2026 Victorian Annual Planning Report

Appendix 4
Declared shared network limitations detail

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Acronyms

Term	Definition
ISP	Integrated System Plan
kV	kilovolt/s
MVA	megavolt ampere/s
MVAr	megavolt ampere/s reactive
MW	megawatt/s
NSCAS	Network Support and Control Ancillary Services
NTP	National Transmission Planning
NSW	New South Wales
REZ	renewable energy zone
RIT-T	regulatory investment test for transmission
VAPR	Victorian Annual Planning Report
VNI	Victoria – New South Wales Interconnector
VTP	Victorian Transmission Plan

Appendix 4:

Declared shared network (DSN) limitations detail

The limitations presented in this section reflect thermal and voltage constraints identified in accordance with the Victorian Electricity Planning Approach, where overloads of 90% or higher are classified as monitored limitations and are included in this assessment. This section does not explicitly include system strength or inertia-related limitations, which are largely regional and reported separately. Changes in the list of limitations in the 2026 Victorian Annual Planning Report (VAPR) compared to the 2025 VAPR are outlined below:

New limitations:

- Overload of Keilor 500 kV A3 transformer, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Keilor–South Morang 500 kV line during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Keilor–West Melbourne 220 kV line during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Altona–Brooklyn 220 kV line during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Geelong–Mount Cottrell–Deer Park–Keilor 220 kV line during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of South Morang H3 & H4 330/220 kV transformer during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Brunswick–Richmond 220 kV line during high generation and New South Wales (NSW) export times driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Richmond–Rowville 220 kV line during high generation and NSW export times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in Section 4.2.
- Overload of Dederang–Murray 330 kV line during high demand times. This limitation is a new monitored limitation, as outlined in section 4.2.
- Overload of Elaine–Moorabool 220 kV line during high demand times. This limitation is a new monitored limitation, as outlined in section 4.2.
- Overload of Ballarat–Waubra–Ararat–Crowlands–Bulgana–Horsham 220 kV line during high demand times. This limitation is now a monitored limitation, as outlined in section 4.2.

- Overload of Eildon–South Morang 220 kV line during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Overload of Tragowell–Kerang 220 kV line during high demand times. This limitation is now a monitored limitation, as outlined in section 4.2.
- Inadequate reactive power support at Altona Terminal Station 220 kV during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Inadequate reactive power support at Sydenham Terminal Station 500 kV, Brooklyn Terminal Station 220 kV and Keilor Terminal Station 220 kV during high demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Inadequate reactive power support at Deer Park Terminal Station 220 kV during high-demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Inadequate reactive power support at Keilor Terminal Station 500 kV during high-demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.
- Inadequate reactive power support at South Morang Terminal Station 500 kV during high-demand times, driven by increased demand from updated connection point forecast and a broader rise in maximum system demand. This limitation is now classified as a load growth-driven monitored limitation, as outlined in section 4.2.

Removed limitations:

- Overload of Dederang–Glenrowan–Shepperton 220 KV line during minimum demand times
- Overload of Dederang 330/220 kV H3 transformer during minimum demand times
- Overload of Cranbourne A1 500/220 kV transformer during maximum demand times

The potential network solutions presented in the sub-sections below should be treated as indicative only. Determining the credible network and non-network options and identifying the preferred option will require an investment test under the relevant investment framework. The preferred option may comprise one or a combination of the solutions presented in the sub-sections below.

In this appendix, triggers are defined as the operating conditions under which system limitations may lead to an increased risk of supply disruptions or constrain generation at increased frequency. The occurrence of a trigger does not justify network augmentation, as any such investment would be subject to assessment through the regulatory investment test for transmission (RIT-T) or an equivalent evaluation process.

In the following tables AEMO National Transmission Planning (NTP) references the latest publications of national transmission planning reports. In the 2026 VAPR, the NTP reports referenced are the 2025 Integrated System Plan (ISP) and the 2025 Network Support and Control Ancillary Services (NSCAS) report.

Limitations categorised as priority will trigger a detailed review and investment test (see section 4.1). The possible network solutions in Table 1 are developed into credible options during these stages which are then assessed in accordance with VicGrid's Contestability Guidelines[1] to determine the appropriate procurement approach.

[1] See https://www.vicgrid.com.au/__data/assets/pdf_file/0034/773368/contestability-guidelines.pdf

A4.1 Central North Victoria corridor

Table 1 Limitations in the Central North Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Bendigo–Fosterville–Axedale–Shepparton 220 kV line thermal capacity limitations (maximum demand and high generation times)	Monitored	To manage thermal capacity limitation on these line sections, the possible options may include: • Install an automatic load shedding and generation runback control scheme to enable the use of five-minute line rating. • Install a wind monitoring scheme. • Install a modular flow controller on the Bendigo–Fosterville–Axedale–Shepparton 220 kV line. • Replace the complete line section with new double-circuit lines.	Increased demand in regional Victoria and/or increased import from NSW. Large-scale new generation connected to Western Victoria and Central North areas, and congestion within Western Victoria relieved to allow the new generation to be sent out of Western Victoria.	Identified limitation as part of Central North Victoria renewable energy zone (REZ).

A4.2 Eastern Victoria Corridor

Table 2 Limitations in the Eastern Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Thermal capacity limitations in Latrobe Valley 220 kV corridor – overloading Hazelwood–Yallourn–Rowville 220 kV lines post Yallourn West Power Station retirement	Priority (Committed project actioned)	• A new switching arrangement was identified at Hazelwood Power Station (modified parallel mode) for post Yallourn West Power Station retirement to utilise the eastern 220 kV corridor. • A minor augmentation has initiated the project to scope out the details of the works required to facilitate the proposed re-configuration in year 2028. The scope includes minor switching works at Hazelwood Power Station and implementation of a control scheme to manage post-contingent overloading. • Further thermal capacity can be unlocked through works considered in the Victorian Transmission Plan (VTP), specifically project 2.2, Install a second 500/220 kV transformer at Cranbourne and tie in the existing Hazelwood to Rowville 500 kV (No.3) circuit at Cranbourne.	This limitation is primarily due to changing flow sharing of the 500 kV and 220 kV networks from the Latrobe Valley to metropolitan Melbourne following retirement of Yallourn West Power Station.	Not identified.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Hazelwood–Loy Yang 500 kV line thermal capacity limitation	Monitored	• Construct a new single-circuit Hazelwood – Loy Yang 500 kV line. • Construct a new double-circuit Hazelwood – Loy Yang 500 kV and string only one circuit. • Construct a new double-circuit Hazelwood – Loy Yang 500 kV and string both.	Commissioning of additional generation connected at Loy Yang Power Station.	Identified in 2020 ISP.
Hazelwood–Loy Yang 500 kV line outage window	Monitored	• Construct a new single-circuit Hazelwood – Loy Yang 500 kV line. • Construct a new double-circuit Hazelwood – Loy Yang 500 kV and string only one circuit. • Construct a new double-circuit Hazelwood – Loy Yang 500 kV and string both. • System strength and reactive power services to reduce reliance on Loy Yang units for these services during low demand periods.	Reduction in dispatchable capacity west of Hazelwood 500 kV. Higher and more frequent demands above 6,000 MW.	Not identified.

A4.3 North East Victoria corridor

Table 3 Limitations in the North East Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Dederang–Mount Beauty 220 kV line thermal capacity limitation	Monitored	• Install wind monitoring scheme. • Uprate the conductor temperature of both 220 kV circuits between Dederang and Mount Beauty to 82°C.	Increased import from NSW or increased export to NSW with high hydro generation in the area.	Not identified.
Dederang–South Morang 330 kV line thermal capacity limitation	Monitored	To manage thermal capacity limitation on the Dederang – South Morang 330 kV line, the possible options may include: • Construct additional interconnector to NSW (Victoria – New South Wales Interconnector (VNI) West). • Rebuild lines rated for 500 kV and change convert stations to 500 kV. • Construct third circuit or replace one circuit with double-circuit structures.	Increased import from NSW or increased export to NSW with high hydro generation in the area.	Not identified.
Mount Beauty–Eildon 220 kV line thermal capacity limitation	Monitored	To manage thermal capacity limitation on the Mount Beauty–Eildon 220 kV line, the possible options may include:	High demand and Increased NSW import and export.	Not identified.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
		• Uprate Mount Beauty–Eildon–Thomastown 220 kV line, including terminations to 75°C operation. • VNI west implementation along with the South Morang Terminal Station 220 KV cut in for Rowville and Thomastown lines to Elaine Power Station will resolve the issue. • Install wind monitoring scheme.		
Eildon–Thomastown 220 kV line thermal capacity limitation	Priority (Committed project actioned)	To manage thermal capacity limitation on the Eildon–Thomastown 220 kV line, as part of VNI West will cut the Eildon–Thomastown 220 kV line in at South Morang Terminal Station. Other options may include • Install wind monitoring scheme. • Uprate Eildon–Thomastown 220 kV line, including terminations to 75°C operation.	This limitation is caused by increased demand growth in the Melbourne metropolitan area, which is further exacerbated by changes in how power flows around the network following retirement of Yallourn West Power Station. These changes tend to increase VNI import into Victoria, and thus flow on the Eildon–Thomastown 220 kV line.	Not identified.
Dederang–Murray 330 kV line thermal capacity limitation	Monitored	• VNI West implementation will resolve the issue along with the construction of power flow controllers connected at Dederang–Murray 330KV double circuits will resolve the issue. • Install wind monitoring scheme	Increased NSW import.	Not identified.
Eildon–South Morang 220 kV line thermal capacity limitation	Monitored (Load growth – driven)	To manage thermal capacity limitation on the Eildon–South Morang 220 kV line, the possible options may include: • Installation of generation control runback scheme for Eildon. • Install wind monitoring scheme. • Installation of power flow controller	High demand and Increased NSW import and export.	Not identified.
Voltage stability at North Victoria/South NSW (import)	Monitored	• Procure network support services, including the provision of additional reactive support (generating). • Install additional capacitor banks and/or controlled series compensation at Dederang and Wodonga Terminal Stations.	Increased import from NSW to Victoria (high demand in Victoria).	Not identified as a material limitation in the scenarios modelled.
Voltage stability at North Victoria/South NSW (export)	Monitored	• Procure network support services. • Install a static var compensator or a static synchronous compensator.	Increased export to NSW from Victoria under low demand in Victoria.	Constraint identified during high export to NSW.

A4.4 North West Victoria corridor

Table 4 Limitations in the North West Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Voltage oscillation in western and north west Vic (under prior outage)	Monitored	• Non-market ancillary services contracts to provide system strength. • Install automatic generation runback control schemes.	Increased probability of prior outages of local 220 kV transmission lines. Reduced system strength in the region.	Constraint identified during high solar generation and prior outage.
Kerang–Bendigo 220 kV line thermal capacity limitation	Monitored	• Build a second Kerang–Bendigo 220 kV line by either building a new single-circuit adjacent to existing line or building a new double-circuit adjacent to existing line and retiring the existing line. • Install an automatic load shedding control scheme to enable the use of five-minute line rating. • Implementation of VNI West will resolve the issue.	Increased generation in regional Victoria.	Not identified as limitation as it is a localised issue.
Red Cliffs–Wemen–Koorangie–Kerang 220 kV line thermal capacity limitation (high generation, high demand)	Priority	• Build a second Red Cliffs–Wemen–Koorangie–Kerang 220 kV line by either building a new single-circuit adjacent to existing line or building a new double-circuit adjacent to existing line and retiring the existing line. • Install a power flow controller (or similar device) on the Red Cliffs–Wemen– Koorangie–Kerang 220 kV line to divert flow away from the line at times of high demand. • Contracting battery energy storage systems to charge or discharge, as required, to manage thermal loading on the Red Cliffs–Wemen–Kerang 220 kV line during peak loading periods.	High Victorian demand post commissioning of EnergyConnect and retirement of Yallourn West Power Station. Increased generation in regional Victoria.	Identified as a limitation as part of the North West Victoria REZ.
Tragowel–Kerang 220 kV line thermal capacity limitation	Monitored	• Install automatic generation runback control schemes. • Build a second Tragowel–Kerang 220 kV line by either building a new single-circuit adjacent to existing line or building a new double-circuit adjacent to existing line and retiring the existing line. • Install wind monitoring scheme.	Increased generation in Western Victoria and North West Victoria REZ	Not identified.
Red Cliffs–Carwarp–Kiamal–Murra Warra–Horsham 220 kV line thermal capacity limitation	Monitored	• Install automatic generation runback control schemes. • Build a second Bulgana–Murra Wurra 220 kV line by either building a new single-circuit adjacent to	Increased generation in Western Victoria and North West Victoria REZ	Not identified.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
		existing line or building a new double-circuit adjacent to existing line and retiring the existing line.		
Voltage instability/collapse in North West Victoria (around Wemen Terminal Station 220 kV)	Monitored	• Non-market ancillary services contract for the use of spare reactive power capacity. • Install dynamic voltage regulation such as a Static Var Compensator.	Low local demand and high solar generation.	Not identified as a limitation as it is a localised issue.

A4.5 South West Victoria corridor

Table 5 Limitations in the South West Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Ballarat–Berrybank–Terang–Gnarwarre–Moorabool 220 kV line thermal capacity limitation	Monitored	• Install automatic generation runback control schemes. • Replace the existing Ballarat–Berrybank–Terang–Gnarwarre–Moorabool 220 kV line with a new double-circuit 220 kV circuit line.	Increased generation in regional Victoria, with higher power flow toward the metro area to meet rising demand.	Identified as a limitation as part of the South West Victoria REZ.
Ballarat–Moorabool–Elaine 220 kV line thermal capacity limitation	Monitored	• The issue will be resolved following the cut in of the existing Ballarat–Moorabool 220 kV line No 2 into Elaine as part of the Western Renewables Link project.	Increased generation in regional Victoria, with higher power flow toward the metro area to meet rising demand.	Identified as a limitation as part of the South West Victoria REZ.
Moorabool–Heywood–Portland 500 kV line voltage unbalance	Monitored	• A switched capacitor with individual phase switching at Heywood or near Alcoa Portland. • Install phase switched power flow controllers at Heywood or near Alcoa Portland. • A static var compensator or a static synchronous compensator. • Additional transposition towers along the Moorabool–Heywood–Alcoa Portland 500 KV line.	New generation connections along the Moorabool–Heywood–Alcoa Portland 500 kV line potentially introduce voltage unbalance along the line. The impact of voltage unbalance levels increases in proportion to power flow, new generation connection points, and output generated.	Limitation not found as part of 2022 ISP/2022 *NSCAS Report* as it is related to voltage quality.
Inadequate south-west Melbourne 500 kV thermal capacity	Monitored	• A new Moorabool–Mortlake/Tarrone–Heywood 500 kV line. • Line limiting plant upgrades. • Install wind monitoring dynamic line rating scheme.	Significant wind generation and/or gas generation (in addition to the existing generation from Mortlake) is connected to the transmission network in the South West corridor.	Identified as a limitation in the 2020 ISP South West Victoria REZ Scorecard.
Moorabool 500/220 kV transformer thermal capacity limitation	Monitored	• Install an automatic generation runback control scheme.	Large-scale new generation connected to western Victoria area, and congestion in western Victoria	Not identified as a material limitation in the scenarios modelled.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
		• Install third Moorabool 500/220 kV transformer.	relieved to allow the new generation to be sent out of western Victoria.	

A4.6 Greater Melbourne and Geelong

Table 6 Limitations in Greater Melbourne and Geelong

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Ringwood–Thomastown 220 kV line thermal capacity limitation	Priority (VTP actioned)	• The impact of these limitations is expected to be reduced through the VTP projects 2.2, 2.3 and 2.4 which install an additional 500/220kV transformer at Cranbourne, perform load mitigation works in the Thomastown–Templestowe–Ringwood–Rowville 220kV line and perform fault level mitigation works at stations to prevent fault level exceedances that the augmentations may cause.	These limitations are primarily due to higher demand growth in the metropolitan Melbourne area, which is further exacerbated by retirement of Yallourn West Power Station.	Not identified as it is a localised issue.
Templestowe–Thomastown 220 kV line thermal capacity limitation	Monitored			
Rowville A1 500/220 kV transformer thermal capacity limitation	Priority (VTP actioned)	• Completion of 2025 VTP project 2.2, Install a second 500/220 kV transformer at Cranbourne and tie in the existing Hazelwood to Rowville 500 kV (No.3) circuit at Cranbourne, along with additional work of transferring the Rowville No.2 500/220 kV transformer to the Rowville No.3-4 220 kV Bus Group in parallel with the Rowville No. 1 500/220 kV transformer.	These limitations are primarily due to higher demand growth in the metropolitan Melbourne area, which is further exacerbated by retirement of Yallourn West Power Station.	Not identified as it is a localised issue.
Rowville–Malvern 220 kV line thermal capacity limitation	Monitored	• Cut-in Rowville–Richmond 220 kV No.1 and No.4 circuits at Malvern to form the Rowville–Malvern–Richmond No.3 and No.4 circuits.	Increased demand or additional loads connected to Malvern Terminal Station 220 kV.	Not identified as it is a localised issue.
Rowville–Springvale–Heatherton 220 kV line thermal capacity limitation	Monitored	• Connect a third Rowville–Springvale circuit (underground cable). • Connect a Cranbourne–Heatherton 220 kV double-circuit overhead line.	Increased demand or additional loads connected to Springvale and Heatherton Terminal Station 220 kV.	Not identified as it is a localised issue.
South Morang H3 and H4 330/220 kV transformer thermal capacity limitation	Monitored (Load growth – driven)	• Replace the existing transformer with a higher rated unit in conjunction with AusNet Services asset replacement program.	Increased demand in metropolitan Melbourne and increased import from NSW.	Not identified as a material limitation in the scenarios modelled.
South Morang–Thomastown No. 1 and No. 2 220 kV line thermal capacity limitation	Monitored	• To address thermal capacity limitations on the South Morang – Thomastown 220 kV No. 1 and 2, the implementation of the South Morang Terminal Station 220 kV cut-in for the Rowville and Thomastown lines to Elaine Power Station, as part	Increased demand around the metropolitan Melbourne area and/or increased export to NSW. Generation planting and retirements as per the 2025 VTP.	Not identified as it is a localised issue.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
		of the VNI West project, will increase line ratings and resolve the constraint.		
Thermal capacity limitation – overloading of the Moorabool–Geelong 220 kV lines	Priority (VTP actioned)	• The impact of limitation can be reduced through works considered in the VTP, specifically project 1.1, Increase the rating of the Moorabool–Geelong 220 kV circuits (No.1 and No.2). • Installing the 3rd Moorabool–Geelong 220 kV circuit may be considered if demand considered to grow.	Increased maximum demand in metropolitan Melbourne. Large-scale new generation connected to south-western Victoria area, and congestion within this area relieved to allow the new generation to be sent out of south-western Victoria. Generation planting and retirements as per the 2025 VTP.	Not identified as a material limitation in the scenarios modelled.
Thermal capacity limitation – overloading Geelong–Keilor 220 kV lines for post credible contingencies	Priority (VTP actioned)	• The impact of this limitation can be reduced through works considered in the VTP, project 1.4, Switching the existing Geelong to Keilor circuits into Deer Park (No.1 and No.3), creating 3 lines between 220 KV Geelong–Deer Park–Keilor. • Rebuilding the three existing Deer Park–Keilor transmission lines as high-capacity double-circuit lines under VTP Project 4.4. • The impact of limitation can be reduced through works identified in the VTP, specifically Project 4.1, which involves the installation of a new 500/220 kV at Truganina and the addition of two new 220 kV double-circuit lines from Truganina to Deer Park.	Increased maximum demand in metropolitan Melbourne. Large-scale new generation connected to south-western Victoria area, and congestion within this area relieved to allow the new generation to be sent out of south-western Victoria. Generation planting and retirements as per the 2025 VTP.	Not identified as a material limitation in the scenarios modelled.
Thermal capacity limitation – overloading of the Geelong–Deer Park line for trip of the Deer Park–Keilor line, or the Deer Park–Keilor 220 kV line for trip of the Geelong–Deer Park line	Priority (VTP actioned)			
Thermal capacity limitation – overloading of Keilor 500/220 kV A2 & A4 transformer for system normal	Priority (VTP actioned)	• The impact of thermal capacity overload can be reduced through works identified in the VTP, specifically Project 1.5, which involves the replacement of the A2, A3, and A4 500/220 kV transformers at Keilor with upgraded units rated at 1000 MVA. • Installation of 4th 1000 MVA 500/220 kV transformer at Keilor Terminal Station.	This limitation is primarily due to higher connection point demand growth in the Melbourne western metropolitan area, which is further exacerbated by retirement of YWPS.	Not identified as a material limitation in the scenarios modelled.
Keilor–West Melbourne 220 kV line thermal capacity limitation	Monitored (Load growth-driven)	• Uprate the line rating of the existing Keilor–West Melbourne 220 kV line. • Replace existing lines with double circuit or install a 3rd Keilor–West Melbourne line. • Install wind monitoring dynamic line rating scheme.	Increased maximum demand in Metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.
Altona–Keilor 220 kV line and Brooklyn–Keilor 220 kV line	Monitored (Load growth-driven)	• Installation of two 220 kV circuits between Keilor–Altona and Keilor–Brooklyn through a new 720 MVA double-circuit line on the spare easement, combined with reconfiguration of existing lines.	Increased demand at Altona and Brooklyn 220 kV.	Not identified as it is a localised issue.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Keilor–Thomastown No. 1 220 kV line thermal capacity limitation	Monitored	• Increase the transfer capability by installing wind monitoring facilities on the Keilor–Thomastown line. • Install an automatic load shedding control scheme to enable the use of a five-minute line rating • Install a third 500/220 kV 1,000 MVA transformer at Rowville, plus any fault level mitigation works.	Reduced supply from Eastern Victoria and increased supply from Western Victoria.	Not identified as it is a localised issue.
Sydenham–Keilor 500 kV line thermal capacity limitation	Monitored (Load growth – driven)	• Installation of second Keilor–Sydenham 500 kV circuit, with a rating of approximately 2,900 MVA at 35°C, to create a total of two 500 kV circuits from Keilor–Sydenham • Uprate line rating of the existing Sydenham–Keilor 500 kV line.	Increased generation in west and south-west Victoria supplying Keilor.	Not identified as a material limitation in the scenarios modelled.
Keilor 500/220 kV, A3 transformer thermal capacity limitation	Monitored (Load growth – driven)	• The thermal capacity overload can be resolved through works considered in the VTP, specifically project 1.5, Undertake a 1000 MVA replacement of the A2, A3 and A4 500/220 kV transformers at Keilor • Install 4th 1000 MVA 500/220 kV transformer at Keilor	Increased maximum demand in metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.
Keilor–South Morang 500kV line thermal capacity limitation	Monitored (Load growth – driven)	• Uprating the existing Keilor–South Morang line. • Install a second Keilor–South Morang parallel line.	Increased maximum demand in metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.
Altona–Brooklyn 220kV line thermal capacity limitation	Monitored (Load growth – driven)	• Uprating the existing Altona–Brooklyn 220 kV line. • Install a second Altona–Brooklyn 220 kV parallel line.	Increased demand at Altona and Brooklyn 220 kV.	Not identified as a material limitation in the scenarios modelled.
Brunswick–Richmond 220 kV line thermal capacity limitation	Monitored (Load growth – driven)	• Install second Brunswick–Richmond 220 kV line • Rebuild Thomastown Terminal Station to a higher fault level capacity such that South Morang Terminal Station can operate with the existing 3 H transformers in parallel to redirect supply away from the Brunswick-Richmond 220kV line.	Increased export to NSW and increased generation.	Not identified as a material limitation in the scenarios modelled.
Richmond – Rowville 220 kV line thermal capacity limitation	Monitored (Load growth – driven)	• Uprate line rating of the existing Richmond – Rowville 220 kV line. • Install wind monitoring dynamic line rating scheme.	Increased export to NSW and increased generation.	Not identified as a material limitation in the scenarios modelled.
Inadequate reactive power support at Altona Terminal Station 220 kV (July 2029)	Monitored (Load growth – driven)	• Re-instate the 200 MVAr capacitor banks at Altona Terminal Station 220 kV.	Increased demand at Altona and Brooklyn 220 kV.	Not identified as a material limitation in the scenarios modelled.

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Inadequate reactive power support at Sydenham 500 kV, Brooklyn and Keilor 220 kV Terminal Stations (July 2029)	Monitored (Load growth – driven)	• Installation of two 220 kV circuits between Keilor–Altona and Keilor–Brooklyn through a new 720 MVA double-circuit line on the spare easement, combined with reconfiguration of existing lines.	Increased maximum demand in metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.
Inadequate reactive power support at Keilor Terminal Station 500 kV (July 2029)	Monitored (Load growth – driven)	• Installation of 2nd Keilor - Sydenham 500 kV circuit, with a rating of approximately 2,900 MVA at 35°C, to create a total of two 500 kV circuits from Keilor - Sydenham	Increased maximum demand in metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.
Inadequate reactive power support at South Morang Terminal Station 500 kV (July 2032)	Monitored (Load growth – driven)	• Installation of 2nd Rowville to South Morang 500 kV circuit, to create a total of two 500kV circuits from South Morang to Rowville	Increased maximum demand in metropolitan Melbourne.	Not identified as a material limitation in the scenarios modelled.

A4.7 Western Victoria corridor

Table 7 Limitations in Western Victoria corridor

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Ballarat–Waubra–Ararat–Crowlands–Bulgana–Horsham 220 kV line thermal capacity limitation	Monitored	• Install automatic generation runback control schemes. • Installing a new double-circuit Bulgana–Murra Warra 220 kV line via a new terminal station at Horsham. • Implementation of Western Renewables Link will reduce this limitation.	Increased generation in Western Victoria and North West Victoria REZ	Not identified.
Inadequate reactive power support in Regional Victoria	Monitored	• Staged installation of additional reactive power support in regional Victoria.	Increased maximum demand and/or reactive power consumption in regional Victoria.	2022 ISP/2024 *NSCAS Report* did not identify this limitation as it is a localised issue.

A4.8 Victoria system-wide

Table 8 Limitations in the Victorian system

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
Insufficient demand to dispatch system strength services from synchronous generation	Monitored	• System strength will be addressed with published RIT-Ts.	Decreasing minimum demand	2024 *NSCAS Report* did identify this limitation, however it clarified that it is expected

Limitation	Limitation type	Possible network solution	Trigger	AEMO NTP references
		• Install synchronous condensers at strategic locations of the network. • Install grid-forming battery energy storage systems. • Contract synchronous generation to provide system strength services.		the outcomes of the System Strength RIT-T will address the limitation.