Victorian Temporary Standby Emergency Power Supply

Community Presentation Morwell, Victoria

January 2018
Introduction

Temporary standby emergency power supply is needed to help meet Victoria’s power needs under extreme conditions over summer 2017-18.

The project site is located in Morwell, on land surrounding the old Morwell Power Station. 105 diesel generators have been installed to provide 110 MW of emergency power supply.
Presentation Outline

- Project context
- Background on Aggreko
- Project activities
- Project site
- Environmental assessments
- Environmental controls
Why is this project being planned?

- The Australian Energy Market Operator (AEMO) is responsible for ensuring that adequate electricity supply is available to meet projected demand

- AEMO’s recent forecast (Electricity Statement of Opportunities (ESOO) September 2017) identified that without intervention, there would be a potential risk of electricity supply shortfall in Victoria this summer:
  - Under extreme scenarios (i.e., heatwave in Victoria and SA), AEMO has identified a supply reserve gap of between 218 - 760 MW
  - Highest risk is on hot afternoons between January and March 2018
What is being done?

- AEMO is undertaking six main ‘summer readiness’ intervention initiatives to mitigate power shortfalls:
  - Maximising existing and new supply availability and capacity
  - Maximising transmission network availability and capacity
  - Minimising risks to fuel supplies to generation
  - Encouraging and maximising demand side participation
  - Seeking additional reserves
  - Dispatch forecasting initiatives

- This project – providing 110 MW of temporary emergency power supply – is one of 21 projects delivering a total of 1,150 MW of energy reserves across Victoria and South Australia

- Under additional reserves, AEMO sought expressions of interest from suppliers to provide temporary standby emergency power supply

- Aggreko has been contracted by AEMO to provide additional power reserves to assist with mitigating the potential power shortfall risk over this summer
When is standby emergency power supply needed?

- Modelling of historical electricity demand variability for Victoria from 2005 to 2017, which has been adjusted to reflect current levels of demand, shows two occasions (2009 and 2014) when the Reliability and Emergency Reserve Trader (RERT) would have been required given current levels of available generation (i.e., demand for electricity was greater than supply available in Victoria and interconnector support from Tasmania and NSW).

- Emergency reserve electricity is only required when demand exceeds current firm generation (blue line) plus interconnector support (imports from NSW and Tasmania) (green line).

- It is likely that there will be minimal support available from SA during high demand periods.
When is standby emergency power supply needed?
Additional modelling undertaken by AEMO to understand when standby diesel generation may be used indicates:

- 61% chance there will be no reserve shortfall over this summer
- If there is a shortfall, AEMO has a hierarchy of measures that they would implement, with the dispatch of diesel generators being one of the last
- If the temporary standby emergency power is required, it would most likely operate between 1:00 and 5:00 pm – i.e., 4 hours
- Based on historical records over the last 12 years, it is estimated that over the 3-month period the temporary standby emergency generation may operate for a total of between 4 and 20 hours

- AEMO has contracted Aggreko to provide temporary emergency standby power to the National Electricity Market (NEM) for this summer
- Contract activities and duration:
  - Installation during December, 2017
  - On standby from 8 January 2018 for 3 months

- Probability of operating diesel generators:
  - 61% probability that they will not be required
  - 19.5% probability of running for 4 hours
  - 13% probability of running for 8 hours
  - 3% probability of running for 12 hours
  - 2% probability of running for 16 hours
  - 1.5% probability of running for 20 hours
Aggreko Contract

About Aggreko

- Aggreko is an international company specialising in helping organisations manage power demands and plan for emergencies
- World leader in temporary power solutions, with over 50 years experience
- Aggreko plc is listed on the London Stock Exchange (AGK.L), and is a member of the FTSE-250 index
- Provides power solutions to ‘bridge the gap’ and ensure reliability for complete power grids, construction sites, mines, events, facilities and more
- Experience in setting up and operating scalable power plants – from 10 KW to 250 MW – within weeks
- Recent local projects:
  - Supported Tasmania through a severe drought and resultant power shortfall by establishing 108 MW of diesel-generated power at short notice
  - Supplied 6 MW to Hazelwood Power Station for 3 months during 2016 while transformers were repaired
  - Supplied 30 MW at Wonthaggi desalination plant

- Aggreko has an all-encompassing health, safety and environmental program, which is an integral part of all operations, and holds a number of ISO certifications
Aggreko Local Content and Commitment

◆ Aggreko’s Australia-Pacific Head Office is located in Braeside Melbourne, with 100 people employed in Victoria

◆ Aggreko is using as much local content and labour as possible:
  - Local firm engaged for installation (around 50 personnel required)
  - Security personnel
  - Cranes and transport companies engaged
  - Accommodation and meals being used in the local area

◆ Aggreko is committed to a wider Victorian spend on items such as:
  - Cable ladder from Geelong
  - HV and LV copper cable
  - Aggregate and earthing material
Aggreko is using the former Morwell Power Station site owned by Energy Brix, located at 412 Commercial Road Morwell.

Aggreko has an agreement with Energy Brix to use the site, and approvals from the EPA, DELWP, Latrobe City Council and Heritage Victoria.

The site is a heavily disturbed industrial site where coal-fired power generation and manufacture of briquettes took place from 1949 to 2014.

The site is zoned as a Special Use Zone 1 (SUZ1) under the Latrobe Planning Scheme.
Proposed Activities

- Aggreko is establishing 110 MW of temporary standby emergency power supply to be produced by 105 diesel-fired engines
- Each diesel engine is contained in its own shipping container (including bunding, sound insulation) with fuel reserves for 5 hours of operations
- At the completion of the contract all equipment will be removed from the site
- There will be no ground disturbance associated with project activities

- Site activities include:
  - Establishment of earth grid under the generating equipment (where required)
  - Placement of crushed stone (blue metal) or similar over the earth grid
  - Laying of electrical cables to connect generators to the transformer
  - Placement of 105 diesel generators (within containers)
  - Placement of 20 transformers (within containers)
  - Placement of ancillary facilities (workshop and stores, all incorporated in containers)
  - Upgrading of existing electrical equipment to enable electricity to be input into the grid
  - Placement of site office
Planning and Site Selection

- There are very few suitable sites that can be used — a key requirement is that the existing electrical infrastructure must be capable of being connected to the grid
- The old Morwell Power Station satisfies this key requirement
- The site is also highly disturbed from previous use and is in an appropriate land use zone, i.e., Special Use Zone 1 under the Latrobe Planning Scheme
Site Selection, Environmental and Stakeholder Considerations

Other factors considered in selecting the site included:

- Site lease: landowner must agree to use of site
- Site physical constraints: size, truck and crane access, overhead clearance to power lines, previously cleared, near flat land
- The site must have a suitable buffer around it, and a reasonable distance to nearest sensitive receptors
- Condition and age of the assets to connect into, and system fault levels
- Electricity connection must suit the requirements of electricity transmission and distribution network service providers, and not cause network stability issues
- Connection cannot be on a constrained part of the network; AEMO must also agree with the site selection
- Given the short time available, only connection at 11 kV or 22 kV is possible. Connecting to electrical infrastructure that is 33, 66 or 132 kV requires long lead times beyond that available for this project

- Baseline studies undertaken:
  - Air quality
  - Noise
- Nearest sensitive receptors are >1.4 km from site to the north, separated by Princes Highway
- Consultation with government and community
In consultation with the Victorian EPA, an air quality specialist has assessed the potential air quality impacts of the proposed temporary power station at nearby ‘sensitive receptors’ and site boundaries.

Modelling has been undertaken incorporating:

- 5 years of meteorological data
- Background air quality data provided by the EPA
- Local topography and layout/heights of existing structures on the site
- Layout and typical emissions of the proposed diesel generators

The closest receptors are industrial properties to the west, south and east.

Nearest residential receptors are to the north, northwest and southeast.
Air Quality

- Modelling was run assuming operation of 8 hours per day every day for 90 days at the request of EPA.
- Additional model runs of 4 hours per day and 2 hours per day, for 90 days.
- NO₂ was the key emission assessed. Results showed possibility of EPA criteria exceedances for NO₂ in the above highly conservative scenarios.
- Modelling by AEMO indicates there is a 61% chance that the power station won’t operate at all, 32.5% chance of running for up to 8 hours, and near zero chance of running for >20 hours, over the whole period.
- Operation is most likely when there is a heatwave in Victoria (3+ days >38°C).

- The air quality specialist reviewed weather data to identify heatwaves in the past 5 years, and ran the model for a typical heatwave dataset.
- In that scenario, there were no exceedances of criteria at any residential receptors.
- At nearby industrial sites, Workplace Exposure Standards (Safe Work Australia, 2013) will not be exceeded.
- Particulates, sulfur dioxide and volatile organic compounds were also assessed.
- Worst case scenarios showed that no receptors beyond site boundaries would have exceedances of PM₁₀ or PM₂.₅.
- Results for SO₂ and VOCs were well below relevant criteria even at site boundaries.
In consultation with the EPA, a specialist acoustic consultant has assessed the potential noise impacts of the proposed temporary power station at nearby sensitive receivers.

Several days of 24-hour noise monitoring were undertaken on site to assess background noise conditions.

Modelling incorporated background noise data and wind conditions of Morwell, the layout of existing structures on site, and the layout and typical noise emissions of the proposed generators.

Nearest residential receivers are to the north, northwest, east-northeast and southeast.

Relevant Victorian noise assessment criteria (NIRV and SEPP N-1) were applied to receivers.
Modelling included a worst case scenario (breezes in direction of receivers) as well as a scenario for more likely wind conditions.

The most critical assessment criteria is for evening operation (6 pm to 10 pm weekdays, longer on weekends).

Operation of generators is limited to 7 am to 10 pm.

Results show evening compliance at all receivers under calm conditions and when breezes blow away from receivers.

Adverse winds impact noise levels – minor non-compliance of 2 to 7 dB(A) may occur in the evening at some receptors in such conditions.

The specialist reviewed long-term average wind directions for Morwell.

In Jan to Mar, only 2 to 4% of winds blow in the direction of each of the Morwell (NW, N) and Church Road (SE) receivers. Such winds are less likely in heatwave conditions.

Although 20 to 22% of winds blow in the direction of Firmins Lane (ENE), modelling shows evening compliance at that site.

Noise levels at industrial/commercial sites are below criteria specified by the OH&S Regulations 2017.
Air Quality and Noise

- Winds from the south, southeast and northwest would have highest potential of air quality and/or noise impacts
- Average summer afternoon (3 pm) winds in Morwell rarely blow in the direction of receptors
- On hot days, winds most often come from the north
Environmental Mitigations and Controls

- All temporary structures and equipment is laid on the surface — no ground disturbance
- Individual diesel generators are in self-contained shipping containers with their own bunding and fuel storage
- Auxiliary fuel storage on site is securely bunded; unlikely to require any fuel/oil changes or deliveries during operations
- All containers and equipment will be removed at the end of the contract

Traffic control procedures are in place to avoid disruption to existing traffic:
- Only using major roads and highways to transport equipment — avoiding residential areas
- No oversized vehicles
Environmental Mitigations and Controls

- Containerised units with noise insulation reduce noise emissions
- Aggreko has been able to source about a third of the proposed generators with lower air emissions
- Within operational constraints, containers are being strategically located to minimise noise and air quality impacts
- Aggreko has installed air quality and noise monitoring equipment on and near the site for the period of early January to end March 2018
- Monitoring will be undertaken on days of potential operations
QUESTIONS
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THANK YOU