DESIGN

Power to Ontario.
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Enhanced Day Ahead Commitment (EDAC)

EDAC Operations Detailed Design

Issue 0.6

This document describes the detailed design for the Enhanced Day Ahead Commitment (EDAC) Operations Process

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Document ID	IESO_DES_0039
Document Name	EDAC Operations Detailed Design
Issue	Issue 0.6
Reason for Issue	Released for Stakeholder and IESO review
Effective Date	February 4, 2010

Document Change History

Issue	Reason for Issue	Date
0.6	Released for Stakeholder and IESO review	February 4, 2010

Related Documents

Document ID	Document Title
IESO_MAN_0041	Market Manual 9: Day Ahead Commitment Process Operations and Settlement
IESO_DES_0035	EDAC Market Design

Table of Contents

List of Figures

List of Tables

Table of Changes

Reference (Section and Paragraph)	Description of Change

Preface

In February of 2009, the *IESO* issued the market design for the Enhanced Day Ahead Commitment (EDAC) Process, which describes the high level design elements for the process. The design serves as the reference document to facilitate further design discussions with stakeholders and to support the subsequent development of *market rules*, *market manuals*, business processes and procedures.

The EDAC market design document was not expected to represent the complete or final statement of the design but represents the expected design at the time of publishing. As the design evolves through subsequent design activities and stakeholder sessions, the design concepts identified in the EDAC market design document will be changed.

This EDAC Operations Detailed Design document expands on the market design to identify the requirements necessary for implementation of the market design as it was known at the time of issue. The charge types and equations necessary to implement the Settlement of the EDAC market design are captured in a separate EDAC Settlements Detailed Design document.

– End of Section –

1. Introduction

1.1 Purpose

This document describes the detailed design for the Enhanced Day Ahead Commitment (EDAC) operations processes. The document serves as a reference for stakeholders as well as supporting the subsequent development of *market rules, market manuals,* business processes, procedures and solutions.

This design document reflects our current understanding of the changes to business processes and is expected to represent a complete statement of the design status at the time of issue. As the design evolves, the concepts identified in this document may change and consequently this document will be revised to reflect the changes.

1.2 Scope

This document describes the detailed design of the enhanced day-ahead operations processes in the *IESO-administered market* in relation to:

- The impact on current business processes and IT systems[1]
- New business processes

Implementation of the EDAC process is largely an integration of new components to the current Day Ahead Commitment Process (DACP), Pre-dispatch and *real-time dispatch processes* to improve the efficiency of the current market. This integration requires modification to *market rules, market manuals*, procedures, IT systems, and business processes. The documentation required to support necessary changes to these documents will be prepared using our current processes.

Various sections of this document refer to current IESO business processes. However, this document is not meant as a restatement of the current design of the IESO processes. Instead, this document focuses on current process elements that may be used in the current or amended form to support EDAC.

The EDAC Operations Detailed Design will be a living document that will be maintained until the end of the EDAC Market Trials. This design will provide a functional overview of the EDAC operations processes, which will be described in detail and will include market facing impacts to the extent that they are known.

The following processes are in scope of the EDAC Operations Detailed Design document:

- Facility Registration
- Data Submission
- EDAC Optimization
- Integration of EDAC results

[1] While this document may describe impacts to the current IT systems, it is not meant to imply any specific system solution going forward. Any system solution required to facilitate the changes that result from the EDAC detailed design will be developed and stakeholdered through the EDAC Technical Working Group

The following items are out of scope of the EDAC Operations Detailed Design document and will be provided in separate documentation:

- Settlements detailed design
- Day Ahead calculation engine detailed design
- EDAC business procedures
- Technical interfaces
- Report specifications

Figure 1–1 below shows the relationship between this design document and the following documents:

- Detailed design and business requirements documents
- Governing documents
- Procurement documents
- Support documents

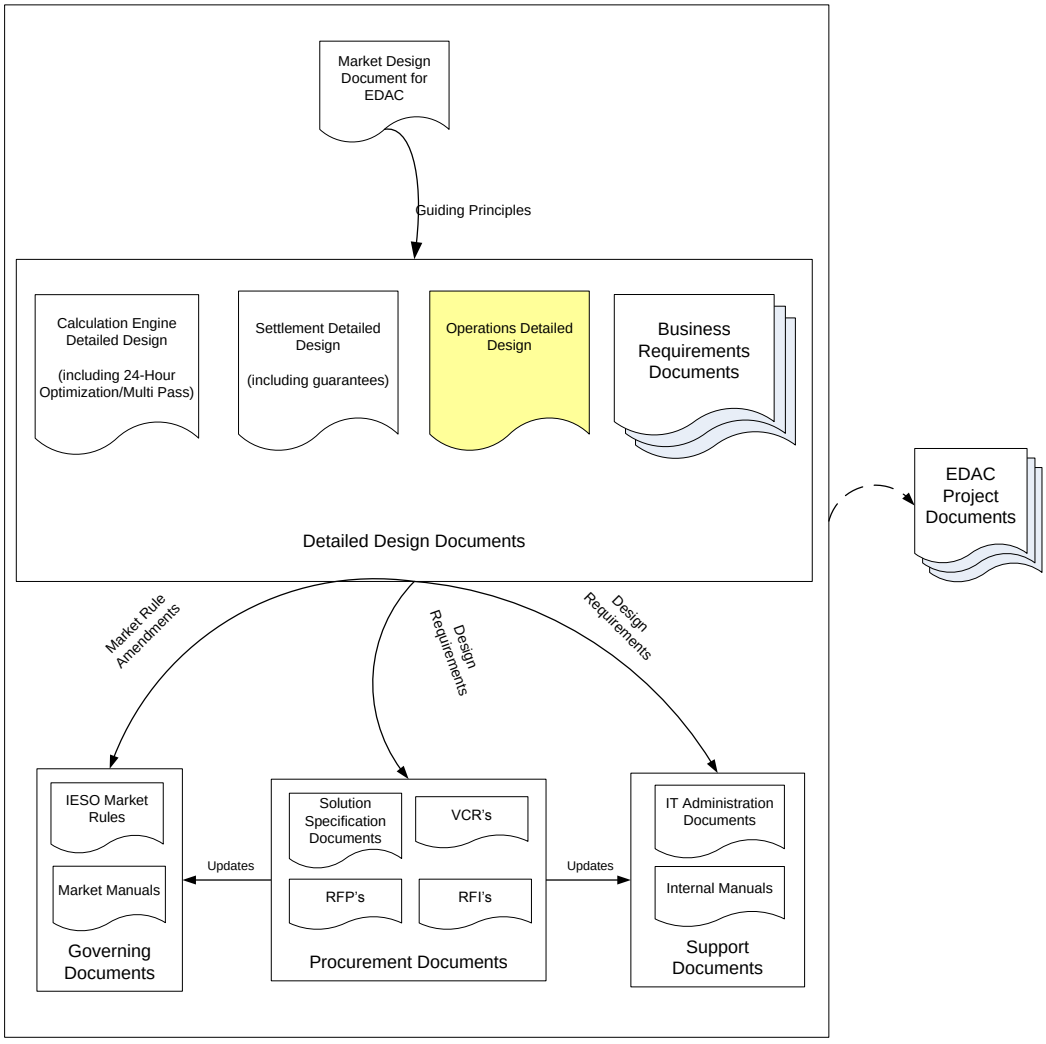


Figure 1–1: Documentation Flow for EDAC

1.3 Who Should Use This Document

This document is prepared for the following groups to use in order to help them understand the changes this design introduces to the *IESO-administered market*:

- Market participant stakeholders in order to assess the potential impact of the design on their businesses and operations
- The EDAC Design Team and pertinent IESO departments as a reference throughout the project lifecycle
- The general public in order to support discussions describing the EDAC detailed design

1.4 Assumptions and Limitations

Assumptions

While this document makes references to specific parameters that might be used in various processes, it does not convey any assumptions on the value of those parameters. These parameters will be set according to IESO policy and will be determined at a later date under the amended authority of the *market rules*.

Limitations

This design of the initial implementation uses the current market participant interfaces to the greatest extent that is practical. However, current limitations of system capabilities and implementation of necessary system changes may alter this design.

This design is based on the known IESO and participant business requirements at the time of issue. While the document will be maintained until the end of Market Trials, it may not reflect changes to the design that occur between publications. Additionally, the detailed design is subject to change throughout its life based on changing business requirements, solution development, testing and trials.

1.5 Conventions

Throughout this detailed design document, “we”, “our”, “us” refers to the *IESO* and unless otherwise stated, “you”, “your” and “yours” refers to participants in the *IESO-administered markets*.

The following standard conventions are used in this document:

- Time in this design document is Eastern Standard Time (EST); DACP operates on Eastern Standard Time (EST) all year round.
- We use the 24-hour clock and the ‘hour-ending’ (HE) convention to specify a particular hour. For example, HE19 or hour ending 19:00 is the hour that starts at 18:00 and ends at 19:00.
- The meanings of the *italicized* terms and acronyms used in this document are in Chapter 11 of the *market rules*.
- Double quotation marks are used to indicate titles of legislation, publications, forms and other documents.
- All prices (e.g. $/MW-month) are in Canadian dollars, and
- The term ‘cost’ used in subsequent sections, refers to as-bid and as-offered amounts as submitted by market participants, to consume and produce energy and operating reserve in the market

respectively. It does not represent the actual expenditures by a market participant to maintain or generate an electricity-related product.

1.6 How This Document Is Organized

This document is organized as follows:

- Section 2 of this document provides an EDAC design overview in the context of the business processes, design elements and EDAC timeline.
- Sections 3 to 7 of this document provides a description of the design elements related to each of the business processes required to support the implementation and operation of DACP.

– End of Section –

2. EDAC Project Overview

The purpose of the EDAC project is to implement a solution that enhances the efficiency of the current DACP for the scheduling and commitment of resources required to provide electricity supply on a daily basis. In order to achieve this, we must:

- Optimize existing and anticipated generation more efficiently
- Provide mechanisms to encourage appropriate bid/offer behaviour of all transactions (internal generation, dispatchable loads, imports and exports) while maintaining system reliability.

The EDAC Market Design describes the market design elements, time lines and business processes required to facilitate the EDAC process at a high level. The EDAC Operations Detailed Design document specifies the business requirements necessary to implement the EDAC Market Design.

– End of Section –

3. Authorization and Registration

Under the current design, there is no expectation that the process to authorize *market participants* or register their *facilities* to operate in the *IESO-administered market* will change. Some additional information to support the enhanced day ahead process must be provided and registered through the authorization and registration process.

Any new or revised registration data will be implemented within six business days. Registration data will be captured using existing forms wherever possible.

3.1 Registration Requirements for the Enhancements to the current DACP

The new Day Ahead Calculation Engine (DACE) will respect the technical characteristics of generation resources. Static physical characteristics will be registered through Market Entry. Variable physical characteristics will be recorded into daily generator data (DGD) and may be overwritten daily if equipment or regulatory conditions warrant (see section 4.2 for details).

Table 3.1 below shows the registration data elements required from Market Participants to support the EDAC process, as determined by resource or facility type.

Table 3-1: Registration Requirements to support DACP, by resource type

Data Description	Unit of Measure	EDAC New Item	Resource/Facility Type				
			Dispatchable Generators ETD > 1 Hour	Dispatchable Generators 5 Min < ETD ≤ 1 Hour	Combined Cycle Plant	Pseudo Units	Dispatchable Generators ETD ≤ 5 Minutes
Minimum Loading Point	MW	NO	X	X			
Minimum Generation Block Run Time	Hours	NO	X	X			
Elapsed Time to Dispatch	Minutes	YES	X	X			X
Daily Cascading Hydroelectric Dependency	Yes or No	YES					X

Data Description	Unit of Measure	EDAC New Item	Resource/Facility Type				
			Dispatchable Generators ETD > 1 Hour	Dispatchable Generators 5 Min < ETD ≤ 1 Hour	Combined Cycle Plant	Pseudo Units	Dispatchable Generators ETD ≤ 5 Minutes
CT and ST Relationship	Relation ship	YES			X	X	
ST Minimum Loading Point Limit[2]	MW	YES			X	X	
ST Share (Applicable to each CT)	%	YES				X	
ST Duct Firing Capacity	MW	YES				X	

[2] Unlike the other data elements in this table, which have only one daily value associated with them, the ST MLP has multiple values – one for each CT configuration at the combined cycle plant (1-on-1 MLP, 2-on-1 MLP, 3-on-1 MLP, etc.).

Figure 3.1 below shows an overview of the dispatchable generator technical data required for EDAC.

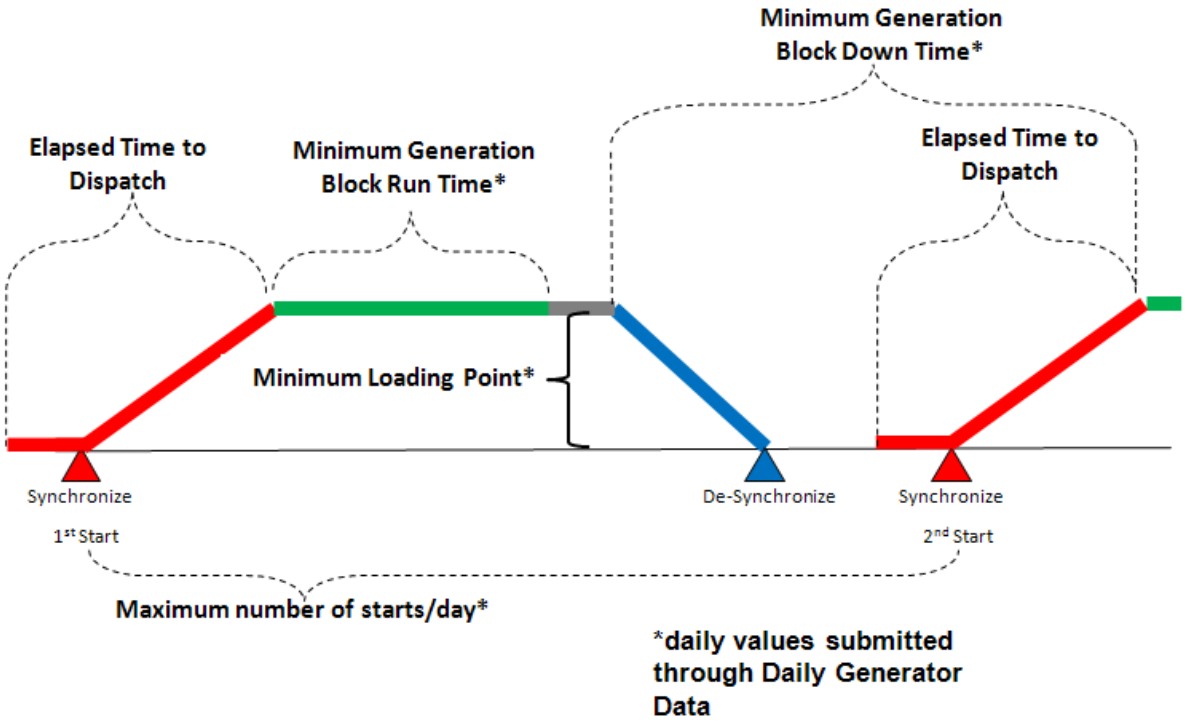


Figure 3-1: Dispatchable Generator Technical Data

3.1.1 Minimum Loading Point (MLP)

Market Rules define the *minimum loading point* as the minimum output of *energy* specified by the market participant that can be produced by a generation facility under stable conditions without ignition support. For registration purposes, the *market participant* submits a single value of *minimum loading point* for each dispatchable not quick start *generation unit*. The value must reflect the technical capability of the *generation unit*.

3.1.2 Minimum Generation Block Run Time (MGBRT)

MGBRT is the number of hours, specified by the market participant, that a generation unit must be operating at minimum loading point in accordance with the technical requirements of the generation unit. For registration purposes, the market participant submits a single value of MGBRT for each dispatchable not quick start generation unit. The value must reflect the technical capability of the generation unit.

3.1.3 Elapsed Time to Dispatch (ETD)

ETD is the minimum amount of time, in minutes, between the time when a dispatchable generator initiates its start-up sequence and the time when it can respond to IESO dispatch signals. For a non quick start *generation unit*, this means that the generator has reached MLP. The ETD must be submitted by all dispatchable generators and must reflect the technical capability of the *resource*.

3.1.4 Daily Cascading Hydroelectric Dependency (DCHD)

A dispatchable hydroelectric *generation facility* has a DCHD if the facility has a Minimum Hydraulic Time Lag[3] of less than 24 hours to or from an adjacent cascading hydroelectric *generation facility* that is controlled by the same *registered market participant*.

DCHD is used to determine if an energy limited dispatchable hydroelectric generation unit is eligible to resubmit dispatch data after the initial run of the DACE. Resources deemed eligible are referred to as Eligible Energy Limited Resources (EELR).

For registration purposes, the *market participant* submits the following information for each dispatchable hydroelectric *generation unit*:

- A self-declaration that the generation unit has a DCHD
- The Resource Name and Resource ID of the cascading hydroelectric dependent generation facility (where applicable).

3.2 Combined Cycle Plant Specific Requirements

In addition to any applicable registration requirements in section 3.1, combined cycle plants have a requirement to submit the data listed in this section.

3.2.1 CT to ST Relationship

For registration purposes, the market participant will provide the Resource Name and Resource ID of all physical combustion turbines (CT) and one physical steam turbine (ST), which make up the combined cycle plant.

If the market participant indicates the desire to participate in pseudo unit modeling for Day Ahead scheduling of the combined cycle plant, PSU resources will be created. Each PSU will consist of one CT and its associated ST. The number of PSUs to be registered at a given CCP is equal to the number of CTs at the CCP.

3.2.2 ST Minimum Loading Point

The *Minimum Loading Point* of a steam turbine at a combined cycle plant may differ depending on the number of combustion turbines that obtain a schedule from DACP. For registration purposes, *n*-1 additional ST MLPs are required for all combined cycle configurations above the MLP submitted for a 1 CT on 1 ST configuration; *n* is equal to the number of combustion turbines at the combined cycle plant. Each value must reflect the technical capability of the generation unit.

3.2.3 ST Percentage Share of a PSU

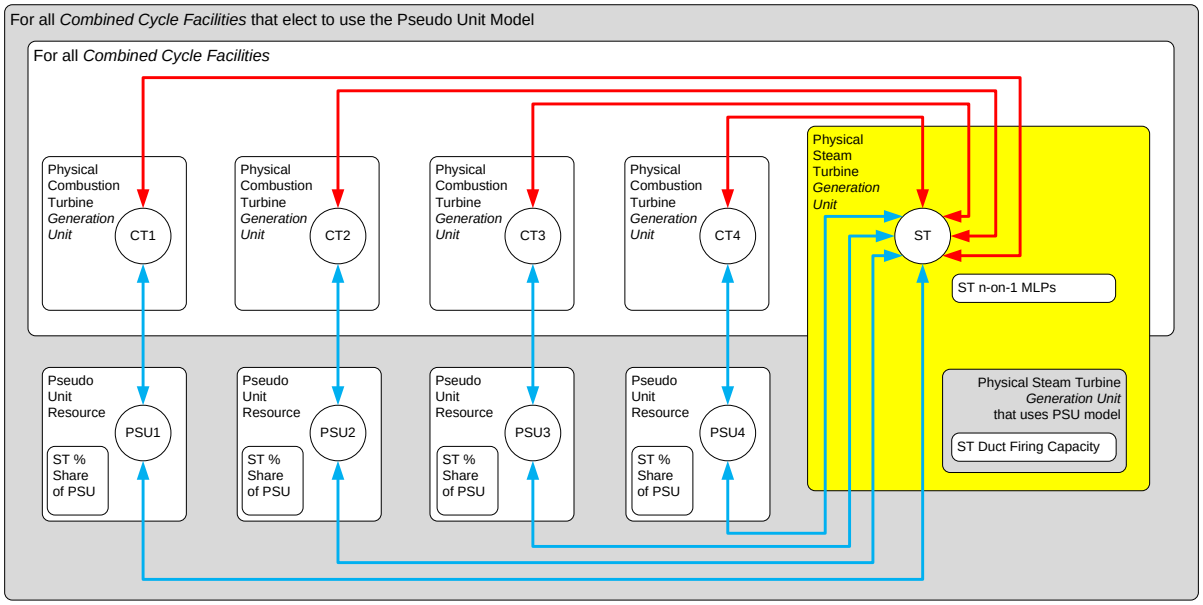
Steam Turbine Percentage Share of PSU is the amount of steam turbine energy capacity associated with each PSU, expressed as a percentage. The values are captured only when the market participant intends to use pseudo unit modeling and must reflect the technical capability of the generation unit.

[3] Minimum Hydraulic Time Lag is the minimum amount of time, in hours (rounded down to the nearest whole hour), that is required for water to travel to, or from, an adjacent hydroelectric *generation facility* on the same water system

3.2.4 ST Duct Firing Capacity

Duct Firing Capacity is the amount of capacity due to the amount of duct firing available from a physical steam turbine. For registration purposes, a single value of Duct Firing Capacity will be provided and captured for a steam turbine resource associated with a *combined cycle facility* that has indicated the desire to use pseudo unit modeling. The value must reflect the technical capability of the *generation unit*.

The combined cycle plant relationships and registration requirements in sections 0 to 3.2.4 are shown in Figure 3.3 below:



Legend: *Combined cycle facilities* require all "**red line**" relationships shown to be established.
Combined cycle facilities that elect to use the pseudo unit model require all "**red line**" and "**blue line**" relationships shown to be established.

Figure 3-2: Combined Cycle Plant Relationships and Registration Requirements

3.3 IESO Validations and Actions

3.3.1 Physical Resource Validation

The IESO receives and validates the facility registration information from market participants as outlined in this section.

Minimum Loading Point (MLP)

A resource that is a dispatchable unit and is not a quick start generation unit may submit a MLP in megawatts (MW) based on its technical capability. The IESO will ensure that number is in the format xxxx and is greater than or equal to zero but less than the Maximum Generator Capability.

The IESO will assign a default value of zero (0) MW to these resources if no value is provided by the market participant.

Minimum Generation Block Run Time (MGBRT)

A resource that is a dispatchable generation unit, and is not a quick start generation unit, may submit a MGBRT in hours based on its technical capability. The IESO will ensure that the number is in the format xx and is greater than or equal to zero but less than 24.

The IESO will assign a default value of zero (0) hours to these resources if no value is provided by the market participant.

Elapsed Time to Dispatch (ETD)

All dispatchable generation units must submit an ETD. The IESO will ensure that the number is a non negative integer in the format xxx and is greater than or equal to zero (0).

The IESO will assign a default value of "NULL" to these resources if no value is provided by the market participant.

Daily Cascading Hydroelectric Dependency (DCHD)

A resource that is a dispatchable generation unit with a registered fuel type of "WATER" may submit a DCHD.

The IESO will ensure that the facilities noted have a cascading hydroelectric dependency with the noted generation facility and is controlled by the same registered market participant.

3.3.2 Combined Cycle Plant (CCP) Validation

When a *market participant* indicates the desire to participate in pseudo unit modeling for Day Ahead scheduling of the combined cycle plant, further validation by IESO includes:

- Physical resources associated with PSU must not be physically aggregated. This does not include Compliance aggregation as described in Market Manual 4.3, Real-Time Scheduling of the Physical Markets, section 1.12.
- The number of PSUs registered must be equal to the number of CTs registered to the facility.
- Each PSU will have a unique CT.
- All CTs at a combined cycle plant that register as a PSU must share one Steam Turbine.
- DA-PCG eligibility for each PSU resource will be based on physical CT unit registration data.
- PSU market type participation (i.e. energy market, operating reserve markets) shall be identical to that of the physical CT unit registration data.
- PSU resource type shall be identical to that of the physical CT unit registration data and shall be registered as dispatchable resources.
- PSU Maximum Generator Capacity (PSU MGC) will be calculated and recorded based on the Maximum Generator Capacity of the CT and ST, and the registered ST Share parameter.

CCP CT to ST Relationship

The IESO will validate the data based on the following validation rules:

- All physical *resources* (CTs and STs) have already been registered individually.
- All physical *resources* (CTs and STs) are part of the same registered *facility.*
- All physical *resources* (CTs and STs) have a resource bid type of dispatchable.

Configurations up to a 4 CTs to 1 ST (i.e. maximum number of CTs = 4, maximum number of ST = 1) must be supported. As an example, if a combined cycle plant has physical resources CT1, CT2, CT3 and ST1 then the IESO must recognize the following relationships:

- ST1 is associated with CT1
- ST1 is associated with CT2
- ST1 is associated with CT3

When the market participant indicates the desire to participate in pseudo unit modeling as part of Day Ahead scheduling of the combined cycle plant, the IESO must also recognize the following relationships:

- PSU1 consists of CT1 and ST1
- PSU2 consists of CT2 and ST1
- PSU3 consists of CT3 and ST1

CT and ST Resources of a Combined Cycle Plant

The IESO will determine the subset of dispatchable generators that are combustion and steam turbines of a combined cycle plant based on the data provided by market participants. The information will be used by the IESO to identify which dispatchable generation units must provide more than one DGD MLP value.

ST Minimum Loading Point

STs at a combined cycle plant require multiple MLPs (one for every CT at the CCP) be submitted. The IESO will ensure that each value is a number in the format xxxx.x and is greater than zero. Additionally, the IESO will ensure that each MLP satisfies the condition:

$$0 < MLP_{(n\text{-}1)\text{-on-}1} < MLP_{n\text{-on-}1} \leq \text{ Maximum Generator Capability, where } 2 \leq n \leq \#\text{ of CTs}$$

The IESO will assign a default value is 0.0 MW for all (n-1) additional MLPs if no value is provided by the market participant.

ST Percentage Share of a PSU

The data submitted by the market participant will be validated by the IESO based on the following validation rules:

- The number of share percentage values provided must equal the number of combustion turbine resources in the combined cycle plant that is being registered for PSU modeling.
- Each value must have the number format xxx.x%.
- Each value must be a non-negative value.
- Each ST percentage must be greater than 0.0% and less than 100%.
- The ST percentage multiplied by ST Maximum Capability Rating (MCR) must be greater or equal to ST MLP $_{1\text{-on-}1}$;
- Each value must have a start date associated with the specified value in order to handle time dependent revisions of Steam Turbine Percentage Share of PSU.
- The sum of all share percentages must equal 100.0%.

ST Duct Firing Capability

The data submitted by the market participant will be validated by the IESO based on the following validation rules:

- It must be a steam turbine from a combined cycle plant.
- The number format xxxx.x – unit is MW.
- $0 \leq$ Duct Firing < Maximum Generator Capability – [(Registered Number of Combustion Turbines at a Combined Cycle Plant) * (Registered ST $MLP_{1\text{-}on\text{-}1}$)].
- Must have a start date associated with the specified value in order to handle time dependent revisions of Duct Firing

CT of a PSU

The IESO will identify the subset of dispatchable generators that are combustion turbines of a combined cycle plant that use the pseudo unit model based on data provided by the *market participant.* This information will be used by the IESO to identify which combustion turbines using the pseudo unit model have the ability to toggle between single cycle mode and combined cycle mode.

3.3.3 IESO Actions

After validation of the registration data submitted by the market participant, the IESO must make a number of status decisions and take specific actions as outlined below.

Eligible Energy Limited Resource (EELR) Flag

From the DCHD registration data submitted by market participants, the ability for a participant to resubmit dispatch data as an eligible energy limited resource will be determined by the IESO. The state for the single value EELR Resubmission Flag will be determined based on the following rules:

IF	Daily Cascading Hydroelectric Dependency = YES
THEN	EELR Resubmission Flag = YES
ELSE	EELR Resubmission Flag = NO

The IESO will initialize the data if the *resource* is a *generation unit;* the default value is NO.

Quick Start Flag

Based on the technical data provided by the market participant of the dispatchable generation unit the IESO will determine a single value for the setting of the Quick Start Flag. If the resource is identified as a quick start, the flag will be set to YES.

Day Ahead Production Cost Guarantee (DA-PCG) Eligibility Flag

The DA-PCG allows eligible dispatchable *generation units* guaranteed cost recovery when dispatched to produce in the real-time market and real-time revenue is insufficient to cover the as-offered costs to produce schedules as committed in DACP. This eligibility is determined at the time of registration and is based on the technical data submitted by the market participant. The IESO registration solution will initialize the flag to a default value of NO. The IESO will automatically determine the value of the flag based on the following rules:

IF Quick Start = NO

AND MLP > 0 MW

AND MGBRT > 1 hour

AND ETD > 60 min

AND Registered Resource Fuel Type is not 'URANIUM'[4]

THEN PCG Eligibility Flag = YES

ELSE PCG Eligibility Flag = NO

Minimum Loading Point (MLP) Tolerance

The MLP Tolerance value is a static percentage (greater than or equal to 100%) applied to all dispatchable generating resources that defines the amount of tolerance to be applied to the registered minimum loading point to determine the amount that Daily Generator Data can change from the registered value without being flagged for further review by IESO market surveillance.

The IESO will monitor and adjust the tolerance percentage if required.

Minimum Generation Block Run Time (MGBRT) Tolerance

The MGBRT Tolerance value is a static percentage (greater than or equal to 100%) applied to all dispatchable generating resources that defines the amount of tolerance to be applied to the registered minimum generation block run time to determine the amount that Daily Generator Data can change from the registered value without being flagged for further review by IESO market surveillance.

The IESO will monitor and adjust the tolerance percentage if required.

– End of Section –

[4] Nuclear *generation units* are excluded from receiving a DA-PCG

4. Data Submission

The data submission process includes the submission of *dispatch data* and technical data, referred to as daily generator data, for support of the EDAC process. The process for submitting dispatch data and daily generator data is described in detail in this section and illustrated in Figure 4.1.

4.1 Dispatch Data

Dispatch data remains unaffected for most resource types with the introduction of EDAC. The lone exception, the three part offer for dispatchable not-quick-start generators, is described below.

Data Description	Unit of Measure	EDAC New Item	Resource Type							
			Dispatchable Generators ETD > 1 Hour	Dispatchable Generators 5 Min < ETD ≤ 1 Hour	Pseudo Units	Dispatchable Generators ETD ≤5 Minutes	TSG; INT; SS Generators	Dispatchable Loads	Imports	Exports
Start-Up Costs	$	YES	X	X	X					
Speed No-Load Costs	$	YES	X	X	X					
Incremental Energy Bid	$/MWh	NO						X		X
Incremental Energy Offer	$/MWh	NO	X	X	X	X			X	
Incremental Energy Quantity	MW	NO	X	X	X	X		X	X	X
Incremental Offer	$/MWh	NO	X	X	X	X		X	X	X
Incremental OR Quantity	MW	NO	X	X	X	X		X	X	X

Energy Ramp Up[5]	MW/ minute	NO	X	X	X	X		X	X	X
Energy Ramp Down	MW/ minute	NO	X	X	X	X		X	X	X
OR Ramp Up	MW/ minute	NO	X	X	X	X		X	X	X
Energy Limit[6]	MWh	NO	X	X	X	X				
Schedules and Forecasts	MWh	NO					X			
NERC Tag Identifier[7]	N/A	NO							X	X

Table 4-1: Dispatch Data Submission by Resource Type

4.1.1 Three Part Offer

Dispatchable not-quick-start generators can submit three part offers for consideration in the DACE. The three parts of the offer are:

- Start-up cost (new offer component)
- Speed-no-load cost (new offer component)
- Incremental energy (existing offer component)

Start-Up Cost (SUC)

Start-Up Cost is submitted as an offer attribute of *dispatch* data. The SUC is a single value for each offered hour submitted (to a maximum of 24 values) for day ahead.

Speed No-Load Cost (SNL)

Speed No-Load (SNL) Cost is submitted as an offer attribute of *dispatch* data. The SNL Cost is a single value for each offered hour submitted (to a maximum of 24 values) for day ahead.

Incremental Energy Bids/Offers

There will be no change to the current incremental bid/offer structure and validation. Approved offers will be used by both DACP and Pre-dispatch (with the exception of pseudo units). Incremental energy offers may be adjusted after the DACP Schedule of Record (SOR) is issued in accordance with existing submission window rules. Pre-dispatch only considers incremental energy offers and ignores

[5] The DACE will convert the hourly ramp up rate to daily time resolution by using the data for energy ramp up/down rates and reserve ramp that applies for the first hour of study.
[6] The energy limit has a daily granularity. The other data elements in this table have hourly granularity.
[7] The NERC Tag identifier of an import that is associated with a wheeling transaction should match with the NERC Tag from the corresponding export.

SNL & Start-up costs. *Market Participants* may want to change their offers (for not quick start generation units) after DACP in order to reflect their integrated costs in a single part offer.

4.1.2 Dispatch Data Submission Prior to 10:00 EST

For a *market participant's* resource to be considered for optimization in the DACP, the *market participant* must submit initial *dispatch data* for the next day's operation before the start of the commitment process. The *market participant* provides either *dispatch data* for the resource between 6:00 and 10:00 or has a standing bid/offer that is accepted prior to 6:00. (Previously submitted standing bids/offers are converted at 6:00 for use in the commitment process.)

4.1.3 Dispatch Data Submission after 10:00 EST

Dispatch data submissions between 10:00 and 14:00 from dispatchable *generators* or dispatchable loads, which are subject to operator approval, must be accompanied by a currently defined reason code. If "OTHER" is selected, a corresponding text description must be included. If a reason code is not included, the bid/offer will be automatically rejected and a validation error will be issued.

Dispatch data for dispatchable *generators* and dispatchable loads waiting for operator approval at 14:00, will be automatically rejected. Any dispatch data from imports, exports and linked wheels waiting for operator approval at 14:00 will be automatically accepted (subject to validation).

Cascade hydroelectric generation units that are energy limited may be scheduled in a sub-optimal way. For this reason, we will give Eligible Energy Limited Resources an opportunity to look at the results[8] of one complete run of the DACE and allow ELR offers including the Daily Energy Limit (DEL) to be adjusted. During the ELR re-submission window (normally from 11:00 to 12:00), restrictions will not apply to *Dispatch Data* changes from Eligible Energy Limited Resources for all revisions and cancellations. As in current DACP processes, there may be limitations on the ability to view DACE results or to change ELR data due to contingencies or other planned events such as software upgrades.

Revisions to dispatch data requiring operator approval can be made for the following reasons:

- The IESO requests submission of dispatch data for reliability reasons.
- The IESO rejects, revokes or recalls an outage.
- Equipment is returning early from a planned or forced outage.
- Changes in the operational status of the generation facility or the dispatchable load facility to prevent the facility from operating in a manner that would violate any applicable law, endanger the safety of any person, or damage property or the environment.

[8] Principles for the access to reports is highlighted in Section 7.1

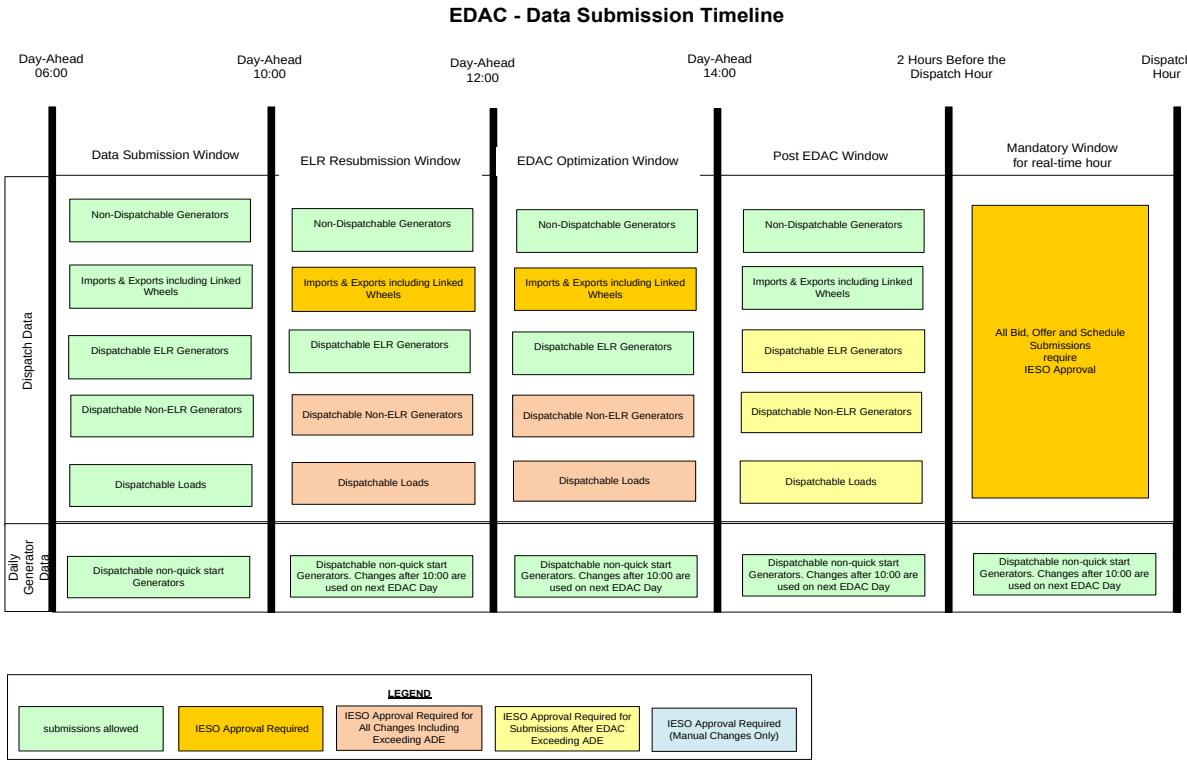


Figure 4-1: EDAC Submission Timeline

4.1.4 Availability Declaration Envelope (ADE)

The Availability Declaration Envelope is the hourly capacity offered day ahead for dispatchable generators or the hourly load *bid* as dispatchable for dispatchable loads. Dispatch data submitted prior to 10:00 forms the resource's initial ADE day ahead.

Market participants must submit their initial real-time offers for PUs associated to a PSU by 10:00 Day 0. For each physical unit (PU) associated with a PSU, the PU initial offer at 10:00 determines the Availability Declaration Envelope for that resource.

Any new or revised dispatch data submission that has been accepted by the IESO before 14:00 is used to establish the resource's ADE.

After 14:00, *market participants* need IESO approval to submit any new or revised *dispatch data* that expands their ADE, except for *dispatch data* submitted in response to an IESO request for additional *bids* and *offers*.

4.1.5 Pseudo Unit Offer Submission – Day Ahead

Market participants that have elected to use the pseudo unit model must submit day-ahead offers for the PSU resource and real-time offers for their physical unit resources that comprise the PSU.

If the *market participant* is making an offer, the following conditions apply:

- Market participants must submit day-ahead PSU offers by 10:00 on Day 0 (i.e., in time for the first Day-Ahead Calculation Engine run of the day).
- Market participants must submit their initial real-time offers for PUs associated to a PSU by 10:00 on Day 0. For each PU associated to a PSU, the PU initial offer at 10:00 determines the Availability Declaration Envelope for that resource.

4.2 Daily Generator Data (DGD)

The DACE requires DGD values for *dispatchable* generators. The DACE initializes DGD with default values[9] (specified below). Not Quick Start generators can provide alternate values to the defaults and can revise the values on a daily basis. Non-dispatchable resources (intermittent, self-scheduling, dispatchable loads, imports and exports) do not have default DGD values or the ability to alter them.

Table 4-2: Daily Generator Data Submission by Resource Type

Data Description	Unit of Measure	EDAC New Item	Resource Type	
			Dispatchable Generators ETD > 1 Hour	Dispatchable Generators 5 Min < ETD ≤ 1 Hour
Minimum Loading Point	MW	YES	X	X
Minimum Generation Block Run Time	Hours	YES	X	X
Minimum Generation Block Down Time	Hours	YES	X	X
Maximum Number of Starts per Day	Number	YES	X	X
Single Cycle Flag[10]	Yes/No	YES	X	X

[9] The DACE does not accept null values as inputs. Inputs to the DACE require initial default values.
[10] Only applies to CTs associated with pseudo units.

4.2.1 Minimum Loading Point

The MLP submitted by the *market participant* will be validated by the IESO by comparison to the DGD MLP Limit. Submissions exceeding this limit are allowed, but will require a reason code and IESO approval and may be identified to compliance for review if the change was made for non-technical reasons.

4.2.2 Minimum Generation Block Run Time

The MGBRT submitted by the *market participant* will be validated by the IESO by comparison to the DGD MGBRT Limit. Submissions exceeding this limit are allowed, but will require a reason code and IESO approval and may be identified to compliance for review if the change was made for non-technical reasons.

4.2.3 Minimum Generation Block Down Time

Minimum Generation Block Down Time is defined as the minimum number of hours, specified by the market participant, required between the time a generation unit is last at its minimum loading point before de-synchronization and the time the generation unit reaches its minimum loading point again after synchronization.

4.2.4 Maximum Number of Starts per Day

The maximum number of starts per day is the number of times that a generation unit can be started within the same day.

4.2.5 Single Cycle Flag

This mode will be used when the combined cycle operator wishes to operate the CT in single cycle mode. (The steam produced from the CT is not used as a primary fuel for the ST). During single cycle mode, IESO will be ignoring the ST contributions while computing the PSU parameters.

4.2.6 Pseudo Unit Daily Generator Data Submission

Market participants are not permitted to directly submit daily generator data (DGD) on their PSU resources. Instead, they must revise their physical unit DGD accordingly, and the IESO will compute their PSU parameters.

Market participants are expected to understand how updating their physical unit DGD will affect their PSU DGD and should adjust their physical unit DGD accordingly to achieve their desired PSU results. The formulas used in computing the PSU parameters are further described in this section.

DGD Single-Cycle Mode for Combustion Turbine of Pseudo Unit Submission

The market participant can elect to operate a PSU in single-cycle mode (i.e., remove the steam turbine contribution from the pseudo unit). The market participant submits their choice using the single-cycle mode DGD value for the combustion turbine associated to the PSU. By doing so, the resulting computed technical parameters on the PSU resource will be equal to the technical parameters of the combustion turbine (CT). This feature is only available to a CT associated with a PSU, and will enable the market participant to continue submitting offers on the PSU.

Single-cycle mode is a daily generator value used by the IESO in calculating PSU DGD values. These PSU DGD values are inputs to the DACE. The single-cycle mode is a single value applied to all hours of the EDAC day.

IF

$SingleCycleModeFlag_{PSU(n)}$ = NO,

then PSU operates in combined cycle mode (ST contribution enabled)

ELSE

$SingleCycleModeFlag_{PSU(n)}$ = YES,

then PSU operates in single cycle mode (ST contribution disabled)

Computation of PSU DGD Technical Parameters

The following PSU parameters are computed by the market participant transaction solution(s) after 10 EST once market participants have updated the related physical unit DGD parameters during DACP:

PSU Maximum Capability Rating (MCR) is computed to be the sum of the MCR of the associated CT (submitted through registration) plus the ST contribution to PSU MCR (computed value based on ST Percentage Share submitted through registration).

$$MaxCapacity_{PSU(n)} = MaxCapacity_{CT(n)} + MaxCapacity_{ST\_to\_PSU(n)}$$

PSU MLP is computed to be the sum of the MLP of the associated CT plus the DGD 1-on- 1 MLP of the ST as submitted through DGD.

IF $SingleCycleModeFlag_{PSU(n)}$ = NO,

$$MLP_{PSU(n)} = MLP_{CT(n)} + MLP_{ST}$$

ELSE

$$MLP_{PSU(n)} = MLP_{CT(n)}$$

PSU MGBRT is computed to be equal to the associated CT DGD MGBRT as submitted through DGD.

$$MGBRT_{PSU(n)} = MGBRT_{CT(n)}$$

PSU MaxStarts is computed to be equal to the associated CT MaxStarts as submitted through DGD.

$$MaxStarts_{PSU(n)} = MaxStarts_{CT(n)}$$

PSU MGBDT is the Minimum Generation Block Down-Time of a PSU equal to the supplied MGBDT of the associated CT through DGD.

$$MGBDT_{PSU(n)} = MGBDT_{CT(n)}$$

Note: Computed parameters will be rounded to the nearest whole number.

Computation of PSU DGD Operating Region Parameters

The **PSU Lower Operating Region Amount** (PSU_OR_1), also known as the MLP Range, is defined as the capacity available from zero output to the MLP of the PSU. The PSU Lower Operating Region is computed to be equal to the computed value of the MLP of the PSU.

$$PSU\_OR\_1_{PSU(n)} = MLP_{PSU(n)}$$

The **PSU Upper Operating Region Amount** (PSU_OR_3), also known as the Duct Firing Range, is defined as the capacity available from duct firing above the Middle Operating Region. The PSU

Upper Operating Region is computed to be the product of ST percentage share per PSU and the ST duct firing capacity. Both input values are submitted through registration.

IF SingleCycleModeFlag $_{PSU(n)}$ = NO,

$$PSU\_OR\_3_{PSU(n)} = Share\%_{PSU(n)} * DuctFiring_{ST}$$

ELSE

$$PSU\_OR\_3_{PSU(n)} = 0.0$$

The **PSU Middle Operating Region Amount** (PSU_OR_2), also known as the Dispatchable Range, is defined as the capacity available above MLP and below the start of duct firing. The PSU Middle Operating Region is computed as the difference of the PSU MCR, the Upper Operating Region and the Lower Operating Region.

$$PSU\_OR\_2_{PSU(n)} = MaxCap_{PSU(n)} - PSU\_OR\_3_{PSU(n)} - PSU\_OR\_1_{PSU(n)}$$

Computation of ST DGD Portion of PSU Operating Regions

The ST Portion of an Operating Region is the amount of capacity the ST contributes to the PSU for a specified operating region. The DACE requires the input of the ST portions expressed as percentages.

The **ST Portion of the Lower Operating Region Amount** (ST_OR_1) is equal to the DGD 1-on-1 MLP of the ST.

IF SingleCycleModeFlag $_{PSU(n)}$ = NO,

$$ST\_OR\_1_{PSU(n)} = MLP_{ST}$$

ELSE

$$ST\_OR\_1_{PSU(n)} = 0.0$$

The **ST Portion of the Upper Operating Region Amount** (ST_OR_3), expressed in MW, is computed as the product of ST percentage share per PSU and the ST duct firing capacity. Both input values are submitted through registration.

IF SingleCycleModeFlag $_{PSU(n)}$ = NO,

$$ST\_OR\_3_{PSU(n)} = Share\%_{PSU(n)} * DuctFiring_{ST}$$

ELSE

$$ST\_OR\_3_{PSU(n)} = 0.0$$

The **ST Portion of the Middle Operating Region Amount** (ST_OR_2), expressed in MW, is computed as the difference of the ST contribution to a PSU MCR, the ST Portion of the Upper Operating Region and the ST Portion of the Lower Operating Region. All three input values are computed.

$$ST\_OR\_2_{PSU(n)} = MaxCapacity_{ST\_to\_PSU(n)} - ST\_OR\_3_{PSU(n)} - ST\_OR\_1_{SU(n)}$$

The ST Portions, expressed as percentages, are computed as the share of the ST Portion divided by the PSU Operating Region. Both input values are computed.

$$K1 = ST\_OR\_1_{PSU(n)} / PSU\_OR\_1_{PSU(n)} * 100$$

$$K2 = ST\_OR\_2_{PSU(n)} / PSU\_OR\_2_{PSU(n)} * 100 \text{ where } PSU\_OR\_2_{PSU(n)} > 0, \text{ else } K2 = 0$$

$$K3 = ST\_OR\_3_{PSU(n)} / PSU\_OR\_3_{PSU(n)} * 100 \text{ where } PSU\_OR\_3_{PSU(n)} > 0, \text{ else } K3 = 0$$

4.2.7 Steam Turbine DGD MLP for n-on-1 CT-to-ST Configuration Submission and Validation

A physical ST that is part of a combined cycle plant (regardless of whether or not the market participant has elected to use the Pseudo Unit Model) will be able to provide each of their n-on-1 DGD MLPs where applicable. The number of DGD MLPs a market participant can submit for a ST is dependent on the number of CTs in the combined cycle plant.

The additional n-on-1 DGD MLPs is limited and equal to (n-1), where n is equal to the number of CTs at the combined cycle plant. For example, a combined cycle plant with three CTs and one ST can provide a 2-on-1 and 3-on-1 DGD MLP, but may not submit a 4-on-1 DGD MLP.

The market participant may only submit CT-to-ST configuration values for the number of combustion turbines in the combined cycle plant.

The DGD MLP Limits are computed based on the registered value of MLP and the tolerances as determined by Operational Analysis.

The submitted MLP will be validated based on the following validation rules:

- Number format xxxx.x, (units are in megawatts[MW])
- $0 < \text{DGD MLP}_{(i)\text{-on-}1} < \text{DGD MLP}_{(i)\text{-on-}1}$ Limit
- $0 < \text{DGD MLP}_{(i\text{-}1)\text{-on-}1} < \text{DGD MLP}_{(i)\text{-on-}1}$ where $2 \leq i \leq n$

4.2.8 Approval of Daily Generator Data

DGD can be submitted at any time. In contrast to unapproved submitted *dispatch* data, DGD submissions are NOT rejected daily at 14:00.

DGD submissions accepted by the IESO prior to 10:00 will be used for Day 1 optimization and must be validated using the DGD limits effective for Day 1. DGD submissions after 10:00 will be used in the next day's DACP.

Submission above the MLP or MGBRT Limit will require a reason code and IESO approval. Submissions above the limit will be approved, but may be identified to compliance for review if the change was made for non-technical reasons.

Table 4–3: DGD Submission Reason Codes

Code	Definition
T	Technical requirement
NT	Non-Technical requirement

4.3 Automatic Generation Control (AGC) Offer Submission

AGC Capacity is offered by each *Ancillary Service* Provider by 9:00 on Day 0 (for DACP Day 1). The Day Ahead Operator (DAO) must process and confirm AGC schedules by 10:00. The IESO will ensure for each hour of Day 1 for which the Ancillary Service Provider has submitted and AGC Capacity offer that the offer is a number in the format of xxx.x and is greater than or equal to 0.0 MW.

4.4 Segregated Mode of Operation (SMO)

Market participants must submit SMO requests by 09:00 in order to be included in the first run of DACP. The DAO must assess the SMO request by 10:00, if it is received from the *market participant* no later than 09:00 (for use in the 10:00 DACP run). The DAO will assess SMO requests received after 09:00 and before 10:00 on a best effort basis. Knowing that SMO can be recalled at any time for reliability, *market participants* are required to have offers in the Ontario Market prior to 10:00 for any SMO generation.

SMO is treated equivalently to an export wanting to be considered in DACP. Thus SMO requests must be approved prior to 10:00 in order to be considered in the DACP process.

4.5 Linked Wheels

The Day Ahead Calculation Engine uses submitted bids and offers to schedule the import and export legs of a linked wheel based on overall economics. The import offer and export bid are individually submitted and the wheel is scheduled if the difference between the export bid and import offer prices exceeds the difference between the import and export zone shadow prices. When one leg of an *offer* to import or a *bid* to export submitted for an identified linked wheel transaction is not successfully scheduled in whole or in part in DACP, the corresponding leg will be reduced to the lowest scheduled quantity.

Note: Linked wheels will be scheduled economically as linked transactions. It is not necessary to follow the pricing constraints for real-time bid/offer rules defined in Market Manual 4.2.

4.6 IESO Actions

4.6.1 Dispatch Data

Dispatch data submitted to the IESO will be accepted if it meets applicable validation rules and is provided in the appropriate submission-time window. If any part of an submission fails its validation, then the entire submission fails.

Start-Up Costs (SUC)

For submitted SUC from a not quick start dispatchable generator, the IESO will ensure that the submission is a number in the format of xxxxxx that is either greater than or equal to zero (0).

Speed No-Load (SNL) Cost

For submitted SNL cost adjust this too from a not quick start dispatchable generator, the IESO will ensure that the submission is a number in the format xxxxx that is either greater than or equal to zero (0).

Daily Generation Data

DGD consists of (initial default values are provided in parentheses):

- Minimum Loading Point (0 MW)

- Minimum Generation Block Run Time (0 Hours)
- Minimum Generation Block Down Time (0 Hours)
- Maximum Number of Starts per Day (24 starts)
- Single Cycle Mode Flag (NO)

Market participants can use the initial DGD default values. If the *market participant* uses the initial default values, their resulting schedule may not respect the technical capabilities of their resource. These initial defaults remain in effect for future runs of DACE until the *market participant* revises them. *Market participants* are responsible for revising existing offers to respect any changes to DGD.

Minimum Loading Point and Minimum Loading Point Limit

The IESO will validate the *market participant's* submission of DGD Minimum Load Point by comparing it to the DGD MLP Limit (a calculated value). The DGD MLP Limit is defined as the minimum of the resource's registered Maximum Generator Capability or the resource's registered MLP multiplied by a tolerance (a percentage value equal to or greater than 100%). The calculation is mandatory for dispatchable generators (excluding Quick Starts) and prohibited for all other resource types.

Minimum Generation Block Run Time and Minimum Generation Block Run Time Limit

The IESO will validate the market participant's submission of DGD Minimum Generation Block Run Time by comparing it to the DGD MGBRT Limit (a calculated value). The DGD MGBRT Limit is defined as the minimum of either 24 hours, or the resource's registered MGBRT multiplied by a tolerance (a percentage value equal to or greater than 100%). The calculation is mandatory for dispatchable generators (excluding Quick Starts) and prohibited for all other resource types

Minimum Generation Block Down Time (MGBDT)

For not quick start dispatchable generators that submitted MGBDT, the IESO will ensure that the number is in the format xx and is greater than or equal to 0 and less than or equal to 24.

Maximum Number of Starts per Day

For not quick start dispatchable generators that submitted Maximum Number of Starts, the IESO will ensure that the number is in the format xx that is greater than or equal to 1 and less than or equal to 24.

Single Cycle Flag

A single value of single-cycle mode will be recorded for each CT associated with a PSU. The single-cycle mode is a single value applied to all hours of the DACP day.

The submitted single-cycle mode will be validated based on the following validation rules:

- Must be a CT associated with a PSU.
- The format is Boolean (i.e., Yes/No).

- End of Section –

5. DACP Optimization

5.1 New DACE Input Requirements

The majority of inputs required to initialize the DACE are identical to those currently required for the Pre-dispatch run of the constrained and unconstrained schedules. The only new inputs required to support the DACE are described in this section below.

5.1.1 Initial Hours of Operation (IHO)

The Initial Hours of Operation, defined as the number of consecutive hours the dispatchable generator is in operation at the end of Day 0, is used to process the resource's start up *offers* for generators at the beginning of the Day 1 and to facilitate the treatment of MGBRT over midnight.

The IHO is determined only for not quick start dispatchable generators and is based on:

- The schedules from the most recent Pre-dispatch run for Day 0
- The previous day's DACP constraints in Contract Manager for Day 0 at the time that the most recent Pre-dispatch run for Day 0 results are published.

5.1.2 Start-up Offer Treatment for the First Hour of Day 1

When determining the schedule for the first hour of Day 1, the DACE does not take into account the start-up offers for dispatchable generators that are already in operation in the last hour of Day 0.

5.1.3 Treatment of Ramp Rate over Midnight

The Resource Initial Schedule (RIS) is used by the DACE to ensure the resource's hourly ramp rate is respected for the first hour of Day 1. RIS is computed as part of each DACE run and requires the most recent Pre-dispatch Schedule results for Day 0.

RIS is determined only for dispatchable generators and loads. It represents the dispatchable resource's initial schedule in HE24 of Day 0. If the dispatchable resource has a non-zero schedule in HE24 of Day 0, the resource is considered to be in operation for the purpose of initializing the DACE.

5.1.4 Treatment of MGBRT over Midnight

The DACE will commit a generator at the beginning of Day 1 for a minimum number of hours to satisfy its remaining MGBRT from the previous day (see Figure 5.1). The DGD MGBRT effective for Day 1 will be used to when calculating the remaining MGBRT which needs to be satisfied.

A generator will have its MGBRT honoured across midnight if it satisfies the following conditions:

- It is a non-quick start generator.
- It has valid offers for all the hours required to satisfy its remaining MGBRT in EDAC Day 1.
- DGD MGBRT – IHO => 1.

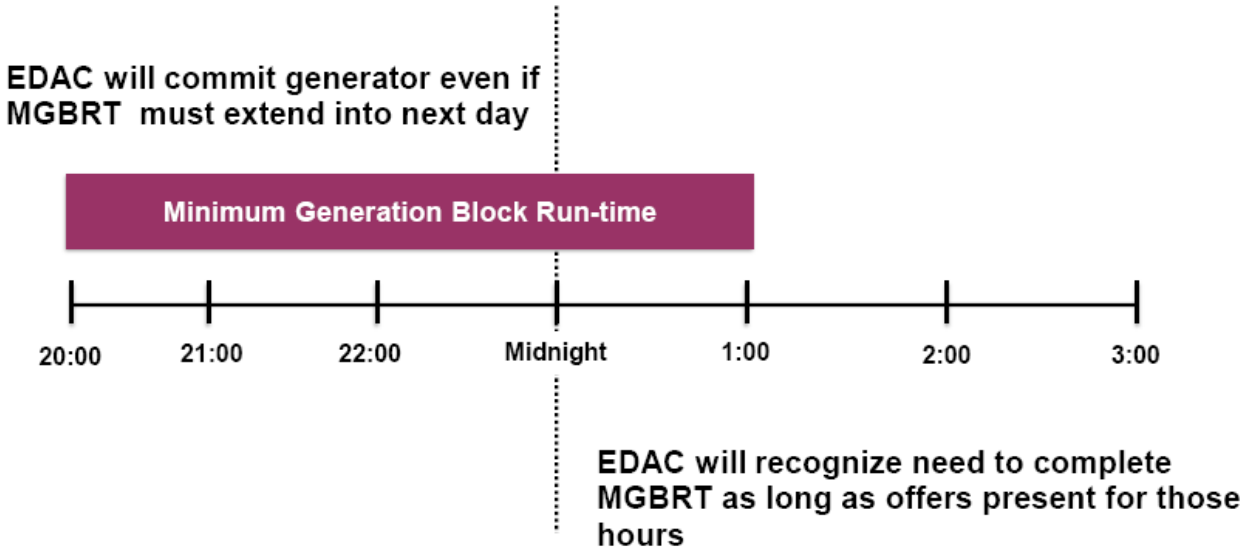


Figure 5–1: Satisfy Generator's MGBRT across Midnight

5.1.5 Use of Three Part Offers in the DACE

The DACE optimizes using the three part offers of non-quick-starts to determine day ahead commitments and schedules. Since the engine will only schedule a *not-quick-start generator* to at least its *minimum loading point*, it needs to know the minimum generation costs for the *generator*. The engine will determine the minimum generation costs as the *generator's* speed no-load cost and the incremental energy offer up to its *minimum loading point*. How the engine interprets each of the three-parts of a *generator's offer* is shown in Figure 5–2 below.

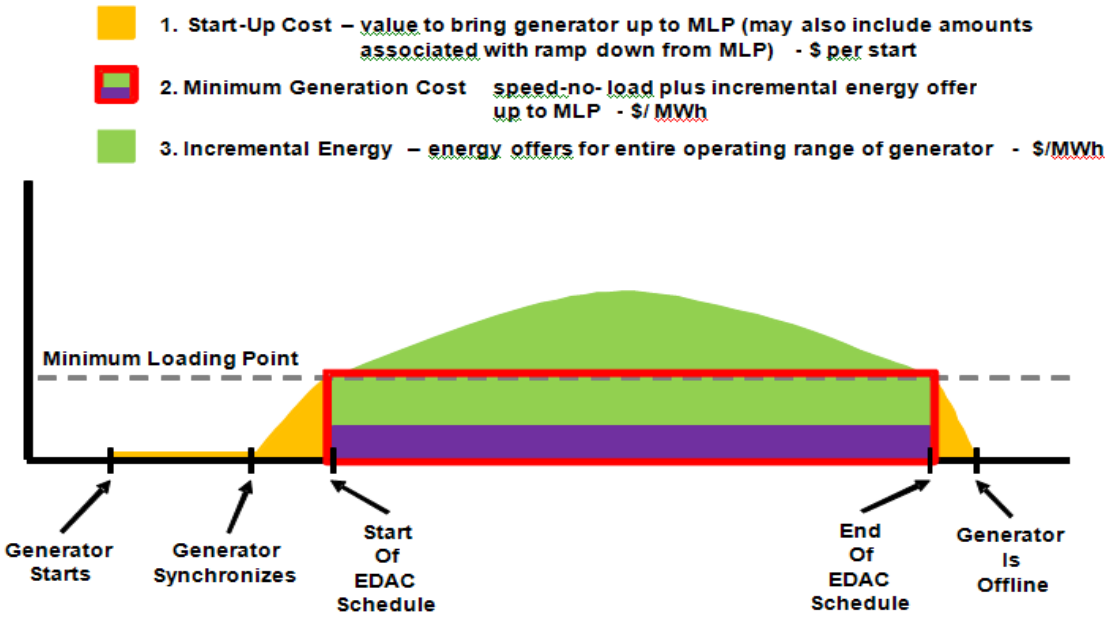


Figure 5–2: Components of Three Part Offer Recognized by DACE

5.2 Optimization Process Overview

The Day Ahead Calculation Engine performs two functions—commitment and scheduling. Commitment refers to the economic selection of non-quick start generators and imports to be scheduled in the next day to satisfy demand. Commitment has financial connotations that represent a status for non-quick-start generators and imports that are eligible for day-ahead guarantees should they:

1. Operate according to EDAC rules and
2. Receive insufficient real-time revenues to cover their day-ahead as-offered costs.

For day ahead scheduling, the engine produces constrained schedules for all economic resources from the day ahead submitted *bids* and *offers*. These day ahead schedules indicate the most efficient set of resources required to meet the forecast demand of the next day. *Market participants* with day ahead schedules may use them to plan their next day's operations. For committed resources, day ahead guarantees are calculated based on these day ahead schedules.

The DACE performs day-ahead commitment and scheduling by maximizing the economic gain from trade. The objective function representing this gain from trade is the same as that used in the real-time *dispatch algorithm*. The engine co-optimizes *energy* and *operating reserve* over the entire 24 hours of the next day while ensuring security constraints such as transmission limits are not violated.

There are three passes used in every DACE run. Each pass has a specific purpose and is explained in detail in subsequent sections:

- Pass 1 is Commitment
- Pass 2 is Reliability
- Pass 3 is Scheduling.

The final outputs of the DACE are schedules for all committed resources (non-quick start *generators* and imports) quick start facilities, dispatchable loads and exports, to meet average forecast demand. It co-optimizes energy and operating reserve over 24 hours of the next day.

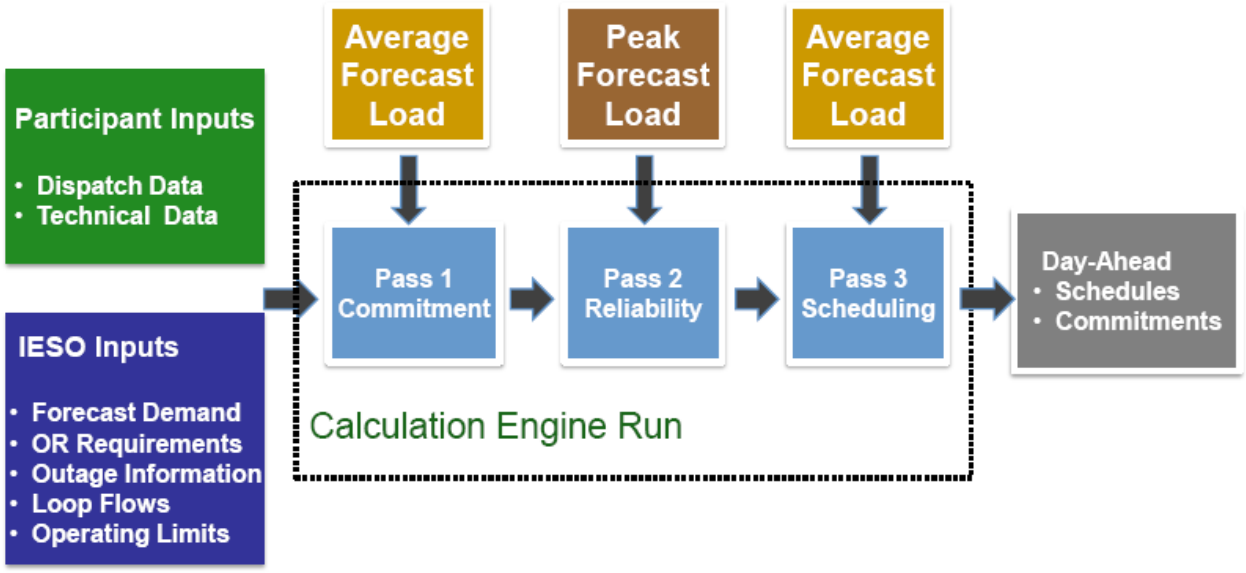


Figure 5–2: 3 Passes = 1 Run

5.2.1 Pass 1 – Commitment

The first pass minimizes the total costs to serve average demand for the next day. The average demand, rather than the peak demand, is used to prevent over-commitment. For the commitment pass, the engine performs least-cost[11] (from submitted *bids and offers*), security constrained commitment and scheduling in order to meet average forecast demand and operating reserve requirements. The pass tries to minimize the total costs to serve average demand and operating reserve requirements for the next day. The inputs that Pass 1 uses are listed in Table 5–1.

Table 5-1: Pass 1 Inputs to Day Ahead Calculation Engine

Pass 1 Inputs	Details
Dispatchable Generator Offers	3-part hourly offers for energy from non-quick start generators Single part hourly offers for energy from quick start facilities Single part hourly offers for operating reserve
Import Offers	Single part hourly offers for energy and operating reserve
Dispatchable Load Bids	Single part hourly bids for energy and operating reserve
Export Bids	Single part hourly bids for energy and operating reserve
Technical Data (Technical parameters the optimization process must satisfy in the determination of schedules and commitments)	Minimum loading point Minimum generation block run-time Minimum down time Maximum number of starts per day Pseudo unit parameters – output relationship between gas and steam units
Forecasts	Average load forecast Forecast of output from transitional scheduling generator/self-scheduling generation facility/intermittent generators
Outage Information	Planned and forced outages and de-rates from all resources Constraints in Contract Manager associated with outage plans
Security Limits	Transmission system limits

[11] The term 'cost' refers to the as-bid and as-offered amounts to consume and produce *energy* in the market respectively. It does not represent the actual expenditure to maintain or generate an electricity-related product.

Table 5-2: Pass 1 Outputs from Day Ahead Calculation Engine

Pass 1 Outputs	Details
Pass 1 Day Ahead Commitments	Non-quick start and imports selected to be scheduled for the next day These resources are eligible for Day Ahead guarantees
Pass 1 Day Ahead Constrained Schedules	*Energy* and *operating reserve* constrained schedules for all resources bid and offered Day Ahead (includes exports) These schedules are only considered in Pass 2 and not used for the *settlement* of Day Ahead guarantees
Nodal prices	Nodal prices as required for Pass 2 evaluation of *offers* (See Section 5.2.4.1)

5.2.2 Pass 2 – Reliability

The goal of Pass 2 is to ensure that if additional commitments are made to meet peak demand, minimal commitment costs are incurred. To achieve the minimum commitment cost, Pass 2 performs a least-cost security constrained commitment and scheduling to meet peak demand and operating reserve requirements, while considering the following rules:

- Schedule the remaining capacity above the minimum loading points of non-quick starts committed in Pass 1. Because these resources were already committed to meet average demand, there would be no additional commitment costs to utilize the remaining capacity to satisfy peak demand. If additional non-quick starts and/or imports get committed, the Pass 2 schedules for non-quick starts committed in Pass 1 could be less than their Pass 1 schedules. However, their Pass 2 schedules would not be any lower than their minimum loading points.
- Scheduled quick starts do not have any commitment costs for start-up and minimum generation.
- Imports committed in Pass 1 are scheduled to no less than their Pass 1 amounts; the import amounts scheduled in Pass 1 are already eligible for Day Ahead guarantees. If a Pass 2 import schedule is greater than its Pass 1 schedule, the entire Pass 2 import schedule is eligible for the Day Ahead guarantee. Additionally, if required, new imports or additional non quick start generation that did not receive a commitment from Pass 1, may be committed in Pass 2.
- Exports and dispatchable loads can be reduced from their Pass 1 amounts since these resources do not have any commitment costs.

Inputs into Pass 2 are listed below in Table 5–3.

Table 5-3: Pass 2 Inputs to Day Ahead Calculation Engine

Pass 2 Inputs	Details
Dispatchable Generator Offers	3-part hourly *offers* for *energy* from non-quick start *generators* Single part hourly offers for energy from quick start facilities Single part hourly *offers* for *operating reserve*
Import Offers	Single part hourly *offers* for *energy* and *operating reserve*
Dispatchable Load Bids	Single part hourly *bids* for *energy* and *operating reserve*
Export Bids	Single part hourly *bids* for *energy* and *operating reserve*
Technical Data (Technical parameters the optimization process must satisfy to determine schedules and commitments)	Minimum loading point Minimum generation block run-time Minimum down time Maximum number of starts per day Pseudo unit parameters – output relationship between gas and steam units
Forecasts	Peak load forecast Forecast of output from transitional scheduling generator/ self-scheduling generation facility / intermittent generators
Outage Information	*Planned* and *forced outages* and de-rates from all resources Constraints in Contract Manager associated with outage plans
Security Limits	Transmission system limits
Pass 1 Commitments	Non-quick-start *generators* and imports committed in Pass 1 These resources are eligible for Day Ahead guarantees
Nodal Prices	Nodal prices as calculated in Pass 1 for evaluation of *offers*

During most hours, peak occurs for only 1 interval. The peak can be served by either ramping up dispatchable generation resources for the interval or scheduling an hourly import while backing down generation for other intervals. Similarly, a *dispatchable load* can be ramped down for an interval or an export can be reduced for an hour.

However, the calculation engine commits and schedules on an hourly basis. To properly assess, on an equivalent basis, whether to ramp a dispatchable resource for an interval or schedule an hourly intertie transaction, Pass 2 performs a least-cost security constrained commitment. Pass 2 least-cost security constrained commitment satisfies peak for 1 interval by assessing *offers/bids* from dispatchable resources in the following manner:

- The incremental offers from non-quick starts committed in Pass 1 and all offers from quick starts that are greater than their shadow prices in Pass 1 will be evaluated as:

  (Pass 1 shadow price) + (offer – Pass 1 shadow price)/12

- This averages out the cost per interval. (Refer to the example provided in Section 5.2.4.1.)
- Bids for dispatchable loads will be treated in a similar manner.

The results produced after Pass 2 has completed its optimization are shown below in Table 5–4.

Table 5-4: Pass 2 Outputs from Day Ahead Calculation Engine

Pass 2 Outputs	Details
Pass 2 Day Ahead Commitments	Any additional non-quick start / or imports selected to be scheduled for the next day to meet peak demand These resources are eligible for Day Ahead guarantees
Pass 2 Day Ahead Constrained Schedules	*Energy* and *OR* constrained schedules for all resources bid and offered Day Ahead (includes exports) These schedules are only considered in Pass 3 and not used for the *settlement* of Day Ahead guarantees

5.2.3 Pass 3 – Scheduling

For this third and final pass, the engine performs least cost, security constrained scheduling to meet average demand and operating reserve requirements for each hour of the next day. Pass 3 performs this optimization to minimize the total costs to serve average demand for the next day while considering the following criteria:

- Committed non-quick starts from Passes 1 and 2 are scheduled to at least their minimums. Since Pass 3 optimization is to satisfy average demand, Pass 3 schedules may be less than Pass 2 schedules, which were calculated to meet peak demand. Pass 3 schedules would not be less than their minimum loading points.
- Committed imports are scheduled to at least their schedules in Pass 2.
- Exports are scheduled to no more than their Pass 2 schedules.
- Dispatchable loads are scheduled to no more than their Pass 1 schedules.
- Energy from non-quick starts ramping up to their minimum loading points is also considered when determining the schedules for all resources in Pass 3.

Inputs into Pass 3 are shown below in Table 5–5.

Table 5–5: Pass 3 Inputs from Day Ahead Calculation Engine

Pass 3 Inputs	Details
Dispatchable Generator Offers	3-part hourly *offers* for *energy* from non-quick-start *generators* Single part hourly offers for energy from quick start facilities Single part hourly *offers* for *operating reserve*
Import Offers	Single part hourly offers for energy and operating reserve

Table 5–5: Pass 3 Inputs from Day Ahead Calculation Engine

Pass 3 Inputs	Details
Dispatchable Load Bids	Single part hourly *bids* for *energy* and *operating reserve*
Export Bids	Single part hourly *bids* for *energy* and *operating reserve*
Technical Data (Technical parameters the optimization process must satisfy to determine schedules and commitments)	Minimum loading point Minimum generation block run-time Minimum down time Maximum number of starts per day Pseudo unit parameters- output relationship between gas and steam units, and Ramping energy to reach minimum loading point. (This is estimated to be 1/3 of the minimum loading point.)
Forecasts	Average load forecast Forecast of output from transitional scheduling generator/self-scheduling generation facility/intermittent generators
Outage Information	*Planned* and *forced outages* and de-rates from all resources Constraints in Contract Manager associated with outage plans
Security Limits	Transmission system limits
Pass 1 and Pass 2 Commitments	Non-quick-start *generators* and imports committed in Passes 1 and 2 These resources are eligible for Day Ahead guarantees

Table 5–6: Pass 3 Outputs from Day Ahead Calculation Engine

Pass 3 Outputs	Details
Pass 3 Day Ahead Commitments	Same commitments determined by Pass 1 and Pass 2 These resources are eligible for Day Ahead guarantees
Pass 3 Day Ahead Constrained Schedules	*Energy* and *OR* constrained schedules for all resources bid and offered Day Ahead (includes exports) to meet average demand These constrained schedules are the final Day Ahead results used to determine guarantees

5.3 Initial DACE Run

The optimization process begins with the initial DACE run at 10:00. After the run completes, IESO validates the results. If the results are valid, the results are published and the ELR Re-submission Window is open until 12:00. If the results are invalid, results are not published and the initial run is a failure. If there is time, the initial run is rescheduled and the ELR Re-Submission Window is extended.

The re-submission window for EELRs is normally open until 12:00. Revised offers from EELR are accepted, if they made an offer with a Daily Energy Limit before 10:00.

5.4 EELR Re-submission Run and Subsequent Runs

If there is no delay from a failed initial run, the ELR Optimization run starts at 12:00. After the run completes, the IESO validates results. Valid results are published, while invalid results are not published and the ELR Optimization run is a failure. If there is sufficient time for another run, the ELR Optimization run will be re-scheduled.

After the initial and ELR optimization runs, there may be sufficient time remaining to complete a subsequent run (if required due to changing system conditions known to impact Day 1). In order to be included in any subsequent DACE run, the necessary changes to *market participant* data must be received, processed and be available to IESO systems in sufficient time. An additional run would be made when specific re-run criteria have been met prior to the latest time possible to initiate a DACE run and still publish DACP results by 15:00. The following list represents the re-run criteria that will trigger the manual start of an additional DACE run, if for any hour of Day 1:

- Results of the previous run show a capacity or energy shortfall for the IESO-administered market.
- Any outage submission or outage revision (i.e. start-time or end-time) for a generating unit that results in a change in available capacity of 400 MW or more. This includes planned outages, forced outages and deratings.
- An increase or decrease of an operating security limit ≥ 400 MW on a limiting interface
- An increase or decrease of an intertie scheduling limit ≥ 400 MW
- An increase or decrease in primary demand forecast ≥ 400 MW
- An increase or decrease in operating reserve requirements ≥ 400 MW.

5.5 Completion of DACP and the Schedule of Record

Initial run reports and ELR Optimization run reports will be published when they are available. Normal completion time should be 13:00[12], but no subsequent run (due to rescheduling or re-run criteria) will occur after 14:00 to ensure that the Day Ahead Schedule of Record (SOR) will be published no later than 15:00.

Notification of Failure of the DACP will be made if results are not available or they cannot be published to the *market participants*. *Market participants* will be advised as soon as we know, but no later than 15:00.

The Day Ahead SOR is the last set of valid results published for Day 1. Market participants can determine the SOR by the validity of the last published set of results, since all invalid and delayed results will be identified through an advisory to the market. If no valid results can be produced from the Initial run after multiple attempts, then there will be no SOR and a failure is declared for that day. Market participants will be notified of this failure.

If the ELR Optimization run fails, or if there is insufficient time for an ELR Optimization run, the results of the Initial run will be the basis of the Day Ahead SOR. DACP will not be declared a failure if the ELR Optimization run is not successful or if its results are not valid.

– End of Section –

[12] All times and durations shown in this document are subject to change based on the performance of the solution delivered.

6. Real-Time Market Integration

With the introduction of EDAC, the majority of activities associated with Pre-dispatch and real-time market operations remain unchanged, including:

- IESO preparation and publication of security and adequacy assessment (SAA) reports and system status reports (SSR)
- IESO preparation of inputs to scheduling tools (e.g. equipment outages, operating security limits, intertie scheduling limits, load forecasts, etc.)
- The acquisition and implementation of ancillary service provider agreements such as regulation, voltage control and reactive support as well as reliability must-run contracts
- The use of constrained and unconstrained IESO-controlled grid models by the dispatch algorithm
- Timing of the issuance of participant-facing private reports and public reports for Pre-dispatch and real-time dispatch (contents of Pre-dispatch reports will change due to the lack of Day 1 information from Pre-dispatch while EDAC is in progress)
- The optimization objective and outputs of the real time dispatch algorithm
- Coordination of interchange scheduling with neighbouring Control Areas following completion of the day- ahead commitment process.

Process changes required with the introduction of EDAC are:

- Discontinuation of the 10:30 SSR
- Incorporation of Day Ahead commitments into real-time
- Rules for the revision of dispatch data originally submitted for the commitment process may change to reflect IESO commitments.

The following sections describe those Pre-dispatch and real-time processes that are new or will change as a result of the commitment process.

6.1 Observing Day Ahead Commitments in Real Time

Market participant acceptance of DA-PCGs is automatic in EDAC. *Market participants* cannot call to reject the guarantee as a means to remove constraints on their resources. Removal of constraints is completed through the withdrawal process as described in Section 6.2.

Like the current process, DA-PCG eligible dispatchable generation resources that are committed by the DACE will have constraints applied that will be observed in the Pre-dispatch and real-time scheduling processes. For each committed generation resource, we will apply a minimum constraint for its submitted minimum loading point (DGD MLP) for a period of hours equal to its Day Ahead schedule. Therefore, the resource will be scheduled and dispatched to a quantity no lower than its minimum loading point. A committed unit will not be dispatched below its minimum loading point unless the IESO approves a withdrawal request or requires de-commitment for reliability.

6.1.1 Reliability Constraints

We will only apply reliability constraints with market participant agreement and only if we consider our intervention necessary in order to ensure or maintain reliability[13].

Reliability constraints for adequacy will not be applied until after EDAC optimization processes have completed. As with DACP, we will allow the market to try to resolve any identified adequacy issues prior to applying reliability constraints.

6.1.2 Passing DACP Commitments to Real Time

When passing DACP commitments into Real Time (RT), committed PCG eligible *generators* will have constraints applied in Pre-dispatch and the RT scheduling process. Minimum generator constraints are applied for the generators' submitted MLP for a period equal to its DACE schedule. *Market participants* cannot reject the DACP commitment in order to remove the constraints.

DACP Commitments – PCG Eligible Generators (Not a Combined Cycle Plant)

PCG eligible resources that have not been identified as a part of a combined cycle plant can be determined by the following condition:

- A set of generators deemed PCG eligible through registration
    - Minus the generators recorded to be an ST of a combined cycle plant
    - Minus the generators deemed to have an association with ST resources.

Every generator that has been identified as PCG eligible but is not part of a combined cycle plant will have constraints applied based on the Daily Generator Data Minimum Loading Point. The constraints are applied for every hour in which the generator has a non-zero Day Ahead schedule in the SOR.

Automated loading of constraints must be completed by 15:06 to ensure that the constraints are available for the 15:07 run of pre-dispatch.

DACP Commitments – PCG Eligible Generators (Combined Cycle Plant)

Resources at a combined cycle plant that are scheduled by the DACE will be committed for use in real time. Every **CT** generator that is identified to be PCG eligible and is a part of a combined cycle plant will have constraints applied. The applied constraints are based on the DGD MLP for every hour in which they have a non-zero Day Ahead schedule in the SOR.

Every **ST** generator that is identified to be PCG eligible and is part of a combined cycle plant will have constraints applied for every hour in which they have a non-zero Day Ahead schedule in the SOR. The constraint amount will vary by hour and is based on the number of associated combustion turbines at the combined cycle plant scheduled in a given hour. The constraint will be equal to:

- For STs not using the PSU model:
    - The 1-on-1 ST DGD MLP whenever an associated CT is not present in the schedule[14] in a given hour, or where only a single associated CT is scheduled in a given hour along with the ST.
    - The *n*-on-1 ST DGD MLP whenever n number of associated CTs (n>1) are scheduled in a given hour along with the ST and the ST received a Day Ahead schedule equal to or greater the *n*-on-1 ST DGD MLP. If the ST receives a Day Ahead schedule that is

[13] *Reliability* means *security* and a*dequacy* (both local and global).

[14] It is possible to economically schedule a steam turbine with no combustion turbine at a combined cycle facility, even though this configuration is physically impossible.

less than the *n*-on-1 ST DGD MLP, the ST constraint will be equal to the next lowest ST DGD MLP for which it was economic (lowest possible outcome is the 1-on-1 ST DGD MLP).

- For STs using the PSU model:
    - The n-on-1 ST DGD MLP where n represents the number of PSUs operating in combined cycle mode that are scheduled in a given hour.

Table 6-1: Combined Cycle Plant EDAC Commitments

# of CT's Scheduled	ST Committed to
1	MLP_{1-1}
2	MLP_{2-1}
…	…
N	MLP_{N-1}

Automated loading of constraints must be completed by 15:06 to ensure that the constraints are available for the 15:07 run of pre-dispatch.

6.2 De-commitment and Withdrawal

The DACE will identify the resources required to be committed for the *dispatch day*. Changes to the set of committed resources after the DACE results are passed to Pre-dispatch, could impact system reliability and *settlement*. The following sections discuss modifications to our current rules and procedures that enable processing of changes appropriately.

6.2.1 Market Participant Withdrawal of Supply Offers for Dispatchable Generators

Under EDAC, dispatchable generation committed to supply *energy* cannot reduce the quantity of *real-time market offers* below Day Ahead committed (or constrained) quantities without IESO approval. Quantity reductions to *offers* associated with committed resources will be considered a request to withdraw the *offer*. All requests for changes to Day Ahead commitment quantities passing our reliability assessment will be accepted. For committed dispatchable generation, the withdrawal request will include a new withdrawal charge. The charge will be levied when the request for withdrawal is within a participant's control and did not provide a benefit to the market as determined by the price impact. If you have done the right thing for the market, you should not receive a withdrawal charge.[15] The withdrawal charge, which will be based on a formula approach similar to the Day Ahead import failure charge, more closely aligns dispatchable generation withdrawal treatment to the import/export withdrawal treatment.

A generator request to withdraw a supply offer must occur no later than two hours before the start of the action required to meet their Day Ahead committed schedule. For a dispatchable generator, the request must occur at least two hours prior to the expected synchronization time, or if already in service, at least two hours before the intended withdrawal time. At the time of the request, the market

[15] Exception conditions include events or circumstances directly related to the *IESO–controlled grid* that are beyond the control of the *generation facility* as listed in *market rules*, CH7, Sec 7.5.3.

participant is required to revise their dispatch data for the resource being withdrawn and to include an appropriate reason code with the dispatch data.

A DA PCG eligible generation unit withdrawing their offer (i.e., cancel the offer) for a reason within their control from any hour of their day ahead commitment, must submit revised offers with an accompanying reason code. These revised offers must be received at least two hours prior to the dispatch hour and will be queued for operator approval. If there is no reason code accompanying the revised offer, the submission will be automatically rejected. A new withdrawal reason code must accompany the revised offer indicating the withdrawal is within their control. If a market participant submits a cancel request of offers for a DA-PCG eligible generation unit that received a day-ahead commitment, the submission will also be queued for IESO operator approval.

6.2.2 IESO De-Commitment of Dispatchable Generators

The communication of all de-commitment requests initiated by the IESO will remain unchanged from the current practices. We will only de-commit dispatchable generation resources or imports due to reliability concerns, not for economics. The IESO will continue to respect the current *market rules* treatment related to compensation.

6.2.3 Day Ahead Production Cost Guarantee Impact

If you are a dispatchable generator that withdraws your *offers* and we remove the constraints applied to your units, you will not be eligible to receive DA-PCGs.

The DACP exceptions rule of payment of guarantees remains unchanged in EDAC when:

- the reduction to the DACP schedule in real-time is due to an IESO de-commitment decision, or
- the inability of a non-quick-start generator to connect to the IESO-controlled grid as a result of events or circumstances directly related to the IESO-controlled grid that are beyond the control of the generation facility.

If a withdrawal is outside of the *market participant's* control:

- PCG is prorated to the part of the MP's DACP schedule that was delivered in Real Time.
- The resource must reach at least MLP to receive the prorated amount.

If a withdrawal is within of the *market participant's* control, the resource is not eligible for a DA-PCG.

6.3 Day Ahead Intertie Transactions

There will be no change to the Pre-dispatch scheduling process, which determines the economic schedules for interchange utilized in the Transaction Checkout process in real time.

As in the current Pre-dispatch process, there is an expectation that *market participants* will offer or bid in the *real-time market* in order to have their transactions scheduled in an amount equal to their EDAC committed and scheduled quantities. This includes both legs of linked wheel transactions scheduled in EDAC.

6.4 Real-Time Market Integration

The incremental energy component of three-part offers accepted Day Ahead will flow through to the real-time market. Real-time Pre-dispatch will optimize using only the incremental energy portion of the Offer and disregard the other parts of the Offer (SNL and SUC). Single-Part offers accepted in Day Ahead will continue with the current practice and flow through to Real Time. Any offers not accepted for use in DACP by 14:00 will be automatically rejected and will not be carried forward for use in real time. Market Participants that want to revise dispatch data for inclusion in pre-dispatch can do so after 14:00 (current rules for dispatch data submission will apply).

Accepted bids/offers for Dispatchable Loads, Imports and Exports will flow through to Real-time. Accepted forecasts/schedules for Non-Dispatchable resources will also flow through to Real-time.

Daily Generator Data submitted after 10:00 will be used in the next day's DACP run.

6.4.1 Availability Declaration Envelope

As mentioned in section 4.1.4, the ADE is established by dispatch data that is accepted by 10:00, or approved before 14:00.

You may submit *offers/bids* in real-time within the hours, *energy* and capacity of your *facility's* ADE. There are no restrictions on price changes and there are no restrictions on daily energy limit changes. However, *offers* exceeding the hours and quantities of the ADE require our approval.

6.4.2 Pseudo Unit Offer Submission – Real-Time

PSU resources do not exist for the purpose of real-time dispatch. The schedules and commitments generated by the DACE associated with the PSU day ahead, are translated to the associated PUs for pre-dispatch and real-time dispatch. Market Participants who want to change their dispatch data for these resources, must submit real-time PU offers for PSU resources. Such offers can be submitted while DACP is in progress, since these offers are ignored during DACP. These offers are not held for DAO approval during DACP. They are not candidates for automatic rejection at 14:00 on Day 0 and are subject to the normal dispatch data rules of real-time submission at the conclusion of DACP.

– End of Section –

7. Publishing and Reporting

7.1 Overview

Reporting refers to the general creation of documents related to the operation of *IESO-administered markets*. *Publishing* refers to the specific preparation of public documents made available on the *IESO's* Web site. Many of the reports currently generated for the DACP, Pre-dispatch and real-time market processes can be leveraged to support EDAC. Specifically, many of the reports produced by the IESO can be used by EDAC without any changes. Other reports produced for the *real-time market* require no change. The reporting process will continue to support the principle that information should be provided to *market participants* on a non-discriminatory basis.

Figure 7–1 shows the publishing and reporting processes.

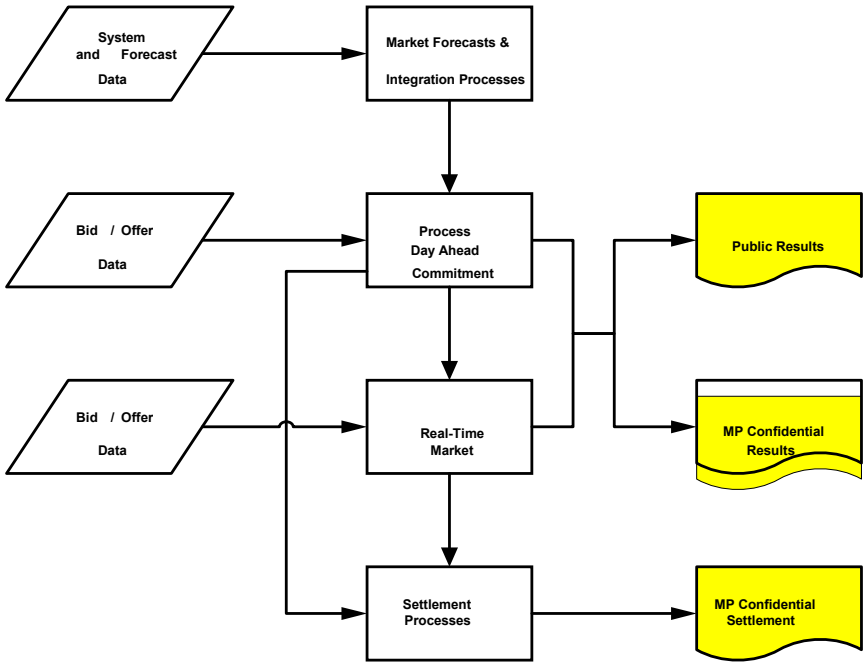


Figure 7-1: Near Time Security and Adequacy Assessment Reports

Prior to closure of the Day Ahead bid/offer window at 10:00, public reports detailing the operating state of the *IESO-controlled grid* (ICG) are *published* to aid *market participants* in making market and operational decisions. Other than the deletion of a reporting requirement at 10:30, the timing and the content of the System Status Reports and Security and Adequacy Assessments will remain unchanged.

7.1.1 Outage Reports

It is anticipated that the current outage reports *published* for the *real-time market* will not change.

7.1.2 Pre-dispatch Reports

The Pre-dispatch process that runs between 00:07 and 14:07 on any given day will only include Pre-dispatch data for all hours of the current *dispatch day*.

The inclusion of the EDAC results in the Pre-dispatch process for the next day will be implemented in the Pre-dispatch run that begins at15:07. This Pre-dispatch run *publishes* results for HE 17 to HE 24 of the current *dispatch day* (Day 0) and all hours of the next *dispatch day* (Day 1).

Subsequent Pre-dispatch processes between 15:07 and 23:07 will continue to *publish* Pre-dispatch data for the remaining hours of the current *dispatch day* (Day 0) and all hours of the next *dispatch day* (day 1).

The Pre-Dispatch publishing schedule is shown below in Figure 7–2.

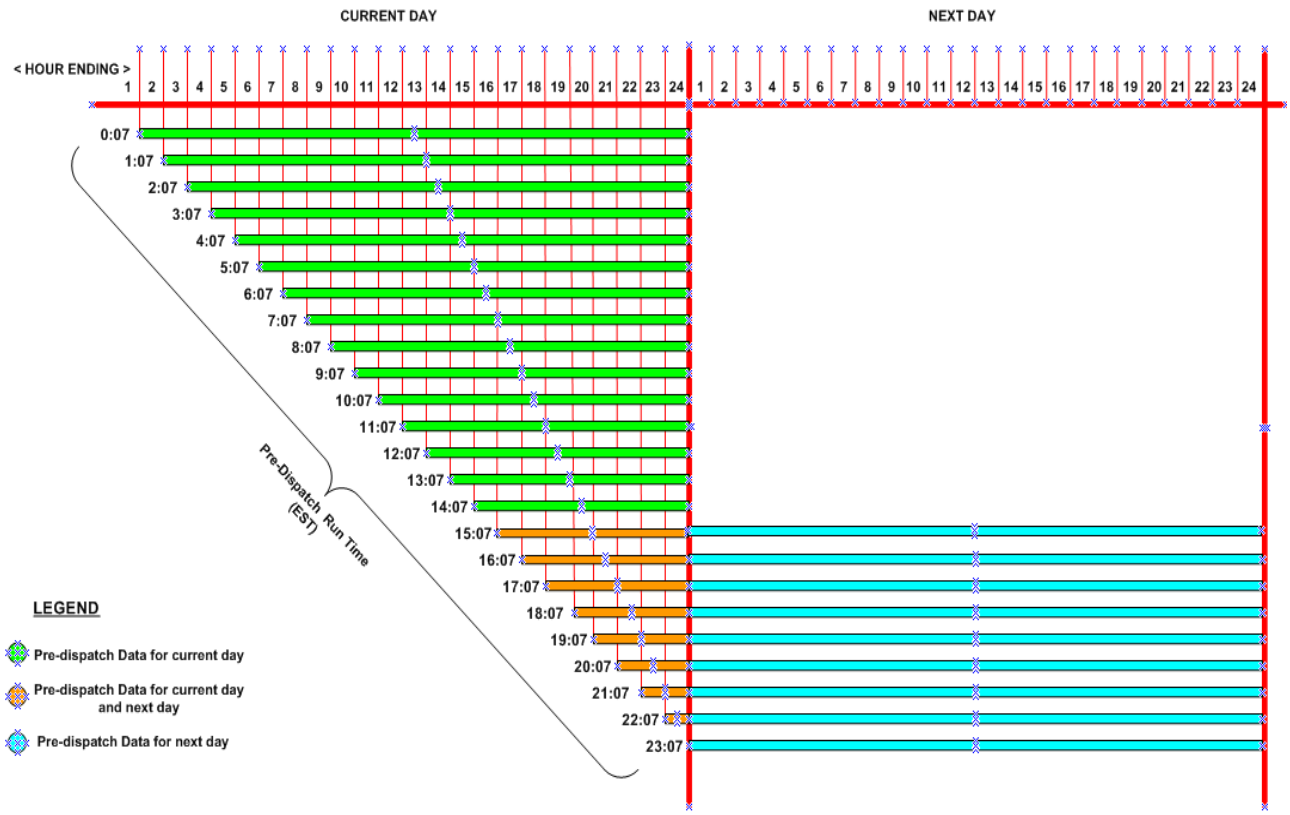


Figure 7-2: Publishing Timelines for Pre-Dispatch Data

7.1.3 Transmission Rights Reports

The transmission rights market is unaffected by EDAC; therefore, no change from the current *TR market* reporting requirements are required.

7.2 Publishing and Reporting of Commitment Process Results

7.2.1 Public Reports

Day Ahead Adequacy

This report provides a summary of any projected shortfall or surplus of energy for the next day and is intended for the public use of all market participants. The report is used by market participants as a resource for making their business decisions when planning day ahead.

If the DAO verifies that the Day Ahead Calculation Engine's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following information:

- Demand, OR Requirement, Energy Scheduled by East and West Zone,
- Imports – by Intertie Zone,
- Scheduled exports and average forecast demand will be included as above, and
- Aggregate import/export bids and offers by intertie zone.

ieso
Power to Ontario. On Demand.

Day Ahead Adequacy
Created on 2009/10/11 HH:MM
For 2009/10/12

Ontario			Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Ontario Peak Demand			12356	12053	11826	12309	13267	14815	16001	16400	16581	16853	16917	16801	16734	16569	16529	16672	16718	17104	17389	17154	16638	15681	14345	13195
Ontario Average Demand			12156	11853	11626	12109	13067	14615	15801	16200	16381	16653	16717	16601	16534	16369	16329	16472	16518	16904	17189	16954	16438	15481	14145	12995
East Demand			11984	11689	11465	11951	12906	14435	15583	15954	16126	16393	16459	16348	16283	16124	16091	16247	16292	16678	16956	16704	16187	15241	13928	12804
West Demand			372	364	361	358	361	380	418	446	455	460	458	453	451	445	438	425	426	426	433	450	451	440	417	391
OR Requirements			1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453	1453
Total Requirement			13809	13506	13279	13762	14720	16268	17454	17853	18034	18306	18370	18254	18187	18022	17982	18125	18171	18557	18842	18607	18091	17134	15798	14648
Internal Resource	Hydro	Offered	5898	5902	5845	5847	5850	6055	6061	6110	6114	6106	6153	6147	6146	6144	6141	6142	6114	6113	6113	6132	6132	6122	6066	6060
		Scheduled	2865	2860	2777	2799	2981	3702	4223	4257	4242	4048	3848	3864	3807	3826	3760	3759	3898	3984	4483	4218	3930	3871	3255	3021
	Fossil	Offered	211	211	211	671	1146	1146	1146	1146	1146	1421	1606	1606	1606	1606	1606	1606	2091	2571	2571	2571	2571	3056	3056	3056
		Scheduled	46	46	46	46	116	526	824	856	865	946	1256	1029	1235	1071	1066	996	962	1256	1158	1099	633	954	299	136
	Nuclear	Offered	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425	9425
		Scheduled	9150	9150	9150	9150	9150	9165	9165	9165	9155	9155	9155	9155	9155	9165	9165	9165	9165	9165	9165	9165	9165	9165	9165	9215
	Other	Offered	3078	3367	3347	3292	2981	3612	3639	3742	4004	4036	4052	4072	4128	4190	4195	4174	5219	5246	5323	5356	5438	5726	5706	5127
		Scheduled	2045	1515	1419	1684	2183	2758	2731	2344	2782	3021	3054	3227	3352	3384	3389	3368	3324	3436	3582	3476	3528	2284	2144	1781
	Dispatchable Load	Bid	-250	-250	-250	-235	-235	-245	-195	-196	-195	-195	-195	-195	-195	-195	-210	-210	-250	-250	-250	-250	-250	-290	-290	-302
		Scheduled ON	-250	-250	-250	-235	-235	-245	-195	-196	-195	-195	-195	-195	-195	-195	-210	-210	-250	-250	-250	-250	-250	-290	-290	-302
		Scheduled OFF	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	Offered/Bid	18862	19155	19078	19470	19637	20483	20466	20619	20884	21183	21431	21445	21500	21560	21577	21557	23099	23605	23682	23734	23816	24619	24543	23970
		Scheduled	14356	13821	13642	13914	14665	16396	17138	16818	17239	17365	17508	17470	17744	17641	17590	17498	17599	18091	18638	18208	17506	16564	15153	14455
Imports	Manitoba	Offered	150	150	150	150	150	150	150	150	150	160	150	150	150	150	150	150	150	150	150	150	150	150	150	150
		Scheduled	0	0	0	0	0	5	4	60	64	114	93	92	96	150	150	150	133	144	150	150	150	143	117	0
	Minnesota	Offered	80	80	80	80	80	80	80	80	80	40	40	80	80	80	80	60	80	80	80	40	40	40	40	40
		Scheduled	5	5	5	5	5	5	5	5	5	5	5	5	0	0	20	10	0	0	0	0	0	0	0	0
	Michigan	Offered	555	605	555	555	555	555	555	355	435	480	430	430	430	355	355	355	355	355	355	355	355	355	355	355
		Scheduled	255	305	255	255	255	0	0	155	80	0	0	0	0	0	0	0	0	0	0	0	0	155	155	0
	New York	Offered	800	700	925	1025	900	925	1190	1100	800	625	600	600	600	600	600	600	600	600	600	600	600	500	500	0
		Scheduled	0	0	75	175	157	5	445	250	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

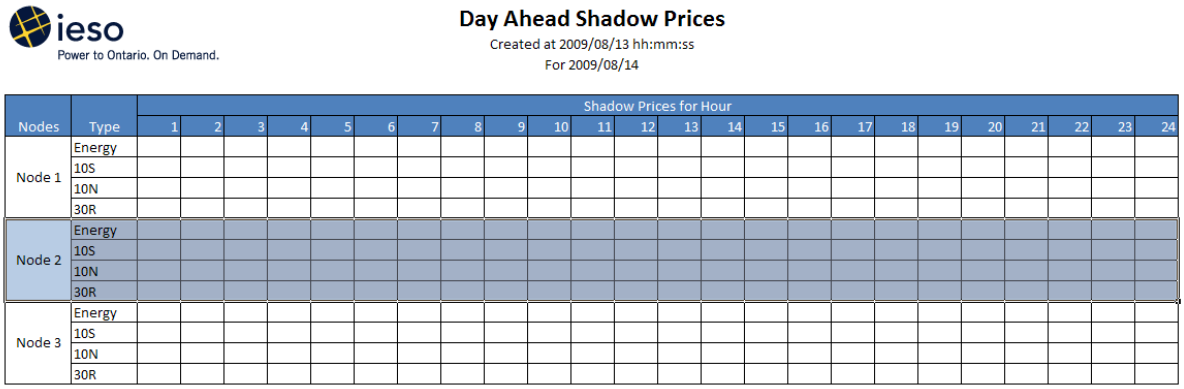
Figure 7-3: Day Ahead Adequacy Report Sample

Day Ahead Shadow Prices

This report contains Shadow Prices for energy and operating reserve at selected nodes internal and external to Ontario. The Shadow Prices are calculated by the DACE. The report is intended for the public use of market participants who should use it as a resource for making their business decisions when planning day ahead.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following information:

- Shadow Price
- Node
- Shadow Price Type – Energy, 10S, 10N, 30R



Day Ahead Shadow Prices

Created at 2009/08/13 hh:mm:ss

For 2009/08/14

Nodes	Type	Shadow Prices for Hour																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Node 1	Energy																								
	10S																								
	10N																								
	30R																								
Node 2	Energy																								
	10S																								
	10N																								
	30R																								
Node 3	Energy																								
	10S																								
	10N																								
	30R																								

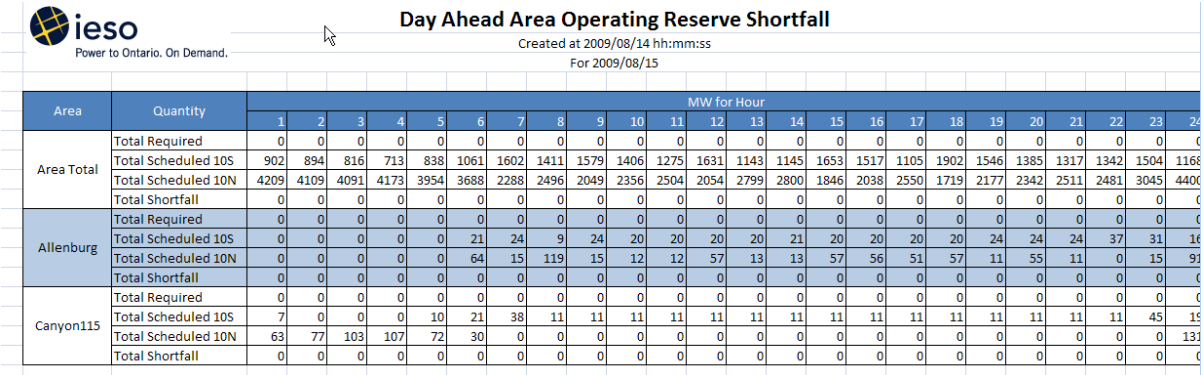
Figure 7-4: Day Ahead Shadow Price Report Sample

Day Ahead Area Operating Reserve Shortfalls

This report contains Operating Reserve shortfalls in each hour, by dispatch area, for the day ahead as calculated by the DACE. The report is intended for the public use of market participants who should use it as a resource for making their business decisions when planning day ahead.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the Day Ahead Calculation Engine. This report includes the following information:

- Dispatch Area Total Requirement
- 10S Scheduled
- 10N Scheduled
- OR Shortfall



Day Ahead Area Operating Reserve Shortfall

Created at 2009/08/14 hh:mm:ss

For 2009/08/15

Area	Quantity	MW for Hour																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Area Total	Total Required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Scheduled 10S	902	894	816	713	838	1061	1602	1411	1579	1406	1275	1631	1143	1145	1653	1517	1105	1902	1546	1385	1317	1342	1504	1168
	Total Scheduled 10N	4209	4109	4091	4173	3954	3688	2288	2496	2049	2356	2504	2054	2799	2800	1846	2038	2550	1719	2177	2342	2511	2481	3045	4400
	Total Shortfall	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Allenburg	Total Required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Scheduled 10S	0	0	0	0	0	21	24	9	24	20	20	20	20	21	20	20	20	20	24	24	24	37	31	16
	Total Scheduled 10N	0	0	0	0	0	64	15	119	15	12	12	57	13	13	57	56	51	57	11	55	11	0	15	91
	Total Shortfall	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canyon115	Total Required	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total Scheduled 10S	7	0	0	0	10	21	38	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	45	19
	Total Scheduled 10N	63	77	103	107	72	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131
	Total Shortfall	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Figure 7-5: Day Ahead Operating Reserve Shortfall Report Sample

Day Ahead Area Reserve Constraints

This report contains hourly maximum and minimum constraints for the Area Reserve regions used as inputs for the DACE. The report indicates regions where reserve supply may be an issue. The report is intended for the public use of market participants who should use it as a resource for making their business decisions when planning day ahead.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following information:

- Region
- Operating Reserve Type 10S, 10N and/or 30R
- Constrained MW

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Day Ahead Area Reserve Constraints

Created at 2009/08/13 hh:mm:ss
For 2009/08/14

Region	Constraint Type	Constrained MW for Hour																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
ALLENBERG	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
BRUCEA	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
BRUCEB	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
CANYON115	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
CHATS230	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
CHENAUX	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
DESJOACH	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
ESSA	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
E_FETT	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
E_LKHD	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
E_QFW	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
E_TEC	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
GLP_MONTRL	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999
KAO	Min	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Max	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999	9999

Figure 7-6: Day Ahead Area Reserve Constraints Report Sample

Day Ahead Constrained Totals

This report contains hourly MW totals (total energy, total losses, total load and total operating reserve) intended for the public use of the market participants. The report is intended for the public use of market participants who should use it as a resource for making their business decisions when planning day ahead.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following information:

- Total Energy
- Total Dispatchable Load
- Total Load
- Total Loss
- Total 10N, 10S, 30R

Day Ahead Constrained Totals

Created at 2009/08/14 hh:mm:ss
For 2009/08/15

Hour	MW						
	Total Energy	Total Loss	Total Load	Total Disp Load	Total 10S	Total 10N	Total 30R
1	16278.3	419.1	15859.2	170.8	254.2	749.7	516.2
2	15605.8	404	15201.8	134.6	254.1	725.9	540
3	15509.9	413.9	15096	66.6	243.5	736.5	540
4	15265.9	402.6	14863.3	99.7	220.6	759.4	540
5	16011.3	445	15566.3	178.6	239.3	740.7	540
6	17420.6	468.7	16951.9	0	286.6	794.6	438.8
7	19344.6	540.9	18803.7	0	472.1	507.9	540
8	20974.1	606.3	20367.8	0	451.1	576.2	492.7
9	21481.6	613	20868.6	0	503.6	476.4	540
10	22277.6	637.6	21640	0	446.8	533.2	540
11	23654	669.9	22984.1	0	410.8	569.2	540
12	22848.6	646	22202.6	0	489	491	540
13	23216.2	662.7	22553.5	0	403.5	621.9	494.6
14	23292.6	672.8	22619.8	0	371.2	662.5	486.3
15	23614.9	689.4	22925.5	0	514	466	540
16	23200.6	694.5	22506.1	0	493	487	540
17	23412.6	683.2	22729.4	0	452.7	527.3	540
18	23165.6	675.9	22489.7	0	573.2	406.8	540
19	22019.6	634.4	21385.2	0	466.4	513.6	540
20	21598.6	611	20987.6	0	428.4	551.6	540
21	21287.6	598.2	20689.3	0	422.5	557.5	540
22	20226.6	580	19646.6	0	458.3	521.7	540
23	18433.6	539.3	17894.3	0	359.2	644.6	516.2
24	16621.8	474.4	16147.4	0	313.8	809	397.2

Figure 7-7: Day Ahead Constrained Totals Report Sample

Day Ahead Intertie Scheduling Limits

This report contains hourly Intertie Scheduling Limits and is intended for the public use of the market participants. The report intended to provide guidance to market participants who are considering submitting import and export dispatch data.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following information::

- Intertie Zones: Direction of flow from Ontario's perspective. The MW limit in the "to" column represents the Ontario "to" the zone flow limit. The MW limit in the "from" column represents the Ontario "from" the zone flow limit.
- Scheduling Limit in MW.

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Day Ahead Intertie Scheduling Limit

Created at 2009/08/13 hh:mm:ss

For 2009/08/14

Hour	Energy in MW																									
	Manitoba		Michigan		Minnesota		New York		Quebec AT		Quebec B5D-B31L		Quebec D5A		Quebec D4Z		Quebec H9A		Quebec H4Z		Quebec P33C		Quebec Q4C		Quebec X2Y		Manitoba SK1	
	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from	to	from
1	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
2	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
3	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
4	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
5	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
6	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
7	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
8	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
9	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
10	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
11	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
12	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
13	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
14	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
15	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
16	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
17	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
18	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
19	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
20	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
21	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
22	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
23	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50
24	-263	263	-1870	1580	-140	90	-1400	1100	-605	605	0	390	-190	240	0	55	0	0	-85	0	0	335	0	0	0	65	0	50

Figure 7-8: Day Ahead Intertie Scheduling Limits Report Sample

Day Ahead Security Constraints

This report contains binding security constraints as determined by the DACE and is intended for the public use of market participants. The report provides information to market participants that may give visibility on why a particular resource received its schedule due to binding security constraints applied by the DACE.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE.

Day Ahead Security Constraints

Created at 2009/08/14 hh:mm:ss

For 2009/08/15

Hour	Constraint
1	BASE CASE 0 CLRGU2.PAXCL
1	BASE CASE 0 NW.T1.EWTEm
1	BASE CASE 0 NW.T1.MEE1
1	BASE CASE 0 NW.T1.NW4
1	BASE CASE 0 NW.T1.NW7
1	BASE CASE 0 NW.T1.SLAKMAR&A5A_I/S.LFE22
1	BASE CASE 0 NW.T1.SLAKMAR&A5A_I/S.LFEm
1	BASE CASE 0 NW.T1.SMACLAK&B6M_I/S.TEM22
1	BASE CASE 0 NW.T1.SMACLAK&B6M_I/S.TEM24
1	BASE CASE 0 NW.T1.SMACLAK&B6M_I/S.TEMm
1	BASE CASE 0 NW.T1.TEKm
1	BASE CASE 0 NW.T1.TEMm
1	BASE CASE 0 NW.T1.WMFE-230d
1	BASE CASE 0 NWL-LKHD.LAKEHEAD_T7_OR_T8_O~3
1	BASE CASE 0 T1M.TEXAN
1	ANSONVILLE-230.T2_XMF 1 H6T.TIXTI
1	LAKEHEAD-230.T8_XMF 1 A5A.ASXMI
1	LAKEHEAD-230.T8_XMF 1 A5A.MIXSC
1	M24L_SCT 1 A1B.AGXKI
1	M24L_SCT 1 T1M.TEXAN
2	BASE CASE 0 CLRGU2.PAXCL
2	BASE CASE 0 NW.T1.EWTEm
2	BASE CASE 0 NW.T1.MEE1

Figure 7-9: Day Ahead Security Constraints Report Sample

7.2.2 Market Participant Confidential Reports

Day Ahead Check Source/ADE

This report is one of two reports that comprise the SOR. The report provides the *market participant* with a confirmation of the dispatch data submission used for a resource included in the EDAC SOR and its ADE. It is intended for the private use of market participants.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following hourly information:

- MP Resource
- NERC Tag (if required)
- Energy PQ pairs
- Daily Energy Limit (DEL)

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Day Ahead Check Source / ADE
for MP name
Created at 2009/08/12 hh:mm:ss
For 2009/08/13

Resource ID	NERC Tag ID (If applicable)	Hour	Energy PQ Pairs	Daily Energy Limit (if applicable)
MP_GENERATOR_G1		1	(70.0,0.0),(70.0,10.0),(65.0,20.0),(60.0,30.0),(55.0,50.0)	
		2	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		3	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		4	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		5	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		6	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		7	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		8	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		9	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		10	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		11	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		12	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		13	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		14	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		15	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		16	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		17	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		18	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		19	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		20	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		21	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		22	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		23	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
		24	(70.0,0.0),(70,10),(65,20),(60,30),(55,60)	
NY.ROSETON.01	NYIS_ABCD1234EFGHI_ONT	1	(240.0,0.0),(240.0,100.0),(260.0,500.0)	
	NYIS_ABCD1234EFGHI_ONT	2	(240.0,0.0),(240.0,100.0),(260.0,500.0)	

Figure 7-10: Day Ahead Check Source/ADE Report Sample

Day Ahead Scheduled Energy

This report is one of two reports that comprise the SOR. The report provides energy and operating reserve schedules for each hour of the next day as established by the DACE and is intended for the private use of market participants.

The report provides a market participant with schedules for their resources, which are determined by the DACE.

If the DAO verifies that the DACE's results are valid, this report is published. The report will be available after every successful run of the DACE. This report includes the following hourly information:

- MP Resource
- Constrained
- NERC Tag

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Day Ahead Scheduled Energy
for MP Name
Created 2009/08/12 hh:mm:ss
For 2009/08/13

Resource ID	Type	MW Scheduled for Hour																						
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Gen 1	Energy					50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1	50.1									
Gen 2	Energy	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2	100.2
	10S	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10N	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	30R	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Load 1	Energy					-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0							
SOURCE.01 NERC TAG ID #1	Energy									100.0	100.0	100.0	100.0	100.0	100.0	100.0									
SOURCE.01 NERC TAG ID #2	Energy			100.0	100.0	100.0	100.0																		
SINK.01 NERC TAG ID #3	Energy							50.0	51.0	52.0	53.0	54.0	55.0	56.0	57.0	58.0	59.0	60.0	61.0	62.0	63.0				
SINK.01 NERC TAG ID #4	Energy		22.0	23.0	24.0	25.0	26.0															22.0	23.0	24.0	

Figure 7-11: Day Ahead Scheduled Energy Report Sample

Day Ahead Commitments

This report provides a list of market participant specific resources that has been committed for acceptance of the DA-PCG and is intended for the private use of market participants. The report is a confirmation that PCG eligible resources receiving a schedule in the SOR had a corresponding commitment applied in Contract Manager.

The report will be available once a day, after the declaration of the SOR. This report includes the following information:

- MP Resource
- MW constrained for PCG by Hour

ieso
Power to Ontario. On Demand.

Day Ahead Commitments
for MP Name
Created 2009/08/12 hh:mm:ss
For 2009/08/13

Resource ID	MW Scheduled for Hour																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Gen 1					50.1	50.1																		
Gen 2												100.2	100.2	100.2	100.2	100.2	100.2	100.2						
Gen 3							73.2	73.2	73.2															
Gen 4									90.0	90.0	90.0	90.0	90.0	90.0	90.0									

Figure 7-12: Day Ahead Commitments Report Sample

Valid Bid Report

The Valid Bid Report is an existing query available to *market participants* through the Market Participant Interface (MPI) to see the most recent valid submitted dispatch data. The query will be revised to allow *market participants* to see submitted three-part offers.

Daily Generator Data Reports

Dispatchable generators, excluding quick starts, receive a private report that provides the Daily Generator Data used in the Day Ahead Commitment Process. The report provides a confirmation to the market participant of the Daily Generator Data submitted prior to 10 EST of the DACP day that was recorded for use as input to the Day Ahead Calculation Engine. This report is available after 10 EST of the DACP day.

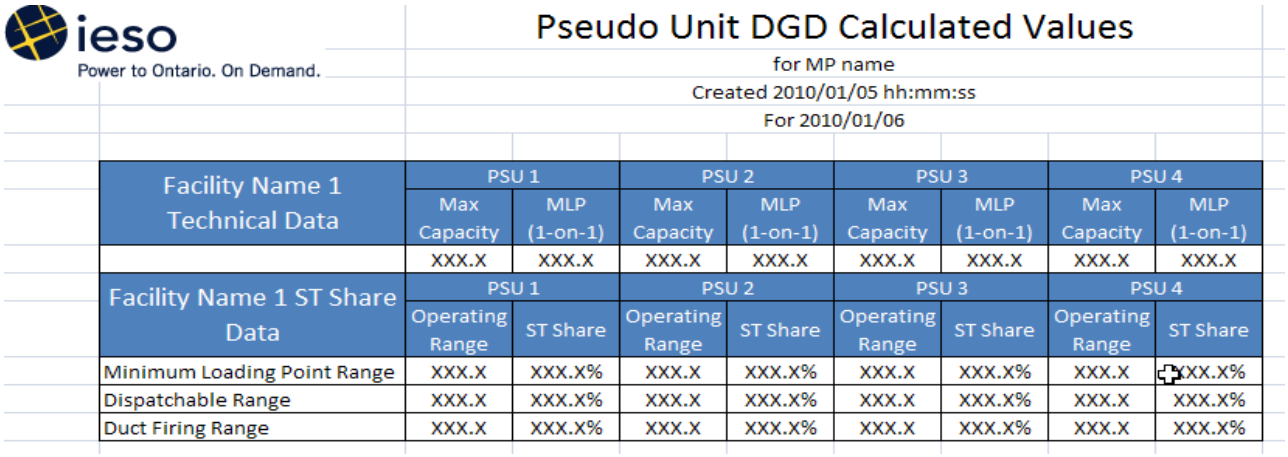
ieso
Power to Ontario. On Demand.

Daily Generator Data
for MP name
created 2009/10/13 hh:mm:ss
for 2009/10/14

	MLP		MGBRT		MGBDT	Max #
	DGD	Limit	DGD	Limit		Starts
Resource 1						
Resource 2						
Resource 2						

Figure 7-13: Daily Generator Data for Day 1 Report

In addition, combined cycle plants that are using the PSU model also receive a report related to the calculate values used by the DACE that were computed from the DGD values submitted for the physical units associated with the PSUs. This private report is intended to provide feedback to the market participants of the calculations performed. This report is available after 10 EST of the DACP day.



Pseudo Unit DGD Calculated Values
for MP name
Created 2010/01/05 hh:mm:ss
For 2010/01/06

Facility Name 1 Technical Data	PSU 1		PSU 2		PSU 3		PSU 4	
	Max Capacity	MLP (1-on-1)	Max Capacity	MLP (1-on-1)	Max Capacity	MLP (1-on-1)	Max Capacity	MLP (1-on-1)
	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X	XXX.X

Facility Name 1 ST Share Data	PSU 1		PSU 2		PSU 3		PSU 4	
	Operating Range	ST Share	Operating Range	ST Share	Operating Range	ST Share	Operating Range	ST Share
Minimum Loading Point Range	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%
Dispatchable Range	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%
Duct Firing Range	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%	XXX.X	XXX.X%

Figure 7–14: PSU Calculated Values based on DGD submissions

7.3 Day Ahead Schedule of Record

After the successful completion of DACP, the SOR is issued. The SOR is made up of two private reports, Day Ahead Scheduled Energy Report and the Day Ahead Check/Source ADE Report. If either of these reports fails to publish, the DACP is declared a failure for that day. On a successful day, the SOR will always be published by 15:00 and will always be based on the last set of published results.

7.4 Notifications

During the execution of the DACP, a number of contingencies may occur that require the IESO to communicate the nature of the contingency and any mitigation to the marketplace. These notifications will be made publically available to market participants and will be triggered manually by the DAO as required.

7.4.1 Notifications Associated with the Initial DACE Run

The initial DACE run results are expected to be available by 11:00. If the initial results are not available (the initial run has been delayed or rescheduled), the following notification will be sent:

- 'Initial Results Delayed' and 'ELR Window Extended' as one notification including:
    - The time to expect results
    - The time to which the window will remain open
    - ELR Optimization Results will also be delayed.

The ELR re-submission window (nominally 1 hour from 11:00 to 12:00) will also have to be extended to allow time for revised offers to be accepted after the initial run. The notification will indicate the end time of the extended re-submission window.

7.4.2 Notifications Associated with the ELR Optimization Run

ELR optimization results should be available to *market participants* by 13:00. If there is a delay to the ELR Optimization run or there must be a re-run, and there was no previous delay before 13:00, a notification that 'ELR Results Delayed' will be sent.

7.4.3 Notifications Prior to Completion of DACP at 15:00

A notification of 'No ELR Optimization' is sent when:

- There is not enough time remaining to complete a run prior to 15:00, or
- The SOR is published after a failed ELR Optimization run.

If DACP has failed to produce a valid ELR optimization run, the DACP SOR will be based on the day's initial run results. Notification that 'Day Ahead Re-Run Criteria has been met' and a subsequent run is required will be sent when conditions warrant.

If no indication of an additional run is announced to the marketplace via notification by 14:00, there will not be any additional DACE runs. The last set of published results will be used as the basis of the SOR.

7.4.4 DACP Failure Notification

A notification of 'DACP Failed' will be sent in the event that no DACE results have been produced, or the results cannot be published to the market participants. If invalid results are inadvertently published as the SOR, a DACP failure will also be declared.

Note: Publication of the SOR and notification of DACP failure both serve as notice of completion of EDAC for the day.

– End of Section –

Appendix A: Dispatch Data Submission

Standing dispatch data may be submitted in any timeframe.

Table A–1: Forecasts and Schedules (Intermittent and Self-Scheduling Generators)

Effective Date	Outside Mandatory Window			Mandatory Window (MW) (May be in any timeframe)
	Data Submission Window 06:00-10:00 D0	**ELR Resubmission Window 10:00-14:00 D0**	**Post EDAC Window 14:00 (D0)-06:00 (D1)**	
Day 0	RT • New and revised accepted, subject to standard validation rules	RT • New and revised accepted, subject to standard validation rules	RT • New and revised accepted, subject to standard validation rules	RT • Manual approval required
Day 1	EI • New and revised accepted • Standing forecasts and schedules (F/S) converted to actual F/S at 06:00 • Used as EDAC forecast schedule effective D1 (same actual F/S as above)	EI • New and revised accepted, subject to standard validation rules	RT • New and revised accepted, subject to standard validation rules	Not applicable • Mandatory Window does not exist in Day 1

Note: Standing Dispatch Data is converted to Actual Dispatch Data at 06:00 Day 0, and is effective as of Day 1.

Table A–2: Bids and Offers

Effective Date	Outside Mandatory Window			Mandatory Window (MW) (May be in any timeframe)
	Data Submission Window 06:00-10:00 D0	**ELR Resubmission Window 10:00-14:00 D0**	**Post EDAC Window 14:00 (D0)-06:00 (D1)**	
Day 0	RT • New and revised accepted, subject to standard validation rules • Market participant notifies CRO of revisions, including ADE violations • Operational Analysis identifies any ADE violations (except tools or CRO)	RT • New and revised accepted, subject to standard validation rules • Market participant notifies CRO of revisions, including ADE violations • Operational Analysis identifies any ADE violations (except tools or CRO)	RT • New and revised accepted, subject to standard validation rules • Market participant notifies CRO of revisions, including ADE violations • Operational Analysis identifies any ADE violations (except tools or CRO)	RT • Manual approval required • Market participant notifies CRO of revisions, including ADE violations • Operational Analysis identifies any ADE violations (except tools or CRO)
Day 1	EI • New and revised accepted, subject to standard validation rules • Standing offers and bids converted to actual offers at 06:00 • Used as Day Ahead offers effective D1 (same actual offer as above)	EI • New and revised accepted for non-dispatchable generators, subject to standard validation rules • Revised EELR offer (for which a Daily Energy Limit has been submitted by 10:00) accepted subject to standard validation rules. • Market participant must notify IESO if offer exceeds established ADE. DAO will identify for MACD compliance follow-up. • Manual approval required for other offers.	RT • New and revised accepted, subject to standard validation rules • Market participant notifies CRO of revisions, including ADE violations. • Operational Analysis identifies any ADE violations (except tools or CRO)	Not applicable • Mandatory Window does not exist in Day 1

Note: Standing Dispatch Data is converted to Actual Dispatch Data at 06:00 Day 0, and is effective as of Day 1. Standing offers can be submitted at any time. If the market participant submits a standing offer prior to 06:00, the offer can be effective Day 1. Standing offers submitted after 06:00 are effective no earlier than Day 2. If the standing offer is for a specific day of the week, the effective date may be beyond Day 2 (e.g., a standing offer for Saturdays that is submitted on a Monday).

Note: All unapproved dispatch data submissions are rejected by the system at 14:00 on Day 0.

Note: The closing of the ELR Resubmission Window is scheduled for 12:00, but can occur as late as 14:00. When there is a delay beyond 12:00, these participants will be advised by the Notification Solution of the revised closing time. They will have time to submit revised offers. If their offers arrive late, the late offers will not be included in the optimization because the run will have started at the close of the window. There are (and will be) two approval windows:

1. RT mandatory window approval solution (including GUI).
2. Market Forecast and Integration (MF&I) Day Ahead offers submitted prior to 14:00 approval solution (including GUI).

– End of Section –

Appendix B: Daily Generator Data Submission

Table B–1: Daily Generator Data

Effective Date	Outside Mandatory Window		Mandatory Window (MW) (May be in any timeframe)
	Day 1 DGD Submission Window 10:00 (D-1) – 10:00 D0	**Day 2 DGD Submission Window 10:00 (D0) -10:00 (D1)**	
Day 0	RT • Revisions manually approved	RT • Revisions manually approved	RT • Revisions manually approved
Day 1	EI • New and revised DGD values are accepted if they are within registered limits, subject to standard validation rules • If DGD values exceed calculated limits, the solution will identify the submission for manual approval by the DAO • Submissions requiring approval after16:00 will be held in the approval queue until the next day • Submissions are identified and may be forwarded for MACD review if MLP Limit or MGBRT Limit is exceeded for non-technical reasons	Not applicable	Not applicable • Mandatory Window does not exist in Day 1

Effective Date	Outside Mandatory Window		Mandatory Window (MW) (May be in any timeframe)
	Day 1 DGD Submission Window 10:00 (D-1) – 10:00 D0	Day 2 DGD Submission Window 10:00 (D0) -10:00 (D1)	
Day 2	Not applicable	EI • New and revised DGD values are accepted if they are within registered limits, subject to standard validation rules • If DGD values exceed calculated limits, the solution will identify the submission for manual approval by the DAO • Submissions requiring approval after16:00 will be held in the approval queue until the next day • Submissions are identified and may be forwarded for MACD review if MLP Limit or MGBRT Limit is exceeded for non-technical reasons	Not applicable • Mandatory Window does not exist in Day 2

Note: All accepted new and revised DGD Day Ahead submissions are identified for MACD review if they exceed their limits. (This applies to submissions between 14:00, Day -1 and 10:00, Day 0, as well as between 14:00, Day 0 and 10:00, Day 1.). Real-Time DGD submission and approval process is entirely manual. Revisions are recorded as constraints in Contract Manager.

– End of Section –

Appendix C: Detailed IHO Calculation and Treatment of MGBRT over Midnight

IHO is used to process start up *offers* for *generators* for input to the DACE and facilitate the treatment of MGBRT over midnight. The DACE will not consider start-up *offers* for dispatchable *generators* that are already in operation in the last hour of the current day to determine the first hour of the Day Ahead schedule. The DACE will determine the number of hours the generator must run to satisfy any MGBRT requirement remaining from the previous day's DACP commitment.

Determining IHO will be triggered by the calculation of Resource initial Schedule (RIS*).* The calculation of IHO will use:

- The results of the most recent Pre-dispatch DSO run for Day 0.
- The constrained on status from the previous day's DACP stored in Contract Manager co-incident with the previous bullet.

For PSUs, this determination is based on the CT associated with the PSU, not the ST.

For the n[th] resource IHO is determined by:

$$IHO_n = \begin{cases} \mathbf{24,} & \mathbf{if}\ RIS_n \neq 0 \text{ and } CMCS24_n = \text{"No"} \\ \min(PDIHO_n, CMIHO_n), & \text{otherwise.} \end{cases}$$

WHERE,

IHO_n = A non-negative integer representing the consecutive hours of operation of a resource before the end of the current day (Day 0)

RIS_n = Dispatchable *generator n* initial resource schedule

$CMCS24_n$ = Dispatchable *generator n* Contract Manager *constrained on* status in HE24 of Day 0 as determined by the DACP SOR from Day -1:

- Yes – denotes *constrained on*
- No – denotes no constraint

$PDIHO_n$ = The number of consecutive hours the dispatchable *generator n* has a schedule greater than zero at the end of Day 0 as determined by the most recent *Pre-Dispatch* DSO run for Day 0

$CMIHO_n$ = The number of consecutive hours the dispatchable *generator n* is *constrained* on in the Contract Manager Function at the end of Day 0 as determined by the DACP SOR from Day -1

From the above calculation, IHO can have the following values:

IHO = 0	The dispatchable *generator* is not in operation in HE24 of Day 0 (i.e., RIS = 0)
0 < *IHO* ≤ 24	The dispatchable *generator* is in operation in HE24 of Day 0 (i.e., RIS ≠ 0), and The dispatchable *generator* has a constraint in HE24 of Day 0 in the Contract Manager as determined by the DACP Schedule of Record from Day -1
IHO = 24	The dispatchable *generator* is in operation in HE24 of Day 0 (i.e., RIS ≠ 0), and The dispatchable *generator* **does not have** a constraint in HE24 of Day 0 in the Contract Manager as determined by the DACP SOR from Day -1

Note: Day -1 (Yesterday's) DACP creates the Day 0 (Today's) constraints in Contract Manager, which are used as inputs to this calculation.

Note: To satisfy the generator MGBRT across midnight, the DACE uses IHO and Day 1 MGBRT (not Day 0 MGBRT). A dispatchable *generator* may receive a DACP schedule at the end of a DACP day even if MGBRT has not been completed within the DACP day. The next DACP day (Day 1), the DAC*E* will commit the dispatchable *generator* at the beginning of the day to satisfy its incomplete MGBRT from the previous day (Day 0).

– End of Section –

References

Document Name	Document ID

– End of Document –