

Dear Economic Regulation Authority

IGO's Submission into the Western Power's Application for exemption from the Technical Rules – Bounty Substation and Kondinin-Bounty Sub-Network

Introduction

IGO welcomes the opportunity to comment on the Western Power Application as an interested party materially affected by the application proposal. IGO's Forrestania Nickel Operation ('Forrestania') is located 400km east of Perth in Western Australia and consists of the underground mine 'Flying Fox' and 'Spotted Quoll' loads ('Forrestania Mine') and a nickel concentrate process plant ('Cosmic Boy Concentrator') load with associated accommodation, offices, dewatering and communication facilities.

In 2022, the Forrestania Operation was acquired by IGO as part of the acquisition of Western Areas. The Flying Fox and Spotted Quoll underground mines are very deep and require continuous power for de-watering to avoid flooding the deep production levels.

Western Power's Application for Exemption

Western Power's Application for exemption from the Technical Rules – Bounty Substation and Kondinin-Bounty Sub-Network should not be granted in full.

High Risk of Failure

The application states *"The Bounty zone substation supplies two existing mining and mineral-processing loads via a 57 km distribution feeder. There are no residential customers supplied from the Bounty zone substation and no adjoining distribution networks for interconnection. The total contracted load for the two connected customers is 9.7 MVA."*

The Flying Fox Mine NMI 8001000287-2 and the Cosmic Boy Concentrator NMI 8001000878-8 are the only two loads supplied. The combined CMD to IGO is 9.6MW (9.7MVA). This confirms IGO as the User to be materially affected by the proposal.

Despite applications and expenses paid to Western Power for engineering to increase this load in 2015 and again in 2018 to enable mine expansion, the CMD has remained at this level because:

1. Western Power designed their Kondinin and Bounty substations with a peak load of less than 10 MVA as N-0.
2. A requirement would be triggered for increases above the 10MVA, for Western Power to meet compliance with clause 2.5.2.2 (N-1 criterion) of the Technical Rules with respect to the Kondinin – Bounty (KDN-BNY) sub-network and the Bounty zone substation (BNY).

It is IGO's understanding that even with an exemption for Western Power to operate their N-0 assets above 10MVA, (IGO) loads would be subject to the **increased risk of transformer failure (due to increased load** on the ancient Kondinin and Bounty power transformers) and the subsequent lengthy power outages for remedial works.

It is IGO's understanding that locating a **suitable replacement transformer (in the event of failure) would be a challenging process**, and there may not be a 'spare' readily available. This increased risk of power failure due to higher loads was unacceptable to IGO's production activities.

The Flying Fox Mine and Cosmic Boy Concentrator have long suffered from an increase in power interruption due to bushfires, but increasingly due to Western Power maintenance on N-0 assets. **There is no 'switch-around' to bypass an asset under maintenance.**

Routine Western Power maintenance of any asset within the N-0 means blackout and lost production for IGO.

During January 2022, the grid was turned off for extended maintenance. The Cosmic Boy Concentrator needed to hire temporary diesel generation, and the mine and accommodation needed to run diesel generation, continuously for days.

Low Fault Current

Due to the distance of the distribution feeder and N-0 assets design from Kondinin to Bounty to the mine and process loads, **the fault current is very low**. The short circuit protection systems in Western Power protection schemes must be set very low to ensure safe operation but this also means customer assets at the point of attachment have a very narrow envelope to achieve safety grading margins of short circuit protection.

In theory, short circuits in customer equipment should be detected and isolated safely by the customer protection device (i.e. recloser) without affecting the Western Power network. In practice, with very small protection grading margins, short circuit faults on customer equipment can sometimes be detected by Western Power protection first, tripping out the entire distribution line or substation. This has occurred from time to time over the last 17 years and requires careful engineering and annual check to minimise the possibility of indiscriminate power outages.



Poor SAIDI

It would be fair to say the Forrestania Mine and Cosmic Boy Concentrator have experienced grid power failures at a higher rate than most, due to the N-0 design of the Western Power connection. IGO would encourage the ERA to seek the SAIDI (System Average Interruption Duration Index) from Western Power for the Bounty Substation and Kondinin-Bounty Sub-Network to validate this statement.

Discussion on Parts of the Application

In its application for exemption, Western Power identified three network elements that it considers would need to be upgraded to meet an N-1 design:

Part A: Build a second transmission line from Kondinin to the Bounty substation.

Part B: Augment the Kondinin zone substation.

Part C: Augment the Bounty zone substation.

Part A: Build a second transmission line from Kondinin to the Bounty substation.

IGO does not support the requirement to build a second line at this time and supports a temporary exemption to Western Power for this Part A only. The existing line of 154.40km (KDN-BNY 81) has a suitable pre-rating (for both IGO and the proposed new lithium mine load) of 29.85MVA. The asset is primarily composed of components easily replaced and maintained.

Part B: Augment the Kondinin zone substation.

IGO does not support an exemption from this Part B. A suitable n-1 transformer and switching arrangement is required to:

1. Ensure increased loads from a new connection will not accelerate the failure of the existing, hard-to-replace aged KDN T2 transformer asset.
2. Increase fault currents to improve protection grading and reduce false trips.
3. Reduce the need for load-shedding control which will increase production loss and interruption to the users.

Part C: Augment the Bounty zone substation.

IGO does not support an exemption from this Part C. A suitable n-1 transformer and switching arrangement is required to:

1. Ensure increased loads from a new connection will not accelerate the failure of the existing, hard-to-replace aged BNY T1 transformer asset.
2. Increase fault currents to improve protection grading and reduce false trips.
3. Reduce the need for load-shedding control which will increase production loss and interruption to the users.

IGO encourages Western Power to improve the reliability of its grid by conforming to its Technical Requirements. As a minimum, IGO would expect the works in Part B and Part C above to be undertaken before connecting new loads to the Bounty Substation and Kondinin-Bounty Sub-Network.

Without taking these steps, all Users of the subnetwork will be subject to increased risk of prolonged network failure, grid reliability issues and costly load-shedding of production.

Yours faithfully


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