

SYSTEM DESCRIPTION

Alinta Energy

Effective to 30 June 2024

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PURPOSE

This is Alinta Duke Energy WA Power Pty Ltd's ("ADEWAP") System Description prepared in accordance with the Pilbara Network Access Code ("PNAC"), the Pilbara Network Rules ("PNR") and the Harmonised Technical Rules ("HTR").

Section 36 of the PNAC establishes the need for this document as follows:

36. Obligation to publish information

(1) An NSP for a light regulation network must in accordance with this Code prepare, publish and maintain the following instruments in respect of the light regulation network:

(a) a system description;

The system description requirements are set out in Section 9 of the PNAC as follows:

The "system description requirements" for a light regulation network are that the description includes at least:

(1) a map showing the geographical extent of the light regulation network;

(2) a simplified single line diagram of the light regulation network that shows the location of key facilities;

(3) all constraint rules which may affect access to or use of the network;

(4) current limit advice provided to the ISO under the PNR;

(5) any other technical constraints in the light regulation network that will or are reasonably likely to materially affect access to or use of the network;

(6) reasonable information about the light regulation network's capacity in key locations.

EFFECTIVE DATE

This System Description is correct as at 1 July 2021.

OTHER RELEVANT POLICIES

The System Description should be read in conjunction with the ADEWAP Contributions Policy.

ADEWAP System

The assets associated with ADEWAP's Port Hedland operations include the ADEWAP Network[1] and the operation of its Port Hedland Power Station.

ADEWAP Port Hedland Assets

Figure 2 (attached at the end of this document) provides a map of the ADEWAP Network, which consists of three 66kV feeders comprising of about 22.5km of 75MVA conductor, of which:

- two feeders connect Port Hedland Power Station to the Horizon Power network substations of Wedgefield and Murdoch; and
- a single line runs between and connects the Port Hedland Power Station's two sites of generation (at Port Hedland and Boodarie).

A printable version of the SLD shown at Figure 3 (attached at the end of this document) is available on the ADEWAP website: www.adewap.com.au.

The ADEWAP Port Hedland Power Station has an operational capacity of around 175MW.

The table below describes the thermal ratings / limits of ADEWAP's transmission lines:

ADEWAP's Transmission Line	Summer 45°C	Limiting Component	Protection Operate Limit	MVA
Hedland Power Station – Boodarie Power Station 66kV Line	1014A	Conductor	1560A	109
Hedland Power Station – Murdoch Drive Substation 66kV Line	670A	Conductor	1560A	75
Hedland Power Station – Wedgefield Substation 66kV Line	860A	Conductor	1560A	98

ADEWAP Network Operation

ADEWAP operates the ADEWAP Network on a 'n-1' basis[2]. Therefore, the two 66kV feeders that connect ADEWAP's Port Hedland Power Station to the Horizon Power network (at Wedgefield and Murdoch) operate as a single connection on an n-1 basis. This provides approximately 68MW of firm network capacity. Figure 1 presents a conceptual view of this below.

[1] The PNAC defines the Alinta Port Hedland Network as the network comprising -

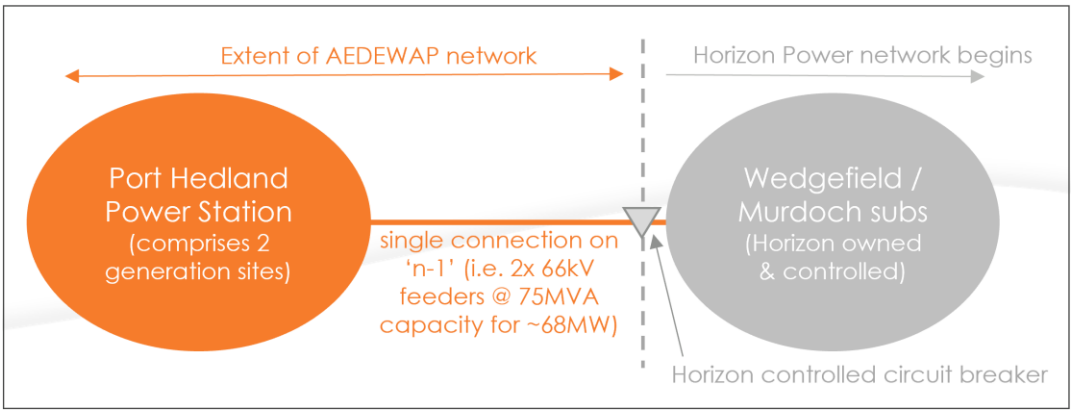
(a) the network as at the code commencement date used for connecting Alinta's Port Hedland and Boodarie power stations with each other, and with Horizon Power's Wedgefield and Murdoch substations; and

(b) any augmentation of the network which forms part of the network under section 4(1) [of the PNAC].

For the purposes of this document, references to ADEWAP Network have the same meaning as Alinta Port Hedland Network defined in the PNAC.

[2] Noting the one exception, as outlined within the ADEWAP Planning Standards, that the HPS-TIG 66kV Transmission Line tee-off operates on an n-0 basis which only impacts the network users who utilise that connection point.

FIGURE 1 – CONCEPT OF ADEWAP NETWORK OPERATING PHILOSOPHY



This mode of n-1 operation is necessitated by good electricity industry practice, since the loss of a single 66kV feeder would see all load immediately transfer to the 66kV feeder which remains in service. Operating on an n-1 basis therefore avoids the 66kV feeder that remains in-service being overloaded, and therefore also lost due to the load exceeding its physical thermal capacity.

ADEWAP Network Capacity

At the time of this publication, there are three contracted users of the ADEWAP Network who all have firm network usage rights under long term agreements. In total, these users have contracted 120MW of firm network capacity, which operates in conjunction with a contractually set tiered ranking of priority. There is a further 50MW of non-firm, 'as available' capacity that is also contracted by the three existing users.

The combination of the ADEWAP Network users' current contracted firm plus non-firm network usage rights see no availability of firm network capacity capable of being contracted by new prospective users of the ADEWAP Network without user funded augmentation in accordance with the ADEWAP Contributions Policy available on the ADEWAP website: www.adewap.com.au.

FIGURE 2: ADEWAP GEOGRAPHICAL EXTENT

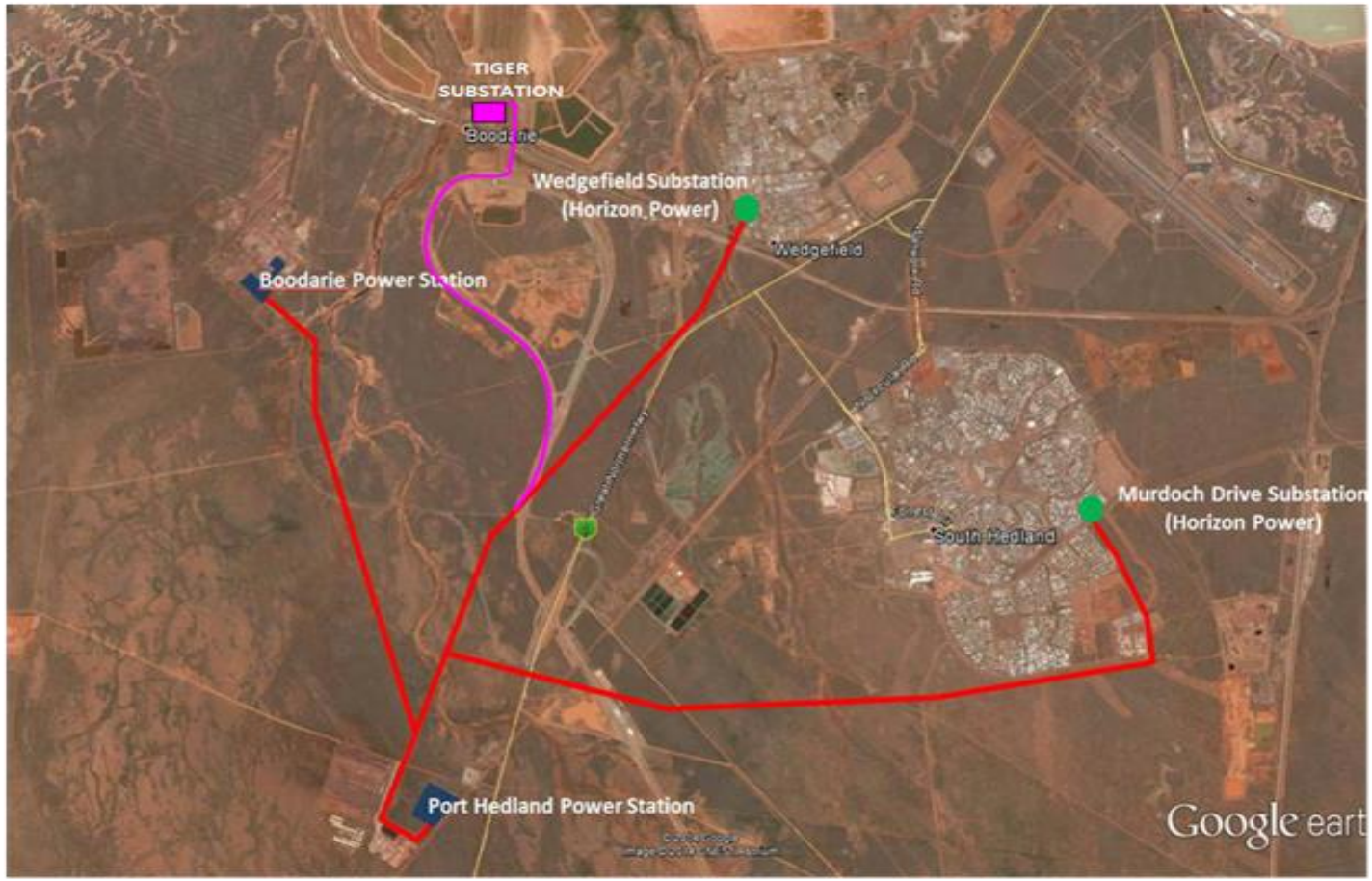


FIGURE 3: ADEWAP SINGLE LINE DIAGRAM

