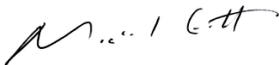


SYSTEM RESTART COMMUNICATION PROTOCOL

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1. INTRODUCTION

1.1. Purpose and scope

This document is the primary part of the Communication Protocol (Protocol) made under clause 4.8.12(j) of the National Electricity Rules (NER). It establishes requirements to facilitate the exchange of all information relevant to the roles played by AEMO, *Network Service Providers* (NSPs), *Generators* and *Customers* in the preparation and implementation of the *system restart plan*.

Therefore, this protocol seeks to define the expectations for information exchange that AEMO and relevant participants will undertake for both:

- (a) planning for system restarts including the preparation and ongoing development of the *system restart plan*; and
- (b) the implementation of the *system restart plan* by way of testing and in any real event.

The remaining aspects of the Communication Protocol are included in the System Restart Plan Overview document (SO_OP_5000), covering communication flows and methods after a *major supply disruption* occurs. SO_OP_5000 is made available by AEMO to NSPs, *Jurisdictional System Security Coordinators* (JSSCs), and certain other *Registered Participants*.

This Protocol is also designated as a *power system operating procedure* under clause 4.10.1(a)(5) of the NER.

The Protocol has effect only for the purposes set out in the NER. The NER and the National Electricity Law prevail over this Protocol to the extent of any inconsistency.

1.2. Definitions and interpretation

1.2.1. Glossary

The words, phrases and abbreviations set out below have the meanings set out opposite them when used in this Protocol.

Terms defined in the National Electricity Law or the NER have the same meanings in this Protocol unless otherwise specified in this section. Those defined terms are intended to be identified in this Protocol by italicising them, but failure to italicise a defined term does not affect its meaning.

Table 1 Glossary

Term	Definition
Control Centre	The nominated 24-hour operational control room of AEMO or a <i>Network Service Provider</i> .
DNSP	<i>Distribution Network Service Provider</i>
ICCP	Inter-Control Centre Communications Protocol
JSSC	<i>Jurisdictional System Security Coordinator</i>
LBSP	Local Black System Procedures
MNSP	Market Network Service Provider
NER	National Electricity Rules
NSP	<i>Network Service Provider</i> (includes TNSP, DNSP and MNSP)
OTN	Operational Telephone Network

Term	Definition
PSTN	Public Switched Telephone Network
Restart Participants	All NSPs and <i>SRAS Providers</i> , and those <i>Generators</i> and <i>Customers</i> whose <i>facilities</i> are identified by AEMO as integral to the implementation of the <i>system restart plan</i>
SCADA	Supervisory Control and Data Acquisition. This is a control system architecture that uses computers and communication networks to receive telemetry from, or control peripheral devices, such as remote terminal units.
SRAS	<i>System restart ancillary service</i>
TNSP	<i>Transmission Network Service Provider</i>

1.2.2. Interpretation

This Protocol is subject to the principles of interpretation set out in Schedule 2 of the National Electricity Law.

1.3. Related documents

Table 2 Relevant Procedures

Procedure Ref.	Title	Published by
SO_OP_5000	System Restart Plan Overview	AEMO
	Guidelines for Preparing Local Black System Procedures	AEMO
	Manual Load Shedding Standard	AEMO

2. RESPONSIBILITIES

2.1. Requirements for this Protocol

- (a) In accordance with clause 4.8.12(j) of the NER, AEMO and Network Service Providers must jointly develop written communication protocols to facilitate the exchange of all information relevant to the roles played by AEMO and *Registered Participants* in the preparation and implementation of the *system restart plan*.
- (b) Under clause 4.8.12(k) of the NER, the communications protocol must specify the categories of information required to, and the timing and process by which information will, be exchanged between:
 - (i) AEMO and *Registered Participants* as relevant, in order for AEMO to prepare and implement the *system restart plan* and for AEMO and the relevant parties to give effect to the *system restart plan*;
 - (ii) TNSPs and parties connected to a TNSP's *transmission network* regarding the nature of *connection point* and *load* characteristics;
 - (iii) NSPs and *Generators* regarding *connection point* characteristics and the steps that may need to be conducted before or during the process of restoring the *power system*; and
 - (iv) DNSPs and parties connected to the DNSP's *distribution network* regarding the nature of *connection point* and *load* characteristics.

- (c) This protocol may include requirements regarding the type, timing and method of providing information for system restart purposes that are additional to those in the NER, or need to be modified in specified circumstances. This protocol is not intended to give rise to any inconsistency with NER obligations, nor any requirement for material expenditure in excess of that needed to comply with other mandatory obligations applicable to AEMO or a Restart Participant.

2.2. Compliance and information sharing obligations

- (a) In accordance with clauses 4.8.12(l) and (m) of the NER, AEMO and relevant *Registered Participants* must:
 - (i) take all reasonable steps to comply with this Protocol; and
 - (ii) respond to any reasonable requests for information contemplated by this Protocol.
- (b) The information and communication requirements in this Protocol are ongoing obligations. They are intended to ensure that the *system restart plan* reflects the current status of *power system* equipment, and that AEMO, Restart Participants and other affected parties maintain the communication facilities necessary for effective implementation of the *system restart plan* at any time.
- (c) Each Restart Participant must share any information or change in status relating to the operation of its *facilities* that could reasonably be expected to affect the development or implementation of the *system restart plan*, as indicated in section 3 of this Protocol, as follows:
 - (i) DNSPs must provide relevant information about their *networks*, including *embedded generating units* and *load*, to the connecting TNSP;
 - (ii) *Generators* must provide relevant information about:
 - (A) *transmission-connected generating systems* to AEMO and the connecting TNSP; and
 - (B) *embedded generating units* to AEMO and the connecting DNSP;
 - (iii) *Customers* must provide relevant information about any applicable *load facilities* to the connecting NSP; and
 - (iv) TNSPs must provide relevant information about their *networks*, including directly connected *load facilities* and information provided by DNSPs and *Generators*, to AEMO.

To the extent that *Generators*, NSPs and any relevant *Customers* are required to include, and have provided, relevant information to AEMO in their current *local black system procedures*, it need not be communicated separately under this Protocol. AEMO may share an LBSP for a *facility* with the NSP whose *network* interfaces with that *facility*.

- (d) JSSCs must share with AEMO any relevant requirements with regard to *load* restoration during a system restart.
- (e) As soon as reasonably practicable after receiving information that materially affects the *system restart plan* for any *region*, AEMO must consult with the relevant TNSP and make any necessary changes to the *system restart plan*.

3. INFORMATION REQUIREMENTS FOR THE RESTART PLAN

3.1. Overview

Matters that are likely to affect the development or implementation of the *system restart plan* include those described in this section 3. Restart Participants are expected to identify information relevant to those matters, including any changes or updates they become aware of, and give that information to the applicable NSP or AEMO as set out in section 2.2(c).

3.2. System Security Obligations

The *system restart plan* must maintain a focus on *power system security*. Restart Participants with access to the *system restart plan* should identify any aspect of the plan concerning the energisation or operation of their *facilities* where system security could be improved through the revision of switching sequences, SRAS unit commitments, stabilising load blocks, etc.

3.3. Consideration of the Technical Envelope

AEMO and the relevant NSPs must assess the *technical envelope* of the *power system* during a system restart. This is generally characterised by reduced fault levels and inertia, which has the potential to impact oscillatory stability, voltage control, power quality and transient stability limits. Consequently, the *system restart plan* must consider any relevant *network limits* that apply during a system restart.

Restart Participants must identify any requirements to adjust *control systems* prior to re-energisation during a system restart, such as changes to the closed loop gain requirements of inverter-based devices, disabling automatic switching schemes or special protection schemes. Similarly, consideration must be given to the requirement to modify *protection systems* to avoid prolonged clearing times during system restart, such as through the enabling of 'weak infeed' distance protection, configuring auto-reclose settings, and assessing the reliability of protection inter-tripping.

3.4. Time sensitive requirements

Restart Participants must identify any time sensitive requirements to be considered within the *system restart plan*. This assessment should be restricted to the objective of establishing generator auxiliary supplies, procurement of stabilising load, and providing supply to any *sensitive loads*. Examples could include the identification of auxiliary supplies that affect compressors associated with hydraulic circuit breakers, the timely restoration requirements for generator degassing, SCADA and communications systems, as well as time limitations on industrial processes, such as smelters.

3.5. Conflicting legislative requirements

Restart Participants must identify and address any conflicting compliance requirements that materially affect the development or implementation of a *system restart plan*. An example could include obligations to patrol distribution feeders prior to energisation during total fire ban conditions. This specific example must be resolved in accordance with the Manual Load Shedding Standard.

4. COMMUNICATION FACILITIES

4.1. Requirements for Operational Communications

Each Restart Participant must have a 24/7 operational contact in Australia, who is familiar with the terminology required for a power system restart and is competent to operate the participant's *facilities* in accordance with instructions from AEMO or an NSP as applicable. All Restart Participants should regularly update the 24/7 contact details to AEMO and their connecting NSP. This information must be provided as soon as practicable following any changes to voice telephony details.

The provision of these operational contacts will facilitate effective communication through the following channels:

- AEMO to communicate directly with TNSPs and *Generators*.
- TNSPs to communicate directly with AEMO, the DNSPs and any large *transmission-connected* end users.
- DNSP to communicate directly with TNSP and relevant *distribution-connected* end users and non-registered *Embedded Generators*.

4.2. Availability and Testing of Emergency Communications

All primary communications links between AEMO and the Restart Participant should be available for at least three hours following a loss of electrical supplies within the NEM.

The provision of backup communications links should be considered as a means of reinforcing the availability of communications between control centres. These backup systems can include dedicated PSTN, backup OTN links or terrestrial radio systems.

Emergency backup communications links must also be available between AEMO, NSPs, and *SRAS Providers*. These emergency communications links should provide an availability of at least 12hrs standby, with 3hrs talk time.

Testing of all operational telephony systems should be conducted at least once every 6 months, with remediation of any observed defects in accordance with the following table. Testing requires a coordinated check of the connection and quality of operational voice channels, where the results are retained for at least 12 months following the test.

Communications Links Between Control Centres	Remediation Requirement
Primary Operational Telephony Link	24 hrs
Backup Links	7 days
Emergency Communications Link	28 days

4.3. Emergency Communications Plan

All Restart Participants must develop an emergency communications plan which defines which communications systems are available, the priority order for utilising these communications and an agreed protocol for when these communications services will be utilised, or turned on.

This plan should consider the various communications tiers, which account for how information shall be shared in real-time between both Control Centres and between teams responsible for emergency management. These tiers may be defined by the following categories:

Category	Description
Operational Communications	Communication links between control centres intended for use by power system operators or controllers. This category shall be used for the purposes of operational commands leading to the operation of the network
Strategic Communications	Communication channels established between Restart Participants utilising back-office or support staff with the objective of assisting in coordination of the restart and operational awareness of power system operators or controllers.
Executive Communications	Communications between responsible officers within the jurisdiction or executive officers of Restart Participants