



Reference document on Main Transmission System definition

Reliability Coordinator

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Preface

This technical reference document was prepared by the Reliability Coordinator for Québec to support the entities targeted by the reliability standards in the application of the definition of the Main Transmission System (Réseau de transport principal, or RTP). This document must be read in conjunction with the full definition, presented in the *Glossary of Terms and Acronyms Used in Reliability Standards*, along with any requests or instructions issued by the Régie de l'énergie. To submit an exception request from the definition, follow the procedure indicated in this document: *Québec Main Transmission System (RTP): Regulatory Framework – Facility Updates*. These two documents can be viewed on the website of the Reliability Coordinator.

Table of contents

Preface	i
Table of contents	iii
Figures	iv
Introduction	7
Opening statement	7
History	7
Purpose	7
Definition	9
Executive summary	11
Inclusions	13
Inclusion I1	14
Inclusion I2	15
Inclusion I3	21
Inclusion I4	22
Inclusion I5	28
Inclusion I6	30
Exclusions	36
Exclusion E1	37
Exclusion E2	41
Exclusion E3:	44
Hierarchical application of the definition	49
Version history	63

Figures

Figure I1-1: Typical transformer operated at higher than 700 kV	14
Figure I1-2: Typical transformer with primary operated at higher than 700 kV	14
Figure I1-3: Typical transformer with primary operated at higher than 700 kV with associated bus bars	14
Figure I1-4: Transformer with primary operated at higher than 700 kV and serving distribution needs	14
Figure 5: Illustration of a typical bus bar	15
Figure I2-6: Generation resource higher than 75 MVA connected to the RTP	15
Figure I2-7: Generation resource higher than 75 MVA not connected to the RTP	16
Figure I2-8: Generation resource of 75 MVA or less	16
Figure I2-9: Example of a generating station with several generating units connected at 300 kV	17
Figure I2-10: Example of a generating station with a gross nameplate rating less than 75 MVA	18
Figure I2-11: Example of a generating unit with a total gross nameplate rating of 75 MVA and of which one of the generating units has several voltage transformation levels	19
Figure I2-12: Example of a generating station with a gross nameplate rating higher than 75 MVA but one of the generating units of which serves Load	20
Figure I4-13: Distributed generation site – wind generation example	23
Figure I4-14: Example of a wind generating station with an unknown configuration on the line side of the switchyard	24
Figure I4-15: Example of a solar photovoltaic power plant with a combined gross aggregate nameplate rating of 80 MVA	25
Figure I4-16: Example of a solar photovoltaic power plant with several levels of voltage transformation	26
Figure I4-17: Example of a solar photovoltaic power plant with generation facilities belonging to different owners	27
Figure I5-18: Example of application of Inclusion I5 on a bus bar of 300 kV or higher	28
Figure I5-19: Example of application of Inclusion I5 on a substation with a maximum voltage of 700 kV or higher	29
Figure I6-20: Example of application of the first scenario of Inclusion I6	31
Figure I6-21: Second example of application of the first scenario of Inclusion I6	32
Figure I6-22: Example of application of the second scenario of Inclusion I6	33
Figure I6-23: Second example of application of the second scenario of Inclusion I6	34
Figure I6-24: Example of application of the third scenario of Inclusion I6	35
Figure E1-25: Radial system that supplies only Loads	39
Figure E1-26: Radial system that encompasses a generation resource, included in the RTP	39
Figure E1-27: Radial system that includes a generation resource, excluded from the RTP	40
Figure E2-28: Customer generating units on the customer's side of the retail meter that inject less than 75 MVA into the RTP	42
Figure E2-29: Customer generating units on the customer's side of the retail meter that inject more than 75 MVA into the RTP	43
Figure E3-30: Local network with 300 kV loop	45
Figure E3-31: Local network with 300 kV loop	46
Figure 32: Step 0 – Illustration of example used for full application of the definition of the RTP	50
Figure 33: Step 1 – Application of basic principle	51
Figure 34: Step 2 a) – Application Inclusion I1	52
Figure 35: Step 2 b) – Application of Inclusion I2	53
Figure 36: Step 2 c) – Application of Inclusion I3	54
Figure 37: Step 2 e) – Application of Inclusion I5	55
Figure 38: Step 2 f) – Application of Inclusion I6	56
Figure 39: Result of application of Inclusions and the basic principle	57

<i>Figure 40: Step 3 a) i) – Application of Exclusion E3</i>	<u>58</u>
<i>Figure 41: Step 3 a) ii) – Application of Exclusion E3 (cont.)</i>	<u>59</u>
<i>Figure 42: Step 3 a) iii) – Application of Exclusion E3 (cont.)</i>	<u>60</u>
<i>Figure 43: Step 3 c) – Application of Exclusion E1</i>	<u>61</u>
<i>Figure 44: Final illustration of full application of the RTP definition</i>	<u>62</u>

Introduction

During writing of this definition of the Main Transmission System (RTP), the Reliability Coordinator drew on the information available to interpret the definition of the Bulk Electric System (BES) on the North American Electric Reliability Corporation (NERC) website. The Coordinator has prepared this document as a guide for interpreting the definition of the RTP.

Opening statement

This document does not represent an official position of the Reliability Coordinator or the Régie de l'énergie in Québec, and it does not bind decisions arising from monitoring of compliance. This document is a professional opinion prepared by the Reliability Coordinator to offer illustrative guidance to the targeted entities in their own determination of RTP Elements.

History

On May 14, 2020, the Régie de l'énergie rendered its Decision D-2020-052, in which it accepted the Québec Reliability Coordinator request to submit a definition and an identification methodology of the Elements making up the Main Transmission System (RTP) to ensure that all Elements necessary for the reliability of the Québec Interconnection are subject to the Reliability Standards developed by NERC. The final definition and methodology were acknowledged by the Régie de l'énergie on month XX, 20XX, in Decision D-20xx-xxx.

Purpose

The main purpose of this document is to assist electricity sector stakeholders in Québec in applying the definition of the RTP. It presents examples that clarify its definition, but the content must not be considered prescriptive. This document provides clarifications and explanations regarding application of the definition of the RTP in a consistent, non-discriminatory manner which is in the public interest.

Definition

The text of the RTP definition is reproduced below.

Main Transmission System (RTP)

Only Elements, groups of Elements and Facilities located within the jurisdiction of Québec figure in this definition.

Basic principle

The Main Transmission System is made up of the operated at a voltage of 300 kV or higher as well as Active Power *and* Reactive Power *resources* connected at a voltage of 300 kV or higher, subject to the Inclusions and Exclusions below. Facilities used in the local distribution of electric energy are excluded.

Inclusions

- **I1:** Transformers with a terminal operated at 700 kV or higher and associated bus bars, unless excluded by application of Exclusion E1 or E3.
- **I2:** Generating resources that are part of a generating station or a Facility whose gross aggregate nameplate rating is greater than 75 MVA, and:
 - for a generation resource connected to the RTP, generator terminals through the high-side of the step-up transformer(s);
 - for a generation resource not connected to the RTP, generator terminals through the low-side of the step-up transformer(s);
- **I3:** Blackstart Resources identified in the Transmission Operator's Restoration Plan.
- **I4:** Dispersed Power-producing Resources with a gross aggregate nameplate rating greater than 75 MVA and connected through a system designed primarily for delivering such capacity to a common point of connection. In such a case, the Facilities designated as part of the RTP are:
 - the individual resources, and
 - the system designed primarily for delivering capacity from the point where those resources aggregate to greater than 75 MVA to a common point of connection.
- **I5:** Static or dynamic devices (excluding generating units) dedicated to supplying or absorbing Reactive Power, unless excluded by Exclusion E4, and that are connected:
 - with a high-side voltage of 300 kV or higher; or
 - with a dedicated step-up transformer with a high-side voltage of 300 kV or higher; or
 - through a transformer and its associated bus bars covered by Inclusion I1; or,
 - a dedicated step-up transformer connected to one of the associated bus bars covered by Inclusion I1.
- **I6:** Facilities that connect the Québec Interconnection to another Interconnection, according to the following criteria:
 - Facilities that, under normal operation, are synchronized to the Québec Interconnection, are included in the RTP, Transmission Facilities, including DC converter Facilities and all the associated Elements, that provide the principal path for power transfer between the Bulk Electric System (BES) Facilities located in the other jurisdiction and the

- Transmission Elements that are part of the RTP;
- For Facilities that, under normal operation, are synchronized to an Interconnection other than the Québec Interconnection, the BES definition applies, with the following exception:
 - for Elements targeted by Inclusion I2 of the definition of the BES, individual units with a gross nameplate rating of 20 MVA or higher must be included in a generating station having a gross nameplate rating greater than 50 MVA;
- for any other scenario, the RTP Transmission Element crossing the Québec border and its DC converter, if applicable.

Exclusions:

- **E1:** Radial systems. A radial system is a group of contiguous Transmission Elements that emanates from a single point of connection at a voltage of 300 kV or higher, and:
 - only serves Load;
 - only includes generation resources not identified in Inclusions I2, I3 and I4 with an aggregate capacity less than or equal to 75 MVA (gross nameplate rating), or,
 - where the radial system serves Load and includes generation resources not identified in Inclusions I2, I3, and I4 with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).

Note 1: A normally open switching device between radial systems does not affect this Exclusion unless that switching device can be used to transfer bulk power among the various parts of the Main Transmission System.

Note 2: The presence of a contiguous loop, operated at a voltage level of less than 50 kV between two configurations considered as radial systems, does not affect this Exclusion.

- **E2:** A generating unit or multiple generating units on the customer's side of the retail meter that serve all or part of the retail Load with electric energy if: i) the net capacity provided to the RTP does not exceed 75 MVA, and ii) standby, back-up, and maintenance power services are provided to the generating unit or to multiple generating units or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a Generator Owner or Generator Operator, or under terms approved by the applicable regulatory authority.
- **E3:** Local networks. A local network is a group of contiguous Transmission Elements operated at less than 700 kV that transfer power to a Load rather than transfer power among the parts of the Main Transmission System. A local network is supplied from one or multiple points of connection at 300 kV or higher to improve the level of service to retail customers, and not to ensure power transfer between the various parts of the Main Transmission System. The local network has all of the following:
 - limits on connected generation: the local network and its Elements exclude generation resources identified in Inclusion I2, I3, or I4, and its aggregate non-retail generation capacity is not greater than 75 MVA (gross nameplate rating).
- **E4:** Reactive Power devices installed solely to meet the needs of one or more retail customers.

Note: Elements may be included or excluded on a case-by-case basis through the Rules of Procedure exception process.

Executive summary

An understanding of the basic principle of the RTP, along with its Inclusions and Exclusions, is required to consistently apply the definition of the RTP. Note that the definition applies both to alternating current (AC) and direct current (DC) Facilities. Application of the definition of the RTP is composed of deterministic criteria regarding what is included in the RTP and what is excluded. The definition applies in three separate steps that, if executed appropriately, will make it possible to determine most of the Elements of the RTP for the entire Québec Interconnection.

Step 1: Application of basic principle

The general principle of applicability underscores the unique nature of the topology of the Québec power grid. This principle establishes a clear demarcation within which all Transmission Elements operated at higher than 300 kV and the active or Reactive Power resources connected over 300 kV are included in the RTP.

Step 2: Application of Inclusions

The second step consists of applying Inclusions following the sequence indicated. The definition encompasses six (6) specific Inclusions that are complementary and that clarify the basic principle, all with the aim of clearly establishing the Elements included in the RTP. Note that although the Inclusions are complementary to the basic principle, Inclusions may overlap, or one or more Inclusions may overlap the basic principle.

Step 3: Application of Exclusions

This step consists of evaluating specific situations where a potential Exclusion from the RTP may exist. Exclusions are formulated to define Elements or groups of Elements that can be specifically excluded from the RTP. Note that for an Element to be eligible for an Exclusion, it must also be included in the RTP under the basic principle or at least one Inclusion.

In the hierarchical application of the RTP definitions Exclusions take precedence over Inclusions, except Inclusion I6, which cannot be excluded. A full example of the hierarchical definition of the RTP is illustrated in the last section of this document.

Inclusions

Each Inclusion is illustrated below in the diagrams and a description to explain the application of the definition of the RTP for the configurations presented as an example. These examples should not be considered prescriptive.

The diagrams show examples of specific applications of the definition of the RTP. Some parts of the diagrams are in black. This color indicates that no hypothesis has been issued for the portion of the network in question.

Diagram color legend:

- **Blue** indicates that an Element is included in the RTP.
- **Green** indicates that an Element is excluded from the RTP.
- **Orange** indicates a connection point.
- **Black** indicates that the Element has not been evaluated for the case illustrated in the diagram.

Inclusion I1

I1: Transformers with a terminal operated at 700 kV or higher and associated bus bars, unless excluded by application of Exclusion E1 or E3.

Figures I1-1 to 1-4 represent various types of transformer operating configurations typically used in the industry.

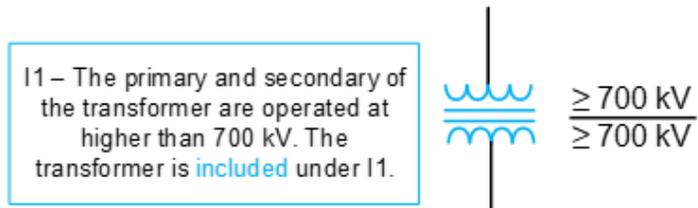


Figure I1-1: Typical transformer operated at higher than 700 kV

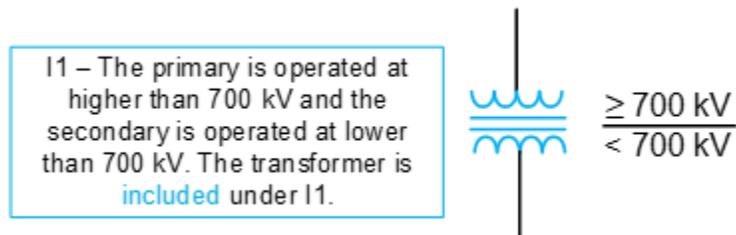


Figure I1-2: Typical transformer with primary operated at higher than 700 kV

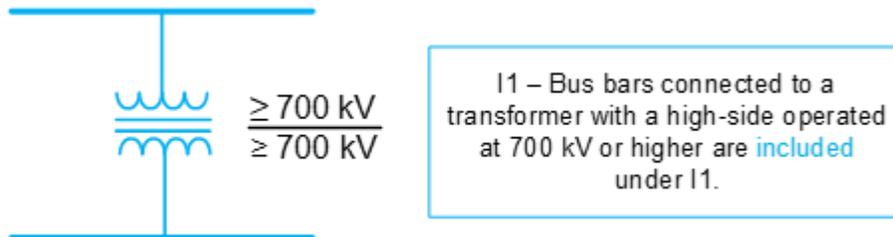


Figure I1-3: Typical transformer with primary operated at higher than 700 kV with associated bus bars

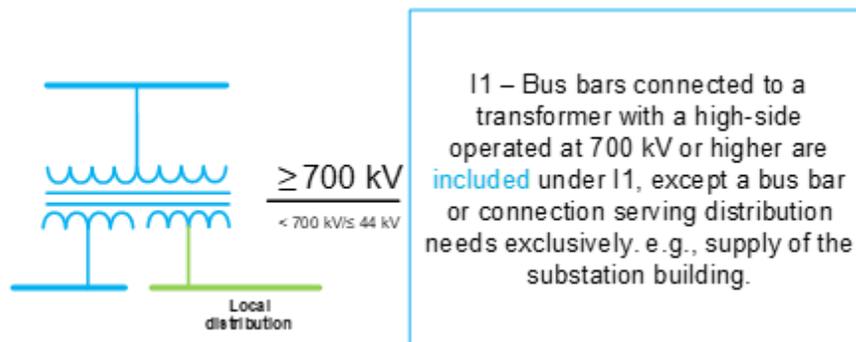


Figure I1-4: Transformer with primary operated at higher than 700 kV and serving distribution needs

Inclusion I2

I2: Generating resources that are part of a generating station or a Facility whose gross aggregate nameplate rating is greater than 75 MVA, and:

- for a generation resource connected to the RTP, generator terminals through the high-side of the step-up transformer(s);
- for a generation resource *not connected* to the RTP, generator terminals through the low-side of the step-up transformer(s);

The interpretation of “and” in Inclusion I2 must be understood as the second condition to be fulfilled should the gross aggregate nameplate rating of the generation resource be higher than 75 MVA.

The presence of a substation, a substation switchyard or a generator auxiliary transformer does not influence the application of Inclusion I2. The substations, switchyards or auxiliary transformers form part of the RTP according to application of the basic principle or Inclusion I1.

Note: Figures I2-5 to I2-11 show the configuration of the bus bars of the generation resource and the generation aggregation or connection point, which is generally located on the site of the generation resource. The configurations of the bus bars of the generation resource vary according to the situation and include, without being limited to, the following configurations: single bus bar assembly, breaker-and-a-half, looped, etc.



Figure 5: Illustration of a typical bus bar

Figure I2-6 illustrates a single generation resource with a gross nameplate rating higher than 75 MVA, connected to a step-up transformer with a high-side exceeding 300 kV. By applying Inclusion I2, the generation resource is recognized as an Element of the RTP.

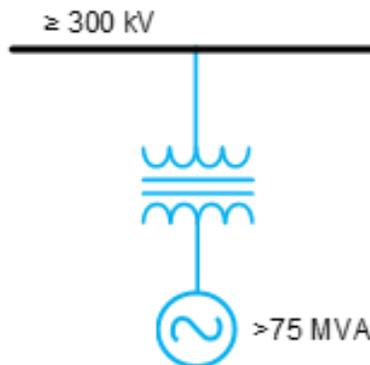


Figure I2-6: Generation resource higher than 75 MVA connected to the RTP

Figure I2-7 illustrates a single generation resource with a gross nameplate rating higher than 75 MVA, connected to a step-up transformer with a high-side inferior to 300 kV. By applying Inclusion I2, the generation resource is recognized as an Element of the RTP.

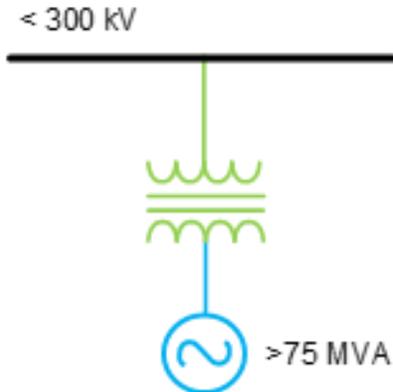


Figure I2-7: Generation resource higher than 75 MVA not connected to the RTP

Figure I2-8 illustrates a single generation resource with a gross nameplate rating less than or equal to 75 MVA. The voltage level of the step-up transformer is irrelevant to evaluation of the Inclusion I2. The generation resource is not considered to be an Element of the RTP.

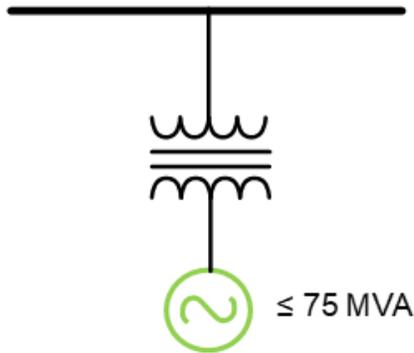


Figure I2-8: Generation resource of 75 MVA or less

Figure I2-9 illustrates a generation facility with several generation resources (generating units, for example), connected to a bus bar of 300 kV or higher. Facility gross aggregate nameplate rating is less than 80 MVA. By applying Inclusion I2, the generation resource is recognized as an Element of the RTP.

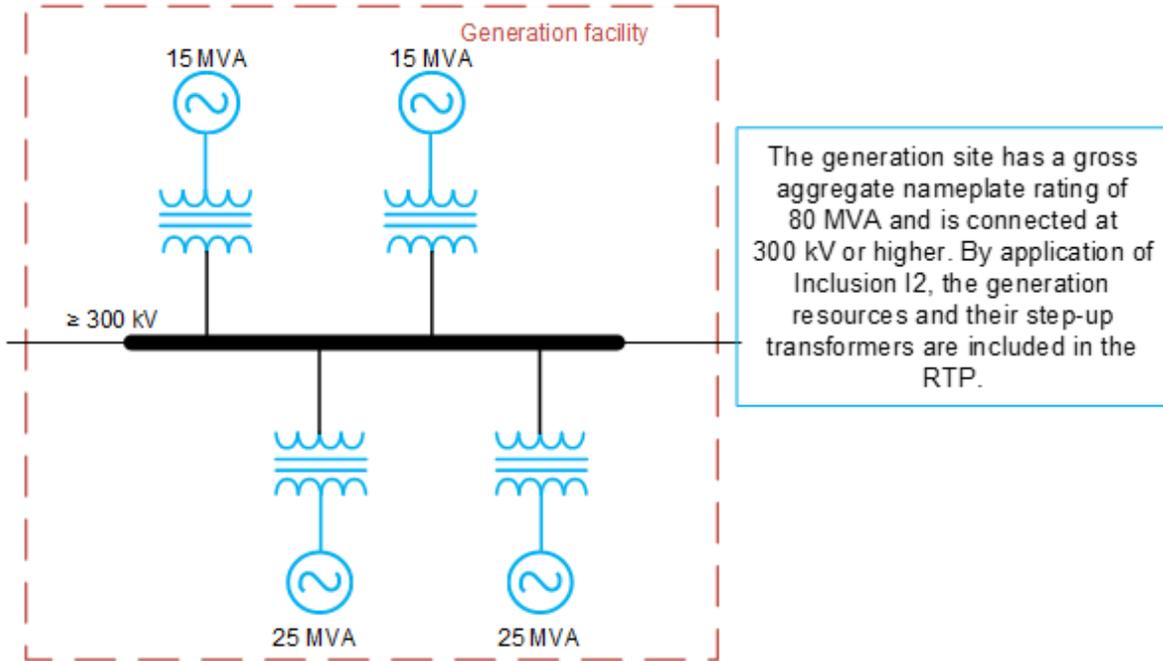


Figure I2-9: Example of a generating station with several generating units connected at 300 kV

Figure I2-10 illustrates a generation facility with several generation resources connected to a bus bar of 300 kV or higher. Gross Facility aggregate nameplate rating is less than 60 MVA. By applying Inclusion I2, these generation resources are recognized as an Element of the RTP.

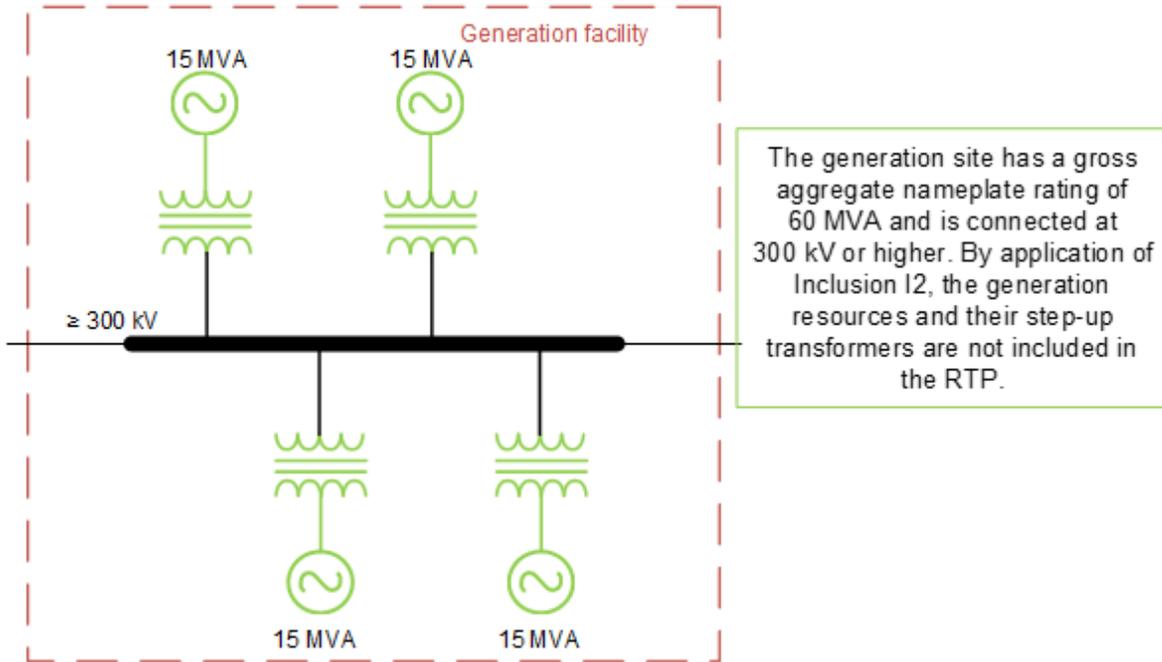


Figure I2-10: Example of a generating station with a gross nameplate rating less than 75 MVA

Figure I2-10 illustrates a generation facility with several generation resources connected to a common point of 300 kV or higher for the high-side of the step-up transformers, and a gross nameplate rating totaling over 75 MVA. By applying Inclusion I2, all of the generation resources connected are included in the RTP. The generation resource with a gross nameplate rating of 10 MVA is included in the aggregated generation, since the step-up transformers and bus bars are connected exclusively to connect the generation resource to the bus bars. The step-up transformers were installed for the sole purpose of increasing the output voltage of generation resources to connect them to the transmission corridor (300 kV or higher).

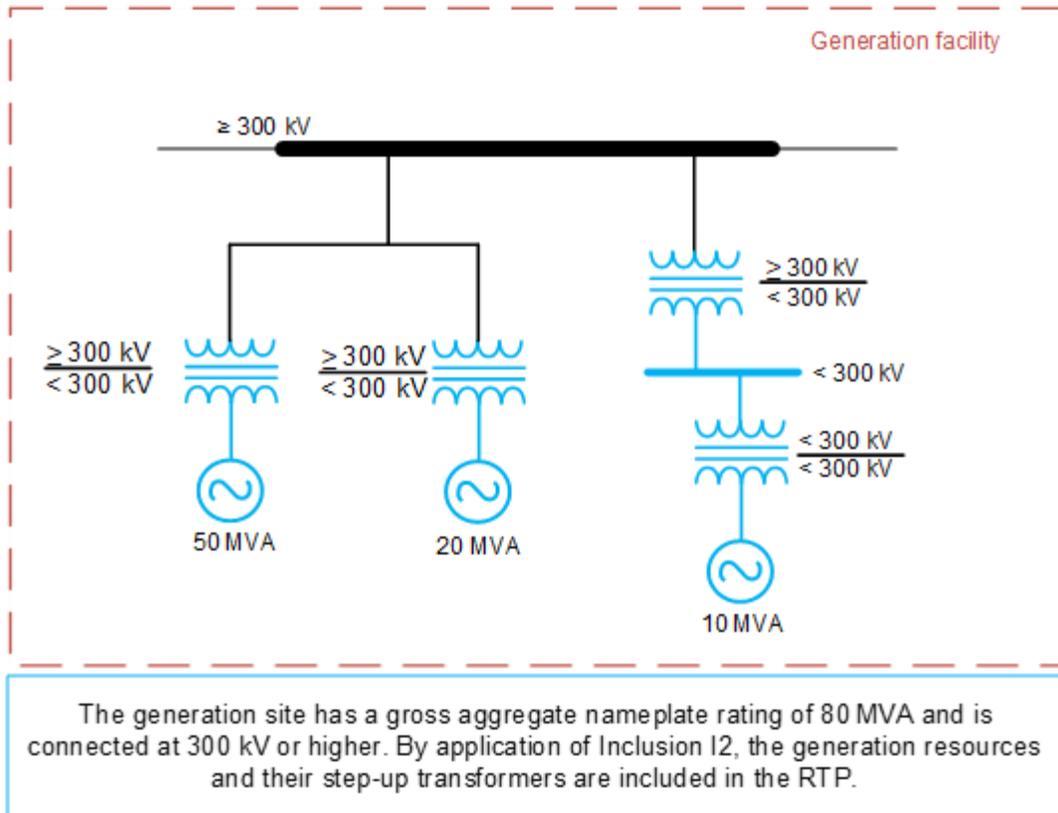


Figure I2-11: Example of a generating unit with a total gross nameplate rating of 75 MVA and of which one of the generating units has several voltage transformation levels

Figure I2-12 illustrates a generation facility with several generation resources, connected to a common point of 300 kV or higher and a gross nameplate rating totaling over 75 MVA. The generation resource with a gross nameplate rating of 10 MVA is included in the aggregated generation since it is part of the generation facility. However, its step-up transformer is not included in the RTP because it serves Load and does not transfer power on the transmission corridor.

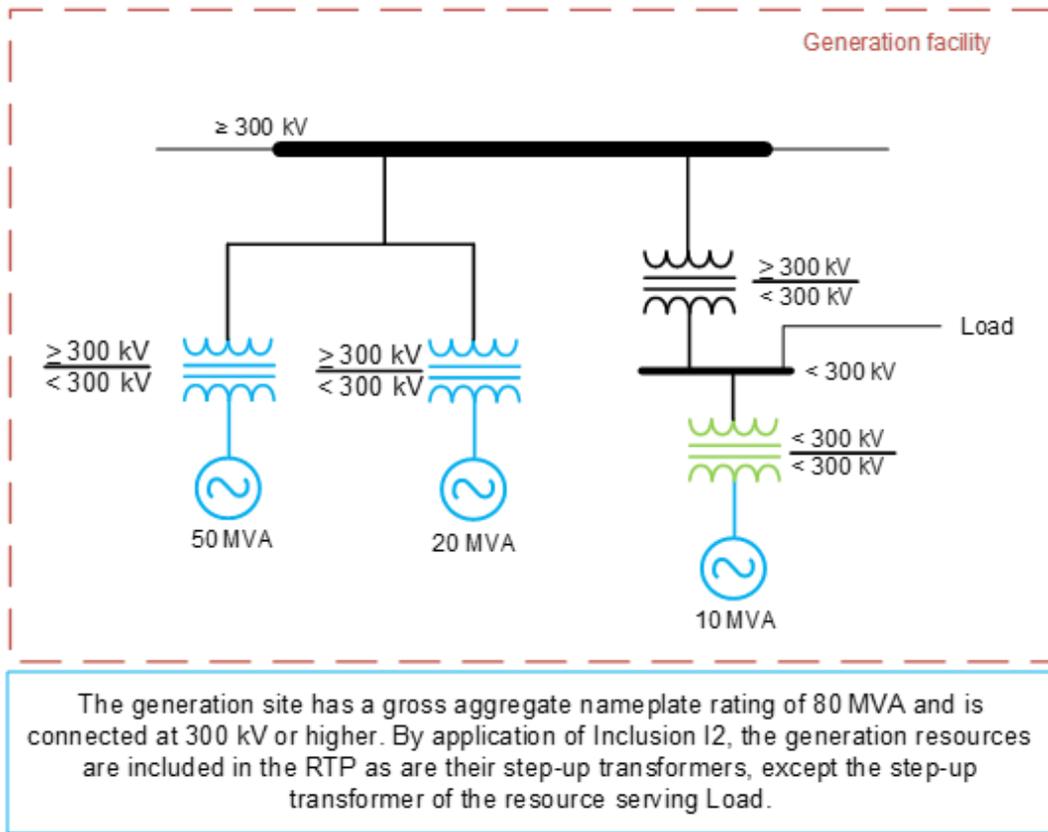


Figure I2-12: Example of a generating station with a gross nameplate rating higher than 75 MVA but one of the generating units of which serves Load

Inclusion I3

I3: Blackstart Resources identified in the Transmission *Operator's* Restoration Plan.

The *Glossary of Terms and Acronyms Used in Reliability Standards* defines a Blackstart Resource as follows:

“A generating unit(s) and its associated set of equipment which has the ability to be started without support from the System or is designed to remain energized without connection to the remainder of the System, with the ability to energize a bus, meeting the Transmission Operator's Restoration Plan needs for real and Reactive Power capability, frequency and voltage control, and that has been included in the Transmission Operator's Restoration Plan.”

The restoration plan of the Transmission Operator (TOP) refers to the restoration plan of the System discussed in the reliability standard EOP-005 about the rest of the System from the Blackstart Resource.

No figure is presented specifically for Inclusion I3 due to the simplicity of the text of this Inclusion.

Inclusion I4

I4: Dispersed Power-producing Resources with a gross aggregate nameplate rating greater than 75 MVA and connected through a system designed primarily for delivering such capacity to a common point of connection. In such a case, the Facilities designated as part of the RTP are:

- the individual resources, and
- the system designed primarily for delivering capacity from the point where those resources aggregate to greater than 75 MVA to a common point of connection.

Common point of connection

The common point of connection is the location where the Transmission Elements are connected to the collection system by a device (the collector ring) designed primarily for delivering capacity to the transmission system. This point is typically indicated in the connection requirements of the Transmission Owner (TO) and the Generator Owner (GO). The gross nameplate rating of a configuration including a common point of connection is calculated without regard to the Facility owner.

Collector ring

The basis for this determination takes into account the significant differences in the configurations of the collector rings that exist today and that do not lend themselves to a clear demarcation at the continental level. It is therefore necessary to correctly determine the parts of the collector ring that systematically contribute to the reliability of the transmission system. The results of this determination of the collector ring make it possible to determine the aggregation point greater than 75 MVA and the interconnection facilities to the transmission system. This aggregation threshold corresponds to the capacity specified in Inclusion I4 in recognition of the fact that the loss of these Facilities would result in a loss of capacity of more than 75 MVA for the RTP.

Figure I4-13 shows a wind farm of 32 turbines with a gross nameplate rating of 2.5 MVA each, for a gross aggregate nameplate rating for the generation facility of 80 MVA. In this case, the individual resources and the common point of connection to the transmission system are part of the RTP.

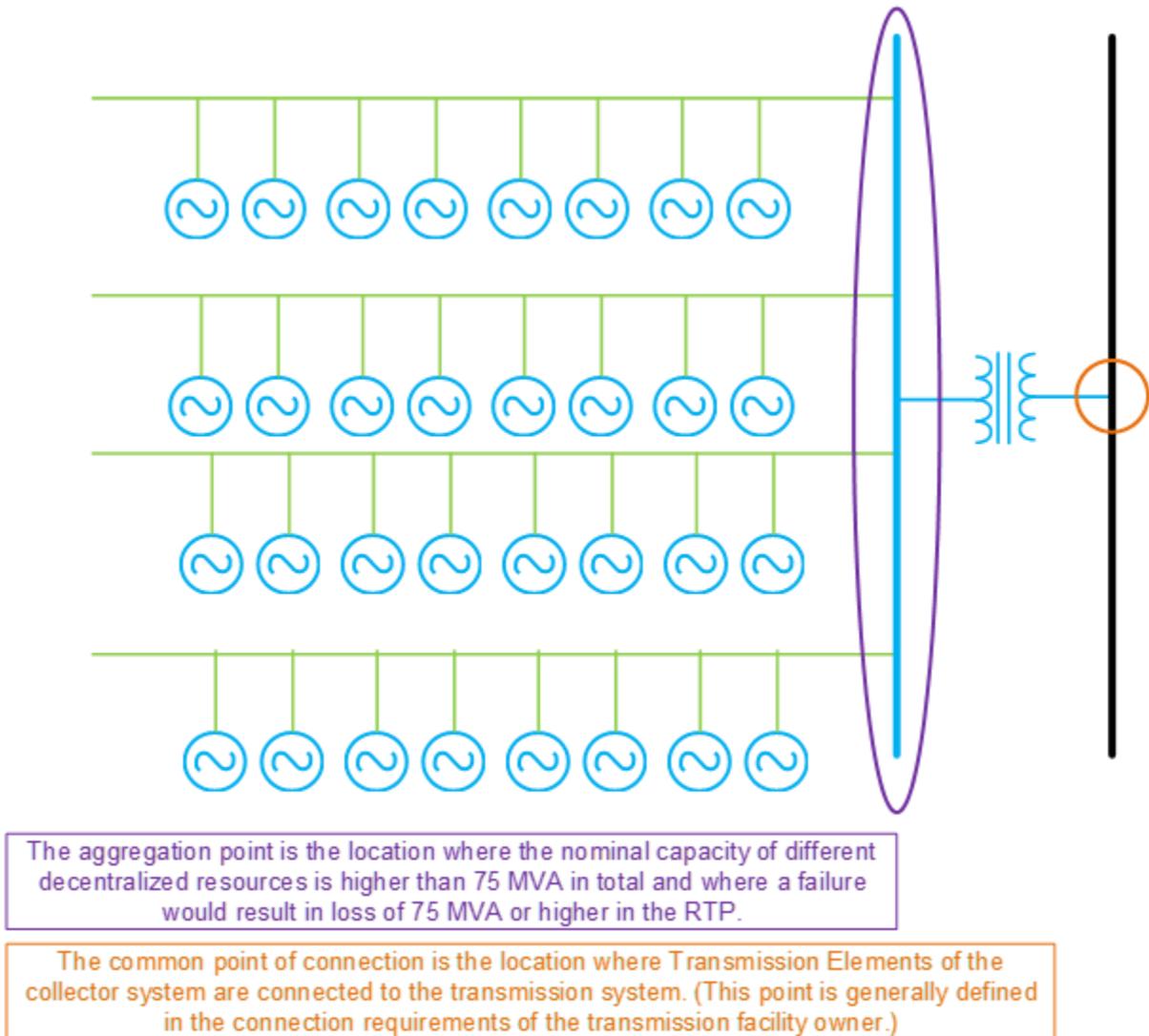


Figure I4-13: Distributed generation site – wind generation example

Figure I4-14 shows a dispersed power-producing resource that illustrates a switchyard of an unknown collector ring design. An aggregate nameplate rating of 80 MVA is collected at the aggregation point.

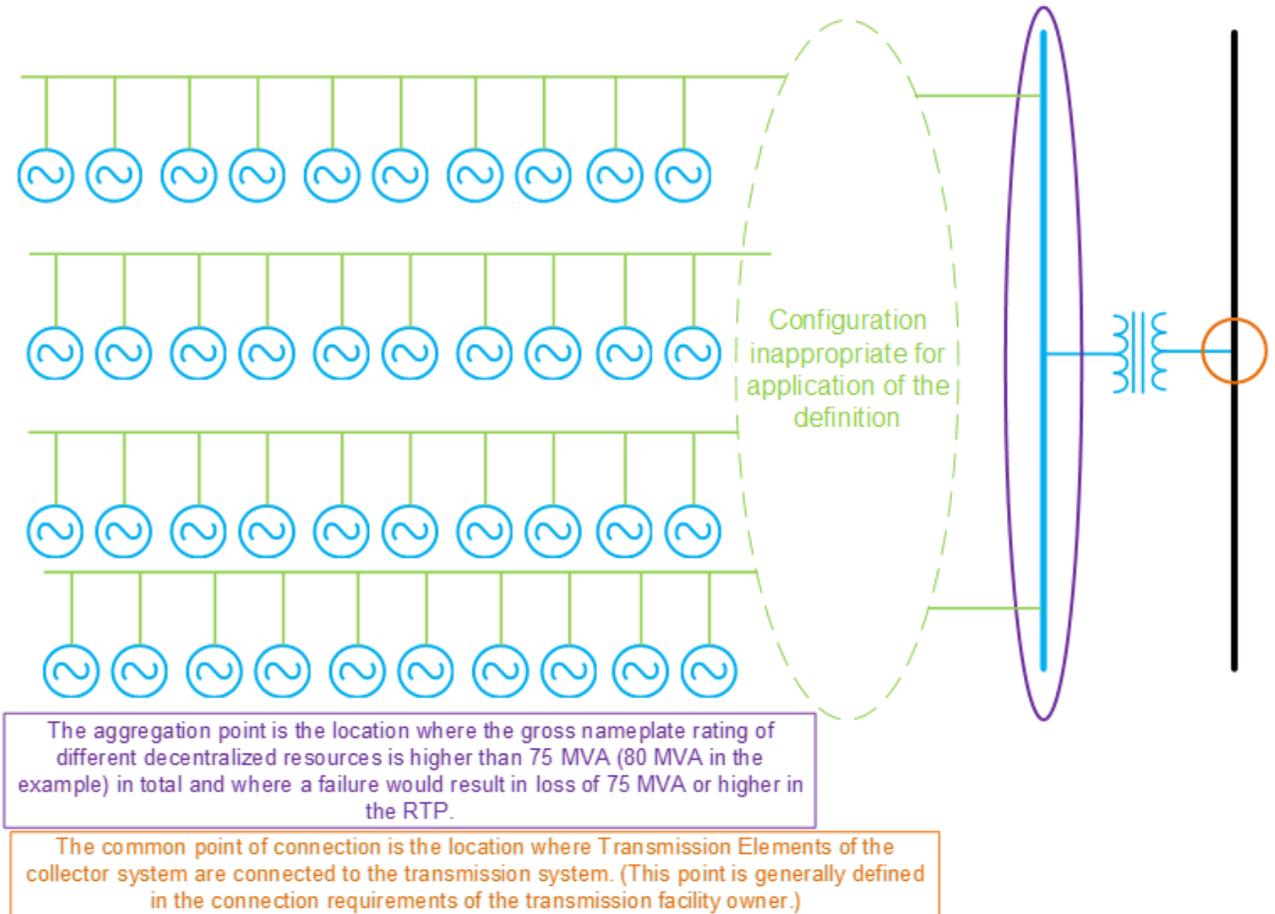


Figure I4-14: Example of a wind generating station with an unknown configuration on the line side of the switchyard

Figure I4-15 shows a dispersed power-producing resource that includes a switchyard of an unknown collector ring design.

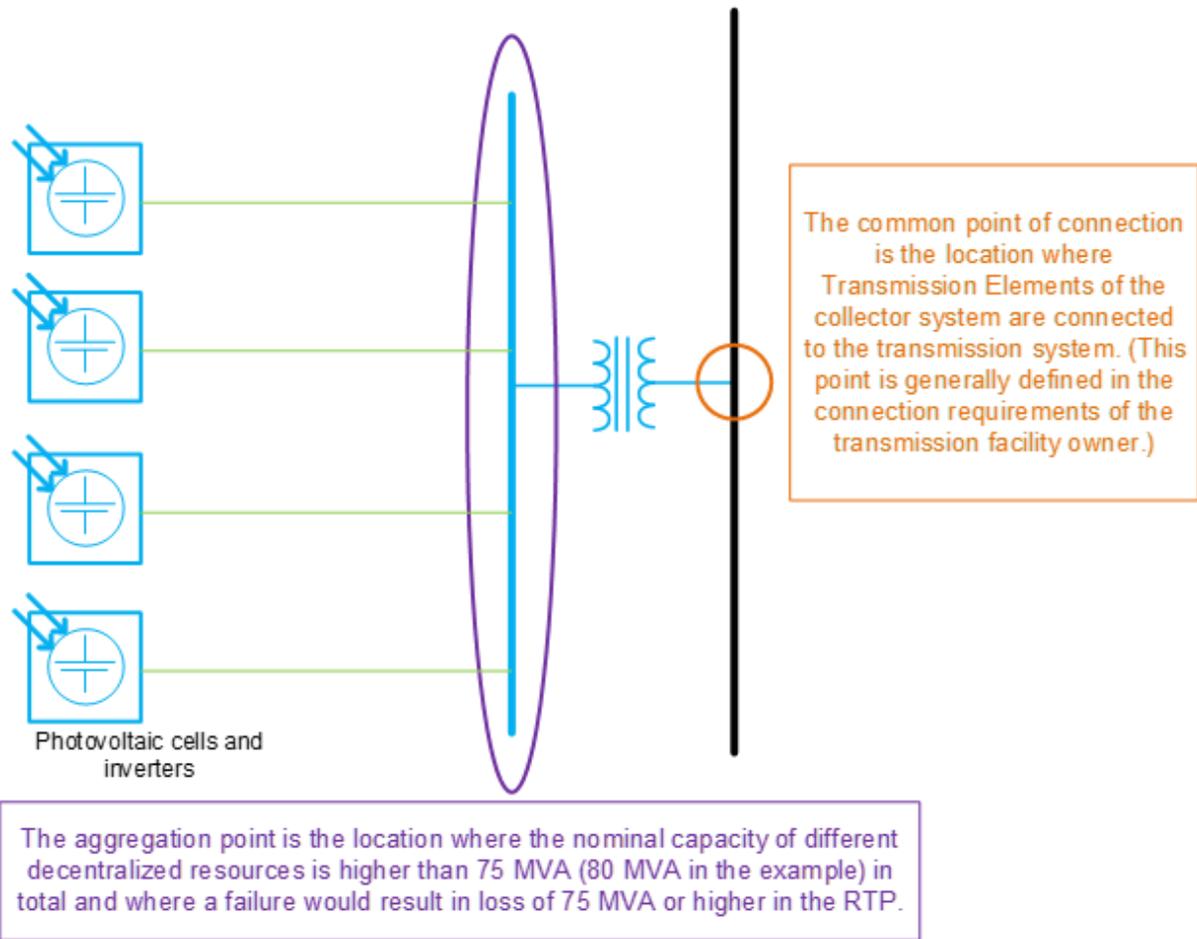


Figure I4-15: Example of a solar photovoltaic power plant with a combined gross aggregate nameplate rating of 80 MVA

Figure I4-16 shows a Facility with dispersed resources as well as a switchyard with several levels of voltage transformation.

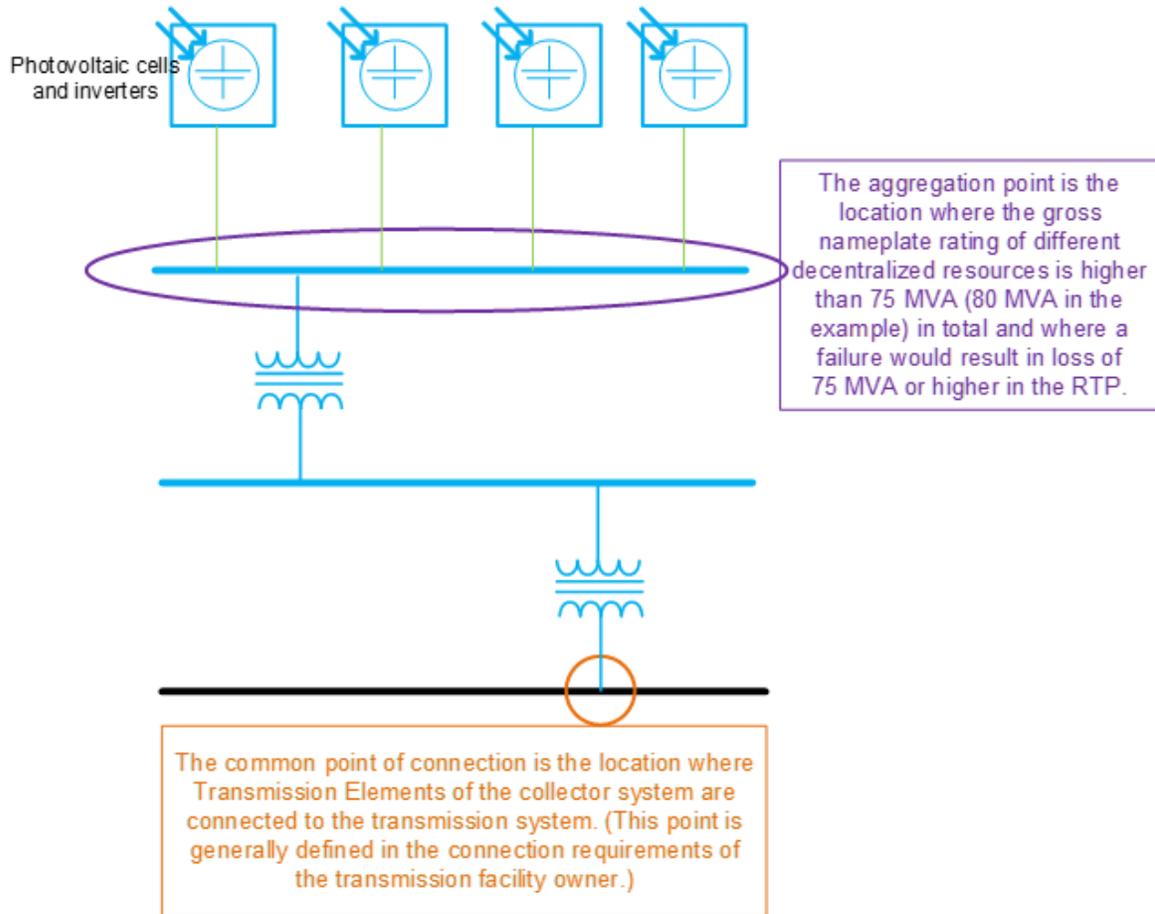


Figure I4-16: Example of a solar photovoltaic power plant with several levels of voltage transformation

Figure I4-17 shows a Facility with several dispersed resources belonging to different owners, as well as a transformer substation with an unknown collector ring configuration.

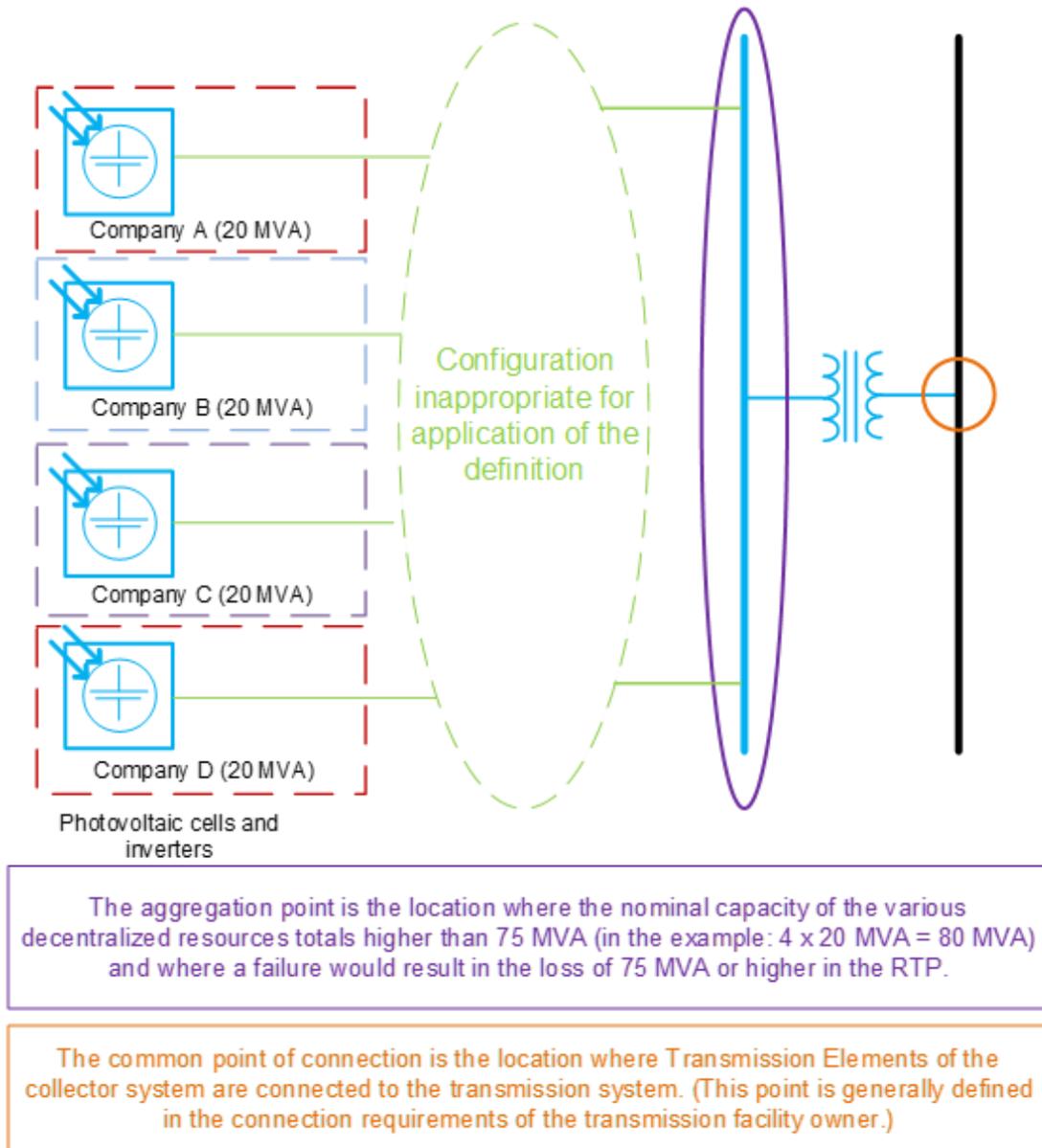


Figure I4-17: Example of a solar photovoltaic power plant with generation facilities belonging to different owners

Inclusion I5

I5: Static or dynamic devices (excluding generating units) dedicated to supplying or absorbing Reactive Power, unless excluded by Exclusion E4, and that are connected:

- with a high-side of 300 kV or higher; or
- with a dedicated step-up transformer with a high-side voltage of 300 kV or higher; or
- through a transformer and its associated bus bars covered by Inclusion I1; or,
- a dedicated step-up transformer connected to one of the associated bus bars covered by Inclusion I1.

Inclusion I5 deals with static or dynamic devices (considered Reactive Power resources throughout this document) connected by specific methods in the text of Inclusion I5 regardless of the quantity of Reactive Power output or input. It is important that Inclusion I5 be limited to static or dynamic devices that meet the connection criteria. In the following examples, several Reactive Power resources (designated as capacitors in the diagrams) are presented with the various connection methods.

Figure I5-18 shows different connection methods for the reactive resources typically used in the industry. The reactive resources symbol represents all potential reactive resources, including static or dynamic devices used in the operation of the transmission system. The diagram shows examples of the two scenarios of Inclusion I5.

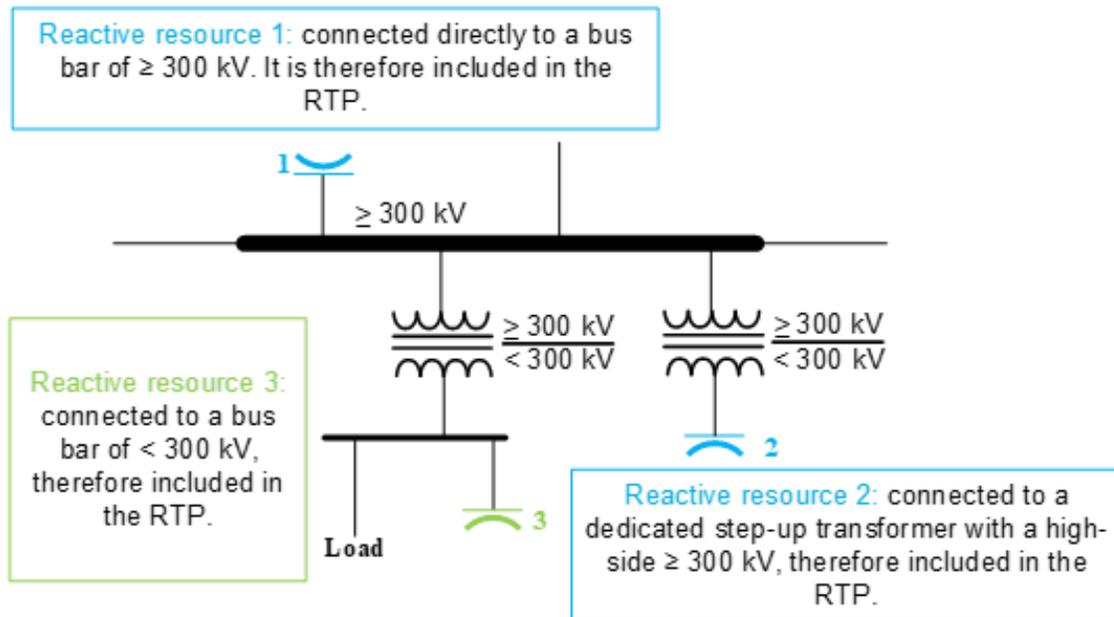


Figure I5-18: Example of application of Inclusion I5 on a bus bar of 300 kV or higher

Figure I5-19 shows different connection methods for the reactive resources typically used in the industry. The reactive resources symbol represents all potential reactive resources, including static or dynamic devices used in the operation of the transmission system. The

diagram shows examples of the last scenario of Inclusion I5, for transformers and bus bars included in the RTP under Inclusion I1.

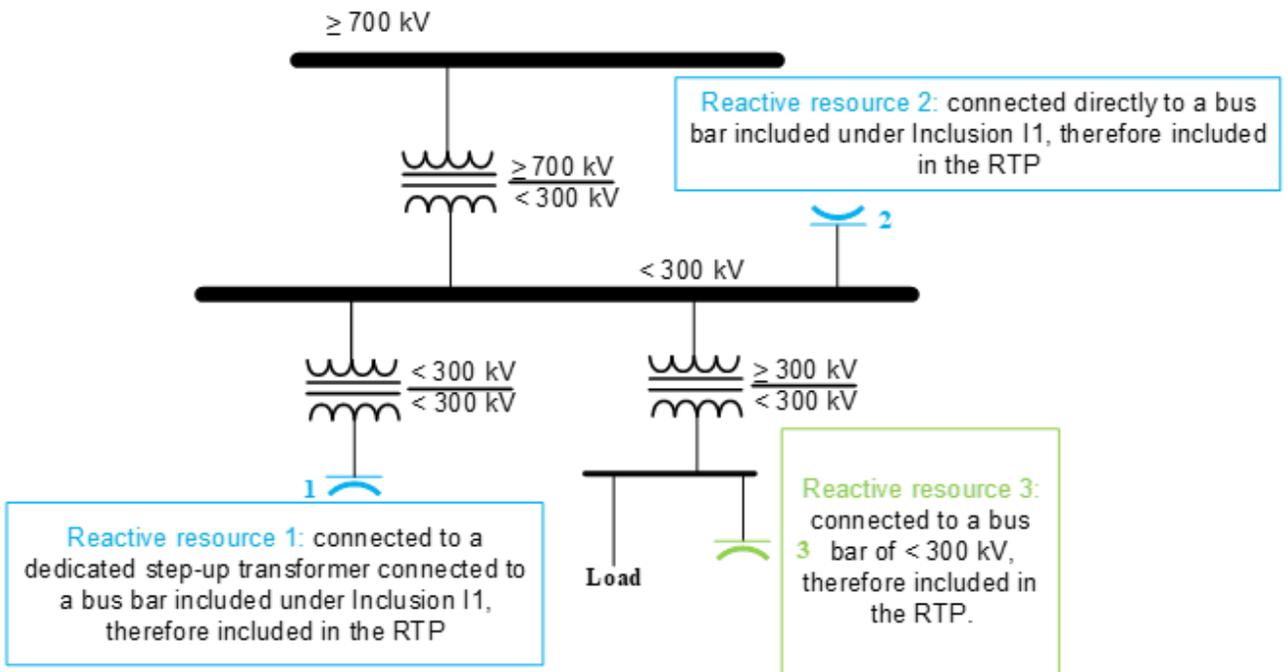


Figure I5-19: Example of application of Inclusion I5 on a substation with a maximum voltage of 700 kV or higher

Inclusion I6

I6: Facilities that connect the Québec Interconnection to another Interconnection, according to the following criteria:

- Facilities that, under normal operation, are synchronized to the Québec Interconnection, are included in the RTP, Transmission Facilities, including DC converter Facilities and all the associated Elements, that provide the principal path for power transfer between the Bulk Electric System (BES) Facilities located in the other jurisdiction and the Transmission Elements that are part of the RTP;
- For Facilities that, under normal operation, are synchronized to an Interconnection other than the Québec Interconnection, the BES definition applies, with the following exception:
 - for Elements targeted by Inclusion I2 of the definition of the BES, individual units with a gross nameplate rating of 20 MVA or higher must be included in a generating station having a gross nameplate rating greater than 50 MVA;
- for any other scenario, the RTP Transmission Element crossing the Québec border and its DC converter, if applicable.

Figure I6-20 illustrates the first scenario of Inclusion I6. It is an Interconnection Line with a neighboring system whose Facilities located within the jurisdiction of Québec are synchronized with the Québec Interconnection. The Facilities located in the neighboring system are part of the BES. In this situation, the RTP must encompass all transmission Facilities, including DC converter facilities and all associated Elements that constitute the principal path of power flow (generally, the path with the lowest impedance) up to the interconnection point.

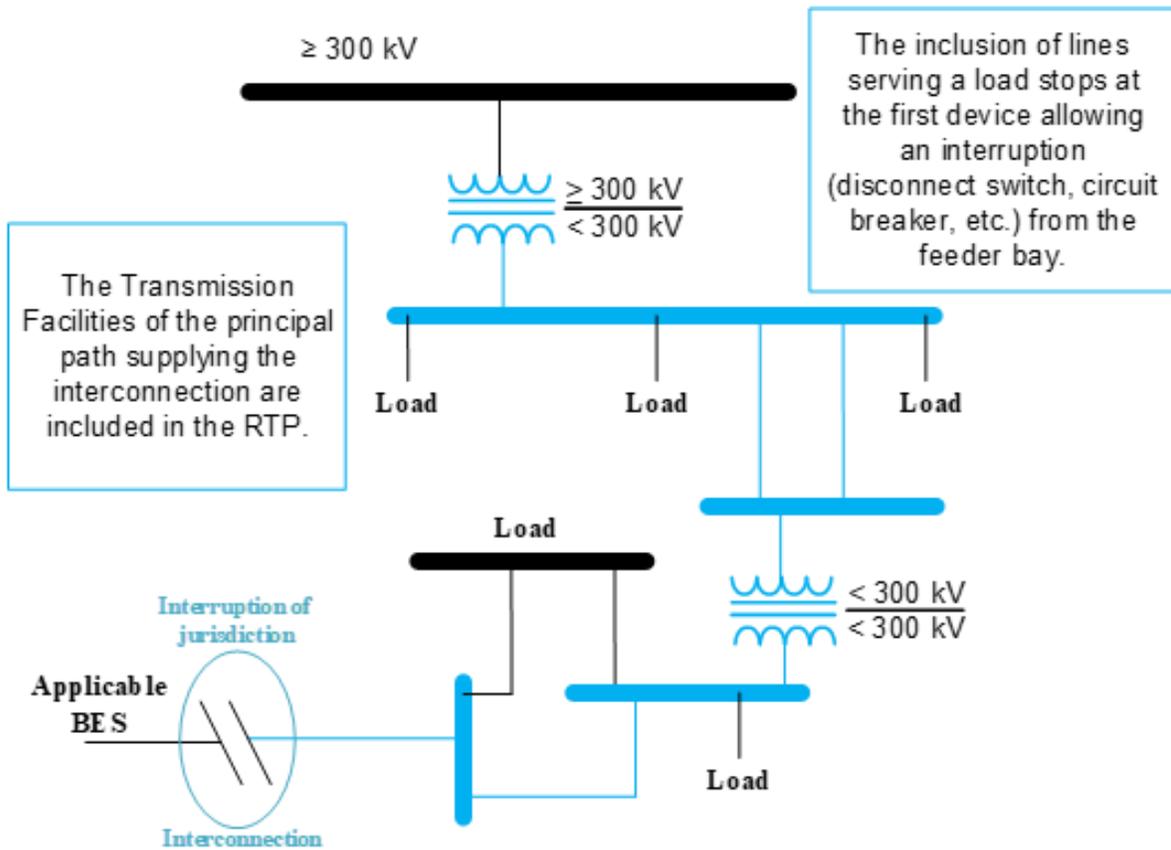


Figure I6-20: Example of application of the first scenario of Inclusion I6

Figure I6-21 illustrates a second situation for the first scenario of Inclusion I6. In this case, a Interconnection Line with the neighboring system is supplied with a voltage of 120 kV by three nearby generating stations. These three generating stations have operating modes that serve the Interconnection Line. Furthermore, these generating stations are included in the RTP under Inclusion I2. It is therefore necessary to establish a path between these generating stations and the interconnection point.

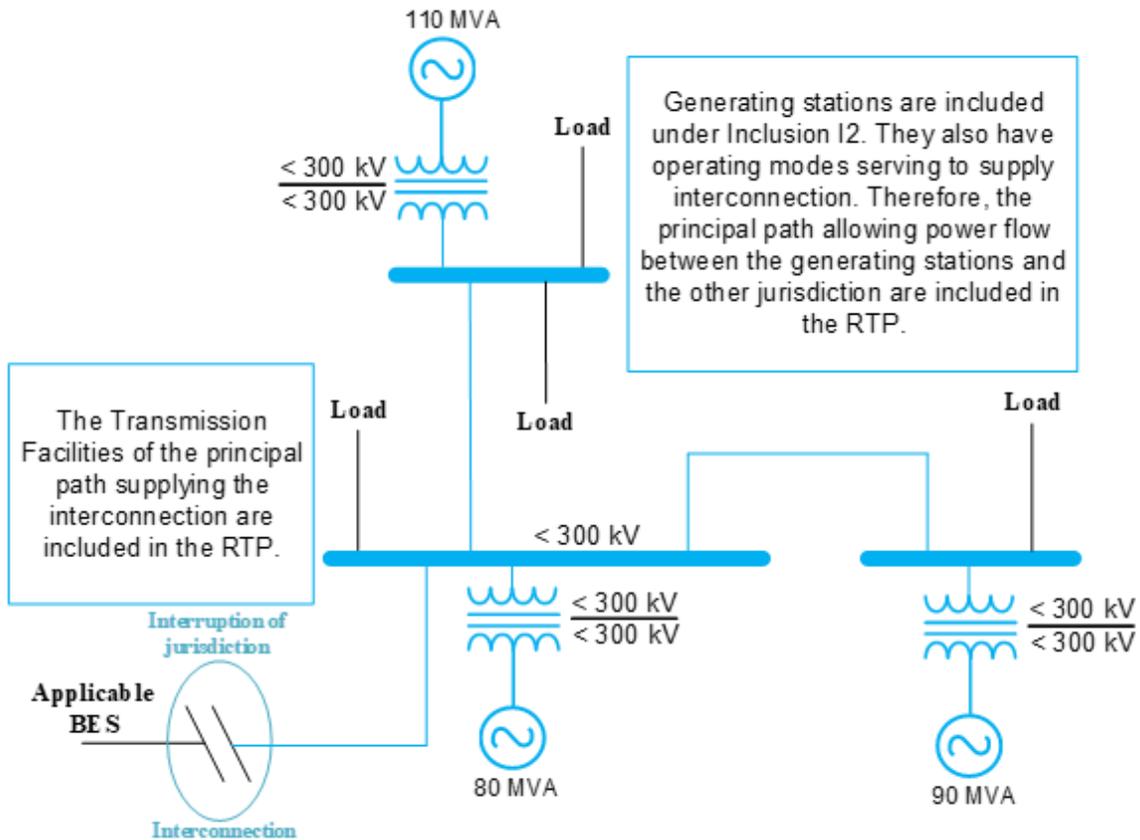
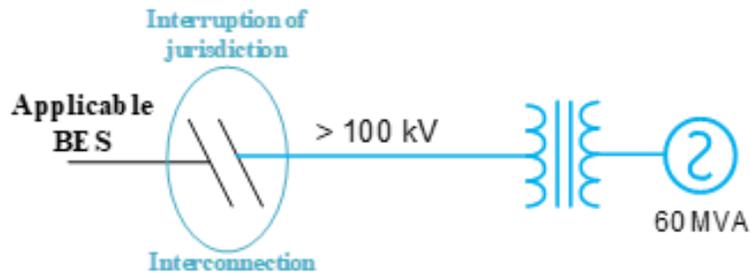


Figure I6-21: Second example of application of the first scenario of Inclusion I6

Figure I6-22 shows an example of the second scenario, where a generating station is located within the jurisdiction of Québec and is synchronized with an Interconnection other than the Québec Interconnection. The generating station includes generating units with a gross nameplate rating of 25 MVA, and the gross aggregate nameplate rating of the generating station is 60 MVA. In this case, the whole generating station is part of the RTP.



The generating station is synchronized with an interconnection other than the Québec Interconnection, and the BES is applicable in the neighboring system. The generating station includes generating units with a gross nameplate rating > 20 MVA, and the gross nameplate rating of the generating station is > 50 MVA. The generating station and transmission facilities supplying the other Interconnection are included in the RTP.

Figure I6-22: Example of application of the second scenario of Inclusion I6

Figure I6-23 illustrates a second use of the second scenario of Inclusion I6. A generating station comprised of generating units synchronized with an Interconnection other than the Québec Interconnection, and one of its generating units has a gross nameplate rating higher than 20 MVA. The gross aggregate nameplate rating of the generating station is higher than 50 MVA. The generating station is therefore part of the RTP, along with all Transmission Elements synchronized with the Interconnection other than the Québec Interconnection.

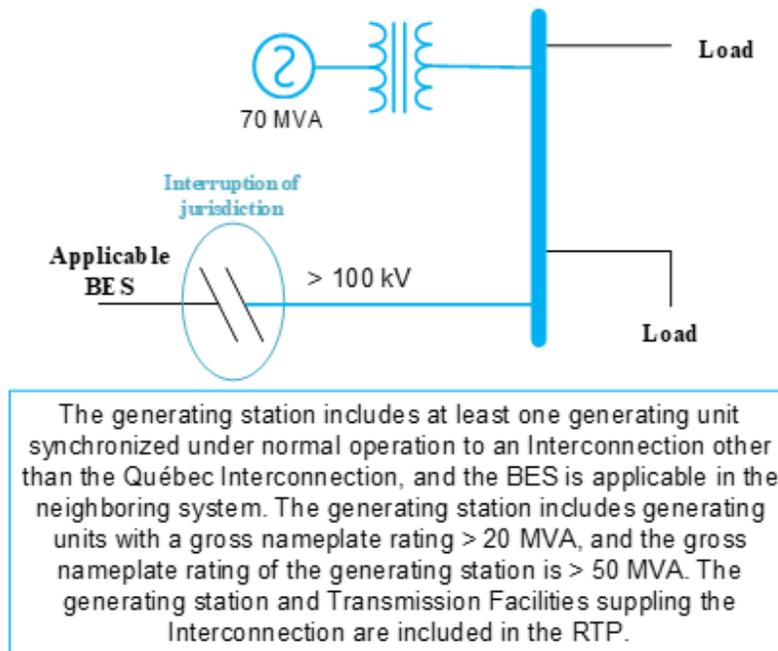


Figure I6-23: Second example of application of the second scenario of Inclusion I6

Figure I6-24 shows the third scenario of Inclusion I6, in which the transmission facilities located in the other jurisdiction are not part of the BES, and there is no reason to establish a power-flow path between the rest of the RTP and the neighboring Interconnection. In the case illustrated, the only Transmission Element (in the example, the line) crossing the Québec border to the neighboring system belongs to the RTP.

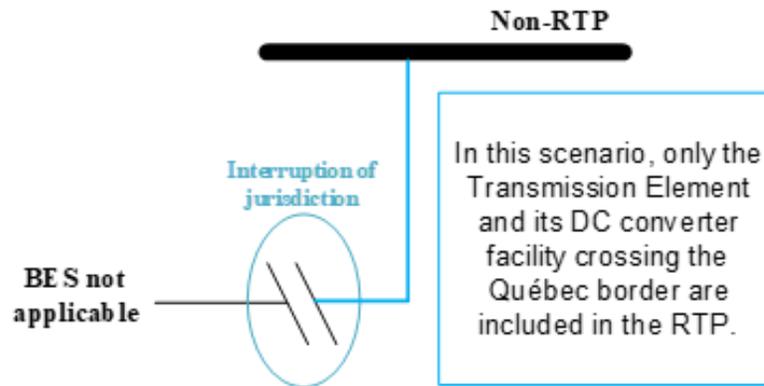


Figure I6-24: Example of application of the third scenario of Inclusion I6

Exclusions

Each Inclusion is illustrated below by the diagrams and a description to explain the definition of the RTP for the configurations presented as an example. These examples should not be considered prescriptive.

The diagrams show examples of specific applications of the definition of the RTP. Some parts of the diagrams are in black. This color indicates that no hypothesis has been issued for the portion of the network in question.

Diagram color legend:

- **Blue** indicates that an Element is included in the RTP.
- **Green** indicates that an Element is excluded from the RTP.
- **Orange** indicates a connection point.
- **Black** indicates that the Element has not been evaluated for the case illustrated in the diagram.

Exclusion E1

E1: Radial systems. A radial system is a group of contiguous Transmission Elements that emanates from a single point of connection at 300 kV or higher, and:

- only serves Load;
- only includes generation resources not identified in Inclusions I2, I3 and I4 with an aggregate capacity less than or equal to 75 MVA (gross nameplate rating), or,
- where the radial system serves Load and includes generation resources not identified in Inclusions I2, I3, and I4 with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).

Note 1: A normally open switching device between radial systems does not affect this Exclusion unless that switching device can be used to transfer bulk power among the various parts of the Main Transmission System.

Note 2: The presence of a contiguous loop, operated at a voltage level of less than 50 kV between two configurations considered as radial systems, does not affect this Exclusion.

One connection point

The only connection point with a voltage of 300 kV or higher is the location where the radial system starts if it meets the criteria of Exclusion E1. For example, the start of a radial system could be a circuit breaker or a feeder bay disconnection switch.

The connection to the radial system must be made from a single point of 300 kV or higher. A group of contiguous Load Elements with multiple connections of 300 kV or higher is not eligible for Exclusion E1.

The switching devices normally open between the radial system does not invalidate the eligibility of a radial system for Exclusion E1.

Evaluation of single connection points in radial systems

If the radial system under study emanates from a single connection point of 300 kV or higher, but does not meet the criteria of Exclusion E1, it is not eligible as such under Exclusion E1. However, an evaluation of the underlying Elements in the radial system may be appropriate. An underlying radial system emanating from a single connection point of 300 kV or higher, may be excluded as a radial system if it meets the criteria of Exclusion E1.

Commercial or non-commercial generation

Non-commercial generation resources are located on the line side of a customer's retail meter. Output in the radial system is limited to 75 MVA.

Commercial generation resources are located on the customer's side of the retail meter. If the resources meet the criteria of Exclusion E2, generation not consumed can supply the RTP up to 75 MVA without being part of the RTP.

Static or dynamic devices

Exclusion E1 excludes Transmission Elements of radial systems that meet the criteria established. This does not allow the exclusion of static or dynamic devices covered by Inclusion I5. Exclusion E1 only allows the exclusion of Transmission Elements of radial systems.

Limits to generation

There are two conditions under which the generation resources can make a radial system ineligible under Exclusion E1:

1. If one or more generation resources present in the radial system in question is subject to Inclusions I2, I3 or I4; or
2. If the nominal installed capacity of the non-commercial generation resources present in the radial system in question is higher than 75 MVA.

If one of these conditions is met, the radial system is ineligible for Exclusion E1.

Exclusion E1 allows exclusion of contiguous Transmission Elements, such as transformers, circuit breakers, transmission lines and bus bars.

Figures E1-25 to E1-27 illustrate examples of application of Exclusion E1, and are intended to guide the user during hierarchical application of the definition of the RTP.

Figure E1-25 represents a radial system that supplies only Loads. There is no limit to the number of Loads in the radial system.

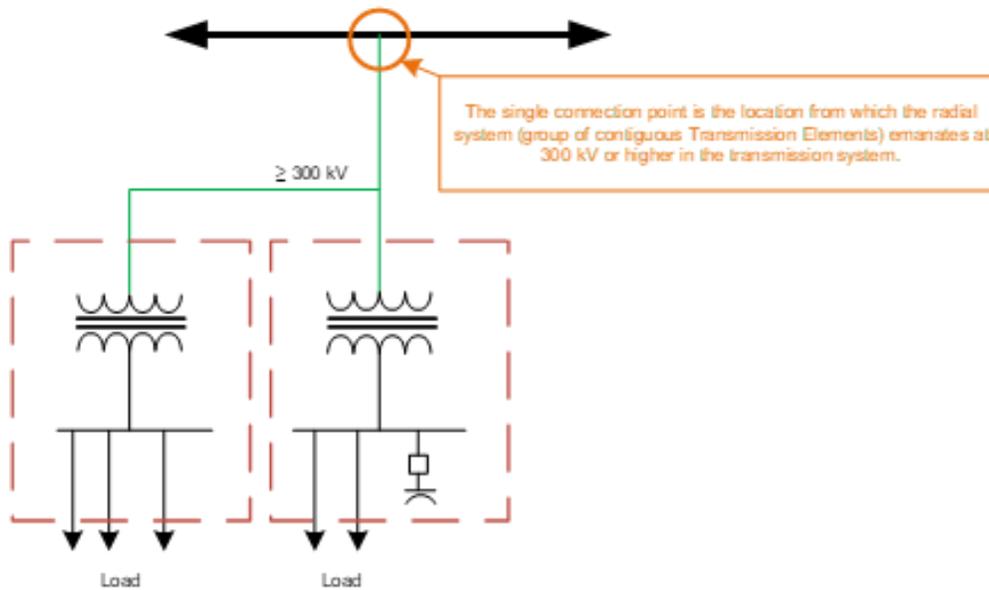


Figure E1-25: Radial system that supplies only Loads

Figure E1-26 represents a radial system that includes a generation resource, but no Load.

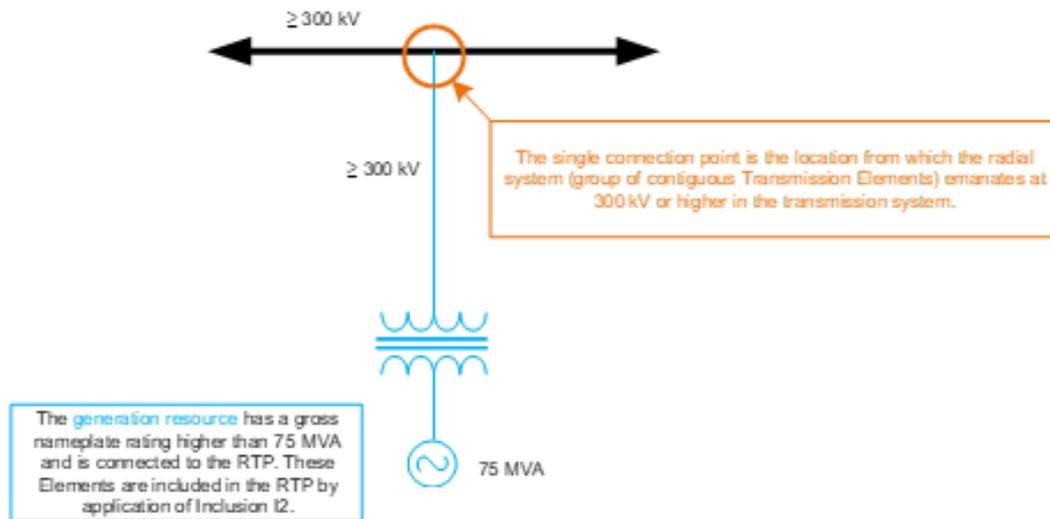


Figure E1-26: Radial system that encompasses a generation resource, included in the RTP

Figure E1-27 represents another case of a radial system that includes a generation resource, but no Load.

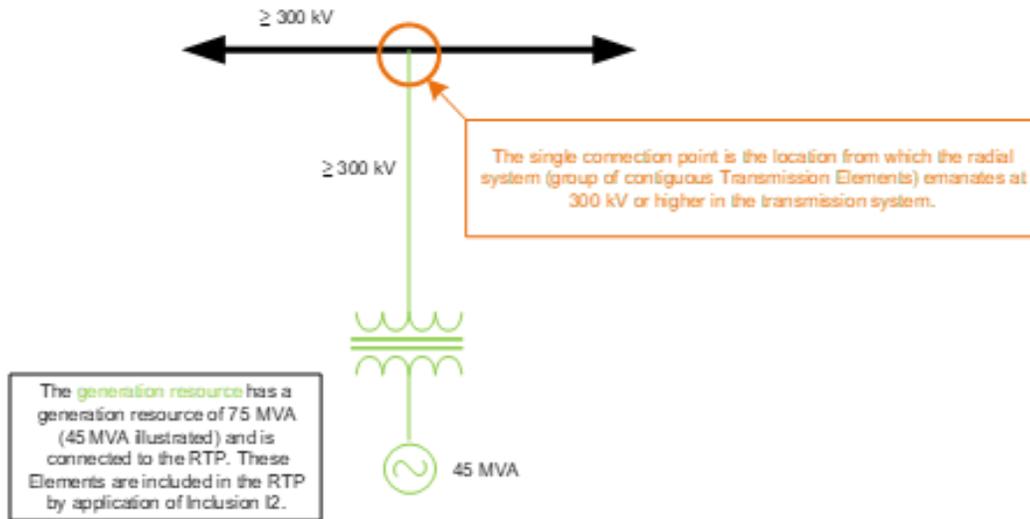


Figure E1-27: Radial system that includes a generation resource, excluded from the RTP

Exclusion E2

E2: A generating unit or multiple generating units on the customer's side of the retail meter that serve all or part of the retail Load with electric energy if: i) the net capacity provided to the RTP does not exceed 75 MVA, and ii) standby, back-up, and maintenance power services are provided to the generating unit or to multiple generating units or to the retail Load by a Balancing Authority, or provided pursuant to a binding obligation with a Generator Owner or Generator Operator, or under terms approved by an applicable regulatory authority.

Exclusion E2 allows for the exclusion of real power resources on the customer's side of the retail meter and take precedence over Inclusion I2. Exclusion E2 refers to the net generation capacity and net capacity provided in the RTP, and does not use the criterion of nominal installed capacity. The power actually injected is subject to a maximum of 75 MVA.

Exclusion E2 applies even if there are several connection points to the RTP.

Net output

The net power criterion for Exclusion E2 designates the net capacity injected into the RTP, according to the value of hourly revenue measured by a meter for the 12 most recent months. Exclusion E2 can apply if there are periods when the net power injected into the RTP exceeds the prescribed maximum, provided that such an overload was requested by the Balancing Authority (BA).

Figures E1-28 to E1-29 illustrate examples of application of Exclusion E2, and aim to guide the user during hierarchical application of the definition of the RTP.

Figure E2-28 represents generating units on the customer's side of the retail meter, and that inject a net output of 50 MVA into the RTP.

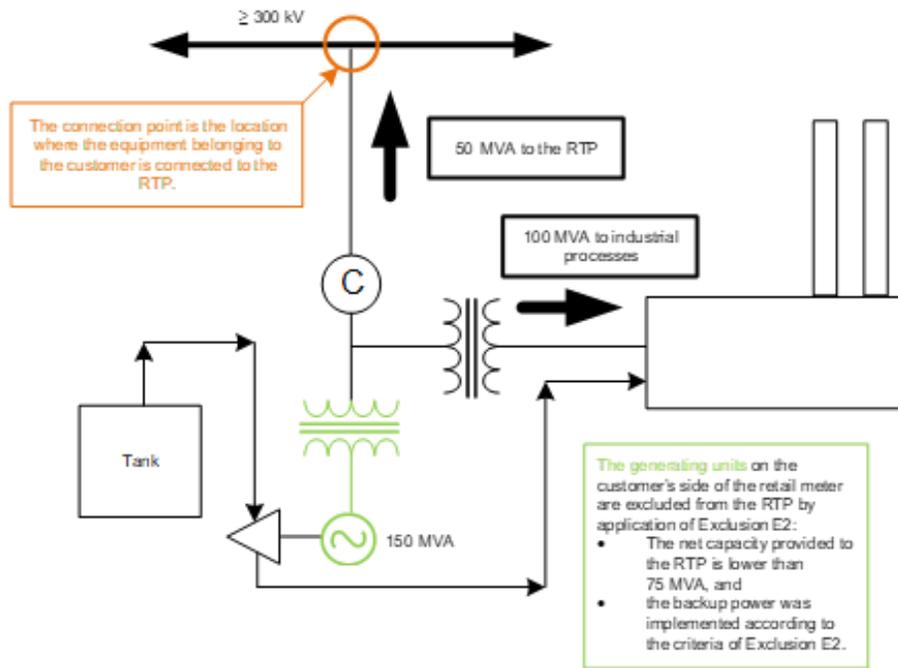


Figure E2-28: Customer generating units on the customer's side of the retail meter that inject less than 75 MVA into the RTP

La figure E2-29 represents generating units located on the customer's side of the retail meter and that inject a net output of 100 MVA into the RTP.

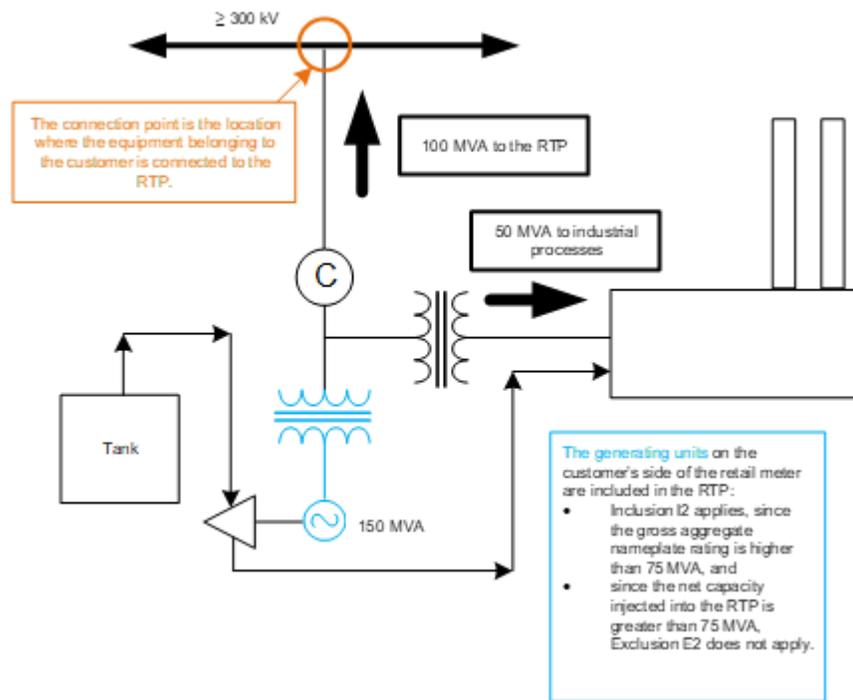


Figure E2-29: Customer generating units on the customer's side of the retail meter that inject more than 75 MVA into the RTP

Exclusion E3:

E3: Local networks. A local network is a group of contiguous Transmission Elements operated at less than 700 kV that transfer power to a Load rather than transfer power among the parts of the Main Transmission System. A local network is supplied from one or multiple points of connection at 300 kV or higher to improve the level of service to retail customers, and not to ensure power transfer between the various parts of the Main Transmission System. The local network has all of the following:

- limits on connected generation: the local network and its Elements exclude generation resources identified in Inclusion I2, I3, or I4, and their aggregate non-retail generation capacity is not greater than 75 MVA (gross nameplate rating).

Exclusion E3 covers local networks in which the contiguous Transmission Elements are operated at less than 700 kV and supplied by several connection points at 300 kV or higher. Exclusion E3 does not depend on the presence of a transfer switch at the connection point of the RTP. Generation resources connected to the local network are eligible for this exclusion. However, Exclusion E3 does not apply to generation resources included under Inclusions I2, I3 and I4. Exclusion E3 does not allow the exclusion of static or dynamic devices that meet the criteria of Inclusion I5. Exclusion E3 allows exclusion of contiguous Transmission Elements, such as transformers, circuit breakers, bus bars and transmission lines that emanate from several connection points of 300 kV or higher.

Static or dynamic devices

Static or dynamic devices that meet the criteria of Inclusion I5 are not eligible for Exclusion E3.

Power limits

There are two conditions under which the generation resources can make a local network ineligible under Exclusion E3:

1. if the nominal installed capacity of the generation resources in the local network exceeds the 75 MVA maximum; or
2. if the local network includes one of the generation resources subject to Inclusions I2, I3 or I4.

If one of these conditions is met, the local network is ineligible for Exclusion E3.

The Exclusion regarding local networks targets Transmission Elements operated at less than 700 kV; it does not apply to Facilities operated at 700 kV or higher. Facilities operated at 300 kV or lower are excluded from the RTP in application of the basic principle.

Figures E1-30 and E1-31 illustrate examples of application of Exclusion E3, and are intended to guide the user during hierarchical application of the definition of the RTP.

Figure E3-30 represents a situation that lends itself to evaluation based on Exclusion E3.

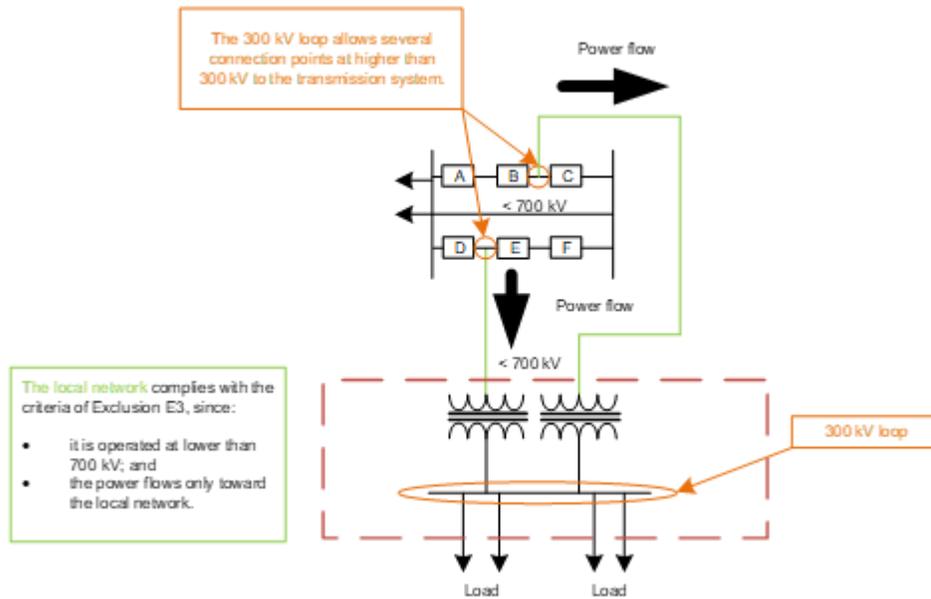


Figure E3-30: Local network with 300 kV loop

Figure E3-31 uses the same configuration as the previous figure; however, since the power flows outside the potential local network, this configuration is not considered a local network under Exclusion E3.

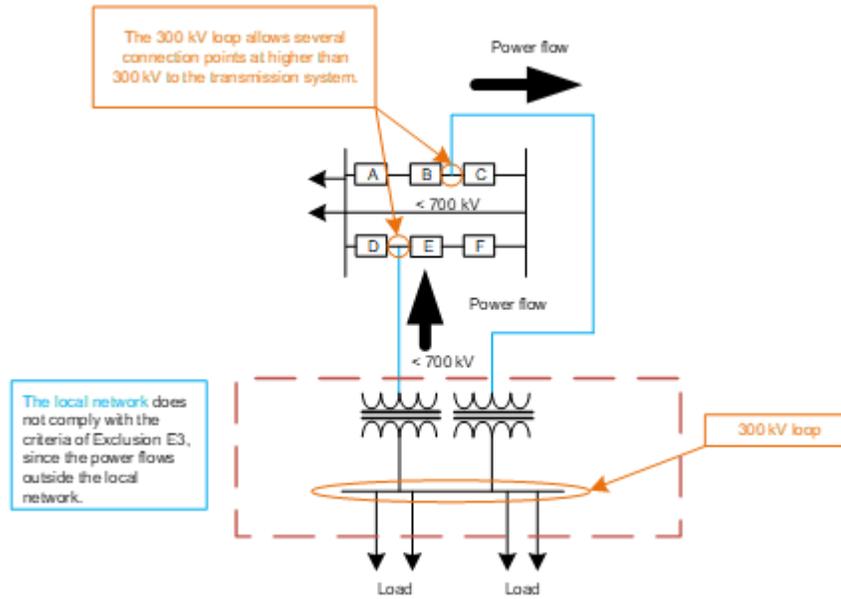


Figure E3-31: Local network with 300 kV loop

Exclusion E4

E4: Reactive Power devices installed solely to meet the needs of one or more retail customers.

Exclusion E4 is based on the planned operation of Reactive Power control devices. No figure is presented specifically for Inclusion I3 due to the simplicity of the text of this exclusion.

Hierarchical application of the definition

Hierarchical application of the definition is illustrated by a series of diagrams based on the configuration of a fictional power system and follows the sequence of application of the definition.

Application of the definition of the RTP is performed in three separate steps that, if executed appropriately, make it possible to determine the vast majority of Elements of the RTP. The example on the following pages does not include an example of application of Inclusion I4, or Exclusions E2 and E4.

Step 1: Application of basic principle

The general principle of applicability underscores the unique nature of the topology of the Québec power grid. This principle establishes a clear demarcation within which all Transmission Elements operated at higher than 300 kV and the active or Reactive Power resources connected over 300 kV are included in the RTP.

Step 2: Application of Inclusions

The second step consists of applying Inclusions following the sequence indicated. The definition encompasses six (6) specific Inclusions that are complementary and clarify the basic principle, all with the aim of clearly establishing the Elements included in the RTP. Note that although the Inclusions are complementary to the basic principle, Inclusions may overlap, or one or more Inclusions may overlap the basic principle.

Step 3: Application of Exclusions

This step consists of evaluating specific situations where a potential Exclusion from the RTP may exist. Exclusions are formulated to define Elements or groups of Elements that can be specifically excluded from the RTP. Note that for an Element to be eligible for an Exclusion, it must also be included in the RTP under the basic principle or at least one Inclusion.

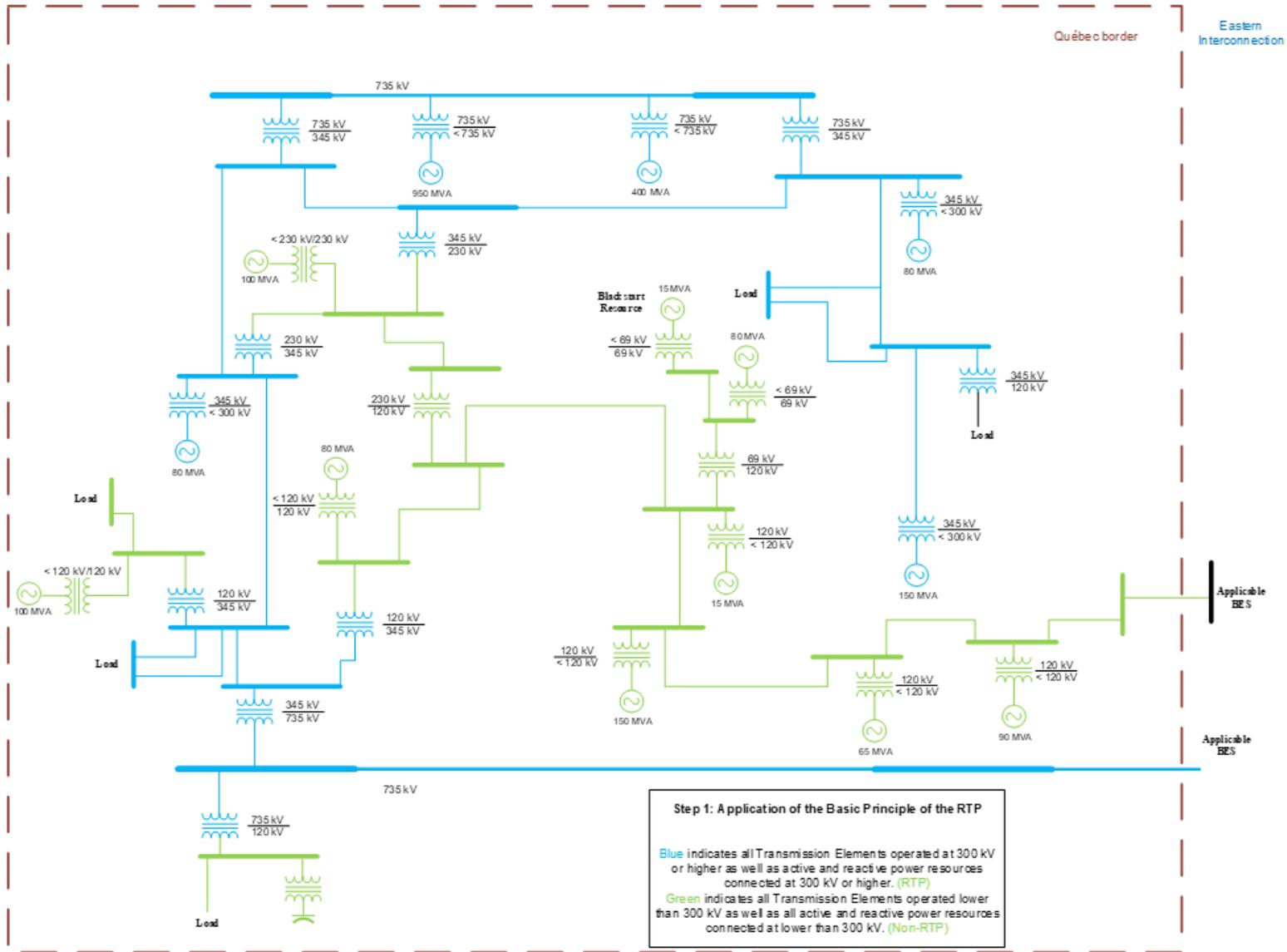


Figure 33: Step 1 – Application of basic principle

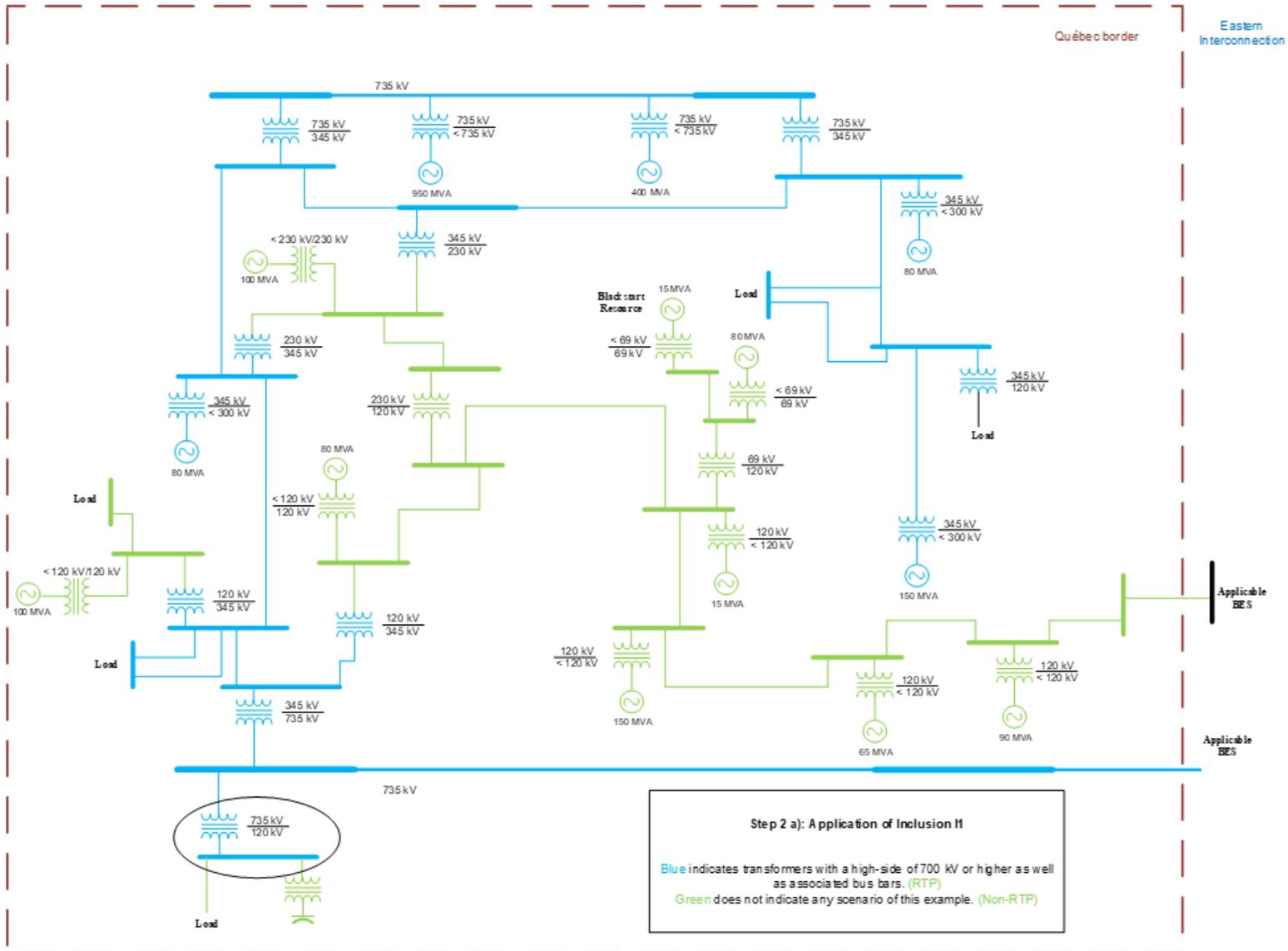


Figure 34: Step 2 a) – Application Inclusion I1

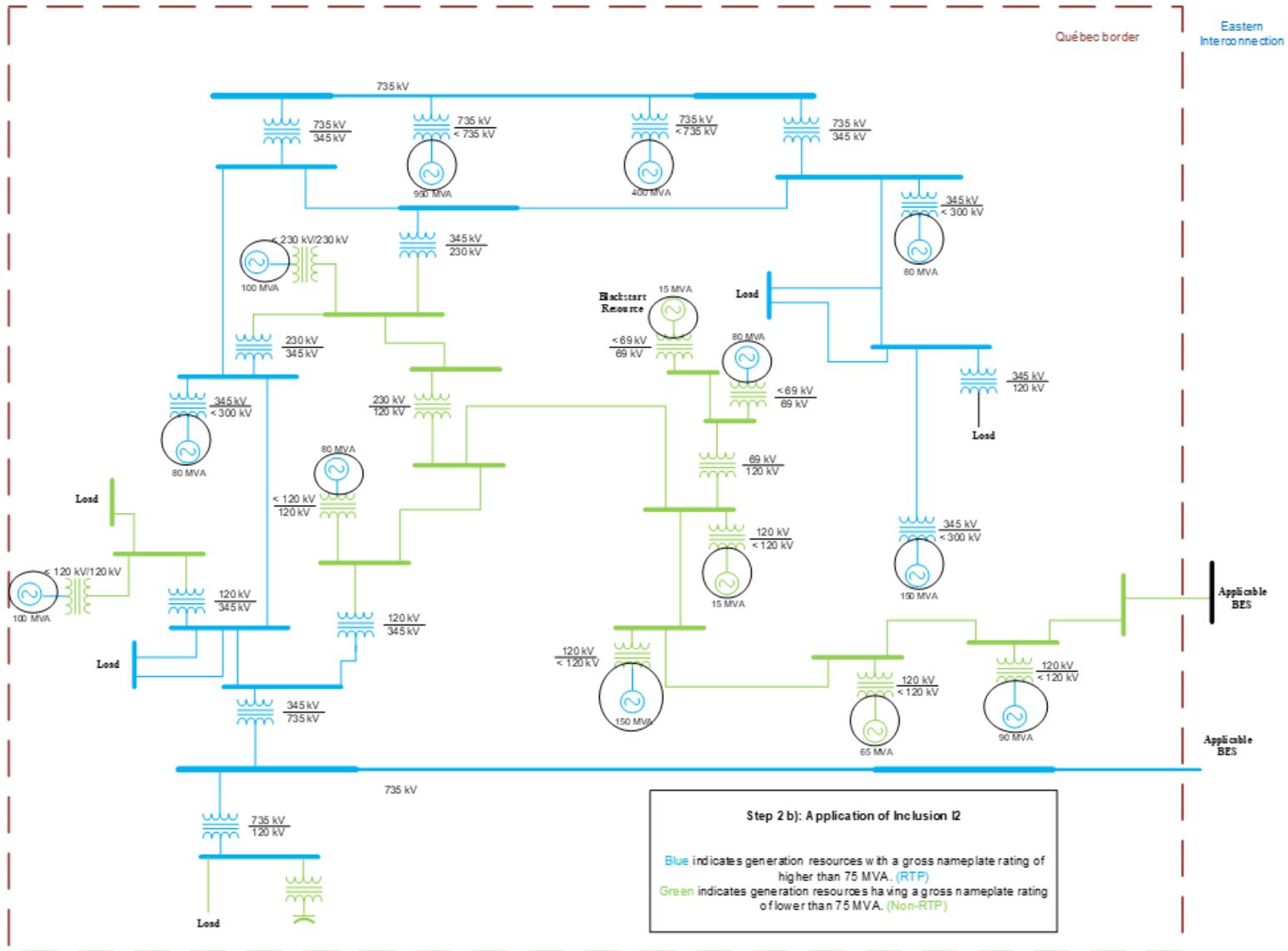


Figure 35: Step 2 b) – Application of Inclusion I2

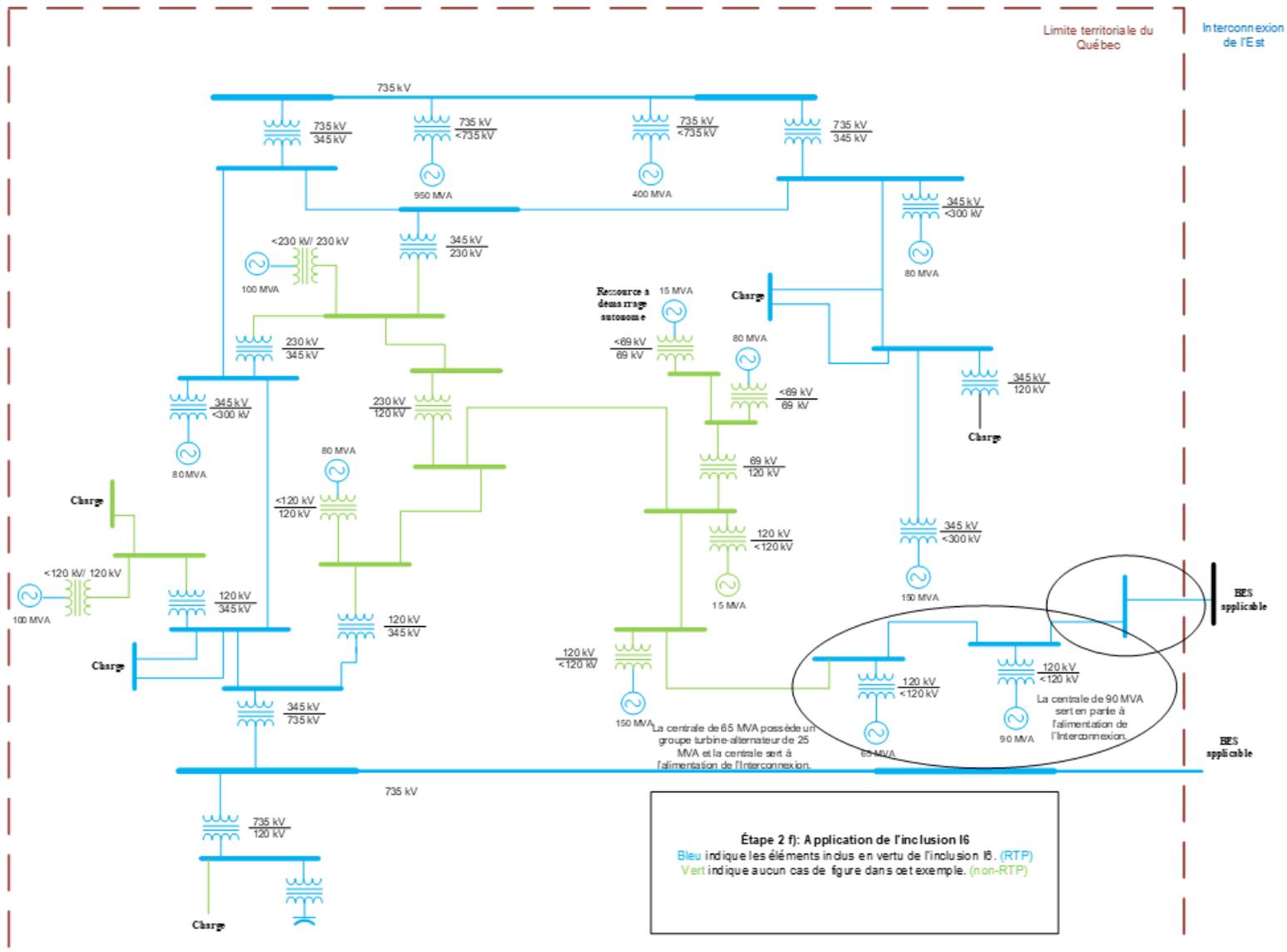


Figure 38: Step 2 f) – Application of Inclusion I6

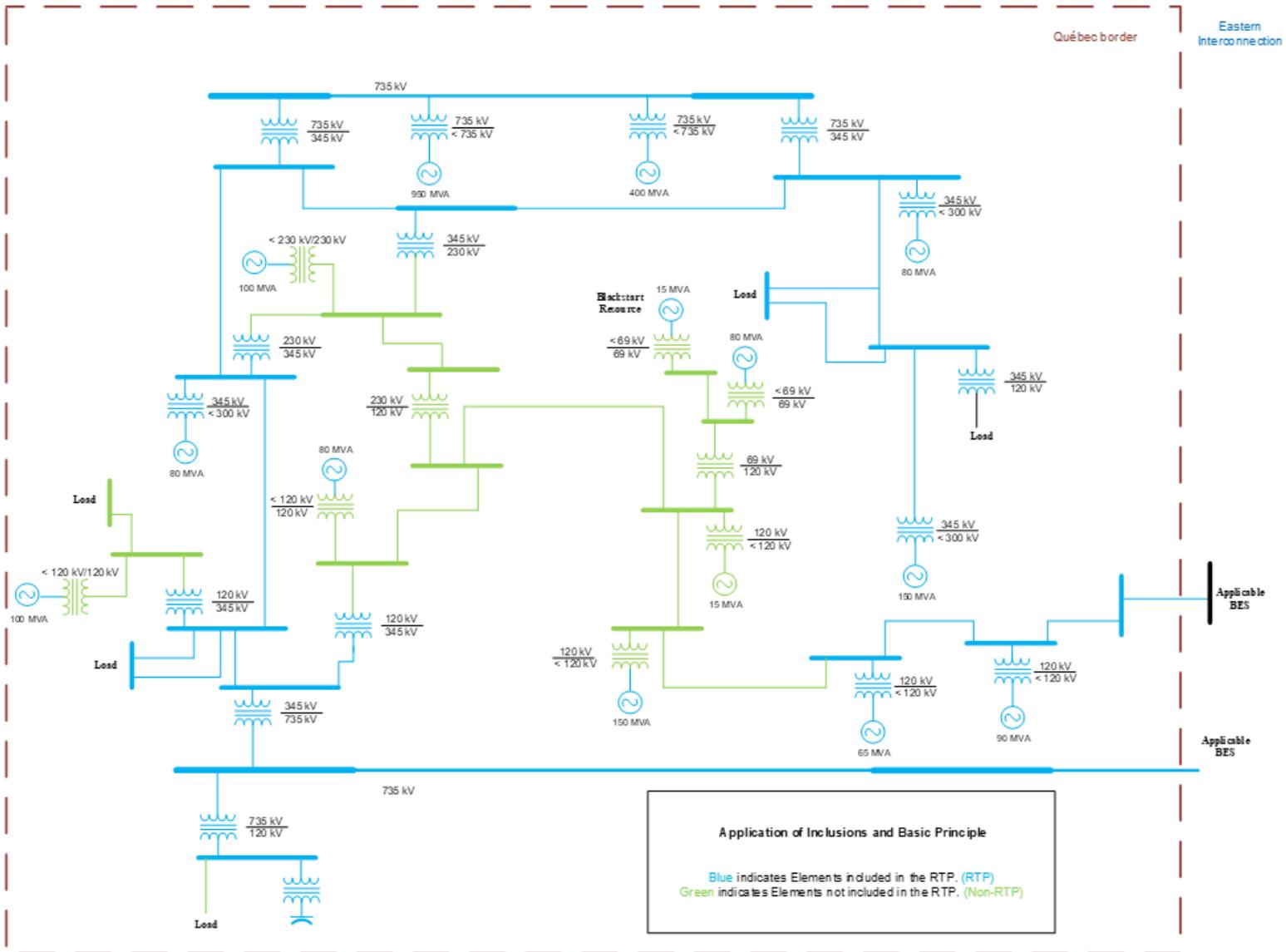


Figure 39: Result of application of Inclusions and the basic principle

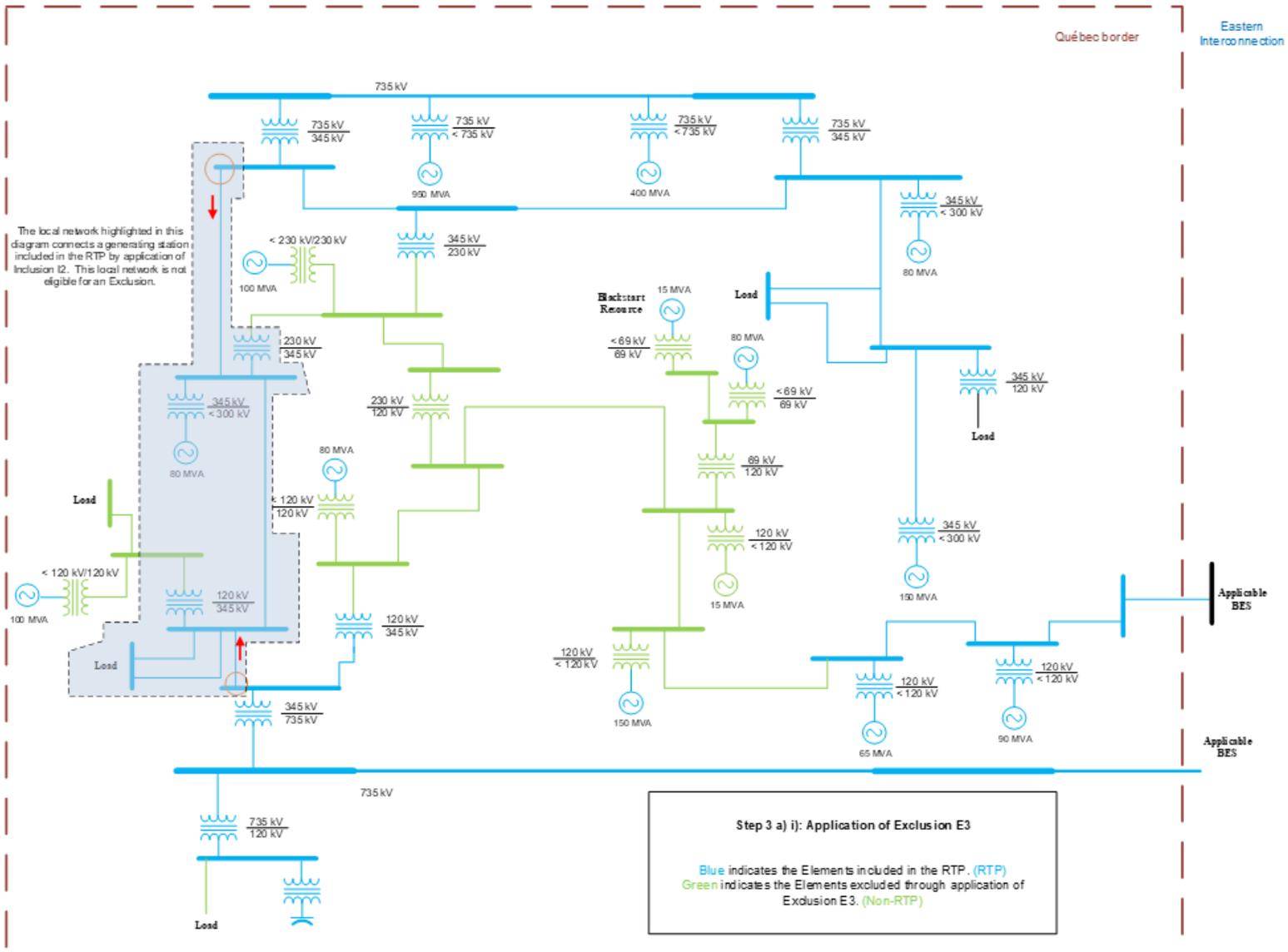


Figure 40: Step 3 a) i) – Application of Exclusion E3

Version history

Version	Date	Action	Change Tracking
1	Month xx, 20xx	RTP interpretation guide according to the RTP definition acknowledged by the Régie in Decision D-xxxx- yyyy	First release