Economic Regulation Authority

ERA Workshop

Proposed amendments to the Technical Rules

Submitted by Western Power in November 2015, March 2016 and April 2016

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Housekeeping

- **Toilets are located just outside the training room, to the left and right of the coffee station**
- **Please put mobile phones on “silent”**
- **The ERA’s media team may take photos during the workshop. Please advise Nurcan, or Elizabeth if you do not want your photo to be published.**
- **Nametags**
- **Attendance sheet**
- **Copies of Draft Decision, ERA Issues Papers and Western Power submissions available**

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Economic Regulation Authority Team

- **Robert Pullella, Executive Director, Access**
- **Elizabeth Walters, Assistant Director, Electricity**
- **Nurcan Catan, Graduate Analyst, Access**

Western Power

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Purpose of this Workshop

- ERA currently considering three “packages” of technical rule amendments
  - November 2015 (DC Injection)- consulting on Draft Decision
  - March 2016 (user agreed connections, two/three phase earth faults, weak infeed)- consulting on proposal
  - April 2016 (NCR planning criteria)- consulting on proposal
- Provide stakeholders with the opportunity to ask questions to help prepare their written submissions (consultations close early June)
- Provide Western Power with the opportunity to outline its proposal and seek feedback directly from stakeholders
- No decisions will be made in this workshop- information sharing only
- Secretariat views only (Technical Consultant- Geoff Brown)

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Decision Criteria

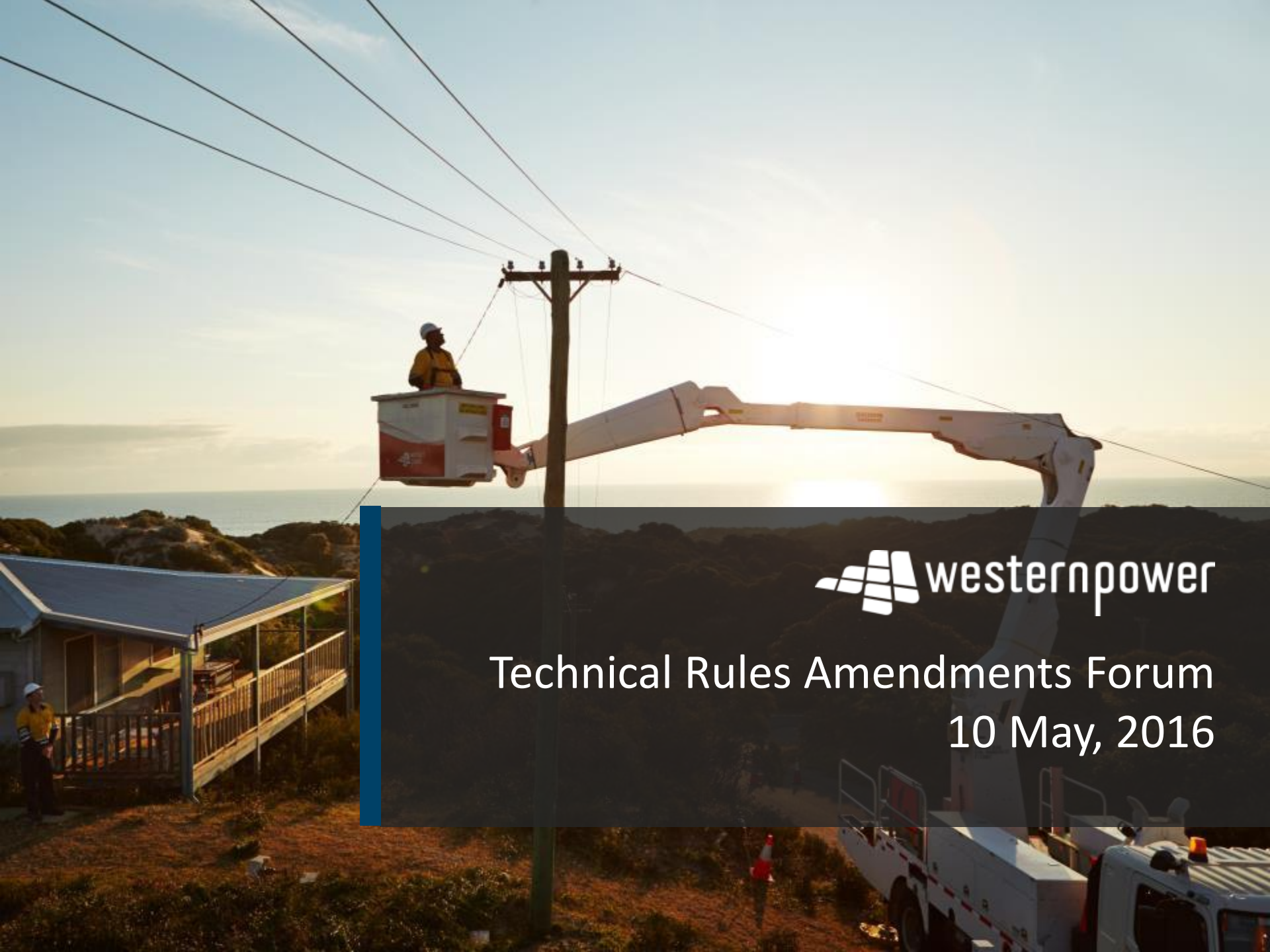
- Must promote economically efficient investment in and operation and use of the network to promote competition
- Reasonable
- Don’t impose inappropriate barriers to entry
- Consistent with good electricity industry practice
- Consistent with relevant laws and statutory instruments

Agenda

- 2pm: Proposed Amendments April 2016
- 2:40pm: Proposed Amendments March 2016
- 3:20pm: Afternoon Tea Break
- 3:40pm Proposed Amendments November 2016

Western Power to present on each topic

Q&A at end of each session



Technical Rules Amendments Forum
10 May, 2016

Introduction

- Western Power has submitted several rounds of Technical Rules amendment requests to the Authority in recent months
- Western Power is providing information to explain these amendments to a wider audience today
- Three groups of topics within these Technical Rules amendment submissions are considered here:
  1. April 2016 – “Part B”
  2. March 2016 – three separate issues
  3. November 2015 – “Part A”

Agenda

April 2016	Part B	1. NCR planning criteria
		2. 2015 Safety Regulations update
		3. Adopt revised Standards
		4. Typographical corrections
March 2016		1. User agreed connections
		2. Two/three phase earth faults
		3. Weak infeed
November 2015	Part A	1. DC injection
		2. Connection point definitions

April 2016

There are four “Part B” components:

1. Normal Cyclic Rating (NCR) planning criterion
2. 2015 safety regulations
3. Updating to latest version of standards
4. Typographical corrections

1. Modify the Normal Cyclic Rating (NCR) criterion

- The NCR risk criterion applies where power transfer capacity at an NCR substation reduces significantly following the unplanned loss of a supply transformer within that substation
- Special provision is made within an NCR substation design so that if there is such a failure, a spare temporary transformer can be readily transported to site within a short period

Proposed Rule change

1. Modify **NCR criterion** clause

2.5.4 Zone Substations

b) Normal Cyclic Rating (NCR) Criterion

1. The NCR risk criterion permits the loss of a portion of *power transfer* capacity at a *substation* following the unplanned loss of a supply transformer within that substation.

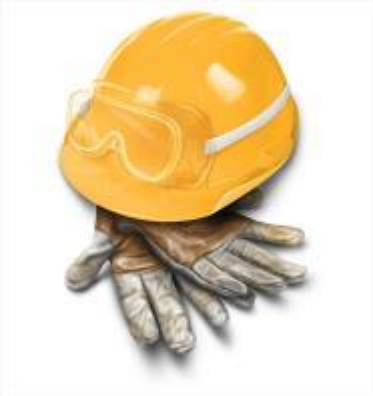
~~2. The portion of the *power transfer* capacity that may be lost is the lesser of:~~

~~A. 75% of the power transfer capacity of the smallest supply transformer within the substation; and~~

~~B. 90% of the *power transfer* capacity of the rapid response spare supply transformer.~~

Replace cl. 2.5.4.(b) 2. with:

2. The maximum *power transfer* at an NCR *substation* is 75% of the *power transfer* capacity of the *substation*, except that the total *power transfer* capacity lost shall not exceed 90% of the *power transfer* capacity of the rapid response spare *supply transformer*.



April 2016

The remaining “Part B” components:

1. Normal Cyclic Rating (NCR) planning criterion
2. 2015 safety regulations
3. Updating to latest version of standards
4. Typographical corrections

Proposed April “Part B” Rule changes - continued

2. Adopt the recent changes in Western Australian safety regulations (2015).
3. Adopt changes to Standards by default – rather than requiring an amendment for each and every change.
4. Spelling and grammatical corrections

March 2016

1. **User agreed connections**
2. Two/three phase earth faults
3. Weak infeed

1. User agreed connection arrangements

- The Technical Rules set out capacity planning standards to ensure reliable supply of electrical energy to network Users.
- In some places network augmentation is required to connect additional users and maintain this capacity planning standard
- Rather than augment the network some new Users prefer to have more flexible lower cost arrangements where their supply is reduced under some circumstances
- Under present arrangements this requires an exemption from the Technical Rules creating delays in customer connection process

Proposed Rule change

Modify the present Rule as below, and add two exceptions, one of which already exists.

To: 2.5.2.2 N-1 Criterion

(b) For sub-networks designed to the N-1 criterion supply must be maintained and load shedding avoided at any load level and for any generation schedule following an outage of any single transmission element, except where:

(1) a zone substation was designed to the 1% risk or NCR criteria in accordance with clause 2.5.4; or

(2) operational restrictions have been agreed between the Network Service Provider and a User as per clause 3.1(b).

March 2016 submission

1. User agreed connections
2. **Two/three phase earth faults**
3. Weak infeed

2. Two phase credible contingency

- The proposed amendment better aligns with Eastern states (NER)
- Typically provides for higher power system transfer limits leading to delayed network investment triggers
- May allow connection of additional Users in some areas without costly network augmentation
- Actual likelihood of a fault in the network doesn't change
- Network still designed to survive non credible faults with interruption (no widespread blackout allowed)
- Proposal allows for an assessment of likelihood of a certain type of fault occurring

Proposed Rule change

Amend the first entry in the existing Glossary definition for “credible contingency”.

To: The definition of *credible contingency event* in the Glossary amended.

A single *contingency event* of one of the following types:

(a) for voltages at or below 66 kV, a three-phase to earth fault cleared by *disconnection* of the faulted component, with the fastest *main protection scheme* out of service;

(b) for voltages above 66 kV, a two-phase or three-phase to earth fault (consistent with good industry practice and based on modes of operation) cleared by *disconnection* of the faulted component, with the fastest *main protection scheme* out of service;

Renumber b) through e) to c) through to f).

This will globally add this discretion to the references in the Rules which defer to this definition.

March 2016

1. User agreed connections
2. Two/three phase earth faults
3. **Weak infeed**

3. Weak infeed

- Weak infeed can result in some circumstances when a small generator is connected and its output interferes with the operation of existing protection systems on the network
- The likelihood of this happening can be assessed and a risk mitigation strategy agreed with the User
- Western Power has a way of ensuring risk is appropriately dealt with – but the wording in the Rules does not presently give clarity that full compliance is maintained
- This amendment proposes to use similar words as are in the NER and give Users and Western Power the discretion to deal with potential weak infeed scenarios in a clear, transparent and consistent way (without requiring an exemption for each case)

Proposed Rule change

From: Present cl. 2.9.4.

To: Add the following clause (j) to clause 2.9.4 after current clause (i).

(j) Notwithstanding any other provision contained in this Rule 2.9.4, for *weak infeed fault conditions* resulting from the connection of *embedded generating units*, the *total fault clearance time* of one of the protection schemes shall meet the remote end *total fault clearance time* of table 2.11. The *total fault clearance time* of the other *protection scheme* shall be as deemed necessary by the *Network Service Provider* to prevent damage to the *transmission or distribution system* and to meet *power system stability* requirements.

Addition to the *Rules* Glossary:

Weak infeed fault conditions occur when a *distribution connected embedded generating unit* supplies a fault current which is significantly below normal *load* current of the installed *transmission protection scheme*.

Agenda

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November 2015- Draft Decision

- Agree changes in relation to DC Injection are necessary
- Issues with proposed amendment to set a limit
- How to best address problem?

November 2015 – Part A

Draft decision published 4 May 2016.

DC injection

DC injection amendments progress

- Modifications to the present Rule are required.
- Our proposal to change the present approach by retaining a limit has been found to be an unacceptable longer term solution to problems which arise from the Rule imposing a limit of zero DC injection.
- Thus it is proposed to remove the clause cl. 3.2.1(c)(3) and rely on the other Rules already in place to ensure harmonic limits are met.

Proposed Rule change

From: Present Rule *3.2.1(c) Harmonics*

(1) A User must comply with any harmonic emission limits allocated by the Network Service Provider in accordance with clause 2.3.4(a).

(2) Where no harmonic injection limit has been allocated in accordance with clause 2.3.4(a), a User must ensure that the injection of harmonics or interharmonics from its equipment or facilities into the transmission or distribution systems does not cause the maximum system harmonic voltage levels set out in Table 2.4 and Table 2.5 to be exceeded at the point of connection.

(3) A User must not inject into the transmission or distribution system any DC component of current produced by its own equipment.

To: Remove the clause (3)

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Thank You

- Interested parties are invited to make submissions to the ERA on the Proposed Amendments March 2016 Issues Paper and the Proposed Amendments April 2016 Issues Paper by **4.00 pm (WST) on Friday, 3 June 2016**.
- Public Consultation on the ERA's Draft Decision on the Proposed Amendments November 2015 is open until **4.00 pm (WST) on Tuesday 7 June 2016**.
- Slides will be circulated
- Feel free to contact us