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EDAC Facility Registration

EDAC Operations Design Working Group
April 16, 2009

Overview

- Introduction
- Registration of facilities in EDAC
- Technical Data Elements
  - Minimum Loading Point (MLP)
  - MLP Limit
  - Minimum Generation Block Run Time (MGBRT)
  - MGBRT Limit
  - Minimum Down Time (MDT)
  - Maximum # of Starts per Day
  - Dispatch Elapsed Time
  - Pseudo Unit Data

Registration of facilities in EDAC

- At the time of registration, IESO will determine eligibility for DA-PCG based on generator-submitted data
- Criteria for PCG eligibility:
  1. not a quick start facility
  2. have a minimum loading point > 0 MW
  3. have a minimum generation block run time > 1 hour
  4. have a need to initiate start up sequences greater than 1 hour in advance of the hour in which they first receive a schedule, in order to respond to a dispatch associated with their constrained schedules

Registration of facilities in EDAC

- PCG-eligible resources must submit the following information at registration:
  - Minimum Loading Point and Minimum Loading Point Limit
  - Minimum Generation Block Run Time and Minimum Generation Block Run Time Limit
  - Minimum Down Time
  - Maximum Number of Starts per Day
  - Dispatch Elapsed Time
  - Pseudo Unit Data

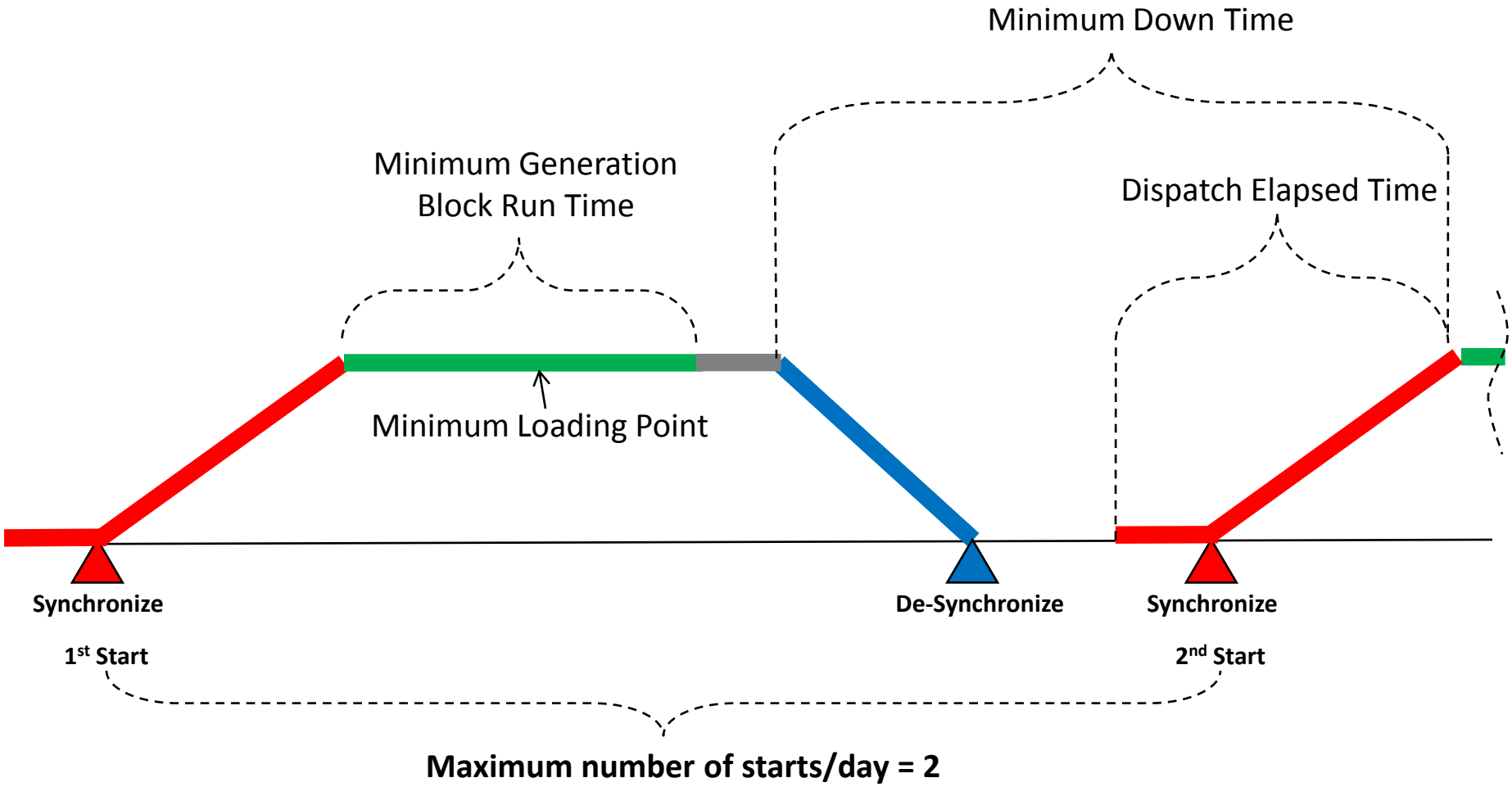
Registration of facilities in EDAC

- EDAC calculation engine will respect the physical characteristics of generation resources
  - MLP, MGBRT, Minimum Down Time, Maximum Number of Starts per Day, Pseudo Unit Data
- Certain physical characteristics will be registered as baseline values that can be overwritten through daily generator data submissions in EDAC for consideration in the engine
  - Both baselined and daily generator data submissions will be subjected to validation

Registration of facilities in EDAC

- Changes to registration data will be implemented within 6 business days
  - daily data submissions may be used to override baselined registration values
- Registration data will be captured using existing forms, where possible
- Where new forms are required to support EDAC, the IESO will endeavour to provide electronic submission mechanisms
  - online forms, portal, etc.

Registration of Facilities in EDAC



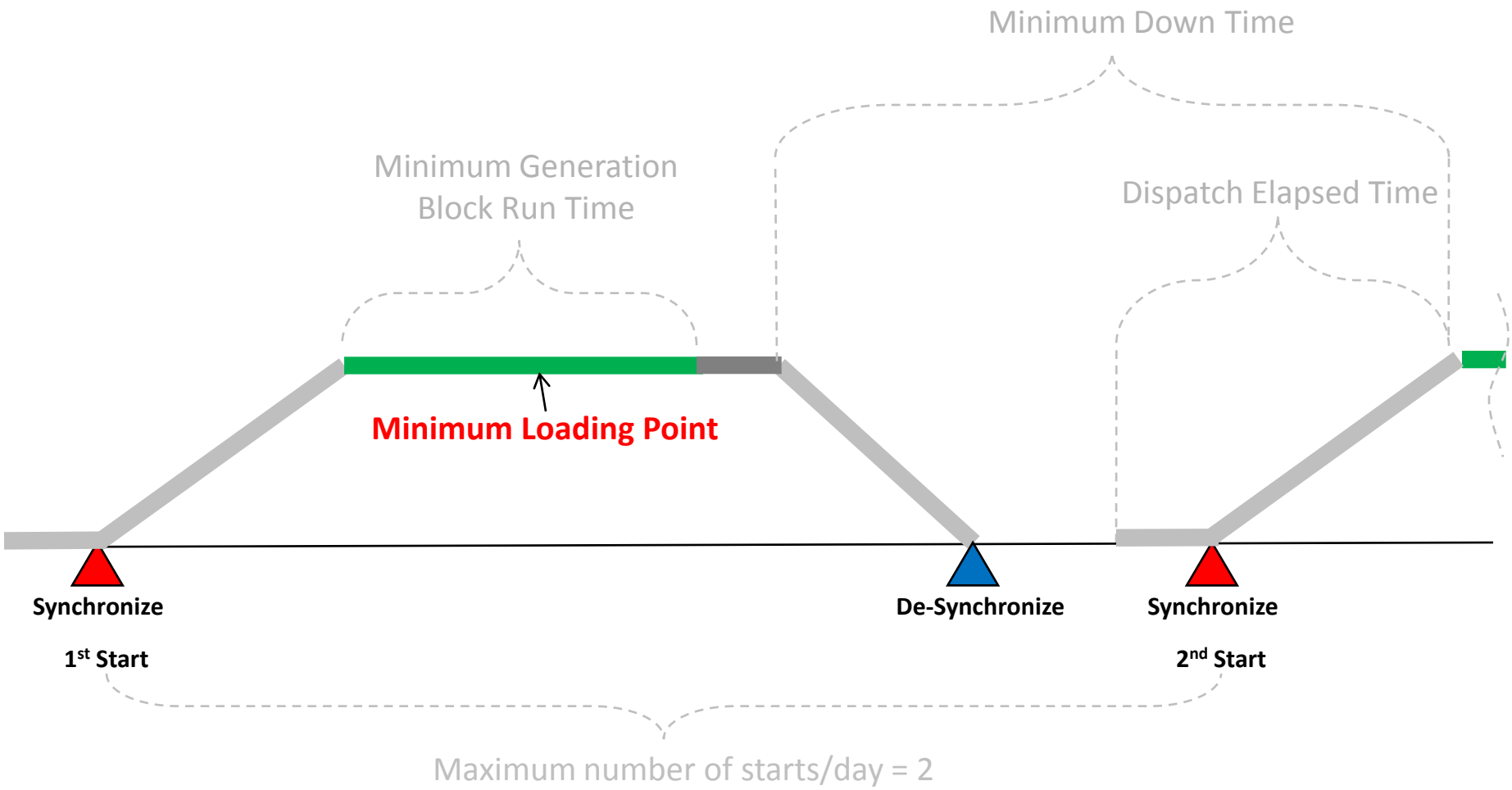
Minimum Loading Point (MLP)

- Minimum Loading Point is the minimum output of *energy* specified by the *market participant* that can be produced by a *generation facility* under stable conditions without ignition support (Market Rules Chapter 11)
- The definition represents the point at which the generator can respond to dispatch signals

Minimum Loading Point (MLP)

- MLP is used to validate criteria #2 of PCG-eligibility (MLP > 0)
- EDAC calculation engine respects this parameter when determining schedules
- Can be submitted day-ahead for use in EDAC calculation engine for the next day

Minimum Loading Point (MLP)



Minimum Loading Point (MLP)

- Captured on Form 1552 today
- Validation rules:
  - Generator must not be a quick start generation unit
  - Number format XXX.X MW
  - A single registered quantity for each resource
  - 0 < MLP <= Maximum generator capability
  - Must reflect the technical capability of the generator
  - All resources whose generator equipment has a technical requirement for MLP must submit this quantity to the IESO

Minimum Loading Point (MLP) Limit

- The MLP Limit is the highest MLP that is required for anticipated operating conditions
- MLP Limit is intended to cover operating conditions that are regularly encountered but not all *possible* operating conditions.
- MLP Limit is used to validate daily submissions and can not be submitted day-ahead
  - MLP is recorded at the time of registration for baselining purposes and may be overwritten through daily generator data if equipment or regulatory conditions warrant

Minimum Loading Point (MLP) Limit

- New definition for EDAC
- MLP Limit will be used to provide an upper bound by which day ahead changes will be evaluated for approval
- If $MLP_{(day\text{-}ahead)}$ <= MLP Limit
  - it will be automatically approved
- If $MLP_{(day\text{-}ahead)}$ > MLP Limit
  - it will require a reason code and comment explaining the reason for the change and will be held for IESO approval
- There is no lower bound validation on MLP

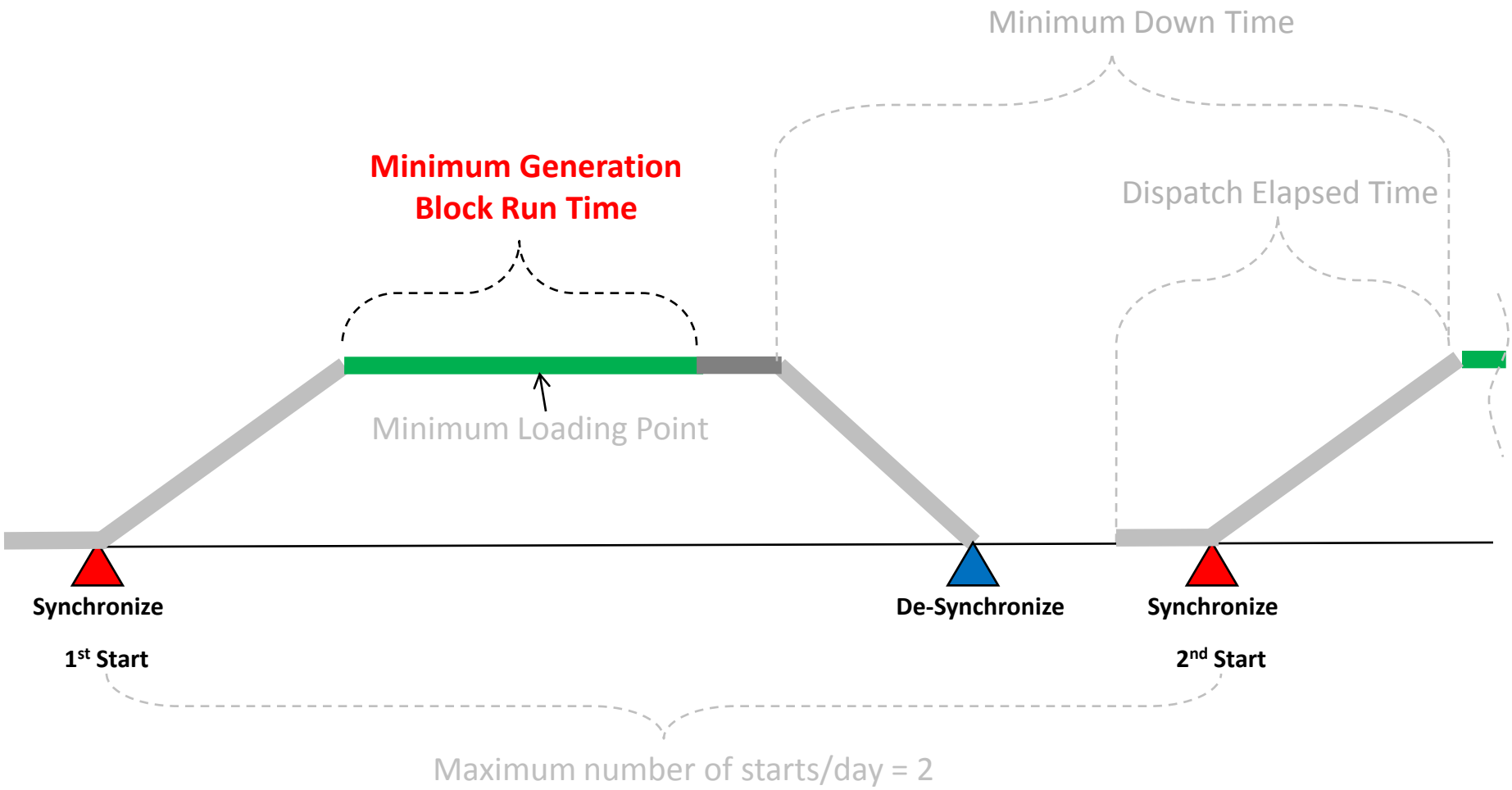
Minimum Loading Point (MLP) Limit

- Validation:
  - Must reflect the technical requirements of anticipated, regularly encountered operating conditions
  - Number format XXX.X MW
  - MLP <= MLP Limit <= Maximum generator capability
  - All resources whose generator equipment has a technical requirement for MLP must submit this quantity to the IESO

Minimum Generation Block Run Time (MGBRT)

- Minimum Generation Block Run Time (MGBRT) is defined as the time difference specified by the *market participant* between the *minimum run-time* and the minimum time required for a *generation facility* to ramp from synchronization to *minimum loading point* (Market Rules Chapter 11)
- Used to validate criteria #3 of the DA-PCG eligibility (MGBRT > 1 hour)
- EDAC calculation engine respects this parameter when determining schedules
- Can be submitted day-ahead for use in EDAC calculation engine for the next day

Minimum Generation Block Run Time (MGBRT)



Minimum Generation Block Run Time (MGBRT)

- Captured today on Form 1552
- Validation rules:
  - Generator must not be a quick start generation unit
  - Number format XX hours (integer)
  - A single registered quantity for each resource
  - 1 < MGBRT <= 24
  - Must reflect the technical capability of the generator
  - All resources whose generator equipment has a technical requirement for MLP must submit this quantity to the IESO
  - If no MLP is registered, no MGBRT can be registered

MGBRT Limit

- The MGBRT Limit is the highest MGBRT that is required for anticipated operating conditions
- MGBRT Limit is intended to cover operating conditions that are regularly encountered but not all *possible* operating conditions.
- MGBRT Limit is used to validate daily generator data submissions
  - MGBRT is recorded at the time of registration for baselining purposes and may be overwritten through daily dispatch data if equipment or regulatory conditions warrant

MGBRT Limit

- MGBRT Limit will be used to provide a range by which day ahead changes will be evaluated for approval
- If $MGBRT_{(day\text{-}ahead)}$ <= MGBRT Limit
  - it will be automatically approved
- If $MGBRT_{(day\text{-}ahead)}$ > MGBRT Limit
  - it will require a reason code and comment explaining the reason for the change and will be held for IESO approval

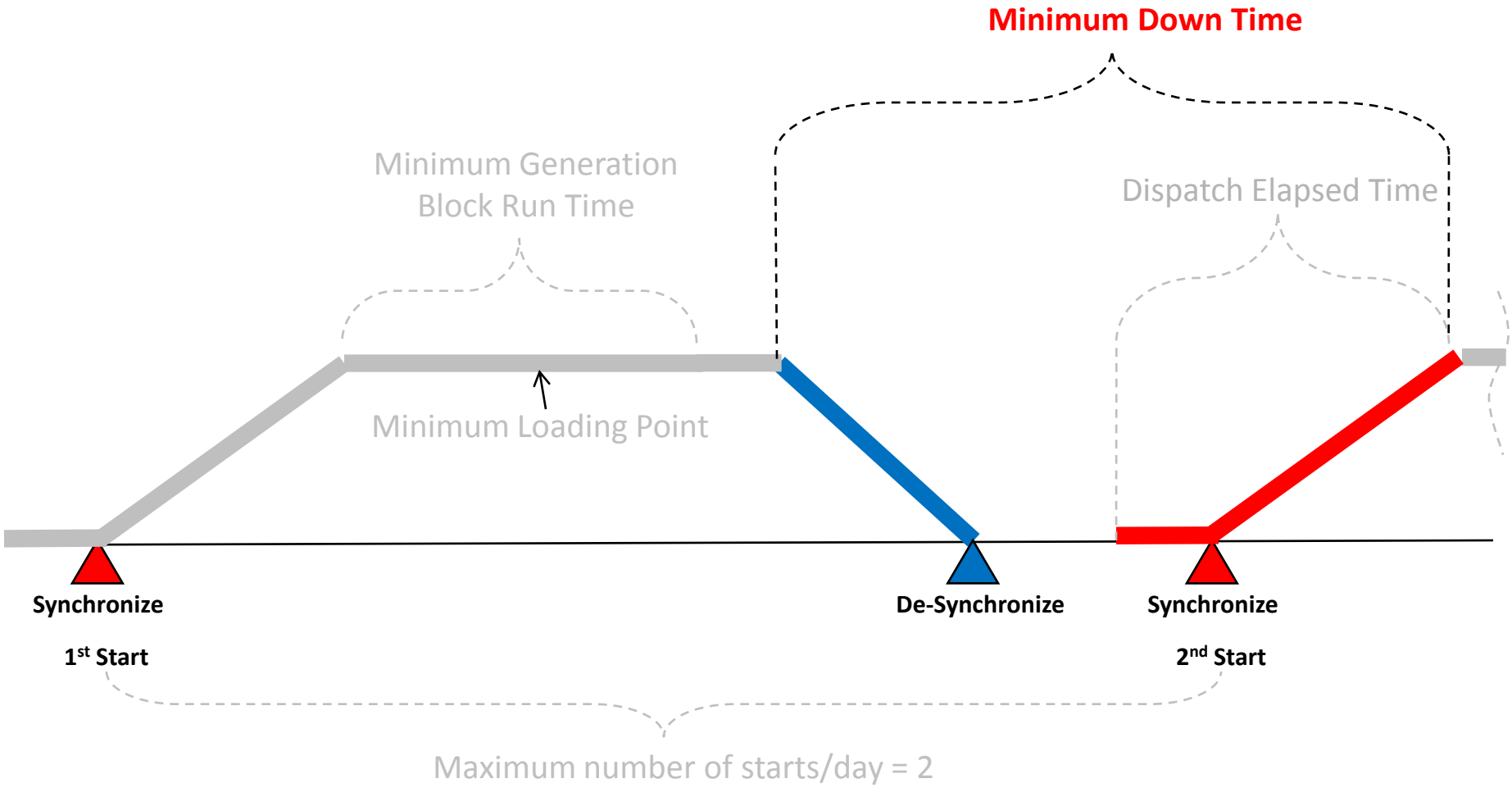
MGBRT Limit

- New definition for EDAC
- Validation rules:
  - Generator must not be a quick start generation unit
  - Number format XX hours (integer)
  - A single registered quantity for each resource
  - MGBRT <= MGBRT Limit <= 24
  - Must reflect the technical capability of the generator
  - All resources whose generator equipment has a technical requirement for MLP must submit this quantity to the IESO
  - If no MGBRT is registered, no MGBRT Limit can be registered

Minimum Down Time (MDT)

- Minimum Down Time (MDT) is defined as the minimum time, in hours, between the time a generator is last at its minimum loading point before de-synchronization and the time the generator reaches its minimum loading point again after synchronization
- EDAC calculation engine respects this parameter when determining schedules
- Can be submitted day-ahead for use in EDAC calculation engine for the next day

Minimum Down Time (MDT)



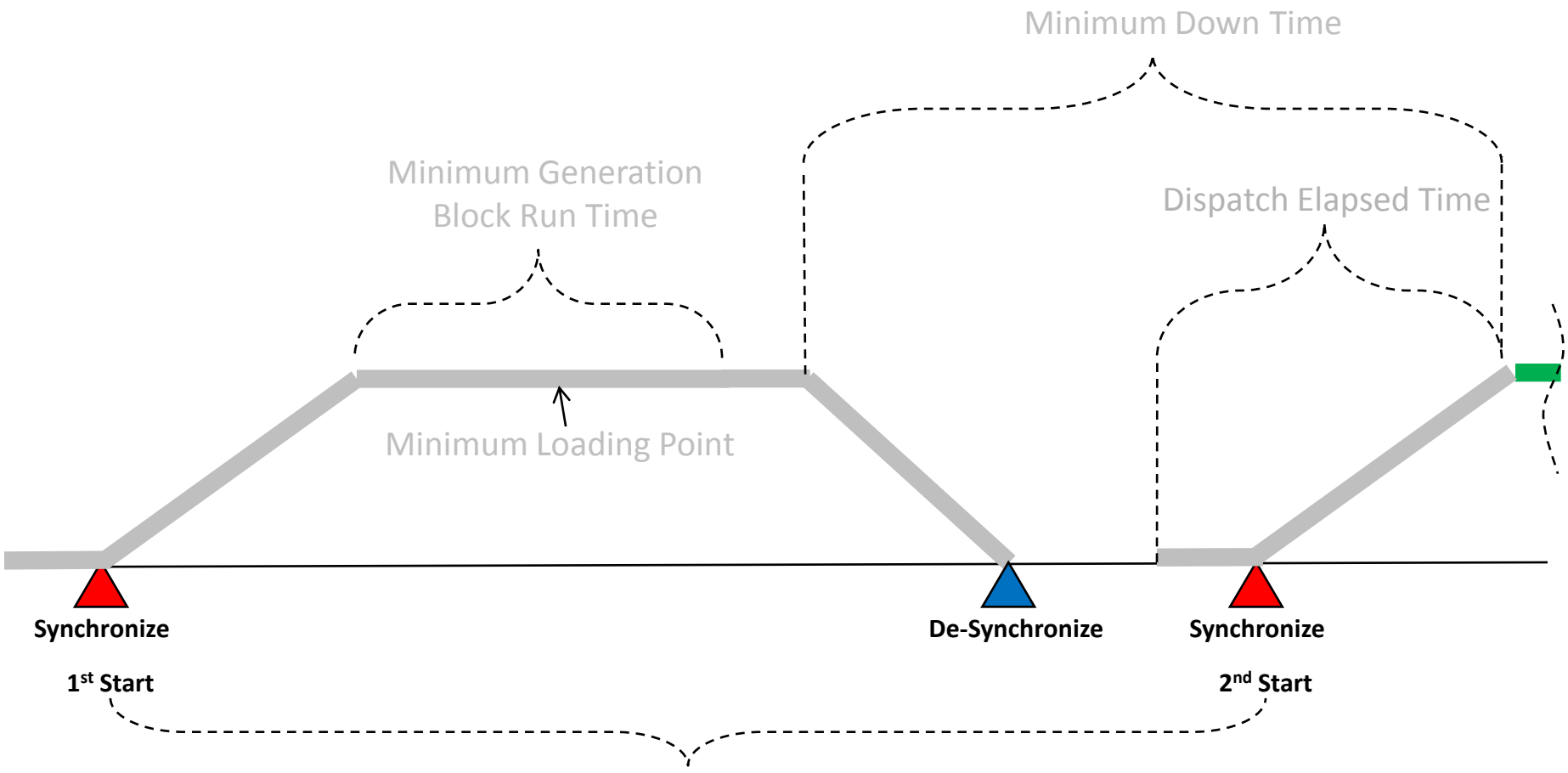
Minimum Down Time (MDT)

- This is a new definition for EDAC
- Validation rules:
  - Generator must not be a quick start generation unit
  - Number format XX hours (integer)
  - A single registered quantity for each resource
  - 0 < MDT <= 24
  - Must reflect the technical capability of the generator
  - All resources whose generator equipment has a technical requirement for MLP and MGBRT must submit this quantity to the IESO
  - If no MLP/MGBRT is registered, no MDT can be registered

Maximum # of Starts per Day

- Maximum # of Starts per Day is defined as the number of times that the unit can be started up within a day
- Ensures that generators are not scheduled to be cycled on and off more than their specified maximum number in a day
- EDAC calculation engine respects this parameter when determining schedules
- Can be submitted day-ahead for use in EDAC calculation engine for the next day

Maximum # of Starts per Day



Maximum number of starts/day = 2

Maximum # of Starts per Day

- Currently captured through Expedited Operational Data (EOD) but will become registration data in EDAC
- Validation rules:
  - Generator must not be a quick start generation unit
  - Number format XX starts (integer)
  - A single registered quantity for each resource
  - <= 1+24/(MGBRT + MDT) rounded down to the nearest whole number

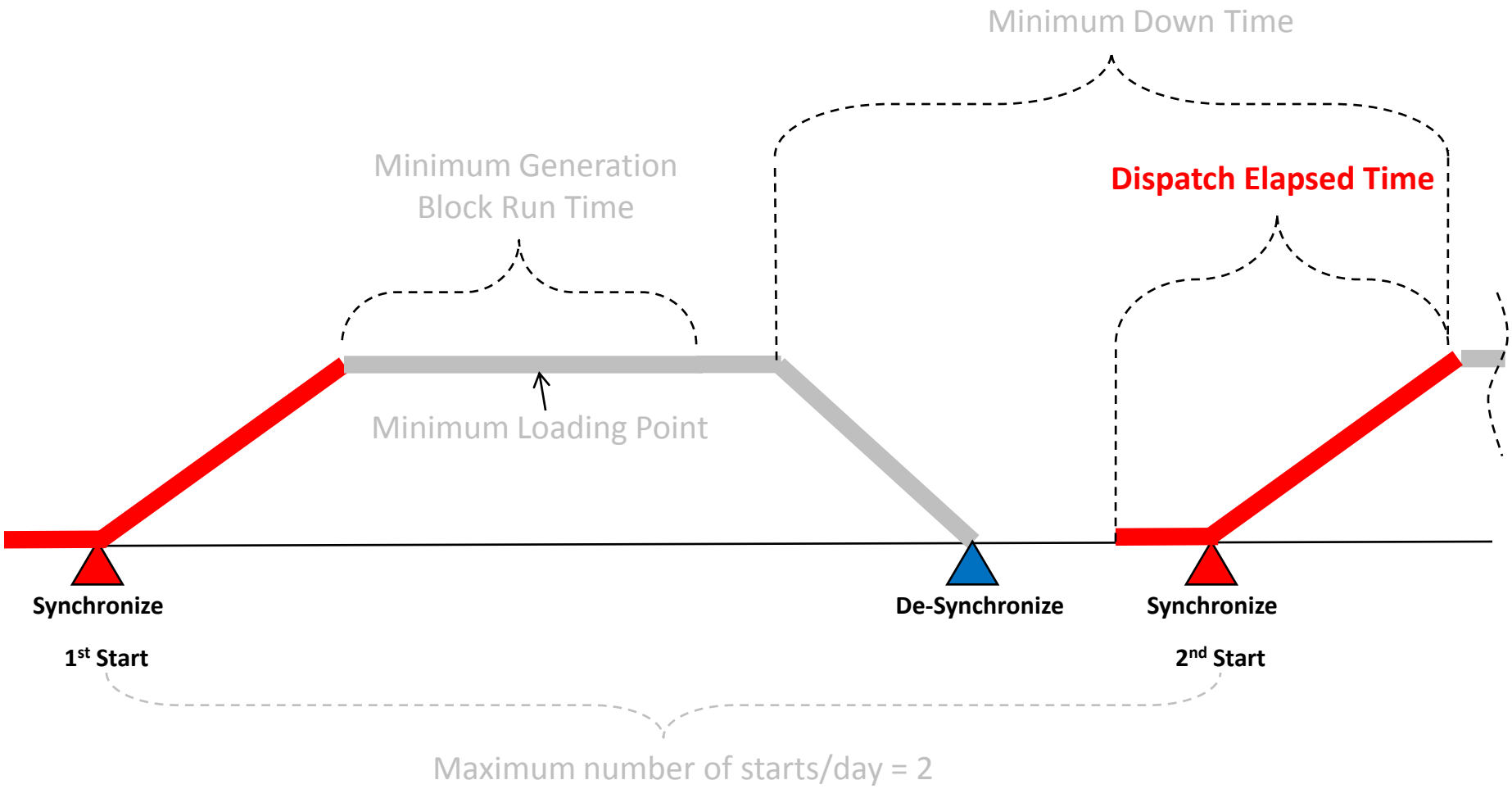
Maximum # of Starts per Day

- Validation rules (cont'd):
  - All resources whose generator equipment has a technical requirement for MLP and MGBRT must submit this quantity to the IESO
  - If no MLP/MGBRT is registered, this quantity can not be registered

Dispatch Elapsed Time (DET)

- Dispatch Elapsed Time is the minimum amount of time, **in minutes**, between the time at which a generator initiates its start-up sequence and the time at which it can respond to IESO dispatch signals
  - For a non-quick start, this means that the generator has reached MLP
- This is a new definition for EDAC
- Must be submitted by all dispatchable generators
  - This applies to existing resources as well as newly registered resources

Dispatch Elapsed Time (DET)



Dispatch Elapsed Time (DET)

- Used to validate:
  - criteria #1 of the DA-PCG eligibility: are not a quick start facility
  - criteria #4 of the DA-PCG eligibility: dispatchable generators that have a need to initiate start-up sequences greater than one hour in advance of the hour in which they first receive a schedule, in order to respond to a dispatch associated with their constrained schedules
- Can not be submitted day-ahead

Dispatch Elapsed Time (DET)

- Validation rules:
  - Must reflect the technical capability of the resource
  - Number format xxx minutes (integer)
  - 0 <= (Minimum Run Time – MGBRT) <= DET
  - A single registered quantity for each resource
  - If DET <= 5 minutes, resource will be registered as a quick start facility

Pseudo Unit Data

- Registration requirements for pseudo units will be stakeholdered separately if pseudo unit design is accepted by stakeholders
- If accepted, the IESO will require:
  - Sharing proportion information between steam turbines and combustion turbines
  - Capacity ranges for pseudo units reflecting dispatchability of combustion and steam turbines
- Details will be available at the next stakeholder session

Recap

- IESO will register the following information to support EDAC:
  - Minimum Loading Point* and Minimum Loading Point Limit
  - Minimum Generation Block Run Time* and Minimum Generation Block Run Time Limit
  - Minimum Down Time*
  - Maximum Number of Starts per Day*
  - Dispatch Elapsed Time
  - Pseudo Unit Data

* These parameters can be overwritten through EDAC daily generator data submission, subject to validation

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EDAC Detailed Design Stakeholdering Session
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