**[Asset Owner Name]**

|  |
| --- |
| **Code Commissioning Plan for** |

**[Name of Unit(s) Under Test]**

1. Fill in your Asset Owner Name and the Name of the Unit under Test between the square brackets.
2. Go to File –> Print to automatically populate those fields throughout the document.
3. Delete the square brackets above and this text box.

Version Record

|  |  |  |  |
| --- | --- | --- | --- |
| **Addendum/Amendment** | **Replaces** | **Document Version** | **Date** |
| Initial version | NIL | 1.0 |  |
|  |  |  |  |
|  |  |  |  |

**Contents**

[1. Scope of Commissioning 4](#_Toc204263388)

[1.1 Introduction 4](#_Toc204263389)

[1.2 Code Commissioning Plan Agreement 4](#_Toc204263390)

[1.3 Commissioning Objectives 5](#_Toc204263391)

[1.4 Commissioning Scope and Sequence 5](#_Toc204263392)

[1.5 Commissioning Period 6](#_Toc204263393)

[1.6 Project Communication Channels 7](#_Toc204263394)

[1.7 Key Personnel 7](#_Toc204263395)

[1.8 Escalation Paths 8](#_Toc204263396)

[2. Pre-requisites for Commissioning 10](#_Toc204263397)

[2.1 Protection Coordination 10](#_Toc204263398)

[2.2 Ability to Meet Dispatch Instructions 10](#_Toc204263399)

[2.3 SCADA Visibility 11](#_Toc204263400)

[2.4 Connection Study and Study Cases 11](#_Toc204263401)

[2.5 Update of Reserves Management Tool 12](#_Toc204263402)

[2.6 Update of Market Model 12](#_Toc204263403)

[2.7 Engineering Methodology 13](#_Toc204263404)

[2.8 Operational Test Plans 13](#_Toc204263405)

[2.9 Day-Ahead Schedule (only upon system operator request) 14](#_Toc204263406)

[3. Assessment of Compliance and Operational Considerations 15](#_Toc204263407)

[3.1 Frequency Support Obligations 15](#_Toc204263408)

[3.2 Voltage Support Obligations 15](#_Toc204263409)

[3.3 Operational Communications 16](#_Toc204263410)

[3.4 Ancillary Services Testing 16](#_Toc204263411)

[3.5 Offer and Dispatch 17](#_Toc204263412)

[3.6 Overview of System Tests 17](#_Toc204263413)

[3.7 Risks to the Power System 18](#_Toc204263414)

[3.8 Special Provisions 19](#_Toc204263415)

[4. Deliverables during Post-Commissioning (Closeout) 21](#_Toc204263416)

[4.1 Timing of Closeout Phase Activities 21](#_Toc204263417)

[4.2 Validated Power System Models 21](#_Toc204263418)

[4.3 Dispensations, Equivalence Arrangements, Exemptions 22](#_Toc204263419)

[5. Appendix 23](#_Toc204263420)

**Note:** The system operator has designed this document to be interactive. We recommend you use Microsoft Word to complete it. This template uses the collapse/expand feature (explained on the next page), which may result in the page numbers above featuring incorrectly. However, you can still ctrl+click on the name of the section you want to reach quickly.

**Introduction**

This document is designed to guide asset owners to create a Code commissioning plan for your generating asset. Use this template to provide the system operator with the required information. Complete this plan thoroughly and accurately for your commissioning to progress safely and without delay to your project schedule.

When creating your Code commissioning plan, the system operator expects you to provide only information that is relevant to Code compliance. Ensure that you:

* consult the [Electricity Industry Participation Code](https://www.ea.govt.nz/code-and-compliance/code/), as well as the documents available on the [System Operator’s Commissioning Generation](https://www.transpower.co.nz/system-operator/information-industry/asset-owner-requirements/commissioning-generation) webpage;
* consult [GL-EA-404 Generation Commissioning Process](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-404%20Generation%20Commissioning%20Process.pdf) for information about the commissioning phases;
* reach out to your assigned contacts within the system operator if you have any questions.

Note that any review or approval by the system operator does not relieve you from your Code obligations. Where there is a conflict between what is recorded in a system operator document (including this one) and the Code, the Code takes precedence.

**Navigating the Template**

This document is organised into four sections arranged according to the generation commissioning phases:

1. Foundational information you will settle on during the feasibility, initiation and planning phases
2. Information and detail you must compile and complete during the delivery phase–before connecting to the power system for the first time
3. Expectations during the commissioning phase
4. Deliverables during closeout phase

In each section, you will find text boxes or tables to complete (some have text pre-recorded for your ease and because they contain elements common to all Code commissioning plans). These will constitute your Code commissioning plan. In other words, the system operator will only review and respond to what you have included in these fields.

To access helpful information about what we expect you to include in each section, simply click on the black triangle to the left of any of the headings, and it will reveal text below. If you want to make it disappear, simply hover over the heading and click the black triangle once more.

# Scope of Commissioning

## 1.1 Introduction

In your introduction, briefly describe:

* the legal name and description of the asset owner(s) and their relationship to each other (if there is more than one asset owner)
* the name of the asset/unit(s) being tested/under test (in the rest of the Code commissioning plan, this will be referred to as “unit(s) under test”)
* the equipment being commissioned
* status of equipment prior to commissioning: brief history of the equipment in relation to other assets or the connection to the power system
* the unit size
* the generation type
* the location of the connection and the connecting party

For example:

*A new governor control system is being commissioned for [Name of unit under test] at our [Plant Location] power station. This upgrade replaces the existing electronic governor with [Specify New Governor Model], a digital electro-hydraulic governor. The project scope also includes upgrades to the wicket gate hydraulics.*

(If you want to reveal/hide help text, hover over the heading above and click the black triangle to the left)

|  |
| --- |
|  |

## 1.2 Code Commissioning Plan Agreement

This section will be signed once both you and the system operator have reviewed and accepted the final version of the Code commissioning plan. Where more than one asset owner exists, it will require multiple signatures.

For the Code commissioning plan expiry date, you should pick a date roughly three months beyond the planned end of the commissioning period (see section 1.5). If anything delays commissioning beyond this date, you will need to agree on a new plan with the system operator. The Code commissioning plan must remain current until all the post-commissioning activities are complete (see section 4).

|  |
| --- |
| We at [Asset Owner Name] have prepared this Code commissioning plan for [Name of Unit(s) Under Test]. The table below signifies that both us and the system operator have agreed on this commissioning plan in accordance with Schedule 8.3, Technical Code A of the Code.We acknowledge that any review and agreement with this document by the system operator does not relieve us from our obligation to continue to meet the requirements of the Code.Both parties below agree that this Code commissioning plan will expire on Click or tap to enter a date. |
|  | **Asset Owner** | **System Operator** |
| **Name** |  |  |
| **Title** |  |  |
| **Date** | Click or tap to enter a date. | Click or tap to enter a date. |
| **Signature** |  |  |

## 1.3 Commissioning Objectives

Briefly explain your objectives for commissioning. We recommend you address the following points:

* safety – you will commission responsibly and safely:
	+ when first connecting to the grid or power system, and
	+ continuing during the rest of the commissioning process (the commissioning and closeout phases)
* compliance – you will commission in accordance with:
	+ the Code
	+ this commissioning plan, and
	+ any other agreements with the system operator
* testing – you will complete tests as agreed

|  |
| --- |
|  |

## 1.4 Commissioning Scope and Sequence

In this section, specify the systems you will test. For a new asset, it should include all the systems below, whereas for an existing asset you may only need to refer to a few.

1. Frequency Control System (governor, frequency controller, driving unit, instantaneous reserves)
2. Voltage Control System (excited, AVR, PSS, excitation limiters, voltage controller)
3. Generator (elements of frequency and voltage control systems)
4. Physical Connection (protection system, connection arrangements, unit transformer)
5. Information (data used for dispatch, SCADA and market systems)

The sequence of tests and their details should be provided in your engineering methodology document–you should be working on that document in parallel with this plan.

For example:

*The scope of the commissioning is limited to the frequency control system and the demonstration of the frequency response characteristics of the unit under test. Tests will be carried out to determine generator stability, response to system disturbances and reserve response for both fast instantaneous reserve and sustained instantaneous reserve.*

*The sequence of tests to commission the assets will be detailed in the Engineering Methodology document which will be provided to the system operator before the start of the commissioning period.*

*An overview of the tests is as follows:*

*1. Trip testing of wicket gate and load rejection tests of generator*

*2. Frequency step testing for stability*

*3. Frequency response tests*

*4. Instantaneous reserves tests*

|  |
| --- |
|  |

## 1.5 Commissioning Period

Define the start and end dates for the commissioning period. These dates are indicative only and may need to adjust depending on circumstances such as delays.

|  |
| --- |
| Start of commissioning period: Click or tap to enter a date. End of commissioning period: Click or tap to enter a date. The commissioning period will conclude on the earliest of the following:1. at the completion of all activities and system tests mentioned in section three of this document, the asset owner having demonstrated compliance to the system operator’s satisfaction
2. when the asset owner and the system operator agree to end the commissioning period

During this period, the system operator will dispatch generation solely for commissioning purposes and in compliance with the Code, according to system conditions and dispatch merit order.Once the commissioning period has ended:* the unit(s) under test will be operated and offered into the market in accordance with the Code. This is only after satisfactory testing and agreement of both us and the system operator.
* any unmet asset owner Performance Obligations or Technical Code obligations will be treated as commissioned but not necessarily compliant with the Code. In such an event, we will apply for a dispensation from the relevant Code obligations. We note that if the system operator agrees to end the commissioning period, it does not guarantee that the system operator will grant any such application.
 |

## 1.6 Project Communication Channels

Find below a sample diagram of the expected communication channels. We have provided it to support clarity. Replace the names of positions with the correct people/organisations connected to your project.

It is important that you communicate with the system operator in a proactive and timely manner. While you, as the asset owner, are responsible for completing commissioning activities and complying with Code obligations, some activities will involve other stakeholders, such as Transpower in its Grid Owner capacity or an Embedded Distributor, depending on who you have contracted to receive your power. For those activities, you must communicate directly with them, as indicated above. To be clear, the system operator will not be an intermediary for you in communicating with the Grid Owner/Distributor.

We remind you that you are responsible for all Code obligations, as well as the information supplied to the system operator, even when you may have contracted other parties to provide this. Other parties might include equipment manufacturers, project managers, or construction companies, among others. We advise you to review all information before you pass it on to the system operator.

*System Operator Commissioning Engineer*

*System Operator’s Other Departments*

*Grid Owner/Distributor Stakeholder*

[Asset Owner Name] *Commissioning Manager*

*Equipment Supplier*

*Construction Company*

## 1.7 Key Personnel

List the primary contacts for both the asset owner and system operator in the table below. You will establish these at the kick-off meeting or during the planning phase of the commissioning process. Use the final part of the table (called ‘Other’) to include the contact information of stakeholders outside of the system operator, such as contacts from the Grid Owner, Distributor, or your contractors or the construction company you engaged. Add rows to the relevant tables if necessary.

|  |
| --- |
| **Asset Owner** |
| **Name** | **Position** | **Email** | **Phone** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **System Operator** |
| **Name** | **Position** | **Email** | **Phone** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| **Other** |
| **Name** | **Position** | **Email** | **Phone** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

## 1.8 Escalation Paths

Define the communication path for escalations in the tables below. These paths are different depending on when the issue occurs.

The first table defines the escalation path during Planning Time. You should use these contacts to raise issues up to one business day prior to a test or event.

The second table defines the escalation path during Real Time. You should contact these persons to raise issues up to the end of the next business day following a test or incident.

To ensure communication flows smoothly and efficiently, the system operator expects that communication at the project or technical level will remain between persons whose role sits at that level. Only escalate to senior management in the rare event of difficulties. We remind you, out of courtesy, to not skip escalation levels if issues are unresolved at the current level. If a difficulty requiring escalation were to arise, both the asset owner and system operator agree to inform the other party of this escalation.

|  |  |  |
| --- | --- | --- |
| **PLANNING PERIOD** | **System Operator** | **Asset Owner** |
| **Primary Contact** | Power Systems Engineer,Click or tap here to enter text. | Click or tap here to enter text. |
| **Escalation 1** | Engineering Assurance Manager,Click or tap here to enter text. | Click or tap here to enter text. |
| **Escalation 2** | Power Systems Group Manager,Click or tap here to enter text. | Click or tap here to enter text. |

|  |  |  |
| --- | --- | --- |
| **REAL TIME**  | **System Operator** | **Asset Owner** |
| **Primary Contact** | Security Coordinator,Click or tap here to enter text. | Click or tap here to enter text. |
| **Escalation 1** | Duty Operations Manager,Click or tap here to enter text. | Click or tap here to enter text. |
| **Escalation 2** | Grid and Systems Operation Manager,Click or tap here to enter text. | Click or tap here to enter text. |

# Pre-requisites for Commissioning

Asset Owners must meet the following pre-requisites prior to the start of commissioning. Failure to do this could result in delays to your schedule.

## 2.1 Protection Coordination

Both parties at the grid interface must provide a written statement to the system operator confirming that protection coordination has been agreed. Below, you must indicate the state of your protection coordination agreement by indicating whether the Grid Owner and the party at the other side of the interface have communicated in writing that protection coordination has been agreed. For each party, choose from whether they have:

* **has/have confirmed** protection coordination on [date]: this means that this party has provided a written statement to the system operator indicating that protection has been coordinated. Simply provide the date that they have submitted this statement.
* **is/are expected to confirm** protection coordination on [date]: this means that the other party at the grid interface is still working on the agreement. It is your responsibility to reach out to the appropriate personnel to arrange this. The system operator should expect the written statement from the party on the date you indicate.

|  |
| --- |
| The Grid Owner Choose an item.protection coordination on Click or tap to enter a date.The party at the other side of the interface is the Choose an item.. They Choose an item.protection coordination on Click or tap to enter a date. |

## 2.2 Ability to Meet Dispatch Instructions

In the space below, indicate information that highlights your asset’s ability to meet dispatch instructions.

For the first selection, choose one of the following protocols from the drop-down menu:

* **ICCP**: this means you have agreed to receive and respond to dispatch instructions via ICCP (Inter-Control Centre Communications Protocol)
* **Web Services**: this means you have agreed to receive and respond to dispatch instructions via Web Services

For the second selection, choose one of the following options from the drop-down menu:

* **tested and available in Transpower dispatch systems as at**: this means that the dispatch facilities have undergone testing and are online from Transpower’s perspective. You will need to indicate the date that the system operator confirmed this with you.
* **undergoing testing, which is due on**: this means the dispatch facilities are being tested. The system operator expects this to be completed by the date that you will insert.
* **not required or not changing**: this means that, due to the specific nature of your project, dispatch facilities are not required or are not changing. You can ignore the date field that follows.

If necessary, provide further detail in the box to expand on your selections. Note that you must train personnel to receive and comply with these instructions. If your traders are unfamiliar with dispatching protocols, you must discuss this with the system operator.

|  |
| --- |
| The chosen protocol for dispatch communications is Choose an item.The electronic dispatch facilities for the unit(s) under test must be configured and test dispatches proven. Appropriate personnel/communication facilities must be in place to receive, acknowledge, comply with dispatch instructions. We acknowledge that the facilities and personnel are ready to meet communication requirements. The dispatch facilities for the unit(s) under test are Choose an item. Click or tap to enter a date. |

## 2.3 SCADA Visibility

In the space below, choose one of the following options from the drop-down menu to indicate the visibility of your SCADA in Transpower’s systems:

* **tested and available in Transpower operational systems as at**: this means the SCADA indications have been tested and the system operator has confirmed it is functional as expected. Indicate the date of this confirmation.
* **undergoing testing, which is due on**: this means the SCADA indications are currently being tested. You should indicate the date you expect this testing to complete.
* **not required or not changing**: this means that, due to the specific nature of your project, the system operator does not require your asset’s SCADA indications, or there is no change to existing SCADA indications. You can ignore the date field that follows.

Furthermore, you must ensure that SCADA indications sent to the system operator meets the requirements of Technical Code C of Part 8. The method of providing visibility of asset operation parameters is via ICCP (see [Inter-Control Centre Communications Protocol (ICCP) | Transpower](https://www.transpower.co.nz/my-transpower/customer-resources/inter-control-centre-communications-protocol-iccp) for more information, as well as [Transpower’s ICCP Standard](https://www.transpower.co.nz/sites/default/files/plain-page/attachments/GC%2029.01.pdf) for initial configuration).

|  |
| --- |
| The system operator requires the unit(s) under test to communicate reliably with the National Coordination Centre. Transpower’s method of providing visibility of the asset’s operational parametres is via ICCP.The SCADA indications of the unit(s) under test are Choose an item. Click or tap to enter a date. |

## 2.4 Connection Study and Study Cases

In the space below you must indicate the state of your connection study report and models for your study cases. Do this by choosing one of the options from the drop-down menu above:

* **has been agreed on**: this means you have provided the final report and study cases to the system operator and they have been agreed on. You will need to indicate the date of this agreement; check meeting minutes and correspondence from the system operator to be sure.
* **will be agreed on**: this means that the system operator expects to agree with your connection study report and study cases by the specified date.
* **is not required**: this means that, due to the specific nature of your project, the system operator does not require a connection study. You can ignore the date field in this case.

In the bottom row, indicate (by checking the box) which models you are submitting.

When required, you must provide the system operator with a connection study report and study cases for review at the times indicated in section four of [GL-EA-404 Generation Commissioning Process](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-404%20Generation%20Commissioning%20Process.pdf) (including when the final report and study cases are due). Refer to [GL-EA-953 Connection Study Requirements](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-953%20Connection%20Study%20Requirements%20for%20Connecting%20a%20New%20Generating%20Station.pdf) for a clear indication of what should be in this report.

|  |
| --- |
| The connection study report (with the study cases) Choose an item. Click or tap to enter a date. |
| Study cases included in the report | [ ]  PowerFactory[ ]  PSCAD |

## 2.5 Update of Reserves Management Tool

You must indicate your progress with updating the Reserves Management Tool (RMT). In the space below, choose one of the following options from the drop-down menu:

* **tested and available in Transpower production systems as at**: this means the unit(s) under test have been modelled within the system operator’s RMT. You will need to indicate the date that the system operator confirmed this with you.
* **undergoing testing, which is due on**: this means the modelling of the unit(s) under test are currently with the system operator and RMT is being updated. The system operator expects this to be completed by the date that you will insert after.
* **not required/not changing**: this means that the system operator does not need you to submit your asset’s model to update RMT. You can ignore the date field if you choose this option.

If necessary, provide further detail in the box to expand on your selection.

The system operator requires all generating assets to be modelled in the RMT. This applies regardless of offering reserves or not because the RMT needs to be updated to reflect the future state. In order to ensure it is updated on time, we remind you to share modelling information with the system operator, as well as details on what energy and ancillary services you intend to offer, and how you intend to offer them.

|  |
| --- |
| The asset’s modelling in RMT is Choose an item. Click or tap to enter a date. |

## 2.6 Update of Market Model

In the space below, indicate whether the status of the market modelling of unit(s) under test. Choose from one of the options in the drop-down menu:

* **tested and available in Transpower market systems as at**: this means the market modelling of your unit(s) have been updated. You will need to indicate the date that the system operator confirmed this with you.
* **undergoing testing, which is due on**: this means the market modelling update is underway and that the system operator expects testing to be done by the date indicated in the space after the option.
* **not required/not changing**: this means that the system operator has indicated it does not need to update the market model. This might be because there are no changes or the scope of work will have no impact on the existing market model.

If necessary, provide further detail in the box to expand on your selections.

The system operator models each generating asset in its market system. Each model is based on parameters and documentation supplied in the Asset Capability Statement. You must supply information connected to your asset to help complete the modelling of your asset.

|  |
| --- |
| The market model is Choose an item. Click or tap to enter a date. |

## 2.7 Engineering Methodology

In the space below you must indicate the state of your engineering methodology document. Do this by choosing one of the options from the drop-down menu above:

* **has been agreed on**: this means you have provided the finalised methodology to the system operator and it has been agreed. You will need to indicate the date of this agreement; check meeting minutes and correspondence from the system operator to be sure.
* **will be agreed on**: this means that the system operator expects to agree with your engineering methodology by the specified date.
* **is not required**: this means that, due to the specific nature of your project, the system operator does not require an engineering methodology. You can ignore the date field in this case.

When required, you must provide the system operator with an engineering methodology for review at the time indicated in section four of [GL-EA-404 Generation Commissioning Process](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-404%20Generation%20Commissioning%20Process.pdf?VersionId=XuEnccDw6FKVBl_9vK4jHHAwUhE6B448). This must include a full description of the proposed tests, the details of which are listed in [GL-EA-010 Generator Testing Requirements](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-010%20Generator%20Testing%20Requirements.pdf).

|  |
| --- |
| The engineering methodology Choose an item. Click or tap to enter a date. |

## 2.8 Operational Test Plans

In the space below you must indicate whether you have provided operational test plans for review. The system operator expects these at least 15 business days in advance of each test. Your drop-down menu options are:

* **have been provided on**: this means you have submitted your operational test plans for review on the date indicated.
* **will be provided on**: this means you are in the process of writing your test plans and will submit them to the system operator at the date you indicate.
* **are not required**: this means that the system operator does not need you to submit this document due to the specific nature of your project. Check in with the system operator to confirm whether this applies to the unit(s) under test. You can ignore the date field if you choose this option.

Refer to [FM-EA-010 Test Plan.docx](https://static.transpower.co.nz/public/bulk-upload/documents/FM-EA-010%20Test%20Plan.docx) for more information on requirements. Note that you can include advice of a temporary change in your asset’s capability or performance with your test. However, this must only apply for the test’s duration. If you are unsure whether a proposed test may impact system security or not, contact the system operator.

|  |
| --- |
| The operational test plans Choose an item. Click or tap to enter a date. |

## 2.9 Day-Ahead Schedule (only upon system operator request)

In the space below you must indicate whether you have provided a day-ahead schedule to the system operator. You will only need to provide this if the system operator requests it. Your drop-down menu options are the same as the Operational Test Plan above.

|  |
| --- |
| The day-ahead schedule Choose an item. Click or tap to enter a date. |

# Assessment of Compliance and Operational Considerations

## 3.1 Frequency Support Obligations

In the right-hand column of the table below, click on the appropriate box(es) to indicate the method(s) by which you will demonstrate compliance for each frequency support obligation. Your options are:

* **Test**: you will demonstrate compliance with this obligation via factory or site testing.
* **Power system analysis**: you will demonstrate compliance with this obligation through power system analysis using a vendor RMS or EMT model to verify the plant response.
* **Other**: you will demonstrate compliance with this obligation through another means, such as verification of ACS data. Please indicate the specific method by typing it out.
* **Not applicable**: you are not required to demonstrate compliance with this obligation.

|  |  |  |
| --- | --- | --- |
| **Code Clause** | **Description** | **The asset demonstrates compliance via…** |
| 8.17 | Contribution by injections to overall frequency management | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |
| 8.19 | Contributions to frequency support in under-frequency events | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |
| 8.25B(2) | Active power response to grid fault | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |

## 3.2 Voltage Support Obligations

In the right-hand column of the table below, click on the appropriate box(es) to indicate the method(s) by which you will demonstrate compliance for each voltage support obligation. Your options are:

* **Test**: you will demonstrate compliance with this obligation via factory or site testing.
* **Power system analysis**: you will demonstrate compliance with this obligation through power system analysis using a vendor RMS or EMT model to verify the plant response.
* **Other**: you will demonstrate compliance with this obligation through another means, such as verification of ACS data. Please indicate the specific method by typing it out.
* **Not applicable**: you are not required to demonstrate compliance with this obligation.

|  |  |  |
| --- | --- | --- |
| **Code Clause** | **Description** | **The asset demonstrates compliance via…** |
| 8.22 | Voltage Range AOPOs | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |
| 8.23 | Voltage Support AOPOs | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |
| 8.25B(1) | Reactive power response to grid fault | [ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |

## 3.3 Operational Communications

In the table below, in the column on the right, choose from the drop-down menu how you are going to demonstrate compliance with operational communication obligations. These include your asset’s ability to receive instructions and formal notices, transmit voice, data and indications while meeting the specified refresh and accuracy requirements. Your options are:

* **Documentation**: you will demonstrate compliance by providing the system operator certain documents
* **Test**: you will demonstrate compliance through testing
* **Calculation**: you will demonstrate compliance via system operator calculations
* **Other**: you will demonstrate compliance through some other means–mention what it is in the space
* **Not applicable**: you are not required to demonstrate compliance with this obligation.

|  |  |  |
| --- | --- | --- |
| **Code Clause** | **Description** | **The asset demonstrates compliance via…** |
| Technical Code C | Operational Communications | [ ]  Documentation[ ]  Test[ ]  Calculation[ ]  Other: Click or tap here to enter text.[ ]  Not applicable |

## 3.4 Ancillary Services Testing

In the right-hand column of the table below, choose the ancillary service(s) your asset **will** provide. If you are offering more than three services, simply copy-paste the ‘filled in’ rows into the empty rows below for each extra service. In the right-hand column, click on the appropriate box(es) to indicate the method(s) by which you will demonstrate compliance with the obligations connected each service. Your options are:

* **Test**: you will demonstrate compliance via factory or site testing.
* **Power system analysis**: you will demonstrate compliance with this obligation through power system analysis using a vendor RMS or EMT model to verify the plant response.
* **Other**: you will demonstrate compliance with this obligation through another means, such as verification of ACS data. Please indicate the specific method by typing it out.

If you are offering no ancillary services through the unit(s) under test, simply change the writing in the top row to reflect this. You can leave the rest of the table untouched.

The requirements for ancillary service testing are listed in our [GL-EA-010 Generator Testing Requirements](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-010%20Generator%20Testing%20Requirements.pdf) document. These services are defined in Code clause 1.1 (1). See also the [Procurement Plan](https://www.ea.govt.nz/documents/918/Certified_copy_of_document_-_ancillary_services_procurement_plan_-_3_May_2022.pdf). We remind you that you must engage with the Markets team within the system operator to initiate an Ancillary Services contract, and that you need to demonstrate the unit(s) under test’s capability to meet the ancillary service, offer and dispatch requirements.

|  |
| --- |
| We are offering the following ancillary services, all of which have been demonstrated as agreed in the engineering methodology document for the unit(s) under test: |
| Choose an item.  | This will be demonstrated through:[ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text. |
| Choose an item.  | This will be demonstrated through:[ ]  Test[ ]  Power system analysis[ ]  Other: Click or tap here to enter text. |
| Choose an item.  | This will be demonstrated through:[ ]  Test[ ]  Model[ ]  Other: Click or tap here to enter text. |
| *(space for other services – simply copy-paste the above into these rows as appropriate)* |  |
|  |  |
|  |  |

## 3.5 Offer and Dispatch

By ticking the check box below (with a click), you acknowledge that your asset will be subject to dispatch requirements (as outlined in Part 13 of the Code) for the entire commissioning period.

While it is possible that the system operator may grant asset owners relief from following dispatch instructions during some tests, this is an exception. Under normal circumstances, the intention is that your unit will follow dispatch.

|  |  |
| --- | --- |
| [ ]  | The unit(s) under test is/are subject to dispatch requirements for the entire commissioning period. |

## 3.6 Overview of System Tests

In the space below, provide a ‘high-level’ list of offline and online tests you expect to undertake to demonstrate compliance with your performance obligations. For example, if your unit has voltage obligations, then you should select **voltage** from the drop-down menu and then describe the specific voltage test you will undertake (for example, step injection). Do not explain these in detail here–that detail belongs in your engineering methodology document.

|  |
| --- |
| **Offline tests** |
| **Test Type** | **Description** |
| Choose an item. |  |
| Choose an item. |  |
| Choose an item. |  |
| Choose an item. |  |
| *(add more rows as needed)* |  |

|  |
| --- |
| **Online tests** |
| **Test Type** | **Description** |
| Choose an item. |  |
| Choose an item. |  |
| Choose an item. |  |
| Choose an item. |  |
| *(add more rows as needed)* |  |

## 3.7 Risks to the Power System

In the table below, indicate the risk that relates to the different periods of commissioning by choosing the option from the drop-down menu. Your options refer to the secondary risk that could be caused by the following classification of events:

* **Contingent Event (CE)**: this is the normal risk for any generating unit. The procurement of instantaneous reserves in the scheduling and dispatch process automatically mitigates this kind of event.
* **Extended Contingent Event (ECE)**: this is similar to the above, except that the mitigation happens through procurement of instantaneous reserves **in combination** with automatic under-frequency load shedding.

You can add information in the table if more detail would make your unit(s) risk situation clearer for the system operator.

|  |
| --- |
| We will submit hold point tests results with the system operator immediately after completion, in order to enable resource allocation for assessing the preliminary test results. The unit(s) under test must not exceed the agreed MW output at these hold points until test results are assessed and agreed by the system operator (which will normally take place within 2 business days). |
| **Period of Secondary Risk** | **Assessed Risk** | **Risk Mitigation** |
| Initial (when first synchronised) | Choose an item. | Results to be assessed:[ ]  Frequency[ ]  Voltage[ ]  Other: Click or tap here to enter text. [ ]  Not required |
| After Hold Point 1 | Choose an item. | Results to be assessed:[ ]  Frequency[ ]  Voltage[ ]  Other: Click or tap here to enter text. [ ]  Not required |
| After Hold Point 2 | Choose an item. | Results to be assessed:[ ]  Frequency[ ]  Voltage[ ]  Other: Click or tap here to enter text. [ ]  Not required |
| (optional) After Hold Point 3(insert more hold points as needed below this) | Choose an item. | Results to be assessed:[ ]  Frequency[ ]  Voltage[ ]  Other: Click or tap here to enter text. [ ]  Not required |

## 3.8 Special Provisions

Use the table below to record details of any Code clauses you may require relief from during commissioning. We remind you that we require that your operational test plans must record any specific relief from Code obligations that applies to the unit(s) under test.

Here is an example of how you might fill out a row of the Special Provisions table:

| **Code Clause** | **Description** | **Duration Required** |
| --- | --- | --- |
| *8.17* | *Relief from frequency control obligations for governor testing* | *Until governor control testing is complete* |

| **Code Clause** | **Description** | **Duration Required** |
| --- | --- | --- |
|  |  |  |
|  |  |  |
|  |  |  |

# Deliverables during Post-Commissioning (Closeout)

The deliverables of the Code commissioning plan include activities within this section, performed during the closeout phase. These must be completed before the Code commissioning plan expiry date agreed in section 1.2 above.

## 4.1 Timing of Closeout Phase Activities

In the space below, you must indicate the planned dates for each of the closeout phase activities. We remind you that the commissioning process is not completed when testing is finished. It is completed only when you submit all documentation required from the closeout phase and after the system operator performs a final assessment. Refer to section six of [GL-EA-404 Generation Commissioning Process](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-404%20Generation%20Commissioning%20Process.pdf) to clarify timing further and other details.

Leave the final row of the table blank if you are not offering any ancillary services.

|  |  |
| --- | --- |
| **Closeout activity** | **Planned date to complete activity** |
| Test results submitted | Expected **up to** **1 week after** the date you expect to complete unit testing | Click or tap to enter a date. |
| Asset Capability Statement updated to Final version in database  | Expected **up to 2 months after** unit tests are expected to complete | Click or tap to enter a date. |
| Power system model(s) validated against test results and submitted | Expected **up to** **2 months after** the dateyou expect to complete unit testing | Click or tap to enter a date. |
| Test results that show the unit meets ancillary service requirements | Expected **before** you offer the ancillary service(s) outlined in Section 3.4 above | Click or tap to enter a date. |

## 4.2 Validated Power System Models

Use the table below to record the validated power system models that the system operator requires you to submit. In the middle column, click the box to ‘tick’ it and acknowledge that the model features that particular detail. In the Submission Status column on the right, choose from the drop-down menu options:

* **will be submitted on:** this means you aim to submit the particular model to the system operator on the date you indicate.
* **not required:** this means that the system operator does not require you to submit this type of model.

Refer to [GL-EA-716 Power Plant Dynamic Model Validation and Submission Prerequisites](https://static.transpower.co.nz/public/bulk-upload/documents/GL-EA-716%20Power%20Plant%20Dynamic%20Model%20Validation%20and%20Submission%20Prerequisites.pdf) for more information on the specifications that apply to these models.

|  |  |  |
| --- | --- | --- |
| **Model** | **Details** | **Submission Status** |
| TSAT model | [ ]  Tuned to “as built” settings | Choose an item.Click or tap to enter a date. |
| Power Factory model | [ ]  Tuned to “as built” settings[ ]  Unencrypted[ ]  Detailed | Choose an item.Click or tap to enter a date. |
| PSCAD model | [ ]  Tuned to “as built” settings[ ]  Detailed | Choose an item.Click or tap to enter a date. |
| WECC model | [ ]  Tuned to “as built” settings[ ]  Detailed[ ]  In PowerFactory | Choose an item.Click or tap to enter a date. |

## 4.3 Dispensations, Equivalence Arrangements, Exemptions

Use the table below to record any dispensations that identify shortfalls in performance that will exist at the end of the commissioning period relating to the asset being commissioned. The table should also record any equivalences that identify where AOPOs or technical codes are met in ways different to how the Code prescribes. Finally, you should note down any exemptions gazetted by the Electricity Authority in this table.

Note that it can take the system operator a few months process dispensation or equivalence applications, so we remind you to be proactive with your requests to avoid breaches of the Code.

| **Dispensation or Equivalence or Exemption** | **Code Clause** | **Description** | **Duration Required** |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# Appendix

Include here any single line diagrams and other elements that you have referred to in earlier sections of the Code commissioning plan.