



IMO Staff Recommendation to Panel on Exemption Application (General)

All information submitted in this process will be used by the *IMO* solely in support of its obligations under the "Electricity Act, 1998", the "Ontario Energy Board Act, 1998", the "Market Rules" and associated policies, standards and procedures and its licence. All submitted information will be assigned the appropriate confidentiality level upon receipt.

- *Terms and acronyms used in this Form that are italicized have the meanings ascribed thereto in Chapter 11 of the "Market Rules".*

PART 1 – GENERAL INFORMATION

Market Participant Name: DOFASCO INC.

Location/Site: Hamilton, Ontario

Exemption Application ID: 1308

Market Participant ID:

Description of Exemption Requested: Market participant requires exemption from:

- Requirement to be compliant with section 7.5.1, chapter 7 of the market rules, which requires registered facilities to comply with dispatch instructions subject to the notification, pricing and penalty provisions of the market rules;
- Requirement to be compliant with section 7.5.2, chapter 7 of the market rules, which requires registered market participants to notify the IMO if there is an expected material difference in operations from the IMO's dispatch instructions.

Date Exemption Application Received: April 30, 2004

Date all relevant application information supplied by exemption applicant: April 30, 2004

Management Approvals Obtained: Yes No

Are there any outstanding disputes, compliance actions, or pending market rule amendments involving the subject matter of this exemption application? Yes No

Are there any outstanding disputes, compliance actions, or pending market rule amendments involving the exemption applicant? Yes No

Section of the Exemption Application and Assessment Procedure under which the exemption application is made:

- Section 1.4.1 "Application for Exemption – General"

Market Rule(s) or related Market Manual(s) from which exemption is requested (copy of Market Rule(s) or Market Manual(s) attached): Market Rules chapter 7, sections 7.5.1 and 7.5.2

Third Party Submissions Received: Yes No *Pending Third Party Review*

Supplemental Assessment Information Attached: Yes No

PART 1 – GENERAL INFORMATION

Background on Electric Arc Furnaces (EAF).
Related Historical <i>Exemption Application(s)</i> or Related <i>Exemption Application(s)</i> in Process: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Note: If YES, list History of <i>Exemption Applications</i> : #1164 IVACO Granted; #1304 Gerdau Ameristeel Whitby Steel Mill – In Progress; #1305 Gerdau Ameristeel Cambridge Steel Mill – In Progress. Role of <i>exemption applicant</i> in the market as it relates to this <i>exemption application</i> : Dispatchable load

PART 2 – RECOMMENDATION

<p>Recommendation: Grant with conditions.</p> <p>Criteria Used in Assessment of General Exemption Applications (Section 1.4.2 of Exemption Application and Assessment Procedure):</p> <p>(If X appears in a box, the criterion is applicable to this <i>exemption application</i> and is evaluated in Part 3 - Details of Assessment; if X does not appear in a box, the criterion is not applicable to this <i>exemption application</i>.)</p> <p>Whether the <i>exemption</i> that is the subject-matter of the <i>exemption application</i> would, if granted, materially:</p> <ul style="list-style-type: none">• impact the ability of the <i>IMO</i> to direct the operations and maintain the <i>reliability</i> of the <i>IMO-controlled grid</i>; <input checked="" type="checkbox"/> See Part 3 Details of Assessment.• impact the ability of the <i>IMO</i> to ensure non-discriminatory access to the <i>IMO-controlled grid</i>; <input type="checkbox"/>• affect the ability of the <i>IMO</i> to operate the <i>IMO-administered markets</i> in an efficient, competitive, and reliable manner; <input checked="" type="checkbox"/> See Part 3 Details of Assessment.• increase costs of <i>market participants</i>; or <input type="checkbox"/>• increase costs of the <i>IMO</i>; <input type="checkbox"/> <p>Whether the <i>exemption</i> that is the subject-matter of the <i>exemption application</i> would, if granted,</p>
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PART 2 – RECOMMENDATION

give the <i>exemption applicant</i> an undue preference in the <i>IMO-administered markets</i> ;	<input checked="" type="checkbox"/>
See Part 3 Details of Assessment.	
Whether the cost or delay to the <i>exemption applicant</i> of complying with the obligation or standard to which the <i>exemption application</i> relates is reasonable, having regard to the nature of the obligation or standard, the nature of the <i>exemption application</i> and the anticipated impact of non-compliance by the <i>exemption applicant</i> in terms of the elements referred to above;	<input checked="" type="checkbox"/>
See Part 3 Details of Assessment.	
The adequacy of the <i>exemption</i> plan submitted by the <i>exemption applicant</i> ;	<input type="checkbox"/>
Where the <i>exemption applicant</i> is the <i>IMO</i> , the identification of the benefit to <i>market participants</i> of compliance with the obligation or standard relative to the financial and other resources required to achieve compliance within such deadlines as may be applicable;	<input type="checkbox"/>
Where the <i>exemption applicant</i> is the <i>IMO</i> , the manner in which it proposes to operate in the <i>IMO-administered markets</i> or direct the operations and maintain the <i>reliability</i> of the <i>IMO-controlled grid</i> during the period in which the <i>exemption</i> would be in effect;	<input type="checkbox"/>
Whether the <i>facility</i> or equipment that is the subject-matter of the <i>exemption application</i> :	
• was in service or was returned to service on the date on which the obligation or standard to which the <i>exemption</i> application relates came into force;	<input checked="" type="checkbox"/>
See Part 3 Details of Assessment.	
• was ordered by the <i>exemption applicant</i> on or prior to the date on which the obligation or standard to which the <i>exemption application</i> relates came into force; or	<input type="checkbox"/>
• was in the process of construction on or prior to the date on which the obligation or standard to which the <i>exemption application</i> relates came into force; and	<input type="checkbox"/>
The capability of the owner of the <i>facility</i> to operate the <i>facility</i> consistent with the terms of the proposed <i>exemption</i> .	<input type="checkbox"/>

PART 3 – DETAILS OF ASSESSMENT

STATION DESCRIPTION

DOFASCO is an integrated steel maker located in Hamilton, Ontario. Within its premises, DOFASCO operates a twin shell electric arc furnace (EAF) that, prior to market opening, was contracted as surplus power with the former Ontario Hydro. DOFASCO would now like to operate the EAF as a dispatchable load to replicate the earlier regime in the new electricity market and have access to the operating reserve market.

The peak demand of DOFASCO'S EAF over a full cycle is usually between 100 MW and 110 MW. A full cycle is approximately 1 hour long. The EAF normally runs 24 hours a day, seven days a week, approximately 52 weeks per year, with the exception of regularly planned shutdowns for weekly and annual maintenance. The electricity consumption of DOFASCO'S EAF fluctuates and, depending on the phase of the production cycle, assumes only two states: full consumption or minimum consumption.

EXEMPTION REQUEST

DOFASCO intends to operate its EAF as a dispatchable load in the IMO-administered markets. Due to the nature¹ of the EAF load, DOFASCO would be unable to comply with all energy dispatch instructions and therefore seeks an exemption from the following *market rules*:

- A. the requirement stated in *Subsection 7.5.1 of Chapter 7*, which requires registered facilities to comply with dispatch instructions subject to the notification, pricing and penalty provisions of the market rules; and
- B. the requirement of *Subsection 7.5.2 of Chapter 7*, which requires registered market participants to notify the IMO if there is an expected material difference in operations from the IMO's dispatch instructions. As defined in Market Manual 4.3, a difference is material if it exceeds the greater of 2% and 10 MW.

Though not explicitly stated, DOFASCO's exemption request implies a request to participate in the operating reserve markets. This request is outside the scope of this recommendation and will be assessed via the facility registration process using specific qualification criteria.

NOTE: Since a deviation from dispatch of less than the greater of 2% and 10 MW is not considered as non-compliance with sections 7.5.1 and 7.5.2, it is understood that this exemption application refers to deviations from dispatch instructions in excess of the greater of 2% and 10 MW.

ASSESSMENT

The IMO assesses that granting the exemption will have minimal impact on the reliability of the IMO-controlled grid provided certain conditions are placed on the exemption.

Impact on reliability of the IMO-controlled grid and the operation of the IMO-administered markets

Impact on the IMO-controlled grid: To maintain the reliability of the IMO-controlled grid, the IMO seeks to preserve the balance between electricity supply and demand by matching the right amount of generation to the expected electricity consumption across the province. Operating as a dispatchable load requires DOFASCO to respond to dispatch instructions and thus provide the IMO with more information about expected consumption and more flexibility in balancing load and generation.

¹ See "Background on Electric Arc Furnaces" provided in the Supplemental Assessment Information.

PART 3 – DETAILS OF ASSESSMENT

However, when DOFASCO cannot comply with energy dispatch instructions, the balance between electricity supply and demand may be adversely affected and the IMO may need to dispatch other resources to compensate for the difference to maintain system reliability. To minimize this impact and reduce the number of intervals of non-compliance, the IMO recommends that DOFASCO adopt the bidding and operating strategies described in this recommendation.

NOTE: Without the implementation of new features in the IMO tools and considering the cumulative effect that batch type loads becoming dispatchable could have on reliability, the IMO may not support future exemption applications of the same or similar nature, regardless of the granting of previous exemptions of a similar type.

Impact on the IMO-administered markets: In operating the IMO-administered markets, the IMO seeks to ensure an efficient, competitive and reliable market for the wholesale sale and purchase of electricity. When DOFASCO does not comply with a dispatch instruction, other resources may need to be dispatched up or down to compensate for the difference. This action may distort the initial economic order in that dispatch interval (e.g. resources that have initially been considered economical may now become uneconomical and dispatched out of the market). To minimize this impact, the IMO requests DOFASCO to adopt the bidding and operating strategies described in this recommendation, which are intended to reduce the frequency and consequence of non-compliance events.

Undue preference in the IMO-administered markets

The electricity consumption of batch-process industries, such as electric arc furnaces, is typically fluctuating and heavily dependent on the specifics of each stage of their production cycles. Therefore, the ability of these industries to comply with energy dispatch instructions is intimately related to their manufacturing process.

By granting this exemption, the IMO recognises the limitations that prevent DOFASCO from complying with all energy dispatch instructions and essentially extends the treatment given to similar loads (see the exemption granted to IVACO), thus providing the applicant with no undue preference within the IMO-administered markets.

Cost to comply

The cost to comply with the *market rules* for which DOFASCO seeks exemption would be the cost to change the production process of the electric arc furnace to be able to maintain a constant consumption level. This scenario is considered unrealistic and the costs would be exorbitant. The denial of this exemption would result in DOFASCO not being able to participate as a dispatchable load in the real-time energy market.

In service date with respect to the date on which the obligation or standard to which the exemption application relates came into force

DOFASCO's electric arc furnace was established in 1996 and had been operating for approximately 4 years when the obligations to which this exemption application relates came into force.

RECOMMENDATION

- A. GRANT DOFASCO an exemption from the *market rule* requirement stated in subsection 7.5.1 of Chapter 7 from the requirement to comply, subject to materiality criteria defined in Market Manual 4.3, with energy dispatch instructions as long as DOFASCO is operating within its normal consumption pattern. The following conditions define compliance with dispatch

PART 3 – DETAILS OF ASSESSMENT

instructions considering DOFASCO operational characteristics.

- B. GRANT an exemption from the *market rule* requirement stated in subsection 7.5.2 of Chapter 7 from the requirement to notify, subject to materiality criteria defined in Market Manual 4.3, the IMO of non-compliance with energy dispatch instructions as long as DOFASCO is operating within its normal consumption pattern.
- C. Though not explicitly stated, DOFASCO's exemption request implies a request to participate in the operating reserve markets. This request is outside the scope of this recommendation and DOFASCO's eligibility to participate in the operating reserve markets will be assessed via the facility registration process using specific qualification criteria.

CONDITIONS OF THE EXEMPTION

1. DOFASCO's EAF operates within its normal consumption pattern as defined in the next paragraph. When outside this pattern, DOFASCO is required to notify the IMO.

For the purposes of this recommendation, DOFASCO's EAF is considered to operate within its normal consumption pattern if, during a production cycle (estimated at approximately one hour), DOFASCO is unable to comply with energy dispatch instructions for no longer than 15 minutes that may span over 3 to 4 five-minute intervals. This pattern has been established on the basis of historical consumption data provided by DOFASCO.

2. DOFASCO will make its energy bids based on the hourly average consumption of the process while running, neglecting the periods of minimum load consumption. The associated energy ramp rate [MW/min] shall allow DOFASCO to go from minimum load to the value of the energy bid lamination within a five-minute dispatch interval.
3. To operate in the energy market, DOFASCO must comply with the following operating strategy :
 - If operating within its normal consumption pattern and dispatched to a level other than full or minimum consumption, there are two possibilities:
 - a) If the energy dispatch instruction is to 50% of its bid or more, DOFASCO will accept the energy dispatch instruction and will dispatch to or remain at full consumption.
 - b) If the energy dispatch instruction is to less than 50% of its bid, DOFASCO will accept the energy dispatch instruction and will dispatch to or remain at minimum consumption.
 - If operating outside its normal consumption pattern, DOFASCO will reject the energy dispatch instructions it cannot meet and notify the IMO accordingly. It is acceptable that such notification be an automated message.

MONITORING INFORMATION REQUIRED AS A RESULT OF GRANTING THIS EXEMPTION

In order for DOFASCO to maintain its status of a dispatchable load, several factors contributing to the facility's qualifications as a dispatchable load will be reviewed semi-annually, including:

- compliance with the eligibility criteria for dispatchable loads as described in the facility registration process; and
- compliance with the bidding and operating strategy described in this recommendation.

PART 4 – TERMS AND CONDITIONS

<p>Effective Date of Exemption (or event causing <i>exemption</i> to become effective)</p>	<p>Date of Panel Approval</p>
<p>Date of Expiration of Exemption</p> <ul style="list-style-type: none"> • If greater than 5 years, the Panel must be satisfied that the circumstances justify a later date. • Circumstances that will cause the exemption to immediately expire. 	<p>Effective as long as DOFASCO seeks to be dispatchable, or until the IMO-administered markets change to accommodate the characteristics of batch load operation.</p>
<p>Market Rule(s) or related Market Manual(s) from which the Exemption is granted</p>	<p>Chapter 7, Subsections 7.5.1 and 7.5.2</p>
<p>Restrictions on the manner of operation and/or additional obligations to be met during the term of the Exemption, if any</p>	<p>Refer to the Conditions of the Exemption</p>
<p>Monitoring Information Required</p> <p>Information required to be provided by the <i>exemption applicant</i> for monitoring by the <i>IMO</i>.</p>	<p>Factors contributing to DOFASCO qualification as a dispatchable load will be reviewed semi-annually. These will include:</p> <ul style="list-style-type: none"> • compliance with the eligibility criteria for dispatchable loads as described in the facility registration process; and • compliance with the bidding and operating strategy and notification requirements described in this recommendation.
<p>Payment of Costs</p> <ul style="list-style-type: none"> • Processing Costs (when introduced) • Incremental Exemption Costs • <i>Settlement amounts</i> to be withheld or repaid. 	<p>None</p> <p>Non-quantifiable workload increases for control room staff. Through monitoring of the proposed mode of operation with respect to notification, incremental cost to the IMO may be established. The IMO reserves the right to seek recovery of costs if experience proves they are significant.</p>
<p>Reconsideration/Removal</p> <ul style="list-style-type: none"> • Date on which the <i>exemption</i> will be reconsidered (if applicable). • Circumstances under which the <i>exemption</i> will be 	<p>Reconsideration may occur if:</p> <ul style="list-style-type: none"> • The IMO determines that allowing the market participant to continue to operate as described in this recommendation will have a detrimental impact on the IMO’s ability to maintain the reliability of the IMO-controlled grid; • The IMO determines that DOFASCO cannot comply with the

PART 4 – TERMS AND CONDITIONS

<p>reconsidered (if applicable) other than unforeseen future change in circumstances.</p>	<p>criteria for dispatchable loads as described in the facility registration process and with the bidding and operating strategy described in this recommendation; or</p> <ul style="list-style-type: none"> The IMO develops tools, similar to those available for generators that will allow loads to de-rate or effectively change status from non-dispatchable to dispatchable on a five-minute basis.
<p>Transferability</p> <ul style="list-style-type: none"> List the terms and conditions that need to be met to allow for a transfer of this <i>exemption</i> to be approved by <i>IMO</i> staff. 	<p>Approval to transfer this exemption may occur once the following criteria have been met:</p> <ul style="list-style-type: none"> the transfer meets applicable terms and conditions set forth in the exemption itself and whether the transfer would affect the ability of the proposed transferee to comply with all of the terms and conditions of the exemption; the proposed transferee is a market participant or undertakes in writing to the IMO to apply for authorization as a market participant.
<p>Other:</p>	<p>Not Applicable</p>

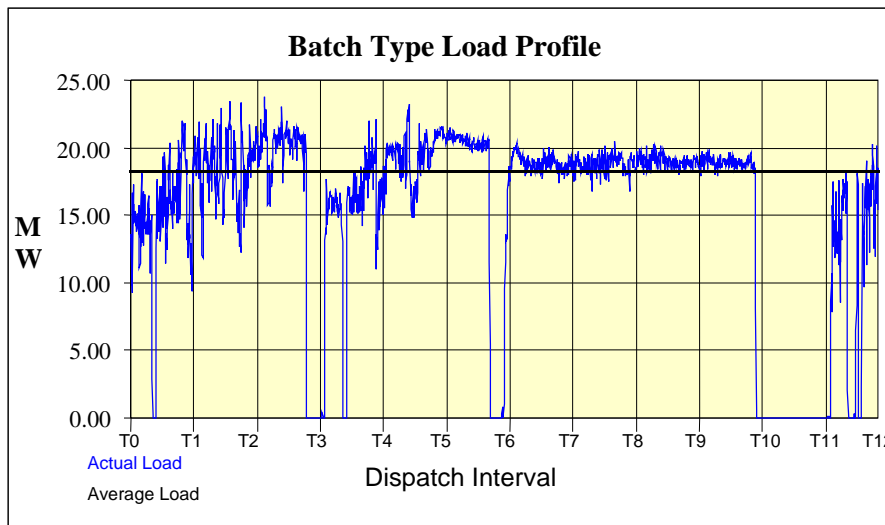
SUPPLEMENTAL ASSESSMENT INFORMATION

Background on Electric Arc Furnaces (EAF)

Generally, an EAF has a process cycle of around 60 minutes that includes several operations:

- charging, when scrap is loaded into the melter;
- melting, when electrical energy is supplied via electrodes to melt the load;
- refining, when chemical components are removed to improve the quality of steel;
- de-slagging, when impurities resulted from previous operations are removed from the furnace; and
- tapping, when steel is poured out.

Tapping and charging are periods of zero electrical consumption that in total last for approximately 5 to 20 minutes. Melting is the core operation of an EAF's process cycle and usually occurs simultaneously with refining and de-slagging. During these operations, the electrical consumption of the furnace is fluctuating, primarily as a result of electrode movement to stabilize the electric arc. A typical EAF load profile is presented below.



EAFs can reduce or increase their consumption within 5 minutes, which makes them good candidates for participation as dispatchable loads in the energy market. For an additional financial benefit and provided that they meet specific eligibility criteria², dispatchable loads could also participate in the operating reserve market. However, because EAF's consumption is fluctuating, their ability to comply with all energy dispatch instructions is limited and intimately related to the specific stages of their process cycles. For example, when at zero consumption during a tapping and re-charging period, the EAF may not be able to comply with a energy dispatch instruction that sends them to full consumption based on their bid price.

Therefore, to operate as dispatchable loads, EAFs need an exemption from the *market rule* requirements to follow energy dispatch instructions at all times.

² Dispatchable load participants wishing to participate in the ten minute non-spinning and thirty minute operating reserve markets must meet specific eligibility criteria. This is assessed via the facility registration process and will not be addressed within this recommendation. Refer to the eligibility criteria for dispatchable load participation as 10 minute non-spinning and 30 minute operating reserve provided in section 3.4.2 of Market Manual 1.2 "Facility Registration, Maintenance and De-registration".