during this period was approximately \$5.75 Billion. Thus, the total constrained off payments for this period of \$63 million, excluding exports and dispatchable load, represented a little more than 1 percent of the energy cost. Looked at another way, an increase in the weighted average market price of about \$0.62 during this period would have raised the total cost of energy by more than the amount of constrained off payments.<sup>3</sup>

## **III) Should Constrained Off Payments Be Eliminated?**

As indicated in the introduction, OPG’s view is that constrained off payments should be retained. The remainder of this section discusses the likely impacts from eliminating constrained off payments, and rebuts the arguments advanced by the MSP to justify ending them.

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<sup>3</sup> Of course, if the energy price rises, a portion of the increase is subject to refund via the Market Power Mitigation Framework (MPMF). While the MSP Paper indicates that 70% of any increase in market prices will be refunded via the MPMF, the actual refund will be 50% of the difference between the annual average price and 3.8 cents per kWh according to the Minister of Energy’s recent announcement.

## **A. Elimination of Constrained Off Payments Will Increase Prices**

As the MSP points out, there are two ways in which constrained off payments can be eliminated. The first would be to calculate the market clearing price using only deliverable resources. In other words, the merit order stack would be purged of all resources that were incapable of delivery and the MCP would be set by the offer of the highest priced deliverable unit dispatched to meet demand.<sup>4</sup> Under this approach, there would be no need for either constrained off or constrained on payments because no units will be constrained on or constrained off. While the theoretical appeal of this approach is clear, its impracticality in the current Ontario circumstance is equally apparent. Simply put, both the levels and volatility of the resulting prices would be unacceptable.<sup>5</sup>

The second approach would be to just stop making payments to generators and imports when they are constrained off. It is difficult to precisely quantify the impacts from this approach because these impacts will depend both on actual market conditions and on the responses of individual market participants. Nevertheless, directionally the MSP has identified two likely impacts. Market prices are likely to rise and supply decrease.

As explained by the MSP paper, without constrained off payments, participants will seek to recover their fixed costs through higher energy offers. In addition, some generation facilities will conclude that they are no longer economically viable and seek to withdraw from the market. This will produce one of two results. Either the IMO will allow the generator to withdraw, with a resulting decrease in supply and increase in market prices, or the IMO will conclude that a particular generation facility is needed for local reliability and enter into a reliability must-run (RMR) contract, the cost of which will be paid by consumers.

With its access to comprehensive data covering the entire market, the MSP is in the best position to simulate the effects on market price from eliminating constrained off payments to generators and imports. Their simulations show market price increases ranging between \$1.32 and \$6.73. (MSP paper, p. 12 and Appendix A) Looking only at the very bottom of this range and taking into account the anticipated impact of OPG's Market Power Mitigation Framework (MPMF) including the recent announcement from the Minister of Energy fixing the rebate for large customers at 50% of the difference between the annual average price and 3.8 cents per kWh, it is easy to conclude that any savings that consumers might see from eliminating \$63 million in constrained off payments are very likely to disappear due to the increase in market clearing price.<sup>6</sup> As we move up the range of potential price impacts produced by the MSP simulations, the cost to consumers becomes quite substantial.

To the extent that it becomes necessary for the IMO to enter into RMR contracts to preserve generation for local reliability, the cost to consumers will increase. While the terms of each RMR contract will be individually negotiated, resources needed for local reliability will expect to recover all their costs including a reasonable return on capital. Realistically, the

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<sup>4</sup> This approach would address constrained off payments arising from both transmission constraints and other factors such as ramp rate limitations that impede the actual flow of energy from a facility

<sup>5</sup> This statement is supported by actual experience. See the discussion below regarding twelve times ramp rate.

<sup>6</sup> The retail price freeze for some consumers does not change this conclusion. To the extent that market prices are higher, the cost of this will have to be addressed through other means that will eventually impact consumers. Furthermore, not all customers are included within the retail price freeze.

total cost of providing a facility with guaranteed full cost recovery is likely to exceed its anticipated recovery from energy sales into the market.

**B. The Electricity Market is Different than Other Markets**

The MSP paper begins its discussion of constrained off payments with the following sentences:

*In markets for most products, where a product cannot be transported to where it can be consumed it simply loses out in the market and receives no payment. Constrained off payments provide compensation for not producing*

Clearly the Ontario electricity market is not like the markets for “most products.” Most products do not require producers to sell all their output through a single wholesale market. In the market for most products, there is no market operator deciding how much is produced and by whom. Nor is that market operator also the sole operator of all transportation facilities with exclusive control over which producers are permitted to access the market. Given that the IMO aims to operate the market and the transportation grid so as to minimize total cost to consumers while maintaining reliability, it is entirely appropriate that market participants be compensated for the specific impacts that this mode of operation imposes on them.

**C. The Initial Configuration of the Transmission Grid is Relevant to the Decision to Make Constrained Off Payments**

The MSP summarily dismisses any arguments related to the initial configuration of the transmission system in Ontario by saying that they do “not appear to us to be based upon considerations of efficiency, reliability or economic logic.” (MSP paper p.16) These comments represent a narrow view of this subject. They ignore considerations of equity in the transition from monopoly to a competitive market and the consequences of the initial configuration of Ontario’s grid.

As the MDC recognized, Ontario’s generation and transmission were constructed as an integrated system to minimize overall cost and maximize benefit to the people of Ontario. (MDC Second Interim Report, p.3-12) This approach resulted in some generation assets with robust connections through multiple facilities and other generation facilities with much more limited access, sometimes via a single transmission line. This integrated approach also produced a few transmission facilities that are frequently congested, while most others are rarely congested. When transmission and generation were owned and operated by a single entity, the resulting puts and takes were accommodated within the goal of overall system efficiency. As these facilities are now owned, operated and used by different entities, the money no longer simply flows into a single pot - there are winners and losers.

In Ontario, as in all other jurisdictions that have made the transition from an integrated monopoly to a market structure, this change has created transitional issues. This was recognized in the *Electricity Act, 1998* which has among its purposes:

- a) *to facilitate competition in the generation and sale of electricity and to facilitate a smooth transition to competition...*
- f) *to facilitate the maintenance of a financially viable electricity industry.*

The MSP paper specifically mentions two situations that illustrate transitional issues; the east-west tie and the 25 Hz system. Frequent congestion on the east-west tie exists because the available generation in the Northwest along with contracted resources from Manitoba often exceed the tie's capacity. One reason that generation from Manitoba is offered at consistently high levels is the 200 MW "take or pay" contract with Manitoba Hydro. This contract was signed by Ontario Hydro and runs through October of this year. The result of this situation, as the MSP notes, is that available economic energy is often bottled in northwest Ontario and paid constrained off payments.<sup>7</sup> (MSP p.9) With regard to the 25 Hz system, this is clearly another legacy from the Ontario Hydro days that creates numerous operational and economic issues, which require resolution. In recognition of similar issues, Niagara Mohawk has decided to end 25 Hz service on the New York side of this trans-border system by 2007. Until a decision is taken to address this issue in Ontario and an acceptable solution adopted, the 25 Hz system will continue to create real constraints on the operation of the Beck facilities, which are appropriately addressed, at least in part, through CMSC payments.

#### **D. Twelve Times Ramp Rate**

The twelve times ramp rate issue exemplifies the way in which constrained off payments compensate generators whose presence in the unconstrained schedule benefits the market by lowering prices. The concept of twelve times ramp rate is a purely artificial construct in which units are assumed to increase their output (ramp up) in the unconstrained dispatch at a rate that is twelve times faster than their actual ramp rate. During the coupled operational dry-run (CODR) immediately preceding market opening, the IMO became concerned that the dispatch algorithm, which can only optimize the dispatch and price for the next five minutes, was creating price spikes as increasingly more expensive units were brought on line to meet rapidly rising demand. The IMO devised and introduced twelve times ramp rate to eliminate these price spikes.<sup>8</sup>

In essence, twelve times ramp rate allows price to be determined on the basis of the offers of generators who are not physically capable of delivering at the levels indicated by the dispatch algorithm. Instead, these generators are constrained off to the levels that they are capable of producing. They receive the market clearing price for their actual production and constrained off payments based on the difference between this production and the level of output assumed in the unconstrained dispatch used to set price. Those generators who are physically capable of ramping up quickly, largely the same generators who would have set

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<sup>7</sup> The degree of congestion that can be expected on the East-West tie once this contract expires is difficult to forecast as it depends on the actions of a number of market participants and on conditions in other markets in which Manitoba generation can be sold

<sup>8</sup> Prior to the open market slower loading units were dispatched well in advance of the rapid increase in load and fast ramping units were later dispatched to fill in the remaining requirements. The problems with an optimization which separately considers each 5-minute interval have been recognized by the IMO and possible solutions are being considered in the multi-interval optimization initiative as part of IMO's recent Market Evolution consultation project.

market prices if actual ramp rates had been used, are constrained on and receive their offer price.

While the MSP views it as entirely appropriate to pay the constrained on generators their offers, it states that it can see no economic justification for paying the generators who are ramping up constrained off payments. (MSP paper p.24) This view looks only at one side of the coin, embracing the head and ignoring the tail. The only reason that the more expensive, faster ramping plants are not setting price is because the dispatch algorithm is pretending that the price is being set by the less expensive, slower ramping plants. In a world based on actual physical limits, the slower ramping generators would receive a much higher price, albeit on a smaller quantity that reflects their actual ability to ramp up. Instead, they receive a much lower price on their actual production and constrained off payments (which are based on the difference between their offers and this lower price) to the extent that their actual production is less than the fictional production levels used to set price.

Clearly, one can argue about the economic justification for instituting twelve times ramp rate. However, once the IMO Board adopted this approach, it necessitated both constrained on and constrained off payments for logical consistency and to maintain fairness to consumers and producers.

**E. The Well Recognized Need to Improve the Transmission Planning is Not an Appropriate Reason to End Constrained Off Payments**

The MSP paper posits that ending constrained off payments will create additional pressure from generators to address deficiencies in the current transmission planning process. (MSP paper pp. 14, 18) In the MSP's view, the existence of constrained off payments removes any incentive for generators to take a more proactive role in addressing transmission bottlenecks.<sup>9</sup> OPG respectfully rejects the allocation of roles and responsibilities that underlies this view. Currently, responsibility for transmission planning rests jointly the IMO, transmitters and the OEB, the entities who, respectively, operate, own and regulate transmission. Generators are transmission system users who are prevented from investing in transmission assets without notice to the OEB and, at the Board's discretion, a formal review. (OEB Act section 80) While it is certainly fair for the MSP in an earlier report to question "*how signals to expand transmission capacity to relieve particular bottlenecks are sent and whether incentives are adequate to encourage Hydro One to act on such signals,*" the MSP must recognize that market participants do not control the transmission expansion process. (MSP Report for The First Four Months, p.138)

Like the MSP, OPG sees two related issues here:

1. How can the IMO achieve greater coordination between transmission and generation outages; and

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<sup>9</sup> Under the logic suggested by the MSP, one would expect that consumers who are currently paying constrained off payments would be leading the charge for transmission planning and expansion. This is not occurring and will not occur because responsibility for identifying transmission bottlenecks and possible solutions rests not with market participants, but with the IMO. Once the IMO initiates this process, it will provide a forum for generators, consumers and all other market participants to advocate their views.



2. How can the process for recommending, approving and constructing network transmission expansions be improved?

On the first issue, OPG sees a need to build explicit incentives to minimize the overall cost of transmission outages into the Operating Agreements between the IMO and transmitters and the IMO Market Rules. Right now, transmitters are concerned with controlling their costs. They have no explicit incentives to limit the number or duration of its outages. Transmitters are also not required to coordinate their outages with those of generators and have no compelling reason to do so. Coordination takes time, costs money and reduces flexibility. Unless transmitters are provided with either a reward for successfully coordinating its outages with generators or a penalty for failing to coordinate, coordination will likely not improve. In any event, ending constrained off payments to generators will not change transmitter's motivations in the slightest.

On the second issue, the IMO, as the operator of the transmission grid, is in the best position to analyze grid performance and recommend expansion. Hydro One is the owner of the great bulk of the Ontario grid and would necessarily need to be involved in any expansion of the transmission network, even if that expansion were undertaken by another entity. Finally, the Ontario Energy Board regulates the transmission grid and would need to approve any expansion as well as address the impact on transmission ratepayers. To date, the process by which these three entities will interact to fulfil their individual responsibilities remains largely unspecified. Until a process is implemented, beginning with the IMO identifying needed transmission system expansions and soliciting proposals to meet those needs, no one is likely to propose network transmission projects.<sup>10</sup>

OPG fully agrees with the MSP regarding the need to identify transmission bottlenecks and solutions to them. OPG respectfully submits, however, that the MSP is in a position to jump-start this process through the use of its power to recommend actions to improve market performance.

#### **F. Non-transmission Related Constrained Off Payments**

The MSP discusses a number of different situations under this heading and concludes that these situations provide further evidence that constrained off payments are inappropriate and should be ended. OPG discusses the specific examples provided below and concludes that they do not justify ending constrained off payments. Moreover, any of these situations that truly represent market anomalies can be dealt with through the IMO's compliance process, changes in IMO operation or Market Rule changes.

##### **1) *Dispatch Deviations, Dispatch Filtering and Plant Limitations***

The MSP paper correctly states that small deviations from dispatch, the impacts of the dispatch filter, and plant limitations can give rise to constrained off payments. As the MSP goes on to point out, these factors can also create constrained on payments. In OPG's experience, these issues represent relatively small dollar amounts and are as likely to cause negative as positive payments. As a result, OPG

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<sup>10</sup> In contrast to network transmission facilities, the process for obtaining approval of transmission connection facilities has been used and, therefore, is relatively well understood.

does not see them as issues demanding quick action when compared to the many other pressing issues that are currently before the IMO whose impacts are orders of magnitude greater. If the MSP does decide to recommend action to eliminate CMSC payments based on deviations from dispatch, the dispatch filter and plant limitations, however, it should be initiated via discussion at the IMO Technical Panel and be done in an even handed manner that addresses both positive and negative payments.

2) ***Multiple Ramp Rate***

OPG has addressed this issue above in section D.

3) ***Constrained Off Energy Limited Resources***

One of the situations in which the MSP proposes *expanded “authority to mitigate, or indeed claw back”* constrained off payments is where an energy limited resource is constrained off so that it is available for peak use. This situation largely concerns hydroelectric facilities with limited storage where the IMO constrains off a unit during lower priced periods in order to have its limited energy available for anticipated higher priced periods later in the day.

This situation is another example, like twelve times ramp, where the IMO intervenes to benefit consumers. The offers from these constrained off units can remain in the unconstrained schedule for many hours until the units are finally called on to run. Generally, these units also will be providing operating reserve during these periods. While it is true that the unit receives constrained off payments for each hour that it does not run, it is also true, and of significantly greater importance to consumers, that the unit remains in the unconstrained energy schedule thereby lowering the market price for each hour that it is constrained off.

4) ***Constrained Off Payments Due to Imports Removed From the New York Schedule***

The MSP has identified one issue of the many that arise owing to difficulties in scheduling transactions between New York and Ontario. This is fundamentally a scheduling issue between New York and Ontario, and not a CMSC issue. The solution to this specific issue and many others should be achieved by developing and consistently applying a robust scheduling protocol between New York and Ontario, rather than by arbitrarily eliminating a particular form of CMSC payment.

**G. Local Market Power Mitigation Safe Harbour Screens**

The MSP paper raises two issues related to the local Market Power Mitigation Framework. With respect to the “safe harbour” screens, OPG agrees that it is appropriate to review the operation of these screens to see if they can be improved based on actual experience. The IMO Technical Panel is the appropriate forum for this review. There, the experience with the screens to date can be analyzed and any proposals to modify them can be vetted to determine if they should be taken forward for consideration by the IMO Board.

With respect to the mitigation process, OPG’s experience has differed significantly from the description presented in the MSP paper. In our experience, rather than the burden being on

the IMO to demonstrate that a market participant has abused local market power, the actual burden is on the market participant to justify any offers that fall outside of the screens. Thus, the approach that the MSP paper advocates already occurs in practice and no additional changes are necessary.

#### **IV) Conclusion**

As the Ontario market develops, issues will be identified that appear to impede its efficient functioning. When this happens, it is clearly appropriate that these issues be debated and resolved. In doing so, however, it is important to consider the reasons why the approach now questioned was initially selected and thoroughly review the implications of any proposed changes. In the context of constrained off payments, the reasons for initially selecting this approach remain valid and the proposed elimination will hurt Ontario consumers and reduce confidence in the market. For these reasons, and the others discussed above, constrained off payments to generators and importers should be retained.