

MRL Calculation & ST Reserve Requirement

July 2009

PRESENTED BY DAVID BONES



CONTENTS



- | | |
|---------------------------|-------|
| 1. MRL Calculation | Pg 3 |
| 2. 2009 MRL Recalculation | Pg 11 |
| 3. ST Reserve Review | Pg 13 |

MRL CALCULATION OVERVIEW



EXISTING MRL AND NET IMPORT LEVEL



2006 MRL RECALCULATION

- MRLs and associated net import limits used operationally from 24 October 2006
- Revised net import limits adopted from November 2007 to accommodate the abolition of the Snowy region

Region	MRL	Net Import Level
Queensland	560	0
New South Wales	-1430	330 ²
Victoria and South Australia ¹	615	940 ³
South Australia ¹	-50	0
Tasmania	144	not applicable

1. The minimum reserve level for the combined Victorian and South Australian regions, and the local South Australian requirement must both be met
2. Varies with availability of Tumut 1, 2 and 3 and Guthega
3. Varies with availability of Murray 1 and 2

OVERVIEW OF CALCULATION



TWO-STEP CALCULATION PROCESS

- Step 1 – determine the generation capacity required to meet the Reliability Standard
- Step 2 – establish the minimum reserve level by comparing the generation capacity derived in step 1 with the 10% POE maximum demand
 - > $MRL = \text{regional generation capacity required to meet the Reliability Standard (calculated in step 1)} + \text{assumed net regional import} + \text{regional committed DSP} - 10\% \text{ POE maximum demand}$

STEP 1 – TARGETING THE RELIABILITY STANDARD



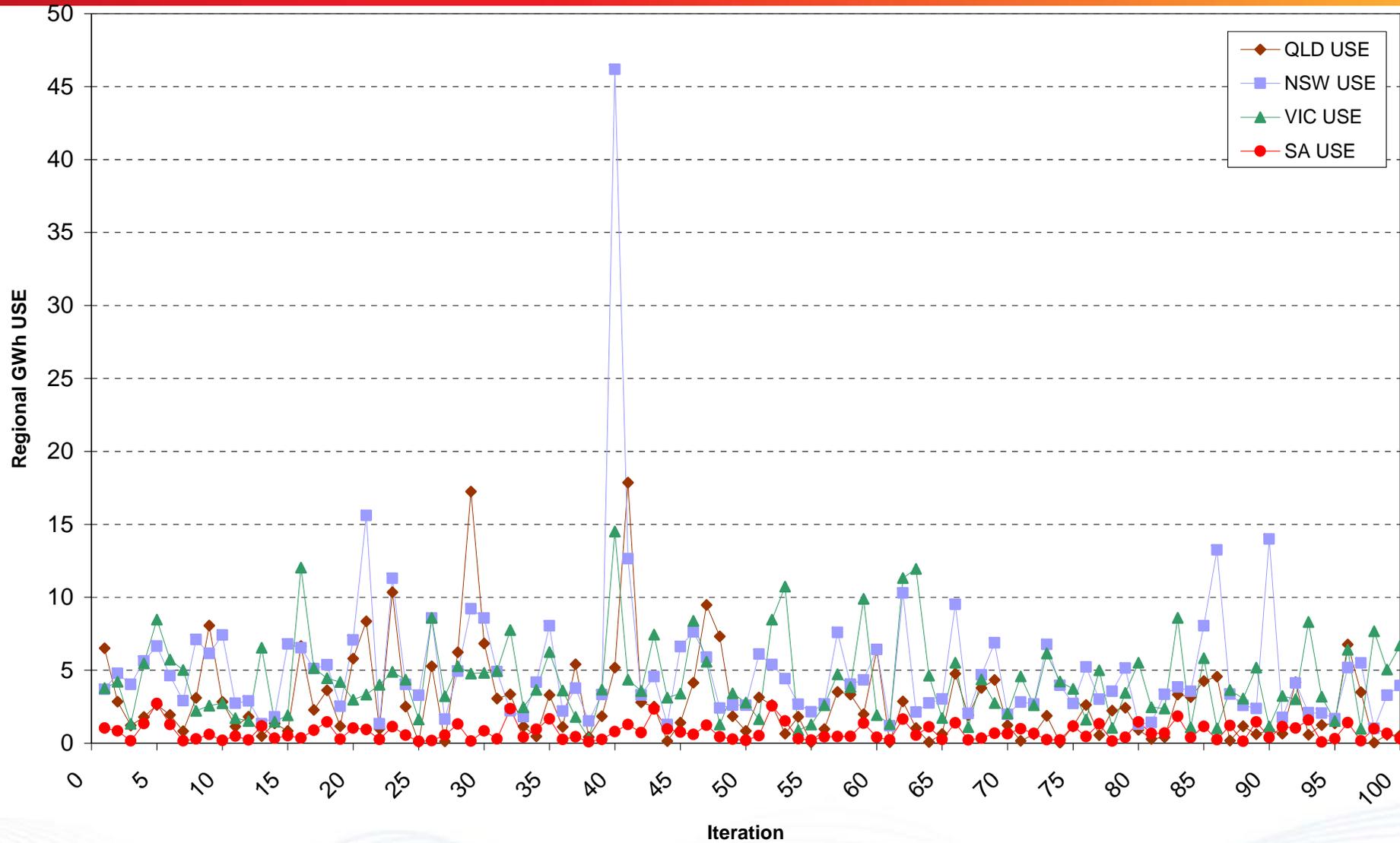
CALCULATION TECHNIQUE

- Time-sequential monte-carlo analysis used to develop the expected level of USE in each region for a given level of installed capacity
 - > ½ Hourly demand trace developed reflecting historical relationships between regional demands
 - > Sufficient iterations (100~200) performed to account for random plant failures
 - > Weighting of USE from both 10 and 50 %POE demand conditions

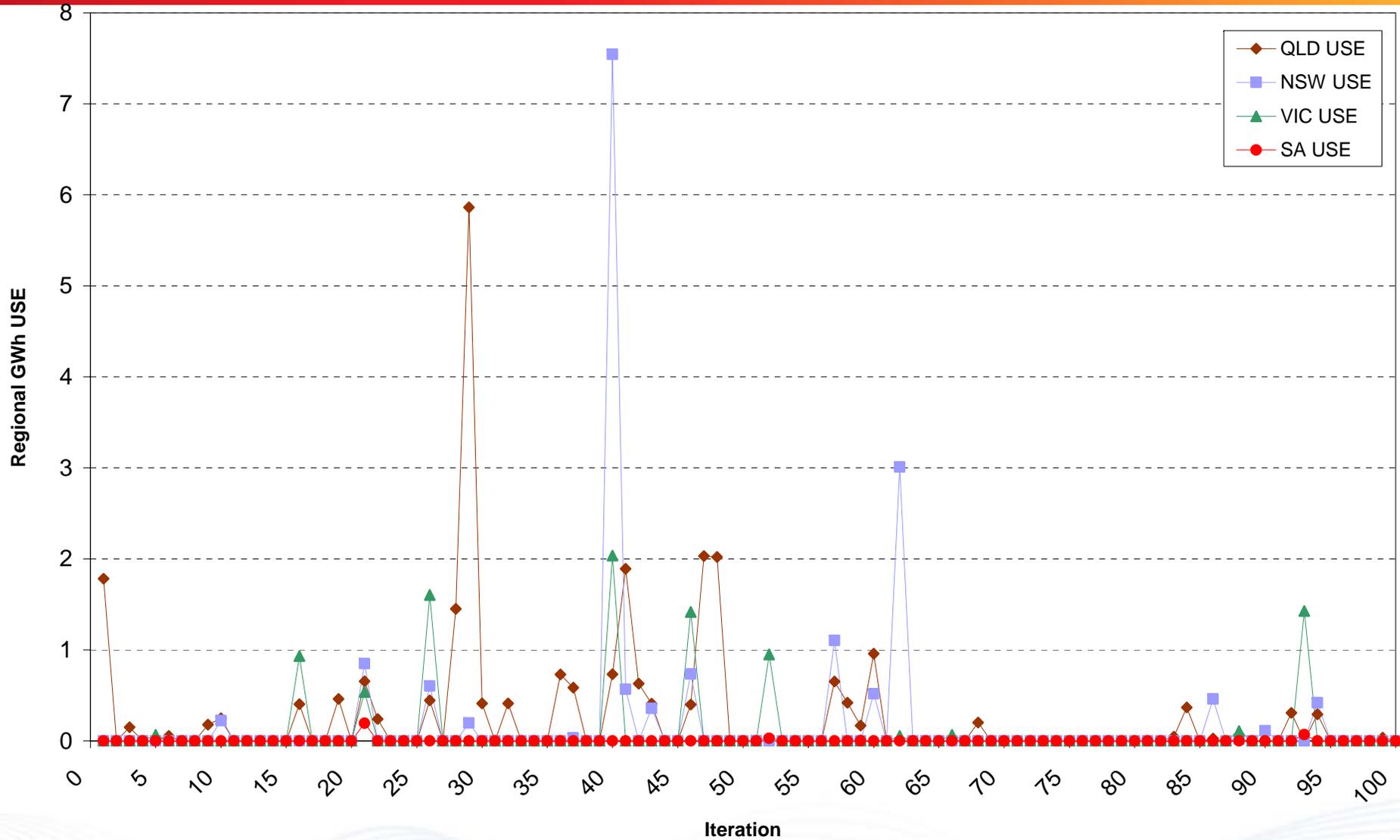
TARGETING THE RELIABILITY STANDARD

- Level of installed generation in each region adjusted and the expected USE recalculated until:
 - > Installed generation is just sufficient to deliver 0.002% USE in each region
 - > The distribution of reserve is such that the total installed generation is minimised

STEP 1 – TYPICAL RESULT 10%POE



STEP 1 – TYPICAL RESULT 50%POE



STEP 2 – MRL AND NET IMPORT LIMIT



TRANSLATING THE MINIMUM GENERATION TO A MRL

- Net Import Limits ensure consistency between
 - > The assessment of reserve margins; and
 - > The translation of minimum generation levels to MRLs
- Net Import Limits = assumed net imports used to translate minimum generation levels to MRLs
- $MRL = \text{regional generation capacity required to meet the Reliability Standard (calculated in step 1)} + \text{assumed net regional import} + \text{regional committed DSP} - 10\% \text{ POE maximum demand.}$

THERE ARE MANY WAYS TO TRANSLATE MINIMUM GENERATION TO MRL

- Need to ensure consistency between the translation and the application of the MRL in MTPASA

DISTRIBUTION OF RESERVE

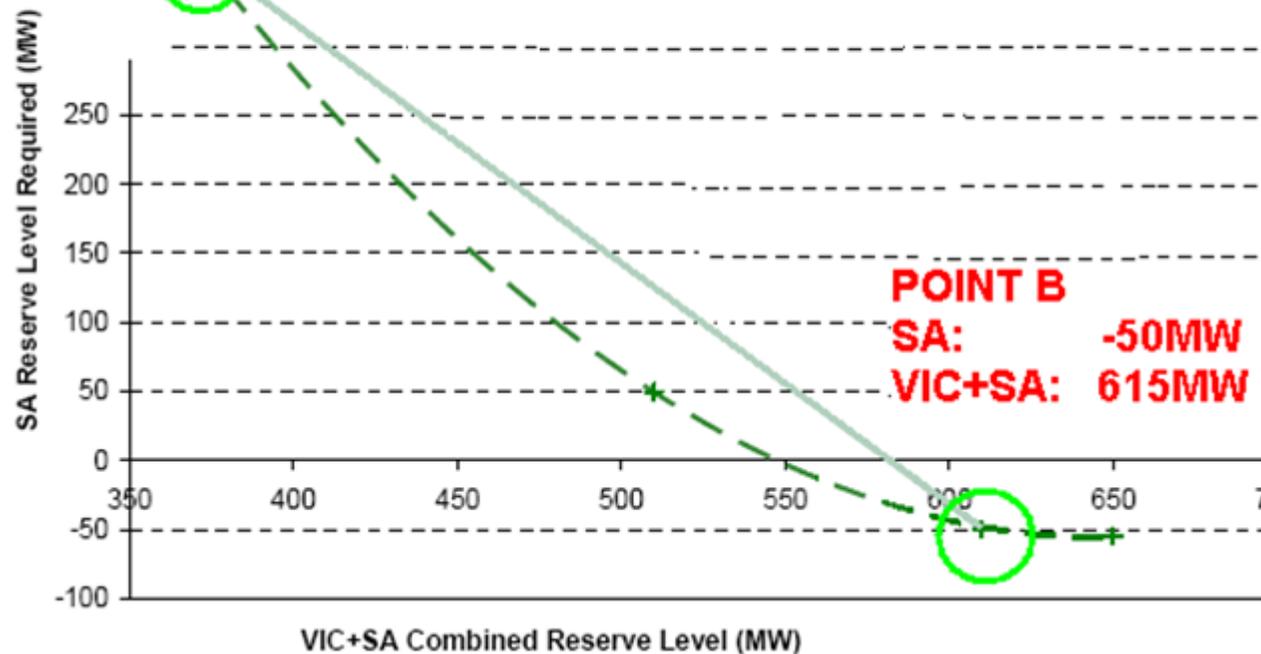
POINT A USE = 0.002% IN VIC AND SA

POINT B USE = 0.002% IN SA AND <0.002% IN VIC

POINT A

SA: 370MW

VIC+SA: 370MW



2009 MRL RECALCULATION



2009 MRL RECALCULATION



- AEMO plans to review the minimum reserve levels in parallel with the Reliability Panel review
- The recalculation will be tightly aligned with the review and will help inform the Panel
- The aim is that new MRLs will be available by late 2010.

ST RESERVE REQUIREMENT



ST RESERVE REQUIREMENT



- In 2008 NEMMCO with the assistance of ROAM Consulting reviewed the factors affecting ST assessment of reliability. The report:
 - > Summarises the current practice for ST reliability assessment, and
 - > Examines the alignment of the existing practice and the Reliability Standard
- The report reaches the following conclusions:
 - > Current LOR2 trigger should be retained, but it equates to a reserve requirement that would be too low to meet the Reliability Standard
 - > An additional ST intervention trigger should be introduced to work with the current LOR2 trigger. It would be more conservative than the current LOR2 trigger.
 - > A specific ST intervention trigger should be added to the Reliability Standard because meeting the current standard cannot be assured by a methodology which only operates in the ST time frame

ST RESERVE ASSESSMENT



- > **Lack of Reserve (LOR2)**
 - **Triggers ST intervention by AEMO**
 - **Security related – LOR2 trigger exists if the occurrence of a critical single contingency event is likely to require involuntary load shedding**
 - **Reserve assessed against 50% POE demand forecast, compared with impact of the critical single contingency**

- > **Low Reserve Condition (LRC)**
 - **LRC exists if regional reserve assessed against 10% POE demand forecast falls below MRL**
 - **Identified LRCs in ST PASA are communicated to the market for information. They do not trigger market intervention by AEMO.**

LOR2 INSUFFICIENT TO GUARANTEE RELIABILITY STANDARD

Figure 4.1 - QLD USE as a function of Operational Reserve Level

