Submission No 17

THE ELECTRICITY OUTAGES AFFECTING FAR WEST NSW IN OCTOBER 2024

Name: Mr Paul Miskelly

Date Received: 7 February 2025

07 January 2025
The Committee of Environment and Planning
The Legislative Assembly
NSW Parliament House
6 Macquarie Street
Sydney NSW 2000

Dear Honourable Members,

Inquiry: The electricity outages affecting Far West NSW in October 2024

I am a professional electrical engineer.
This is a personal submission to the Committee on this matter.

Declaration

In making this submission, I declare that I have made no donations to political parties, nor members of political parties.
I declare that, in making this submission, I am not seeking to represent any organisations, in particular, organisations that are associated with the electricity or energy industries. This is a submission by a private individual.

Introduction

This submission consists of a collation of, and a summary of relevant, salient facts from, a selection of the publicly-available documents published during the months leading up to the series of electricity outages that affected Broken Hill and the wider region following the collapse of a section of the Buronga to Broken Hill transmission line during a storm on the night of 16 October 2024.

These documents were produced by some of the parties involved in the provision of the electricity supply to Broken Hill and its wider region. The selection of documents is not presented as being complete, or the result of an exhaustive search, that is, there may be relevant documentation of which this author is unaware.

The submission also contains an analysis from an engineering perspective of the information made publicly available in those documents and a professional opinion as to why the sequence of events, and the decisions made by some of those parties, might have contributed to those electricity outages. See the “Conclusion” section below.

A Summary of the Events leading to the Broken Hill Blackout on 16 October 2024

Executive Summary

In this paper I have chronicled some decisions made by relevant organisations that are involved in the day-to-day running of the electricity grid at Broken Hill, New South Wales. The sequence of documents, all in the public domain, shows, as a result of certain decisions made, primarily by Transgrid, the Network Service Provider for the region, that Transgrid knew that the type of initial event, the 7-tower collapse in the single transmission line serving Broken Hill and its wider region that occurred during the night of 16-17 October 2024, would likely result in serious consequences, one such consequence being a prolonged and widespread blackout, should sufficient local backup generation not be available.

The document trail shows that in December 2023, Transgrid had chosen as its preferred backup option a compressed-air storage scheme, and had proceeded with a new-build with the chosen supplier. In stating the reasons for the decision to proceed with this backup option, Transgrid had demonstrated that it was well aware of the consequences resulting from any failure of the transmission line, and therefore the importance of maintaining an instantly-operational backup system at all times. What is puzzling then is that Transgrid seems not to have continued with a programme of adequate ongoing care and maintenance of the pair of diesel-fuelled gas turbine generators[1] that constituted the already-existing local backup generation, while the new-build of the compressed-air storage system was proceeding.

1 These diesel-fuelled, gas turbine generators are described in, for example: https://www.aer.gov.au/system/files/2024-02/Transgrid%20-%20PUBLIC%20Application%20for%20Waiver%20for%20Broken%20Hill%20Gas%20Turbines%20-%20January%202024.pdf

AGL's Grid-Scale Battery at Broken Hill NSW - Commissioning Experience

AGL published an interesting set of documents through 2023-2024 that detail that company's experiences in setting up a grid-scale storage battery at the city of Broken Hill, NSW. At the link below, AGL states that the battery is able to supply 50 MW for one hour, that is, the battery storage capacity is 50 MWh.

These documents are available at (last accessed 09:40 AM, 10 January 2025):
https://www.agl.com.au/about-agl/operations/broken-hill-battery-energy-storage-system#accordion-7279a81cea-item-02d85be48e
under the heading: "Project knowledge Sharing Reports" (click on the "+" for expansion).
The several titles are:
1. System Strength Modelling Knowledge Sharing Report – 15 November 2023
2. Project Knowledge Sharing Report #2 – 29 August 2024
3. Lessons Learnt Report #1 – 15 November 2023
4. Lessons Learnt Report #2 – 27 September 2024
5. Broken Hill Battery Operations Data

The last item is a very complete set of .csv data for operation of a portion of the battery for the period: 1 September 2024 – 13:00 hrs on 13 December 2024.

Background

This Grid-Scale Battery project is part of a wider plan to make Broken Hill a pioneer on the path to so-called "NetZero".

This AGL Big Battery is supposed to complement, by providing so-called "time-shifting" services, the operation of the two "renewable" generators which have been built at Broken Hill, or in its near vicinity, the Silverton Wind Farm and the Broken Hill Solar Plant.

The Silverton Wind Farm, located near the mining town of Silverton, is situated some 25 km northwest of Broken Hill.[2]

The Broken Hill Solar Plant is located some 5 km southwest of Broken Hill.[3]

According to Nick Cater in The Australian: https://www.theaustralian.com.au/commentary/even-with-a-price-tag-our-renewables-future-is-already-broken/news-story/889525e04688e0bd112988428a37cad7
these "renewable" assets represent some $AUD650 million worth of investment.

Broken Hill and the surrounding region is, under normal circumstances, connected to the wider Eastern Australian Grid by a single 220 kV transmission line operated by Transgrid. A search on: "Broken Hill to Buronga transmission line X2 specifications" finds a number of useful links.
See for example: https://www.aer.gov.au/system/files/2024-02/Transgrid%20-%20PUBLIC%20Application%20for%20Waiver%20for%20Broken%20Hill%20Gas%20Turbines%20-%20January%202024.pdf
from which I quote:
"*Broken Hill is located in the far west of New South Wales and is part of Transgrid's south-western transmission network. It is currently supplied by a single 220 kV transmission line, 'Line X2', from Buronga which spans approximately 260 km.*"

2See: https://www.agl.com.au/about-agl/how-we-source-energy/silverton-wind-farm
3See: https://www.agl.com.au/about-agl/how-we-source-energy/broken-hill-solar-plant

The Big Battery Commissioning

At the first link above, AGL states that the battery is able to supply 50 MW for one hour, that is, the battery storage is 50 MWh. As of August 2024, this battery, (called a Battery Energy Storage System or BESS by the AEMO), entered what AGL refers to as “commercial service” with its full 50 MW capacity available.

At the time of publication of these reports, the Battery’s commissioning had reached the stage where it was being tested to determine whether or not it would be able to provide “virtual inertia”, or “grid-forming capability”. This is the ability to provide some sort of approximation to the “synchronous inertia” normally supplied by a conventional, fully-dispatchable, generator.

This “synchronous inertia”, supplied by a fully-dispatchable generator, is supplied routinely, effortlessly, continuously to the grid, and at no cost. It is supplied because power is supplied to the grid via a conventional mechanical rotor spinning at synchronous speed.[4]
If, for example, the generator has what is called a 2-pole rotor, then that rotor will rotate at a constant speed of 3000 rpm (50 cycles per second times 60 seconds).
That it exists and is supplied results directly from the fact that the spinning mass has a mechanical inertia which, to an extent that depends on the actual mass of the rotor, makes the generator more or less impervious to various electrically transmitted shocks that routinely occur during normal operation of the grid. In the case of a grid-scale generator, supplying several hundred MW, the rotating mass may be some several hundred tonnes. Such a large inertia is relatively impervious to such as massive changes in the load, (demand), caused by such things as the switching on and off of large loads such as electric trains on a city’s rail network, or emergencies such as trees falling on and shorting power lines to ground.
Further, where there is a number of conventional generators supplying the grid, all of them are not only operating at synchronous speed, but they actually lock each other together in phase. Efectively, all the generators are turning at the speed set by that of the largest generator. The result is that the effective mechanical inertia seen by the grid is the sum of the rotational inertias of all of those generators. This combined inertia, which can therefore be an extremely large number, is what is then available to be brought to bear on any disturbance to the grid. This makes any grid that is principally supplied by conventional generators extremely resilient where it comes to dealing with disturbances, even very large disturbances. This is a “fail-safe” property, in the sense that it is always present. Unlike such as “virtual inertia” it does not have to be manufactured in some way.

The “always on” presence of synchronous inertia is critically important to the continued operational security of any grid. Its importance cannot be overstated.

Batteries, by contrast, because they provide direct current which is then converted to alternating current by means of power electronics, do not have moving parts rotating in a magnetic field that is intimately involved with the supply to the grid. As such, they do not therefore, automatically provide any “synchronous inertia”. If they are to provide anything which even remotely resembles an inertial response, any imbalance due to a disturbance has to be sensed, and then the power electronics has to manufacture a response. There is therefore a manufactured response: it is not “always on”, and there is a time lag before it is generated. The possibility for failure to generate the response is always present, so the generation of “virtual inertia”, in contrast to real “synchronous inertia”, can never be regarded as “fail-safe”.

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4 The term “synchronous speed” is, strictly speaking, the speed of rotation of the magnetic field within the stator of an AC electrical machine (generator or motor). This is a constant speed at that machine’s equivalent of the AC frequency, (50 cycles per second in Australia). See, e.g.: https://licchavilyceum.com/what-is-synchronous-speed/.

For Broken Hill, normally, the necessary synchronous inertia is provided from the external grid via the 220 kV transmission line connection to Buronga. The particular reason stated by AGL for the need for the provision of "virtual inertia" by the AGL big battery is that the battery be able to provide what AGL refers to as "islanding functionality", in the event of a fault. Unsurprisingly, this functionality is required under the specific emergency condition where Broken Hill is isolated from the rest of the grid. This situation occurs not infrequently: it happens whenever there is a failure that results in an outage of that single 220 kV transmission line connecting Broken Hill to Buronga. Hence the term, the "islanding", that is, the isolation of Broken Hill from the wider grid.

According to the AGL commissioning documents, the development of this "grid-forming capability" is ongoing.

Ultimately, however, according to the first of these AGL documents, it seems that this "islanding functionality" is not to be permitted to be used. Apparently Transgrid, as the designated Network Service Provider for the Broken Hill region, required that the battery not be permitted to provide "islanding functionality" services, on the basis that the provision of these services would interfere with Transgrid's proposed Hydrostor compressed-air storage battery. Of which, more later.

The Blackout Incident

According to a summary posted at:
https://wattclarity.com.au/market-operations/major-outages/2024-10-16-towers-down-western-nsw/,
"Overnight on Wednesday 16th October 2024 into Thursday morning, severe storms blew over transmission towers (on the 'X2 line') feeding power into western NSW.
This disrupted power supplies to (and local generation in) areas like Broken Hill for a number of weeks."
This storm caused the collapse of a 7-tower section of the single transmission line that connects Broken Hill to the wider grid. From 17 October 2024 last, Broken Hill and the surrounding wider region suffered a 2-week period of extensive blackouts.

There is an excellent report on the initial blackout incident and its consequences at:
https://joannenova.com.au/2024/10/650m-in-renewable-energy-didnt-save-broken-hill-from-days-of-blackouts-after-a-storm-islanded-it/

According to the ABC, the blackout affected an estimated 20,000 people. Among other loss and damage, it resulted in the spoilage of large quantities of frozen foodstuffs, as a result of the inability of local cold storage facilities to continue to operate. It also resulted in the destruction of significant quantities of essential life-saving pharmaceutical products for the same reason. As a result, large quantities of foods and pharmaceuticals had to be rushed to Broken Hill from other parts of NSW.

This type of disconnection event is exactly the cause of the "islanding" referred to above. It seems that the reason that the "islanding" could not be managed was the failure to provide sufficient power from local generation, power that also provided the all-important synchronous inertia.

Not contested by Transgrid is that, at the time of the blackout, one of two 25 MW diesel-fuelled gas turbine generators, provided to Broken Hill many years ago specifically for this "islanding" contingency, was not operational. See, e.g:
https://www.abc.net.au/news/2024-10-30/broken-hill-residents-still-without-reliable-power/104540208
and:
https://www.abc.net.au/news/2024-10-30/transgrid-maintenance-broken-hill-blackout-nsw-power/104538124

From the above ABC reports, it seems that attempts were made to use the remaining generator, but it consistently promptly shut down, because the local demand was too great for it on its own.

As for the use of the AGL Big Battery, according to a quote from the NSW Minister for Energy at: https://wattclarity.com.au/articles/2024/10/26oct-brokenhillbess-charging/, (this link is cited in the above article by Jo Nova), the battery commenced charging – the Minister didn't say how – on Saturday 26 October, that the main backup generator was operational, and that the battery was then available to assist with the evening peak. The Minister was also quoted at the above wattclarity link as saying that the transmission line rebuild was expected to be completed by 6 November 2024.

It is instructive to read the above-quoted set of AGL commissioning documents in their entirety, in conjunction with other documents from the local Network Service Provider, (Transgrid), the AEMO, and the Australian Energy Regulator, issued during the months before the blackout incident.

In particular, it is instructive to reproduce in full Section 10 "Islanding Studies" of the AGL report entitled "System Strength Modelling Knowledge Sharing Report", the first document in the list cited in this paper's introduction. (I have reproduced the text below in italics for clarity.)
I quote:

10. Islanding Studies

"It had been hoped that the Broken Hill Battery could be used to supply the Broken Hill load in the event of supply from the grid not being available due to faults or maintenance outages. This service had previously been provided by Essential Energy using two 25MW GTs running on diesel.

When Essential Energy decided that it no longer wished to provide this service, AGL offered to configure the battery to operate in island mode in conjunction with the Broken Hill solar farm, Silverton wind farm and the existing GTs which they had an option to purchase.

Transgrid ran a RIT-T process to select its preferred provider of standby supply for Broken Hill and chose a compressed air storage alternative. As a consequence, and to avoid adverse interaction between the battery and the compressed air system, the battery has been configured under Transgrid guidance to include an anti-islanding scheme.

The battery provider is still contracted to include islanding functionality, but this functionality will be inhibited to avoid interaction with the compressed air scheme."

10.1. System Restart Service (SRS)

"The anti-islanding scheme (described above) being implemented on the Broken Hill battery will prevent the battery from being able to provide System Restart Services.

To be able to provide System Restart Services, the battery would need to be able to energise a local section of the grid, isolated from the main grid. The anti-islanding scheme prevents this from happening."

End of quote.

I thought then to seek out information on Transgrid's "compressed air storage alternative".

What I found, not to overstate the situation, beggars belief.

I was able to locate the document referred to in the quoted section above that describes in detail the "RIT-T process", (the Regulatory Investment Test – Transmission process), that TransGrid had conducted. This document is available as:
https://www.transgrid.com.au/media/se5fsh2z/transgrid-padr_revised_maintaining-reliable-supply-to-broken-hill.pdf

In this document, Transgrid states quite clearly that, even though the continued use of the diesel generators would normally be the preferred option, nonetheless (opening paragraph, pp. 7, again italics emphasis is mine):

"Notwithstanding that the continued use of the diesel-fired turbines under Option 2 exhibits the highest net benefit and therefore is identified as the 'preferred option' (according to the specific definition in the RIT-T), we have concerns that prolonging the use of fossil fuel technologies is inconsistent with the Sustainability Strategy of Broken Hill City Council2 or the general transition of the electricity sector to low emission technologies.
The highest ranked non-fossil fuel option under this RIT-T assessment is a non-network option, Option 1A/5A(2). Option 1A/5A(2) does not have an enduring reliance on fossil fuel technologies as part of the long term solution to meet reliability standards at Broken Hill. Instead, Option 1A/5A(2) is a compressed-air energy storage solution that will create a mini-grid at Broken Hill that will normally operate connected to the grid, and can meet the identified need over the long term."

For the reasons given above, Transgrid chose the compressed-air storage option over the continued use of the existing, available-on-site, pair of diesel-fired gas turbine generators.

So, what was the state of this compressed-air storage facility at the time of the separation incident on 16 October 2024?

Here is Transgrid's Press Release announcing the choice of the compressed-air storage scheme as the preferred backup facility, and the supplier, Hydrostor Inc., of Toronto, Canada:
https://www.transgrid.com.au/projects-innovation/broken-hill-supply.

I was then able to locate a press release from the preferred supplier, Hydrostor.

Here is Hydrostor's take on the state of the project, issued on 8 December 2023:
https://hydrostor.ca/hydrostor-and-transgrid-enter-first-of-its-kind-agreement/
Note that this announcement states clearly that the system is expected to be operational:
"as early as 2027".
The announcement also states that the facility will have the capability to deliver up to 200 MW for 8 hours, that is, 1600 MWh of storage.

For a wider perspective, the following article in the November 2024 issue of PV magazine provides a useful guide:
https://www.pv-magazine-australia.com/2024/11/08/long-duration-storage-solution-to-backup-broken-hill-region-energy-needs/

Considering the above-quoted statement from AGL, and the outcome of the Transgrid decision to purchase a compressed-air storage scheme, a scheme which is not expected to be operational until "early 2027", it is difficult to understand why Transgrid would impose conditions on the operation of the AGL Big Battery on the basis that they might somehow affect the operation of a facility that is yet to be built, a facility moreover that is not to be operational for at least 2 years.

What beggars belief is Transgrid's apparent reluctance to carry out the necessary maintenance on the diesel generators, knowing that it will be 2 years-plus before the compressed-air storage facility is likely to be available. It would seem that the fault in one of the generators became apparent some months prior to the blackout incident, that is, providing a time frame where, should the necessary maintenance have been performed, the generator would have been returned to service well before the blackout incident.
From the quotes in the ABC story cited above, it is clear that Transgrid took a gamble that such a separation incident would be unlikely to occur within the 2-year timeframe before the compressed-air scheme was up and running. It seems that they have learned nothing from the weather-driven experiences in South Australia during the last few years, particularly the outcome of that weather event of 28 September 2016, which caused a similar collapse of transmission line towers, and resulted in a statewide blackout in South Australia.

Why is it, then, that Transgrid thought it ok to turn Broken Hill and its wider region into some sort of, as Jo Nova rightly puts it at the relevant link above, "crash-test dummy", in this way?

In the above PV magazine article, the NSW Minister for Energy, Penny Sharpe, is quoted as saying about the compressed-air storage facility:

"*NSW Minister for Climate Change and Energy Penny Sharpe said recent events in the Far West region of NSW have demonstrated the need for long duration storage to secure energy supply for Broken Hill and the Far West.*

'This Silver City Energy Storage Facility is a solution that will make Broken Hill a renewable energy leader. The city will be generating, storing and distributing cleaner and more affordable energy to the Far West region and the rest of the state.'

'This project will replace the older large-scale back-up diesel generator, preventing a repeat of the recent energy emergency in the Far West region of NSW.'"

What the Minister does not seem to understand is that until it is fully tested, fully commissioned, a process which will take at least 3 years, and then up and running in real time in a real disconnection emergency, there can be no certainty whatsoever that this compressed-air storage project will provide any such certainty.

Broken Hill requires a reliable back-up system to be installed right now, that works right now. Should the existing diesel-fuelled pair of gas turbines have been properly maintained then that proven backup system was there, already in place, and any power loss and resulting disruption, if indeed any occurred, would have been much less. Yet governments and government corporations continue to pursue untried and untested technologies, at great expense to the taxpayer, and at great distress to residents, in the case of situations such as resulted from these unwise decisions, at Broken Hill. How long will it be before governments come to their collective senses?

Meanwhile, on a similar path, where on this one the AEMO seems to be turning the Eastern Australian Grid into some kind of experimental test-bed, ("crash-test dummy"), we see that the AEMO is promoting the use of so-called "synthetic" inertia, using Grid-Scale batteries. Here is a typical link:
https://aemo.com.au/-/media/files/initiatives/der/managing-minimum-system-load/supporting-secure-operation-with-high-levels-of-distributed-resources-q4-2024.pdf?la=en&hash=2E2FB1224036454B7961ABC181ABA219

Disturbingly, I have been unable to find any AEMO links that indicate expected performance of such providers, and therefore how the reliable provision of "synthetic inertia" is to be achieved.

Conclusion

The provision of such as "synthetic inertia", "grid-forming capability", "the provision of fast frequency response from inverter-based resources", etc., all definitions of what might be provided by non-synchronous forms of generation as a replacement for conventional mechanical-electrical synchronous inertia, can best be described as "an area of active research". That is, to the author's understanding, there are no real-world systems, in Australia at least, routinely providing "synthetic inertia" to a real electricity grid.

The AGL documents cited in this article show that AGL has been conducting research at its Broken Hill BESS facility to attempt to be in a position to use this battery to supply "synthetic inertia" to an islanded Broken Hill microgrid in the event of disconnection from the wider Eastern Australian grid. Due to restrictions placed on the facility by the local Service Provider, real-world testing would not yet seem to be possible.

It would seem that Transgrid, as that Network Service Provider, had not only placed restrictions on the local AGL Big Battery on the implementation of "grid-forming capability", but had failed to properly maintain the one existing source of backup generation that is able to provide both sufficient backup generation to the Broken Hill region, and sufficient actual synchronous inertia services.

From the various press reports covering the incident at the time, it is difficult not to conclude that Transgrid had, at the very least, taken a gamble that the separation event for which the existing backup generation was, historically, specifically provided, would not occur before their preferred backup service, (an untried, untested, compressed-air storage system), was due to be fully operational, in 2027; and had therefore chosen not to continue to properly maintain the existing diesel-fuelled gas-turbine backup generation.

I understand that an investigation into the matter by the NSW Independent Pricing and Regulatory Tribunal (IPART) is ongoing. See the "References" list below for relevant publications.

Paul Miskelly BE MEngSc (Electrical Engineering)
13 January 2025

References

IPART Statement calling for a review of the Broken Hill incident:
IPART 2024 *Broken Hill tower failures and power outages.* Available at:
https://www.ipart.nsw.gov.au/sites/default/files/documents/2024-10/D24%2025951%20Investigation%20Terms%20of%20Reference%20-%20Broken%20Hill%20tower%20failures%20and%20power%20outages%20-%2023%20October%202024.pdf

IPART 2024 *IPART's investigation into the Broken Hill tower failures and power outages* 16 December 2024. Available at:
https://www.ipart.nsw.gov.au/sites/default/files/cm9_documents/Information-Paper-Broken-Hill-Investigation-December-2024.PDF

Appendix 1 - Geographic details of the Buronga to Broken Hill 220kV Transmission Line

This transmission line connects Broken Hill to Buronga, near the Victorian border, a distance of some 250 km. See, for example:
https://www.transgrid.com.au/media-publications/news-articles/preferred-option-for-broken-hill-back-up-electricity-supply-identified, dated 26 May 2022.

Buronga is located near Gol Gol and Mildura. For maps, see:
https://www.aer.gov.au/system/files/Appendix%20Q%20-%20Network%20Map.pdf
https://digital.atlas.gov.au/datasets/digitalatlas::electricity-transmission-lines/about

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Appendix 2 – The Hydrostor Compressed-air Storage Facility for Broken Hill

Hydrostor's Advanced Compressed Air Energy long duration Storage (A-CAES) is mentioned in:
https://www.transgrid.com.au/media/frljjtfb/hydrostor-submission_redacted.pdf.
Intriguingly, this document includes the following statements:

"Long term operation of fossil fuel generation inconsistent with Transgrid Vision and policies of all levels of Australian Government While Option 2 (where TransGrid would purchase the existing turbines and undertake required refurbishment activities) exhibits the highest net benefit (between 9% and 12% higher Option 1A/5A (2)) TransGrid notes its concerns in the revised PADR that "prolonging the use of fossil fuel technologies is inconsistent with Broken Hill's City Council's Sustainability Strategy and the general transition of the electricity sector to low emission technologies." [page 7 PADR] TransGrid's concern is an understatement. Simply put, option 2 should not even be considered as part of the RIT-T. The prolonged use of diesel generators is also inconsistent with: 1. TransGrid's corporate vision of "A clean energy future for Australia" and a backward step in TransGrid's 5-star rating by the Global Real Estate Sustainability Benchmark (GRESB) 2020 ESG benchmarking report (and presumably TransGrid's upcoming corporate ESG Strategy to be released before the end of 2021) 2. NSW Government's Electricity Infrastructure Roadmap seeking to transform its electricity system into one that is "cheap, clean and reliable" and includes a target of 2GW long duration storage. 3. NSW Government's target of 50% reduction in emissions by 2030 and net zero by 2050 4. Commonwealth Government's net zero policy by 2050 and a 35% reduction in emissions by 2030. 5. AER's commitment to the newly launched international Regulatory Energy Transition Accelerator. 6. Prudent cost planning for long-term

operations, given significant uncertainties with the long-term operational cost of these assets, which does not appear to be accounted for in the RIT-T. In addition, the AER requires Network Service Providers to take into account feedback from the community and stakeholders. The feedback from the Broken Hill community and stakeholders is clear that TransGrid should not progress with the acquisition of the diesel generators and select the highest-ranking clean energy option in the PADR It is incongruous with all the above for the AER to force TransGrid to purchase and operate diesel generators. While it is reasonable and necessary to have these diesel generators continuing to provide an interim network support solution (until the long-term solution will be constructed and operational – in the case of A-CAES by 2025), it seems wholly unreasonable and imprudent to consider these near-end-of-life diesel generators as a long-term network support solution that will both ensure reliability, meet policy objectives, and enable clear support from consumers and local stakeholders."

This is an extraordinary document from a prospective equipment supplier. The prevalence of this kind of thinking may explain Transgrid's reluctance to provide the necessary maintenance for the existing backup diesel generators.
See also: https://www.transgrid.com.au/projects-innovation/broken-hill-supply, which refers to the above document.

Here is Hydrostor's take on the state of the project, issued on 8 December 2023:
https://hydrostor.ca/hydrostor-and-transgrid-enter-first-of-its-kind-agreement/
Note that this announcement states clearly that the system is expected to be operational:
"as early as 2027".
The announcement also states that the facility will have the capability to deliver up to 200 MW for 8 hours, that is, 1600 MWh of storage.

Further into the document is the statement:
"Hydrostor has a successful utility scale facility commercially contracted to the Independent Electricity System Operator (IESO) located in Goderich, Ontario,"
I thought to do a search on:
"Hydrostor utility scale facility commercially contracted to the Independent Electricity System Operator (IESO) located in Goderich, Ontario, Canada"

This provided a link from 30 November 2019:
https://magazine.appro.org/news/ontario-news/6125-1578966620-world%E2%80%99s-first-commercial-advanced-compressed-air-energy-storage-completed.html
Described here is a system capable, apparently, of supplying, wait for it:
"… 1.75 megawatts of peak power output, a 2.2 MW charge rating, and 10+ megawatt-hours of storage capacity …"

That's it. It is best described as tiny.

To let a contract which will require the supplier to scale up from a 1.75 MW output facility to a facility supposedly capable of some 200 MW output for 8 hours is best described as a leap of faith. It also needs to be remembered that this new facility is required to support a mission-critical activity: the lives of some 17,000 people are dependent on this facility kicking into life and operating as planned, instantly, when a disconnection of the main transmission line supplying Broken Hill occurs.

For Transgrid's discussion of various backup proposals, and for the justification for the compressed-air option in particular, see:
https://www.transgrid.com.au/media/se5fsh2z/transgrid-padr_revised_maintaining-reliable-supply-to-broken-hill.pdf