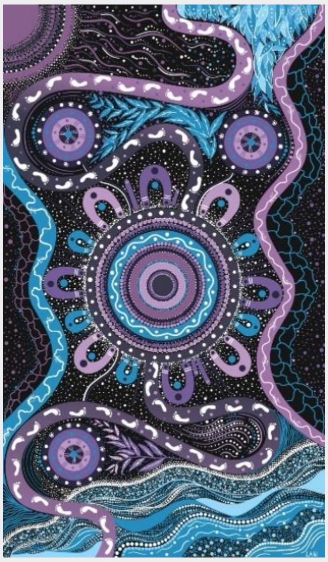
Reserve Capacity Mechanism Congestion Report

November 2024

A report for the Wholesale Electricity Market Congestion Information Resource



We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have launched its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Important notice

Purpose

The purpose of this report is to assist Rule Participants and other interested stakeholders to understand the impact of Network Congestion on the outcomes of the Certified Reserve Capacity process for the 2024 Reserve Capacity Cycle.

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Executive summary

The Network Access Quantity (NAQ) framework was introduced in the Reserve Capacity Mechanism (RCM) in the 2022 Reserve Capacity Cycle (RCC), which allows the limitations of the Network to be considered when assigning Capacity Credits and encourages new Facilities to locate in lesser congested parts of the Network.

On 30 September, AEMO published the 2024 NAQ results[1] on the WEM Website[2].

The purpose of this report is to assist stakeholders in the WEM to understand the impact of Network Congestion on the NAQ results. Specifically, this report aims to improve visibility of previously unpublished components of the NAQ calculation, and to provide possible reasons for the difference between Certified Reserve Capacity (CRC) assignments and the NAQ results (which eventuate into Capacity Credits).

Table 1 presents the Constraint Equations identified to be most relevant to the 2024 NAQ results.

Table 1 2024 NAQ Results – Most Relevant Constraint Equations

Constraint Equation ID	Credible Contingency	Monitored Element
>{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]	Trip of the first three-ended 132kV between Cannington Terminal (CT), Meadow Springs (MSS) and Pinjarra (PNJ), including the impact of the "Manual Intervention Scheme" that disconnects WGP81-SWA (the Wagerup end of the three-ended 132kV line between Southern River (SNR), Wagerup (WGP) and Alcoa Pinjarra (APJ)).	Thermal overload (>) of the first 132kV line between Mandurah (MH) and PNJ measured exporting (~) from the PNJ end.
>{NT-LDE 81, SPS_NTLOAD}[NT-HBK 81 (NT~)]	Trip of the first 132kV line between Northern Terminal (NT) and Landsdale (LDE), including the impact of a new protection scheme that automatically opens MUL-PBY 81 (the first 132kV line between Mullaloo (MUL) and Padbury (PBY)) in the event of an overload of NT-BCT 81 (the first 132kV line between NT and Balcatta (BCT)).	Thermal overload (>) of the first 132kV line between NT and Henley Brook (HBK), measured exporting (~) from the NT end.
>{ST-KNL 91}[ST-CT 81 (ST~)]	Trip of the first 330kV line between Southern Terminal (ST) and Kenwick Link (KNL).	Thermal overload (>) of the first 132kV line between ST and Cannington Terminal (CT), measured exporting (~) from the ST end.

[1] NAQ results translate into Capacity Credits for the relevant Reserve Capacity Cycle.

[2] Refer "market data": https://aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/data-wem/market-data-wa

Table 2 shows which Facilities were impacted by these constraints.

Table 2 2024 NAQ Results – Facilities Impacted by Constraint Equations

Constraint ID	Most Impacted Facilities
>{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]	**Existing:** N_ALINTA_PNJ_U1 N_PREMPWR_DSP_02 N_SYNERGY_DSP_04 N_TESLA_KEMERTON_G1 N_ALCOA_WGP N_ALINTA_WGP_ESR1 N_ALINTA_WGP_GT N_ALINTA_WGP_U2 **New:** N_COLLIE_ESR4 N_COLLIE_ESR5
>{NT-LDE 81, SPS_NTLOAD}[NT-HBK 81 (NT~)]	Positive impact to N_PINJAR_X (no impact to NAQ)
>{ST-KNL 91}[ST-CT 81 (ST~)]	Possible positive impact to N_ALCOA_WGP and N_ALINTA_PNJ_U1

AEMO investigated the impact of the most relevant Constraint Equation, which was identified as >{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]. If this Constraint Equation was removed from the model (e.g. due to a Network augmentation), then all facilities would receive NAQ equal to their CRC.

AEMO also investigated the impact of Non-Co-Optimised Essential System Services (NCESS) contracts on final NAQ results. In accordance with Appendix 3 of the WEM Rules, Facilities with NCESS contracts are included in Prioritisation Step 3A. If Facilities with NCESS contracts were instead treated the same as other new committed facilities and included in Prioritisation Step 5, then those facilities would have received NAQ reductions, other facilities would have received increased NAQ, and the total NAQ assigned would be reduced by 16.6MW, leading to a lesser surplus (~240 MW) of Capacity Credits against the 2024 Reserve Capacity Requirement.

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1 Introduction

1.1 Purpose

On 30 September, AEMO published the 2024 Network Access Quantity (NAQ) results on the Market Data Site[3].

The purpose of this report is to assist stakeholders in the Wholesale Electricity Market (WEM) in their understanding of the impact of Network Congestion on the NAQ results. Specifically, this report aims to improve visibility of previously unpublished components of the NAQ calculation, and to provide possible reasons for the difference between Certified Reserve Capacity (CRC) assignment and the NAQ (Capacity Credits) results.

1.2 Supporting Documentation

This report should be read in conjunction with:

- The WEM Rules[4]
  - Appendix 3 (Determination of Network Access Quantities)
  - Section 4.4B (RCM Limit Advice and RCM Constraint Equations)
  - Section 4.15 (Network Access Quantity)
- WEM Procedures[5]
  - WEM Procedure: Network Access Quantity Model
  - WEM Procedure: RCM Constraint Equations
  - WEM Procedure: Certification of Reserve Capacity
  - WEM Procedure: Declaration of Bilateral Trades
- NAQ Process Summary RCC2024[6]: Includes all NAQ Results for all NAQ Entities and all Prioritisation Steps.

1.3 Context

The NAQ framework was introduced in the RCM in the 2022 Reserve Capacity Cycle (RCC), which allows the limitations of the Network to be considered when assigning Capacity Credits (CCs) and encourages new Facilities to locate in lesser congested parts of the Network.

A NAQ is assigned to each Facility by considering the following during a peak demand event:

- the capability of that Facility

[3] https://aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/data-wem/market-data-wa

[4] https://www.wa.gov.au/government/document-collections/wholesale-electricity-market-rules

[5] https://aemo.com.au/en/energy-systems/electricity/wholesale-electricity-market-wem/procedures-policies-and-guides/procedures

[6] https://aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/wa-reserve-capacity-mechanism/network-access-quantities

- the capability of the Network
- the impact of other Facilities sharing the Network
- the priority of that Facility with respect to other Facilities (by considering Appendix 3 of the WEM Rules)

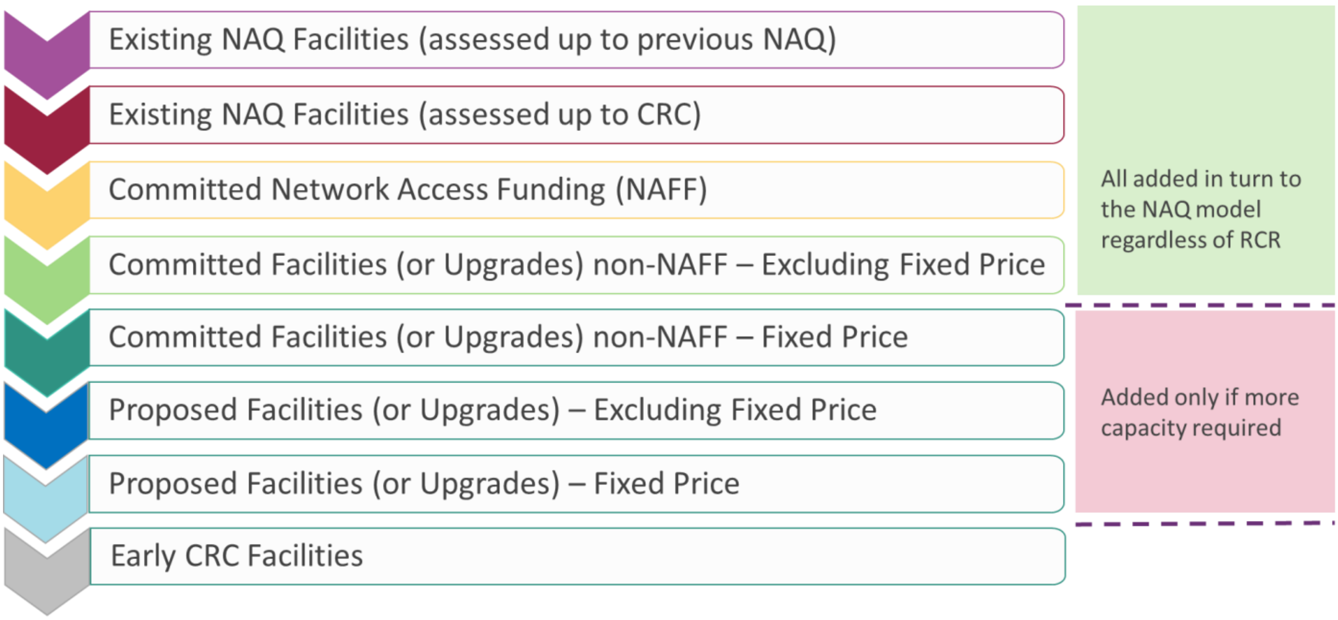
The capability of a Facility is represented by the assigned CRC as calculated in accordance with the WEM Procedure: Certification of Reserve Capacity (refer to section 1.2). The CRC assignments were not changed by the introduction of the NAQ framework - CRC indicates the physical capability of a Facility to inject during a peak demand event, considering restrictions such as ambient temperature and fuel dependency.

The capability of the Network is represented by RCM Constraint Equations as calculated in accordance with WEM Procedure: RCM Constraint Equations (refer to section 1.2). The RCM Constraint Equations indicate the thermal and non-thermal limits of the network as a function of every Facility and consider the most likely state of the network at the commencement of the relevant Capacity Year as advised by the Network Operator.

The impact of other Facilities sharing the network is estimated by considering many Facility Dispatch Scenarios (FDSs) in accordance with WEM Procedure: Network Access Quantity Model (refer to section 1.2). For each FDS, the NAQ model attempts to minimise any change that may be required to satisfy all RCM Constraint Equations. The NAQ outcome for a given Prioritisation Step is the "post-Constraint Equation" limit (or CRC if unconstrained) of a Facility in 95% of those FDS.

The priority of a Facility for access to the Network with respect to other Facilities is outlined in Appendix 3 of the WEM Rules (refer to section 1.2) and determines which Facilities are included (and to what CRC level) in each Prioritisation Step. The Final NAQ for a Facility is the outcome of the final Prioritisation Step. A summary of the priorities (Prioritisation Steps) is provided in Figure 1 below

Figure 1 NAQ Priorities (Prioritisation Steps) per WEM Rules Appendix 3 Part B[7][8][9]



[7] NCESS Facilities are included in Prioritisation Step 3A, the same as Existing Facilities, as per Appendix 3 of the WEM Rules (see section 1.2)

[8] NAFF: Network Access Funding Facility (see chapter 4.10A. of the WEM Rules)

[9] Proposed and Committed status information provided in the Appendix B of WEM Procedure: Declaration of Bilateral Trades (see section 1.2)

It is noted that some Facilities may not be assigned a NAQ if they are not required to meet the Reserve Capacity Requirement (RCR), as indicated in Figure 1 above.

Key metrics of the 2024 Reserve Capacity Cycle (2024 RCM) are provided in Table 3 below:

Table 3 2024 RCM – Key Metrics

Reserve Capacity Requirement:	**5,696 MW**
Total CRC assigned:	~6,228 MW
Total Certified Capacity added to the NAQ model[10]:	~6,118 MW
Final NAQ assigned:	~5,953 MW
Surplus:	~257 MW

For more details of the NAQ calculation process and results, refer to the Supporting Documentation (section 1.2) and other RCM and Constraint Equation training offered by AEMO.

[10] Not all the available CRC was added into the NAQ model as the RCR was met before adding the Facilities from the last priority groups (Prioritisation Steps), in line with Appendix 3 of the WEM Rules.

2 NAQ Model Data

2.1 Binding Constraints

A previously unpublished output of the NAQ model is the "slack" associated with each Constraint Equation, in each solved FDS. In any case where the solved slack is "0", the equation is "binding" and has impacted the dispatch profile. If an equation "binds" in more than 5% of FDS, it is plausible that it has some impact on the Final NAQ of some Facilities.

Constraint Equations that "bound" in the 2024 NAQ model are provided in Table 4 below. More details about the naming and purpose of each of these Constraint Equations can be found in the Constraints Library of the WEM Congestion Information Resource on AEMO's website[11]. The steps identified in Table 4 refer to the Prioritisation Steps (priorities) detailed in Appendix 3 of the WEM Rules.

Table 4 2024 NAQ Model – Binding Constraints

Binding Frequency (%) Constraint ID (RCM-RCC2024-CY2026-S3)	Step 3A	Step 3B	Step 3C	Step 5
>{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]	**5.7**	**6.4**	**7.9**	**20.4**
>{D-MJ 81}[GLT-FFD 81 (GLT~)]	1.0	1.1	1.3	2.0
>{KW-CC-MED 81}[WM81-MWO (WM-)]	2.7	2.0	1.3	2.4
>{LWT-ST 91, SPS_MI_WGP}[KEM81-PPBK (KEM~)]	0.0	0.0	0.1	3.1
>{MU BTT1}[PIC-MRR 81 (MRR~)]	0.4	0.5	0.4	0.8
>{NT-LDE 81, SPS_NTLOAD}[NT-HBK 81 (NT~)]	2.6	2.9	3.3	**21.0**
>{ST T1}[ST-CC 81 (ST~)]	0.0	0.0	0.0	0.2
>{ST-KNL 91}[ST-CT 81 (ST~)]	2.0	2.3	2.3	**15.7**
>{ST-WLN 81}[ST-CC 81 (ST~)]	0.1	0.1	0.1	2.3

2.2 NAQ Reduction

Table 5 identifies "NAQ Reduction", which is the difference between the NAQ received and the maximum possible NAQ ("NAQ Ceiling") for each Prioritisation Step. The maximum possible NAQ for a Facility can increase in each Prioritisation Step (refer to supporting documentation in section 1.2). Where a Facility has a non-zero NAQ Reduction, it has been affected by a Constraint Equation.

[11] https://aemo.com.au/energy-systems/electricity/wholesale-electricity-market-wem/system-operations/congestion-information-resource/Constraint Equations-library/rcm-Constraint Equations-library

Table 5 2024 NAQ Model – NAQ Reductions

NAQ Reduction (MW) NAQ Entity ID (Facility)	Step 3A	Step 3B	Step 3C	Step 5
N_ALCOA_WGP	0.000	0.000	7.120	7.120
N_ALINTA_PNJ_U1	1.283	1.283	1.283	1.283
N_ALINTA_WGP_GT	0.000	0.000	0.924	0.924
N_ALINTA_WGP_U2	0.000	0.000	1.213	0.924
N_PREMPWR_DSP_02	0.000	2.006	2.006	2.006
N_SYNERGY_DSP_04	0.000	3.877	3.877	3.877
N_TESLA_KEMERTON_G1	0.000	0.794	0.794	0.794
N_ALINTA_WGP_ESR1	0.000	0.000	0.000	0.203
N_COLLIE_ESR4	0.000	0.000	0.000	73.990
N_COLLIE_ESR5	0.000	0.000	0.000	74.653

2.3 NAQ Change

Table 6 identifies "NAQ Change", which is the difference between NAQ received in this cycle, and the NAQ received in the immediately preceding cycle (RCM 2023), where positive numbers indicate an increase. This table confirms that only one Facility receives fewer NAQ than the previous cycle (N_ALINTA_PNJ_U1).

Table 6 2024 NAQ Model – NAQ Changes

NAQ Change (MW) NAQ Entity ID (Facility)	Step 3A	Step 3B	Step 3C	Step 5
N_ALCOA_WGP	0.000	0.000	2.88	2.88
N_ALINTA_PNJ_U1	-1.283	-1.283	-1.283	-1.283
N_ALINTA_WGP_GT	0.000	0.000	11.076	11.076
N_ALINTA_WGP_U2	0.000	0.000	10.787	11.076
N_PREMPWR_DSP_02	0.000	2.305	2.305	2.305
N_SYNERGY_DSP_04	0.000	4.987	4.987	4.987
N_TESLA_KEMERTON_G1	0.000	0.919	0.919	0.919
N_ALINTA_WGP_ESR1	0.000	0.000	0.000	48.536
N_COLLIE_ESR4	0.000	0.000	0.000	176.01
N_COLLIE_ESR5	0.000	0.000	0.000	175.347

3 Constraint Details

3.1 Introduction

Insight into the impact of a specific Constraint Equation can be gained by collectively examining:

- The coefficients of Facilities in each Constraint Equation,
- The NAQ Prioritisation Step in which a Facility is first entered into the model, and
- Which Facilities received NAQ reductions in each Prioritisation Step.

The NAQ model will generally prioritise the reduction of Facilities with the highest coefficient when meeting the requirements of a Constraint Equation. However, a Facility's NAQ cannot be reduced by capacity that is added in a later Prioritisation Step as per WEM Procedure: Network Access Quantity Model (refer to 1.2). It is therefore likely that the Facilities most impacted by a Constraint Equation are:

- those that receive a NAQ reduction in the same or later step that a Constraint Equation starts to bind, and
- of Facilities meeting this criterion, those that have the highest Constraint Equation coefficient in that equation.

However, there are reasons that this might not be true, particularly when multiple equations are binding at the same time.

It should also be noted that removing one Constraint Equation (e.g. by Network augmentation, or otherwise) may not actually impact NAQ results, as other similar equations that are "close to binding" may become "binding" as soon as a Constraint Equation is removed. As such, the accuracy of the possible correlations that are shown in this report are not guaranteed.

3.2 Constraint 1: >{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]

3.2.1 Description

This Constraint Equation describes the limit to avoid:

- Thermal overload of the first 132kV line between Mandurah (MH) and Pinjarra (PNJ),
- For a contingency of the first three-ended 132kV between Cannington Terminal (CT), Meadow Springs (MSS) and PNJ,
- Including the impact of the "Manual Intervention Scheme" that disconnects WGP81-SWA (the Wagerup (WGP) end of the three-ended 132kV line between Southern River (SNR), Wagerup (WGP) and Alcoa Pinjarra (APJ)), which is triggered by this overload.

This equation bound in more than 5% of FDSs in every step.

3.2.2 Coefficients

Table 7 summarises the coefficients of this Constraint Equation for Facilities that received a NAQ reduction:

Table 7 "Constraint 1" Relevant Coefficients

NAQ Entity (Facility)	Step Added	Coefficient
N_ALINTA_PNJ_U1	3A	0.3127
N_PREMPWR_DSP_02	3A	0.0491
N_SYNERGY_DSP_04	3A	0.0491
N_TESLA_KEMERTON_G1	3A	0.0491
N_ALCOA_WGP	3A	0.0319
N_COLLIE_ESR4	5	0.0178
N_COLLIE_ESR5	5	0.0178
N_ALINTA_WGP_ESR1	5	0.0168
N_ALINTA_WGP_GT	3A	0.0168
N_ALINTA_WGP_U2	3A	0.0168

3.2.3 Insights

This Constraint Equation is the only Constraint Equation to bind in more than 5% of FDSs in steps 3A, 3B and 3C. It is hence likely the cause of all NAQ reductions in those steps, although other equations with small binding percentages may have contributed.

N_ALINTA_PNJ_U1 is the only NAQ entity to have a reduction in Step 3A, which is when this equation first starts to bind. It is therefore likely that this equation is the direct cause of reduction to N_ALINTA_PNJ_U1. As this equation is already binding over 5% of the time in Step 3A, it is likely that any capacity added in later steps with a positive coefficient (making the problem worse) will also face a reduction, to avoid further reducing the NAQ of N_ALINTA_PNJ_U1.

N_PREMPWR_DSP_02, N_SYNERGY_DSP_04 and N_TESLA_KEMERTON_G1 face reductions in step 3B:

- It is noted that the "ceiling" (maximum NAQ) of these Facilities was increased in step 3B. These ceilings are the Highest NAQ for the Facilities determined in accordance with the WEM Rules, based on historical NAQ and CRC values. In this case, the NAQ assigned in the 2022 RCC is used, despite the NAQ from the 2023 RCC being lower.
- However, these Facilities negatively affect a Constraint Equation that is already binding in the previous step. As such, whilst these Facilities receive more NAQ than the previous year, they are not able to regain all the NAQ held in the 2022 RCC.

N_ALCOA_WGP, N_ALINTA_WGP_GT and N_ALINTA_WGP_U2 face reductions in step 3C:

- Similarly, it is noted that the "ceiling" (maximum NAQ) of these Facilities was increased in step 3C. These ceilings reflect the CRC of these Facilities, which is higher than the Highest NAQ used in step 3B and is higher than the CRC from previous NAQ calculations.
- However, these Facilities also negatively affect a Constraint Equation that is already binding in the previous step. As such, whilst these Facilities receive more NAQ than the previous year, they are not able to get capacity equal to their CRC.

N_ALINTA_WGP_ESR1, N_COLLIE_ESR4 and N_COLLIE_ESR5 face reductions in step 5:

- These Facilities are considered new committed Facilities from the perspective of the 2024 RCC, and this is the first step that the Facilities are added into the model.
- N_ALINTA_WGP_ESR1 receives a much smaller reduction than N_COLLIE_ESR4 and N_COLLIE_ESR5, due to having a slightly smaller coefficient (refer to introductory comments for more explanation).
- Despite all three Facilities having low coefficients in this equation, these Facilities still have a negative impact on a Constraint Equation that is already binding in the previous step, and hence receive a NAQ reduction.
- With small coefficients, a larger reduction is required to mitigate the same issue described by the Constraint Equation. As such, these Facilities receive substantial NAQ reductions compared to previous steps. The coefficients are above the minimum threshold specified in the WEM procedure, and hence cannot be removed from the Constraint Equation, despite being relatively small.
- Other new Facilities added in this step have smaller coefficients (or no coefficients) and are not impacted by this Constraint Equation.

3.3 Constraint 2: >{NT-LDE 81, SPS_NTLOAD}[NT-HBK 81 (NT~)]

3.3.1 Description

This Constraint Equation describes the limit to avoid:

- Thermal overload of the first 132kV line between Northern Terminal (NT) and Henley Brook (HBK),
- For a contingency of the first 132kV line between NT and Landsdale (LDE),
- Including the impact of a new "scheme" that automatically opens MUL-PBY 81 (the first 132kV line between Mullaloo (MUL) and Padbury (PBY)) in the event of an overload of NT-BCT 81 (the first 132kV line between NT and Balcatta (BCT)), which can be caused by this contingency.

This equation bound in more than 5% of FDSs in step 5 only.

3.3.2 Coefficients

The Facilities that received NAQ reductions did not have coefficients in this equation.

3.3.3 Insights

This equation only has negative coefficients. This means that turning on specific Facilities will alleviate the issue but turning off Facilities will not.

The biggest negative coefficient in this equation is N_PINJAR_X (any of the units at Pinjar Power Station). When this equation binds, it is likely to turn on N_PINJAR_X units (to minimise overall MW change). The Facility that is constrained down to compensate is likely co-optimised with any other Constraint Equation that requires downwards Constraint Equation.

This equation doesn't bind in step 3. This is likely because there are sufficient Pinjar units (or nearby Facilities) in every FDS that no "constrain on" is needed. However, in step 5, when Facilities are added that do not have a coefficient in this equation, it becomes possible to create FDSs where Pinjar power station is not online.

N_PINJAR_X does not receive a NAQ reduction. As such, the upwards pressure that this Constraint Equation applies to N_PINJAR_X has no impact on the Final NAQ. This may change in future if there are other binding Constraint Equations that require N_PINJAR_X to be constrained down.

3.4 Constraint 3: >{ST-KNL 91}[ST-CT 81 (ST~)]

3.4.1 Description

This Constraint Equation describes the limit to avoid:

- Thermal overload of the first 132kV line between Southern Terminal (ST) and Cannington Terminal (CT).
- For a contingency of the first 330kV line between ST and Kenwick Link (KNL) (which is equivalent to loss of the transformer at KNL, or the loss of the first 132kV line between CT and KNL).

This equation bound in more than 5% of FDSs in step 5 only.

3.4.2 Coefficients

Table 8 summarises the coefficients of this Constraint Equation for Facilities that received a NAQ reduction:

Table 8 "Constraint 3" Relevant Coefficients

NAQ Entity (Facility)	Step Added	Coefficient
N_ALINTA_WGP_ESR1	5	-0.0135
N_ALINTA_WGP_GT	3A	-0.0135
N_ALINTA_WGP_U2	3A	-0.0135
N_COLLIE_ESR4	5	-0.0171
N_COLLIE_ESR5	5	-0.0171
N_PREMPWR_DSP_02	3A	-0.0363
N_SYNERGY_DSP_04	3A	-0.0363
N_TESLA_KEMERTON_G1	3A	-0.0363
N_ALCOA_WGP	3A	-0.1301
N_ALINTA_PNJ_U1	3A	-0.1751

3.4.3 Insights

This equation only has negative coefficients. This means that turning on specific Facilities will alleviate the issue, but turning off Facilities will not.

The biggest negative coefficients in this equation are N_ALINTA_PNJ_U1 and N_ALCOA_WGP, which are both Facilities that received a NAQ reduction in previous steps. When this equation binds, it is likely to increase N_ALINTA_PNJ_U1 and N_ALCOA_WGP (to minimise overall MW change) but may also increase other Facilities with a negative coefficient due to interactions with other Constraint Equations. The Facility that is constrained down to compensate is likely co-optimised with any other Constraint Equation that requires downwards Constraint Equation.

This equation does not bind in step 3. This is likely because there are sufficient units with negative equation coefficients (such as N_ALINTA_PNJ_U1 and N_ALCOA_WGP or Facilities at Kwinana 132kV) in every FDS that no "constrain on" is required. However, in step 5, when Facilities are added that have small (or no) coefficients in this equation, it becomes possible to create FDSs where this equation binds.

N_ALINTA_PNJ_U1 and N_ALCOA_WGP receive NAQ reductions in earlier steps. As such, it is likely that there is already downwards pressure from other Constraint Equations (such as >{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)] described previously), and it is therefore likely that other Facilities with negative coefficients in this Constraint Equation would get increased to minimise overall MW change. As such, the upwards pressure that this Constraint Equation applies to any Facility is unlikely to have impact on the Final NAQ but may change in future as other equations begin to bind.

4 Other Details

4.1 Impact of Most Relevant Constraint

As noted in section 3.2.3, the Constraint Equation “>{CT-MSS-PNJ 81, SPS_MI_WGP}[MH-PNJ 81 (PNJ~)]” is most likely to have caused NAQ reductions due to high binding frequency (refer Table 4) and high coefficients (refer Table 7) associated with Facilities that received a NAQ reduction (refer Table 5).

If this Constraint Equation was removed from the model (e.g. due to a Network augmentation), then all Facilities would receive NAQ equal to their CRC (i.e. no NAQ reductions).

4.2 Impact of NCESS Contracts

In accordance with Appendix 3 of the WEM Rules (as referenced in section 1.2), Facilities with NCESS contracts are included in Prioritisation Step 3A.

AEMO was aware that prioritisation of Facilities holding NCESS contracts may impact existing Facilities in the 2024 Reserve Capacity Cycle. AEMO's selection of NCESS contracts as part of the 2023 NCESS for Reliability considered the impacts of network limits expected to apply for the 2026-27 Capacity Year. This assessment ensured that procured quantities would result in a net increase in capacity available to the SWIS to meet forecast shortfalls.

As part of stakeholder engagements with Market Participants on the outcomes of the 2024 CRC process, AEMO received queries about the impact of NCESS contracts on the NAQ results. Table 9 shows the difference in NAQ reductions If Facilities with NCESS contracts were instead included in Prioritisation Step 5 like other new Committed Facilities (refer section 1.3):

Table 9 NCESS Contract NAQ Reduction Impact

NAQ Reduction (MW) NAQ Entity (Facility)	NCESS Facilities included in Prioritisation Step 3A	NCESS Facilities included in Prioritisation Step 5
N_ALCOA_WGP	7.1	0.0
N_ALINTA_PNJ_U1	1.3	0.0
N_ALINTA_WGP_GT	0.9	0.0
N_ALINTA_WGP_U2	0.9	0.0
N_PREMPWR_DSP_02	2.0	0.0
N_SYNERGY_DSP_04	3.9	0.0
N_TESLA_KEMERTON_G1	0.8	0.0
N_ALINTA_WGP_ESR1	0.2	0.0
N_COLLIE_ESR4	74.0	56.5
N_COLLIE_ESR5	74.7	56.5
N_COLLIE_BESS2	0.0	69.4
TOTAL	**165.8**	**182.4**