

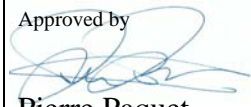


## Québec Balancing Authority Area Procedure

*Maximum Real and Reactive Power Verification  
at Generation Facilities of 50 MVA or Higher Capacity*

May 9, 2014



Title		Number	
<b>Maximum Real and Reactive Power Verification at Generation Facilities of 50 MVA or Higher Capacity</b>		<b>IQ-P-001-A</b>	
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Issued to <b>Generator Owners and Generator Operators in the Québec Balancing Authority Area</b>			
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## PURPOSE

The purpose of this Procedure is to provide guidance for verifying the maximum real and reactive power of a generating station (station test) and of each generating unit (unit test), and for compiling the performance data of wind farms.

This must be done in order to update real-time system operations databases and evaluate available resources in the Québec Balancing Authority Area. The results of unit tests help validate official specifications for generating units provided by Generator Owners or Generator Operators and used for system planning, operations studies and steady-state system models.

This verification must comply with the requirements of Hydro-Québec TransÉnergie, particularly with the document [Transmission Provider Technical Requirements for the Connection of Power Plants to the Hydro-Québec Transmission System](#), which sends a letter every year to each Generator Owner and Generator Operator notifying it that verification must be done.

### 1. APPLICATION

This Procedure applies to the Generator Owners (GOs) and the Generator Operators (GOPs) of generation facilities with a capacity of 50 MVA or more, located in or considered part of the Québec Balancing Authority Area.

### 2. COMPLIANCE

This Procedure is in compliance with the NERC Reliability Standards [TOP-002-2.1b](#) (R13, R14 and R14.1) and [VAR-001-3](#) (R1 and R2), and with the NPCC criteria included in Directories [D9](#) and [D10](#).

### 3. CONFIDENTIALITY OF DATA

In accordance with the [Transmission Provider Code of Conduct](#) and the [Reliability Coordinator Code of Conduct](#), Hydro-Québec TransÉnergie staff participating in this Procedure keep data submitted by GOs and GOPs confidential.

### 4. VERIFICATION CONDITIONS

#### 4.1. WIND FARMS

Because of the intermittent nature of the wind, 50 MVA or more wind farm GOs or GOPs must submit required data as specified in section 6. Wind-farm performance tracking replaces maximum real and reactive power tests. Also, each GO and GOP is in charge of compiling the performance data and making sure that the criteria in this Procedure are followed.

#### 4.2. HYDROELECTRIC GENERATING STATIONS, THERMAL PLANTS AND GAS-FIRED PLANTS

For hydroelectric generating stations, thermal plants and gas-fired plants, two types of tests are used to verify maximum real and reactive power:

- The station test, used to verify the maximum real and reactive power that a generating station can develop under peak conditions;
- The unit test, used to verify the characteristics of generating units.

#### 4.2.1. The Generator Owner's and the Generator Operator's responsibilities

Each GO and GOP is in charge of scheduling and conducting the tests and making sure that the criteria in this Procedure are followed.

Although, during the tests, the GO and the GOP may test or measure other generating unit parameters for its own purposes provided this does not change test conditions and does not lead to power variations.

#### 4.2.2. Station test

Since loads on the Hydro-Québec TransÉnergie system are not heavy in summer, the Direction – *Contrôle des mouvements d'énergie* (CMÉ), assuming the role of Transmission Operator for the Québec Balancing Authority Area, specified that station tests must be conducted in the winter period that is from **November 1<sup>st</sup> to February 28<sup>th</sup>**, and **every 3 years**.

A station test can be conducted outside this period provided that a waiver is granted to the GO or to the GOP by the Direction – CMÉ. Refer to section 4.2.5 for the application details.

The station tests must be conducted for all generating stations with a capacity of 50 MVA or more according to a three-year schedule drawn up by the GOs and the GOPs. The schedule must be revised **every year** and sent no later than **October 31<sup>st</sup>** to:

- The Regional Outage Scheduler for generating stations connected to the Hydro-Québec TransÉnergie transmission system;
- The System Control Outage Scheduler for generating stations connected to an auxiliary transmission system or for the Churchill Falls Generating Station;
- Direction – CMÉ.

#### 4.2.3. Unit test

The unit test can be realized in any period of the calendar year and must be conducted **every 5 years** or as soon as changes are made that affect the generating unit's real or reactive power.

The unit tests must be conducted for all generating units of generating stations with a capacity of 50 MVA or more according to a five-year schedule drawn up by the GOs and the GOPs. This schedule must be revised **every year** and sent no later than **December 1<sup>st</sup>** to:

- The Regional Outage Scheduler for generating stations connected to the Hydro-Québec TransÉnergie transmission system;
- The System Control Outage Scheduler for generating stations connected to an auxiliary transmission system or for the Churchill Falls Generating Station;
- Direction – CMÉ.

#### 4.2.4. Test duration

For hydroelectric generating stations, thermal plants and gas-fired plants:

- The minimum duration of the station test must be 1 hour 15 minutes;
- The minimum duration of the unit test must be 1 hour 15 minutes.

#### 4.2.5. Waiver request for conducting the station test

A station test can be conducted outside the winter period provided that a waiver is granted to the GO or to the GOP by the Direction – CMÉ.

A waiver request can be submitted by the GO or the GOP to the Direction – CMÉ if the following conditions are met:

- Permanent conditions so that it is impossible to achieve the maximum power of the generating station when conducting the station test in the winter period, as is required in section 5.2.2.1;
- Possibility of conducting the station test of the generating station outside the winter period and achieve the maximum power of this generating station, as is required in section 5.2.2.1.

The waiver request shall be submitted with the following information:

1. Generating station for which a waiver request is made.
2. Identification of the winter period for which a waiver request is done.
3. Proposition of a different period for conducting the station test of the generating station.

The waiver request must be submitted by the GO or the GOP to the Direction – CMÉ no later than **October 31<sup>st</sup>** before the date scheduled for conducting the station test of the generating station.

The Direction – CMÉ must, **within 30 days** following receipt of the waiver request from the GO or the GOP, notify the latter of the acceptance or the refusal of the request.

#### 4.2.6. Other test constraints

1. Maximum real and reactive powers are tested in compliance with any operating restrictions which may apply to generating stations, generating units or related equipment. Operating constraints to prevent damage to generating units (e.g., on axial pulsing, vibrations and temperature) must not be exceeded.
2. Testing must not lead to contravening operating criteria (e.g., minimum operating reserves, maximum power flows, acceptable voltage ranges for equipment). Testing may be limited or interrupted at the request of a System Control Dispatcher should a system limit be reached and transmission system reliability compromised.
3. The maximum real and reactive powers tests of hydroelectric generating stations with interdependent water levels or flows potentially affecting the results must be tested at the same time.
4. The maximum real and reactive powers tests of generating stations, whose the reactive power generation mutually affect each other, depending on the maximum voltage of their common collector system, must be tested at the same time.
5. It is preferable that generating stations or units capable of being islanded to a neighboring system be tested when the generating units are synchronized to the Québec grid. If that is not possible, the System Control Outage Scheduler or System Control Dispatcher – Interconnections, depending on the horizon, analyzes the impact of testing on maintaining interchange schedules.
  - Testing is conducted if power fluctuations are negligible or can be compensated on the quantity of inadvertent energy generated, and provided the System Control Dispatcher – Interconnections and counterpart Operator in the affected Balancing Authority Area reach agreement. Otherwise, testing is postponed to a later date.

6. During the maximum real and reactive powers test, the GO or the GOP must identify in the "Comments" section of forms in Appendices D and E any condition or other factor which could influence test results, and where the Declared Net Capabilities in MW or in Mvar cannot be reached.

### 4.3. EXEMPTIONS

#### 4.3.1. Generation facilities with a capacity less than 50 MVA

Generation facilities with a capacity less than 50 MVA are exempted from performing the maximum real and reactive power verification described in this Procedure because Hydro-Québec TransÉnergie considers these generation facilities all together in the generation/load forecasts.

#### 4.3.2. Station tests in the summer period

Generation facilities with a capacity of 50 MVA or more are exempted from performing the station tests described in this Procedure in the summer period because system conditions are not adequate at that time of the year (high voltages and light loading).

#### 4.3.3. Gross Power

As Net Power is more significant for Hydro-Québec TransÉnergie and, in most cases, the difference between Net and Gross Power is negligible, it is not required that GOs and GOPs verify generation facilities' Gross Power.

However, GOs and GOPs are required to provide real and reactive powers readings of generation facilities service loads during the verification.

#### 4.3.4. Other exemptions

- If a GO or a GOP cannot perform maximum real and reactive powers verification specified in this Procedure because of one of the reasons listed below, the generator must provide a written explanation to the Direction – CMÉ **as soon as possible**.
  - Adverse impact on transmission system reliability;
  - Potential damage to transmission system security or, to the GO's or to the GOP's equipment security;
  - Environment conditions;
  - Governmental regulatory or operating license limitations;
  - An extended outage to the generator or generation facility;
  - A generating unit which has no influence on the stability of the transmission system, due to the nature of its regulation systems.

The Direction – CMÉ must, **within 30 days** following receipt of the written explanation from the GO or the GOP, notify the latter that he is exempted from performing the verification. However, the GO or the GOP must provide historical data of maximum real and reactive powers reached in the current year in winter conditions and the normal load of its station services (MW and Mvar).

- In the event that the GO or GOP temporarily suspends its operations, it is exempted from performing the verification described in this Procedure. However, during the year in which operations resume, the verification must be performed according to the current Procedure.

## 5. TEST PROCEDURE – HYDRO, THERMAL AND GAS-FIRED GENERATING STATIONS

### 5.1. SCHEDULING THE TESTS

The scheduling process is the same for both station and unit tests.

Under special circumstances where opportunities for testing arise on short notice, GOs or GOPs may send outage request that do not allow the normal time for processing. Hydro-Québec TransÉnergie will do its best to accommodate such tests, provided that power system conditions so permit and transmission system reliability is not compromised.

**Note:** The scheduling process for the Hydro-Saguenay Generating Stations has special features. Please refer to the scheduling process described in Appendix C of the current Procedure for more details.

#### 5.1.1. Generating stations connected to the Hydro-Québec TransÉnergie transmission system

*Reference – Process A1 in Appendix A*

1. The GO or the GOP must send its testing request as an outage request, and include its testing procedure with it. The outage request is submitted to the Regional Outage Scheduler for its area.

In scheduling the test, the GO or the GOP takes such facility-specific factors into account (e.g., time of local ice cover formation).

The GO or the GOP must complete test scheduling **before noon**, at least **4 working days** before the test date.

2. The Regional Outage Scheduler analyzes the request in terms of its impact on regional transmission system reliability.
  - a. If regional transmission system reliability and transmission equipment security are not compromised, the Scheduler forwards the request to the System Control Outage Scheduler. The latter studies the request in terms of the main transmission system. The request will be approved, provided that reliability of the main transmission system is not compromised.
  - b. Should either the Regional Outage Scheduler or the System Control Outage Scheduler refuse the request, the GO or the GOP representative will be informed and given the reasons for the refusal.

In the event of refusal, the Regional Outage Scheduler will propose a new date for performing the test to the GO or the GOP representative.



### 5.1.2. Generating stations connected to an auxiliary transmission system and for the Churchill Falls Generating Station

*Reference – Process A2 in Appendix A*

1. The GO or the GOP must send its testing request as an outage request, and include its testing procedure with it. The outage request is submitted to the System Control Outage Scheduler.

In scheduling the test, the GO or the GOP takes such facility-specific factors into account (e.g., time of local ice cover formation).

The GO or the GOP must complete test scheduling **before noon**, at least **4 working days** before the test date.

2. The System Control Outage Scheduler analyzes the request received from GO or GOP in terms of the main transmission system.
  - a. Provided that reliability of the main transmission system is not compromised, the request is approved.
  - b. Should the request be refused, the GO or the GOP representative is so informed and given the reasons for the refusal.

In the event of refusal, the System Control Outage Scheduler will propose a new date for performing the test to the GO or the GOP representative.

## 5.2. CONDUCTING THE TESTS

*Reference – Process B1 and B2 in Appendix B*

### 5.2.1. Communications before and during the test

**Note:** The communications before and during the test for the Hydro-Saguenay Generating Stations have special features. Please refer to the test conducting process described in Appendix C of the current Procedure for more details.

#### 5.2.1.1. Generating stations connected to the Hydro-Québec TransÉnergie transmission system

*1 hour prior to the test*

1. On the day of testing, one hour before testing is to begin, the GO or the GOP representative contacts the Regional System Control Dispatcher to ask him to authorize the test.
2. The Regional System Control Dispatcher analyzes the impact of testing on regional transmission system reliability. Provided that testing does not compromise regional transmission system reliability, the Regional System Control Dispatcher asks the System Control Dispatcher to authorize the test.

If it does compromise reliability, the Regional System Control Dispatcher cancels the test and informs the GO or the GOP representative of the reasons for doing so. The latter must then reschedule the test as set out in section 5.1.1.

3. The System Control Dispatcher analyzes the impact that testing will have on main transmission system reliability. Provided that the request does not compromise main transmission system reliability and has no major effect on interchange schedules, the Dispatcher authorizes the Regional System Control Dispatcher to proceed. The Regional System Control Dispatcher contacts the GO or the GOP representative to ensure that testing begins on schedule.

If testing does compromise reliability of the main transmission system, the System Control Dispatcher so notifies the Regional System Control Dispatcher. The Regional System Control Dispatcher informs the GO or the GOP representative, who must then reschedule the test as set out in section 5.1.1. The reasons for denying the test are also given to the GO or the GOP representative.

At the beginning of the test

At the scheduled time of testing or the time specified by the Regional System Control Dispatcher, the latter asks the GO or the GOP representative at the generating station to perform the test following standard procedures. The Regional System Control Dispatcher must notify the System Control Dispatcher of the exact time testing will start.

During the testing

The designated operator of the generating station notes any unusual situation arising during the testing and sends that information to the Regional System Control Dispatcher, who records it.

### **5.2.1.2. Generating stations connected to an auxiliary transmission system and for the Churchill Falls Generating Station**

1 hour prior to the test

1. On the day of testing, one hour before testing is to begin, the GO or the GOP representative contacts the System Control Dispatcher to ask that the test be authorized.
2. The System Control Dispatcher analyzes the impact that testing will have on main transmission system reliability. Provided that the request does not compromise main transmission system reliability and has no major effect on interchange schedules, the Dispatcher authorizes the GO or the GOP representative to proceed.

If testing does compromise reliability of the main transmission system, the System Control Dispatcher notifies the GO or the GOP representative to that effect. The latter must then reschedule the test as set out in section 5.1.2. The reasons for denying the test are given to the GO or the GOP representative.

At the beginning of the test

At the scheduled time of test or the time specified by the System Control Dispatcher, the latter asks the GO or the GOP representative at the generating station to perform the test following standard procedures. The GO or the GOP representative must notify the System Control Dispatcher of the exact time testing will start.

During the testing

The designated operator of the generating station notes any unusual situation arising during the testing and sends that information to the System Control Dispatcher, who records it.

## 5.2.2. Framework test procedures

### 5.2.2.1. STATION TEST – Maximum real and reactive power of a generating station

For hydroelectric generating stations, thermal plants and gas-fired plants, the station test lasts at least **1 hour 15 minutes** and consists of the following steps:

1. For a minimum duration of **1 hour**, test the maximum real power of the generating station (all generating units simultaneously) accounting for the reactive power (Mvar) required by the state of the power system at the time of testing.
2. For **the first 15 minutes** of the second hour, maintain the state described in step 1, then check the reactive power (Mvar) developed by raising the generator output voltage setpoint until the limit for one of the following is reached:
  - generator output voltage;
  - transmission system voltage;
  - stator current or rotor current.

Given the impact of this testing method on regional transmission systems, it must be coordinated with Hydro-Québec TransÉnergie staff.

### 5.2.2.2. UNIT TEST – Maximum real and reactive power of each unit at a generating station

The purpose of the unit test is to check the electrical characteristics of generating units. Two types of tests are designed to determine the characteristic curve (P-Q curve) of a generating unit at the generating unit's maximum real power (MW).

#### 1. *Unit test of reactive power produced (lagging test)*

For the hydroelectric generating stations, thermal plants and gas-fired plants, the Generator Operator increases the generating unit's real power to its maximum, then checks:

- For a minimum duration of **1 hour** (or until the temperature stabilizes), the reactive power (Mvar) developed by raising the generator output voltage setpoint until the stator current limit or rotor current limit is reached.

#### 2. *Unit test of reactive power absorbed (leading test)*

Once the unit test for the production of reactive power is completed, the Generator Operator must keep the generating unit at its maximum real power (MW) and check:

- For a minimum duration of **15 minutes**, the reactive power (Mvar) obtained by lowering the generator output voltage setpoint until the stator current limit or polar angle limiter has been reached.

### 5.2.3. Retesting

The test must be performed again at a different time if the state of the power system at the time of testing does not allow one of the following limits to be reached: generator output voltage, stator current or rotor current.

### 5.2.4. After testing

When testing ends, the designated operator of the generating station must notify the Regional System Control Dispatcher or System Control Dispatcher of any restriction, constraint or alarm that occurred during the test and was related to the equipment tested, as the case may be. The Regional System Control Dispatcher, for generating stations connected to the Hydro-Québec TransÉnergie transmission system (excluding Churchill Falls Generating Station), records this information and forwards it to the System Control Dispatcher.

When testing ends, the Regional System Control Dispatcher, after receiving instructions from the System Control Dispatcher, directs the designated operator of the generating station to adjust generation to the scheduled value or another value, depending on the state of the power system at that time. For generating stations connected to an auxiliary transmission system or for the Churchill Falls Generating Station, the System Control Dispatcher directs the Generator Operator to set the generation at the scheduled level.

**Note:** The end of testing for the Hydro-Saguenay Generating Stations has special features. Please refer to the test conducting process described in Appendix C of the current Procedure for more details.

## 5.3. COMMUNICATING RESULTS

The GO or the GOP must send the compiled test results to the Direction – CMÉ:

- **Every year** and no later than **April 1<sup>st</sup>** for station tests conducted during the previous winter period, that is from November 1<sup>st</sup> to February 28<sup>th</sup>.
- **Every year** and no later than **January 31<sup>st</sup>** for unit tests conducted between January 1<sup>st</sup> and December 31<sup>st</sup> of the previous year.

Furthermore, the GO or the GOP is in charge of recording the test results. To do so, the forms in Appendices D and E must be used. However, a different form format which contains at least the information requested in Appendices D and E may be used.

## 5.4. DISCREPANCIES IN RESULTS

If the difference between the results of station tests or unit tests and the Declared Capability (i.e. calculated theoretical values established using the parameters provided by the GO or the GOP for this generating station in conditions similar to the test conditions) is **4% or more**, an explanation must be given to the Direction – CMÉ by the GO or the GOP **within 30 days** following transmission of the compiled test results. In addition, the GO or the GOP must provide a list of measures to address the discrepancies.

As required, the GO or the GOP will have to update parameters provided for this generating station. If the GO or the GOP is not able to explain the discrepancy, the GO or the GOP will have to retest.

## 6. TEST PROCEDURE – WIND FARMS

### 6.1. VERIFICATION METHOD

The verification method for wind farms consists of providing performance data recorded under normal operating conditions at the connecting point, as described in Appendix F. The following data must be supplied:

- Maximum real power output (10 minutes average MW) obtained in the current year, date, hour and horizontal wind speed (10 minutes average from the highest captor) at the connecting point.

For wind farms equipped with a secondary voltage control (included in Wind Farm Manager Systems), the following data are also required:

- Maximum reactive power output and maximum reactive power absorbed (10 minutes average Mvar) obtained in the current year, date, hour and horizontal wind speed (10 minutes average from the highest captor) at the connecting point.

### 6.2. COMMUNICATING RESULTS

Performance data of wind farms must be submitted **every year** to the Direction – CMÉ as soon as available, but no later than **January 31<sup>st</sup>** for the period between January 1<sup>st</sup> and December 31<sup>st</sup> of the previous year.

The compilation of the performance data must be done by the GO or the GOP in the form supplied in Appendix F of this Procedure. However, a different form format which contains at least the information requested in Appendix F may be used.

### 6.3. DISCREPANCIES IN RESULTS

If the difference between the performance data of a wind farm and the performance data of the previous year is **4% or more**, an explanation must be provided to the Direction – CMÉ by the GO or the GOP **within 30 days** following transmission of the compiled performance data. Also, the GO or the GOP must provide a list of measures to address the discrepancies.

The GO or the GOP will have to update parameters provided for this wind farm, as required.

## 7. INABILITY TO ACHIEVE THE DECLARED CAPABILITIES

At any time, when a generating unit, a generating station or a wind farm cannot achieve the Declared Capability in MW or in Mvar because of equipment issues, the GO or the GOP must notify **as soon as possible**:

- The Regional Outage Scheduler for a generation facility connected to the Hydro-Québec TransÉnergie transmission system;
- The System Control Outage Scheduler for a generation facility connected to an auxiliary transmission system or for the Churchill Falls Generating Station.

Moreover, the GO or the GOP must supply an action plan in order to address the discrepancies within **30 days** following the detection of a problem.

If the Declared Capability cannot be achieved all the time, the GO or the GOP must:


- For hydroelectric generating stations, thermal plants and gas-fired plants, conduct the maximum real and reactive power verification **as soon as possible**, and send the test results to the Direction – CMÉ within **30 days** following the verification;
- For wind farms, update parameters of the wind farm concerned.

## 8. COMMUNICATING RESULTS OF UNIT TESTS TO HYDRO-QUÉBEC TRANSÉNERGIE


The results of unit tests help validate official specifications for generating units provided by GOs or GOPs. These results will be transmitted by the Direction – CMÉ to Hydro-Québec TransÉnergie's unit Planification et stratégies du réseau principal.

















9. CONTACTS

**For submitting your results or for any questions related to this Procedure, please write to:**

 [CME\\_Verification\\_PQ\\_max@hydro.qc.ca](mailto:CME_Verification_PQ_max@hydro.qc.ca)

Direction – Contrôle des mouvements d'énergie  
 Complexe Desjardins, tour est, 19<sup>e</sup> étage  
 C.P. 10000, succ. pl. Desjardins  
 Montréal (Québec) H5B 1H7  
 Fax: 514 879-4691

<b>System Control Centre (CCR) in Montreal</b>	
System Control Dispatchers	 514 289-4990 514 289-4991 514 289-4992

<b>Regional Outage Schedulers</b>	
Chicoutimi	 418 696-3815 or 819-764-5124 ext. 4320  <a href="mailto:Agent_Planification_Nord@hydro.qc.ca">Agent_Planification_Nord@hydro.qc.ca</a>
Rouyn-Noranda	 819 764-5124 Ext. 4326, 4313 or 4378  <a href="mailto:Agent_Planification_Nord@hydro.qc.ca">Agent_Planification_Nord@hydro.qc.ca</a>
Baie-Comeau	 1 866 561-5697 Ext. 3909  <a href="mailto:Agent_Planification_Est@hydro.qc.ca">Agent_Planification_Est@hydro.qc.ca</a>
Québec	 1 866 561-5697 Ext. 3906, 3908 or 3907  <a href="mailto:Agent_Planification_Est@hydro.qc.ca">Agent_Planification_Est@hydro.qc.ca</a>
Trois-Rivières	 819 694-2432, 819 694-2508, 819 694-2600, 819 694-2543 or 819 694-2422  <a href="mailto:Agent_Planification_Est@hydro.qc.ca">Agent_Planification_Est@hydro.qc.ca</a>
Montréal	 1 866 604-4041 Ext. 3904, 3905, 3906, 3907 or 3908  <a href="mailto:Agent_Planification_Sud@hydro.qc.ca">Agent_Planification_Sud@hydro.qc.ca</a>
Saint-Jérôme	 1 866 604-4041 Ext. 3901, 3902, 3903  <a href="mailto:Agent_Planification_Sud@hydro.qc.ca">Agent_Planification_Sud@hydro.qc.ca</a>
<b>System Control Outage Schedulers</b>	
Montréal	 514 289-4364, 514 289-3845 or 514 289-5998 Fax: 514 289-4556  <a href="mailto:PCME-Retrait@hydro.qc.ca">PCME-Retrait@hydro.qc.ca</a>

**Note:** To contact the Regional System Control Dispatchers, please refer to the telephone numbers indicated in the Common System Operating Instructions.

**10. HISTORY OF UPDATES**

<b>Date</b>	<b>Modification</b>	<b>Reason</b>
2005-10-21	Initial effective date	New procedure
2007-10-26	<ul style="list-style-type: none"> <li>• Modification to most sections, to all Appendices and to all processes;</li> <li>• Sections 7 and 9 added;</li> <li>• Sub-sections 5.4 and 6.1.1 added;</li> <li>• Process 1B and 2B added;</li> <li>• Appendix C added.</li> </ul>	<ul style="list-style-type: none"> <li>• Control Areas are now called Balancing Authority Areas;</li> <li>• Administrative changes in Hydro-Québec TransÉnergie;</li> <li>• Compliance with NPCC A-13 Criteria;</li> <li>• Standardization of vocabulary used (French version only).</li> </ul>
2008-10-14	<ul style="list-style-type: none"> <li>• Minor modifications to most sections, to processes and to Appendices in order to clarify certain points;</li> <li>• Section 3, addition of a reference: Reliability Coordinator Code of Conduct;</li> <li>• Section 4.4.4, addition of a exemption condition when a Generator Owner suspends operations;</li> <li>• Appendices A and B: consider status of the stabilizers and of the voltage regulator during the tests;</li> <li>• Section 9, deletion of the telephone numbers of the Regional System Control Dispatchers and addition of a note.</li> </ul>	<ul style="list-style-type: none"> <li>• Updates;</li> <li>• New phone system in the Regional System Control Centres for the Regional System Control Dispatchers.</li> </ul>
2009-10-16	<ul style="list-style-type: none"> <li>• Modifications, sections 2, 4.3.4, 5.4, 6.3, and 7, and Appendices E, F and G;</li> <li>• Modification, Purpose;</li> <li>• Reorganization of section 4;</li> <li>• Section 4.2.2: modification of the deadlines for submitting the schedule and distinction between station and unit tests;</li> <li>• Modification: sections 4.2.3 and 5.2.2.1;</li> <li>• Modifications: sections 5.1 and 5.2.1;</li> </ul>	<ul style="list-style-type: none"> <li>• Update of the compliance; new NPCC Directories D9 and D10 and Criteria A-03 cancelled;</li> <li>• Addition of the verification method for wind farms;</li> <li>• Make a distinction between the verification conditions of the generating stations and the wind farms;</li> <li>• Accuracy concerning the global test schedule;</li> <li>• For hydroelectric generating stations and thermal plants, the minimum duration of the station test is 1 h 15 instead of 2 h; For all generating stations, the minimum unit test duration is 1 h 15;</li> <li>• Separate the procedures for generating stations connected to the HQT system and for the generating stations connected to a private system (including the Churchill Falls Generating Station);</li> </ul>

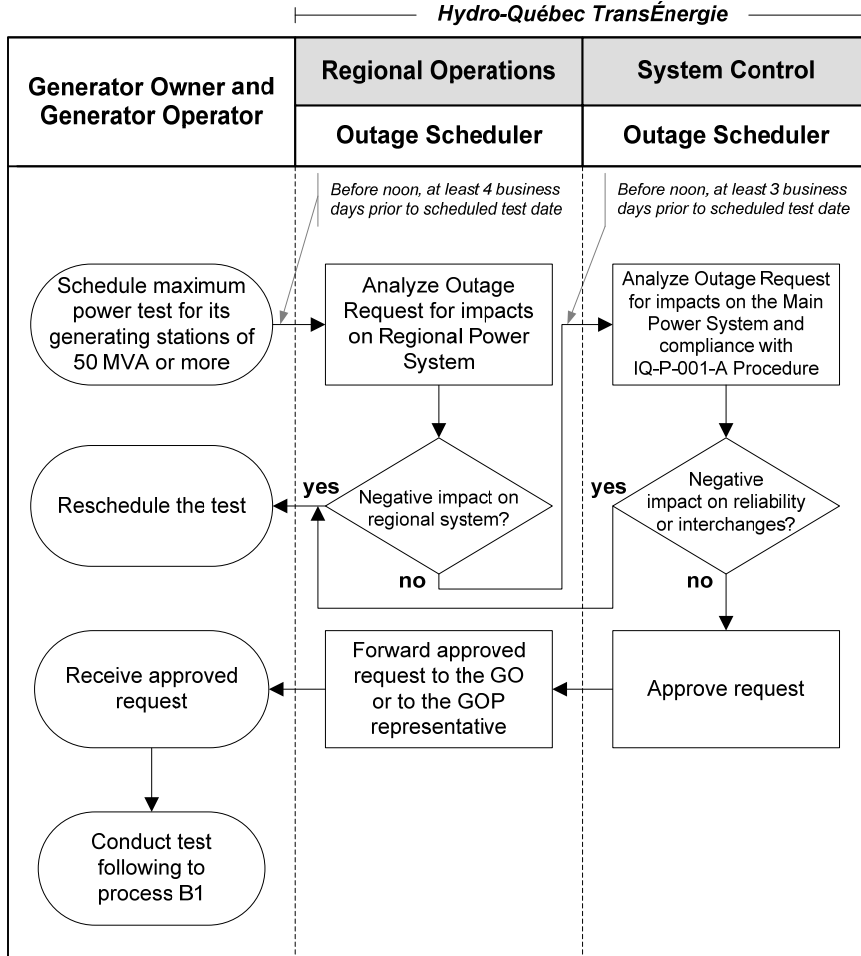


Date	Modification	Reason
2009-10-16	<ul style="list-style-type: none"> <li>• Sections 5.3 and 6.2: modification of the deadlines for submitting the test results and the performance data;</li> <li>• Sections 4.2.4, 5.3 and 6.2: use the supplied forms for compiling the test results or the performance data;</li> <li>• Modification of the procedure title;</li> <li>• Section 8: removal of contact information for the Senior Agent – System Operations;</li> <li>• Appendices A and B: modification of how processes are numbered and removal of columns and notes;</li> <li>• Addition of Appendices C and D and reference to these appendices in the main text.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the number of test result reports submitted per year for the generating stations and grant an extension for the wind farms;</li> <li>• Standardization of the data submitted;</li> <li>• Update;</li> <li>• Describe the special features of test scheduling and test conducting for the Hydro-Saguenay Generating Stations and Chats Falls Generating Station.</li> </ul>
2010-10-18	<ul style="list-style-type: none"> <li>• This procedure also applies to Generator Operators;</li> <li>• Direction "Contrôle des mouvements d'énergie" is now "Contrôle et exploitation du réseau";</li> <li>• Section 2: modification;</li> <li>• Section 4.2.2: station test must be conducted every 3 years instead of every year;</li> <li>• Section 4.2.3: unit test must be conducted every 6 years instead of every 5 years;</li> <li>• Sections 4.2.2 and 4.2.3: the schedules must be also sent to Direction DCER;</li> <li>• Section 4.2.5: new section "Waiver request for conducting the station test";</li> <li>• Section 8: modification of contact information (phone numbers);</li> <li>• Appendices A and B: update of the processes;</li> <li>• The Appendix titled "Chats Falls Generating Station – Particular process for scheduling and conducting the tests" has been removed from this document.</li> </ul>	<ul style="list-style-type: none"> <li>• Update of the compliance according to NERC Standard TOP-002-2a;</li> <li>• Update;</li> <li>• Update of the compliance;</li> <li>• New requirements;</li> <li>• Allow the station test to be conducted outside the winter period under certain conditions;</li> <li>• Update;</li> <li>• It is no longer necessary to conduct tests at the Chats Falls Generating Station because this facility is located in the Ontario Balancing Authority Area.</li> </ul>

Date	Modification	Reason
2014-05-09	<ul style="list-style-type: none"> <li>• Direction "Contrôle et exploitation du réseau" is now "Contrôle des mouvements d'énergie";</li> <li>• Section 2: modifications;</li> <li>• Section 4.2.3: unit test must be conducted every 5 years, instead of every 6 years;</li> <li>• Section 4.2.6: article 2, addition;</li> <li>• Section 4.3.4: modifications;</li> <li>• Section 6.1: modifications;</li> <li>• Section 7: modifications;</li> <li>• Section 8: new article;</li> <li>• Section 9: modifications;</li> <li>• Appendix C: the company is now named Produits forestiers Résolu;</li> <li>• Appendix F: modifications.</li> </ul>	<ul style="list-style-type: none"> <li>• Update;</li> <li>• Update of the compliance; Addition, VAR-001-3;</li> <li>• New requirement;</li> <li>• Addition of an operating criterion;</li> <li>• Addition of reasons for an exemption;</li> <li>• Modification of performance data to be submitted;</li> <li>• An action plan must be supplied within 30 days following the detection of a problem;</li> <li>• Transmission of unit test results to HQT;</li> <li>• Update;</li> <li>• Update;</li> <li>• Update in accordance with section 6.1 and request for additional information.</li> </ul>

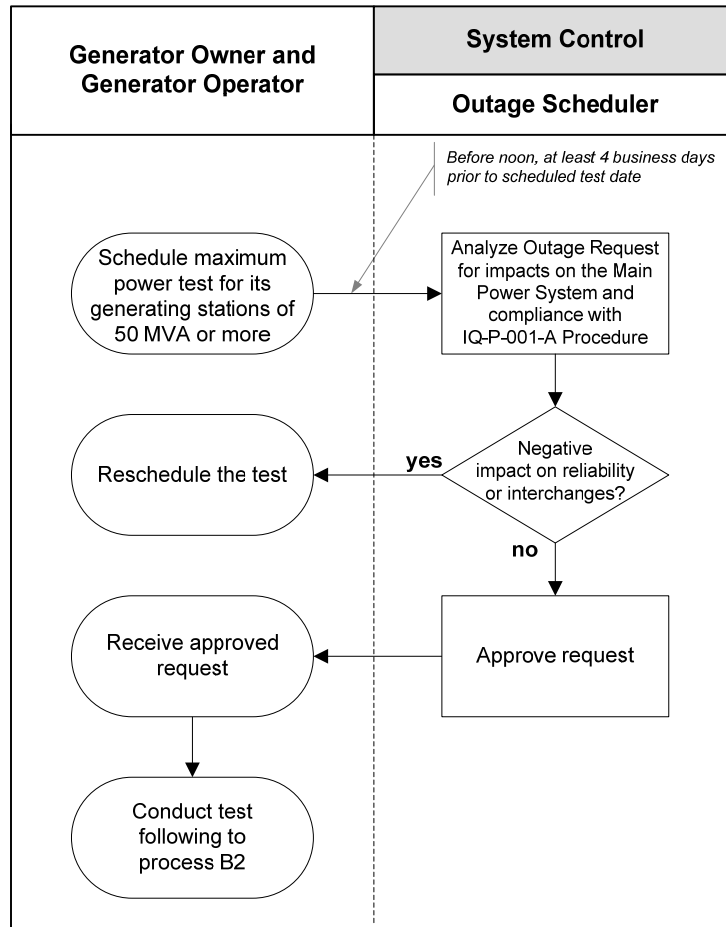
APPENDIX A PROCESS – SCHEDULING THE TESTS

**Process A1**  
**Generating stations connected to the**  
**Hydro-Québec TransÉnergie transmission system**



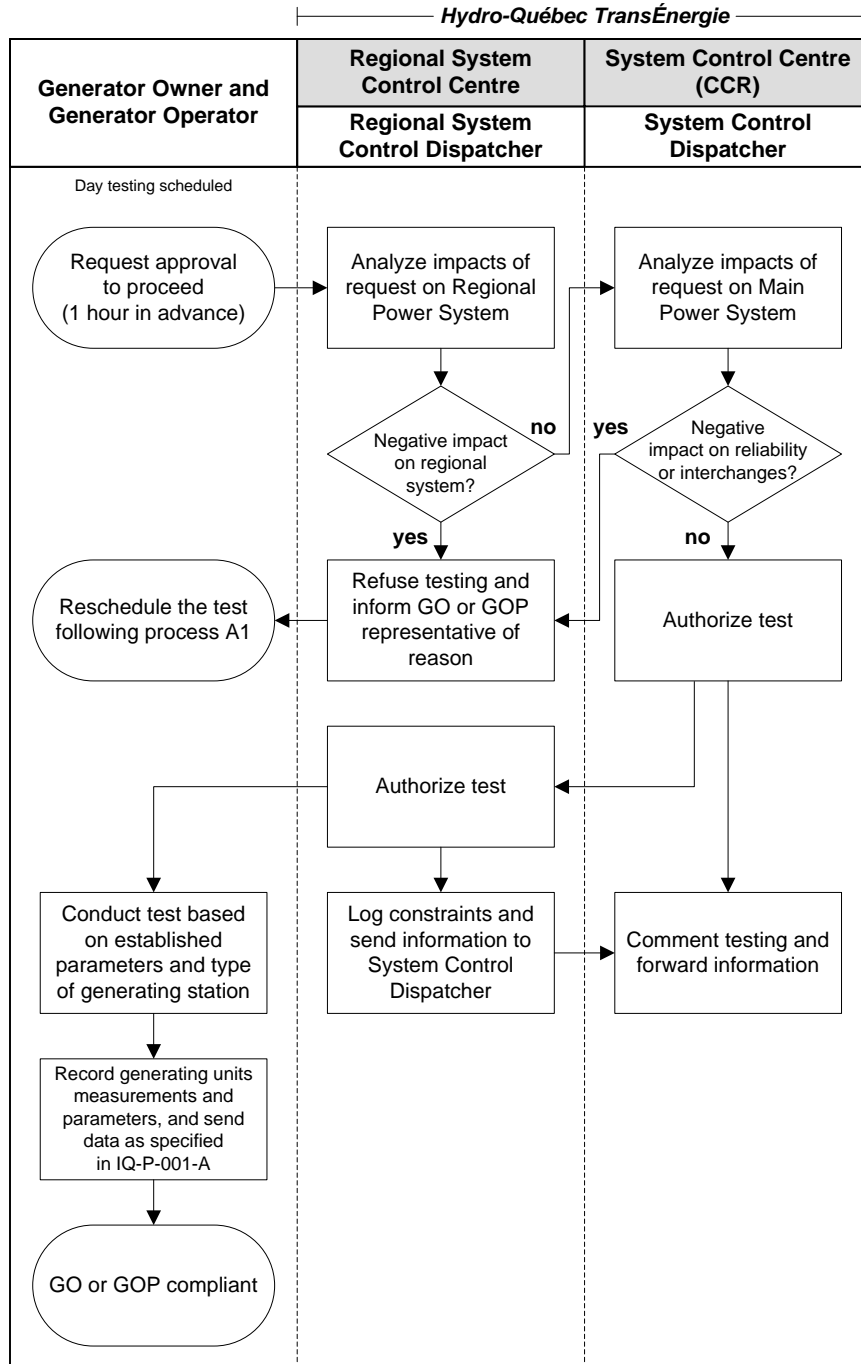
**Process A2**  
**Generating stations connected to an**  
**auxiliary transmission system**  
**and Churchill Falls Generating Station**

Hydro-Québec TransÉnergie



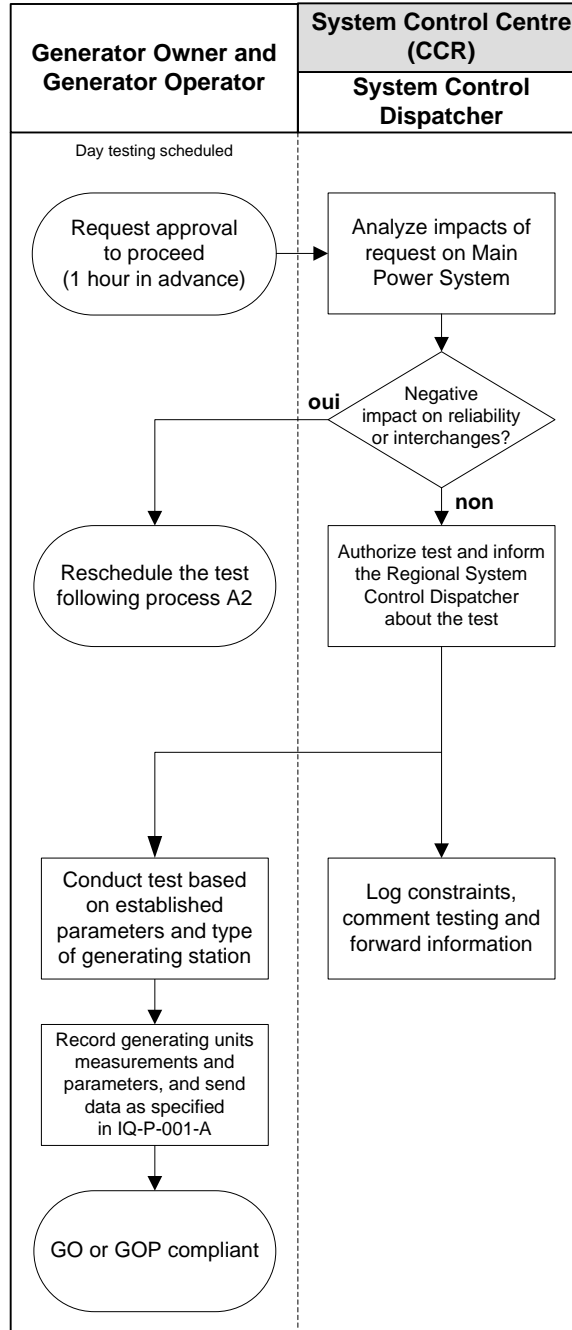
APPENDIX B PROCESS – CONDUCTING THE TESTS

**Process B1**  
**Generating stations connected to the**  
**Hydro-Québec TransÉnergie transmission system**



**Process B2**  
**Generating stations connected to an**  
**auxiliary transmission system**  
**and Churchill Falls Generating Station**

Hydro-Québec TransÉnergie



## APPENDIX C HYDRO-SAGUENAY GENERATING STATIONS – PARTICULAR PROCESS FOR SCHEDULING AND CONDUCTING THE TESTS

The power system of the Produits forestiers Résolu Company (Hydro-Saguenay division) is connected to the auxiliary transmission system of Rio Tinto Alcan (RTA), but it is commercially fed by Hydro-Québec. Because of this unusual feature, scheduling and conducting the tests must be done in the way described below.

### Scheduling the test

1. Hydro-Saguenay must send its testing request as an outage request, and include its testing procedure with it. The outage request is submitted to the RTA – Outage Scheduler. The latter sends a copy of this outage request to the Regional Outage Scheduler (Regional Operations at Chicoutimi) and to the System Control Outage Scheduler.

In scheduling the test, Hydro-Saguenay takes facility-specific factors into account (e.g., ice cover formation period).

Hydro-Saguenay must complete test scheduling **before noon**, at least **4 working days** before the test date.

2. The RTA – Outage Scheduler analyzes the request received from Hydro-Saguenay in terms of its impact on his transmission system reliability.
  - a. Provided that reliability of the transmission system is not compromised, the request is approved.
  - b. Should the request be refused, Hydro-Saguenay is informed and given the reasons for the refusal. Furthermore, the RTA – Outage Scheduler will propose a new date for performing the test to Hydro-Saguenay.

The RTA – Outage Scheduler also communicates the decision to the Regional Outage Scheduler (Regional Operations at Chicoutimi) and to the System Control Outage Scheduler.

### Conducting the test – Communications before and during the test

#### 1 hour prior to the test

1. On the day of testing, one hour before testing is to begin, Hydro-Saguenay contacts the RTA – System Control Dispatcher to ask him to authorize the test.
2. The RTA – System Control Dispatcher analyzes the impact that testing will have on RTA transmission system reliability. Provided the request does not compromise transmission system reliability, Hydro-Saguenay will be authorized to proceed.

If testing does compromise reliability, the RTA – System Control Dispatcher notifies Hydro-Saguenay to that effect. The latter must then reschedule the test as set out in the previous section. The reasons for denying the test are given to Hydro-Saguenay.

The RTA – System Control Dispatcher also communicates his decision to the Regional System Control Dispatcher (Regional Operations at Chicoutimi) and to the System Control Dispatcher.

At the beginning of the test

At the scheduled time of testing or the time specified by the RTA – System Control Dispatcher, the latter asks the Hydro-Saguenay to perform the test following standard procedures. The RTA – System Control Dispatcher must notify the Regional System Control Dispatcher (Regional Operations at Chicoutimi) and the System Control Dispatcher of the exact time of the test will start.

During the testing

Hydro-Saguenay notes any unusual situation arising during the testing and sends that information to the RTA – System Control Dispatcher, who records it.

After testing

When testing ends, Hydro-Saguenay must notify the RTA – System Control Dispatcher of any restriction, constraint or alarm that occurred during the test and was related to the equipment tested. The RTA – System Control Dispatcher records this information and forwards it to the Regional System Control Dispatcher (Regional Operations at Chicoutimi) and the System Control Dispatcher

**Note:** Communicating results must be done according to section 5.3 of the current Procedure.



**APPENDIX D STATION TEST – MAXIMUM REAL AND REACTIVE POWER VERIFICATION**

Test date (yyyy-mm-dd): [       -       -       ]

Generating station	Station service load	Time	Total Output		Water temp. <sup>1</sup> (hydro generating station) (° C)	Air temp. <sup>2</sup> (° C)	Upstream level (m)	Down-stream level (m)	Comments
			(MW)	(Mvar)					
	MW:	Start:							
	Mvar:	End:							

UNITS		DECLARED CAPABILITY		MW	Mvar	kV	G.O. <sup>3</sup> (%)	Stabilizers (ON/OFF)	Voltage regulator (auto/manual)	Comments
		(MW)	(Mvar)							
	Start:									
	After 1 h of testing:									
	After 1 h 15 of testing:									
	Start:									
	After 1 h of testing:									
	After 1 h 15 of testing:									
	Start:									
	After 1 h of testing:									
	After 1 h 15 of testing:									
	Start:									
	After 1 h of testing:									
	After 1 h 15 of testing:									

<sup>1</sup> Water temperature: temperature of cool water at the generator cooling system intake  
<sup>2</sup> Air temperature: temperature of cool air at the cooling system outlet or generator rotor intake  
<sup>3</sup> G.O.: Gate opening

By: \_\_\_\_\_ Company: \_\_\_\_\_  
 Email: \_\_\_\_\_ Phone: \_\_\_\_\_

Compiling Date: \_\_\_\_\_

**APPENDIX E UNIT TEST – MAXIMUM REAL AND REACTIVE POWER VERIFICATION**

Test date (yyyy-mm-dd): [       -       -       ]

Generating station	Station service load	Time	Total Output		Water temp. <sup>1</sup> (hydro generating station) (° C)	Air temp. <sup>2</sup> (° C)	Upstream level (m)	Down-stream level (m)	Comments
			(MW)	(Mvar)					
	MW:	Start:							
	Mvar:	End:							

UNITS		DECLARED CAPABILITY		MW	Mvar	kV	G.O. <sup>3</sup> (%)	Stabilizers (ON/OFF)	Voltage regulator (auto/manual)	Comments
		(MW)	(Mvar)							
	Start:									
	End:									
	Leading test <sup>4</sup> :									
	Start:									
	End:									
	Leading test <sup>4</sup> :									
	Start:									
	End:									
	Leading test <sup>4</sup> :									
	Start:									
	End:									
	Leading test <sup>4</sup> :									

<sup>1</sup> Water temperature: temperature of cool water at the generator cooling system intake

<sup>2</sup> Air temperature: temperature of cool air at the cooling system outlet or generator rotor intake

<sup>3</sup> G.O.: Gate opening

<sup>4</sup> For specified generating stations only

By: \_\_\_\_\_ Company: \_\_\_\_\_

Compiling Date: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_

**APPENDIX F PERFORMANCE DATA FOR WIND FARMS**

Wind Farm name: \_\_\_\_\_

**Wind Generators Description**

Manufacturer	Model	Hub height	Number of wind generators	Installed capacity by wind generator		Power factor	Operating range Wind speed	Operating range Outside Temperature	Comments
		(m)		(MW)	(Mvar)		(m/s)	(°C)	

**Description of Reactive Power Compensation System**

Manufacturer	Model	Technology	Number	Maximal absorbed	Maximal output	Operating range Active power	Operating range Temperature	Comments
				(Mvar)	(Mvar)	(MW)	(°C)	

**Wind Farm Performance Data**

Date of collect data from (aaaa-mm-jj): [   -   -   ] to [   -   -   ]

Wind Farm	Generation	Date	Time	Number of wind generators	Total Output	Outside Temperature	Wind speed	Station service load	
					(MW or Mvar)	(°C)	(m/s)	(MW)	(Mvar)
PERFORMANCE DATA	Maximum – MW								
	Maximum absorbed – Mvar								
	Maximum output – Mvar								

Wind Farm	Generation	Total Output
		(MW or Mvar)
DECLARED CAPABILITY	Maximum – MW	
	Maximum absorbed – Mvar	
	Maximum output – Mvar	

Annual Capacity Factor
(%)

By: \_\_\_\_\_ Company: \_\_\_\_\_  
 Email: \_\_\_\_\_ Phone: \_\_\_\_\_

Compiling Date: \_\_\_\_\_