

NEED/OPPORTUNITY STATEMENT (NOS)



Marulan No.4 Transformer Renewal

NOS- 000000001219 revision 0.0

Ellipse project description: Marulan No. 4 Transformer Renewal

TRIM file:

Project reason: Capability - Improved Asset Management

Project category: Prescribed - Asset Renewal Strategies

Approvals

Author	Lalit Sonawane	Substations Asset Strategist
Endorsed	Tony Gray	Substations Asset Manager
Approved	Lance Wee	Manager Asset Strategy
Date submitted for approval	18 May 2016	

1. Background

Marulan 330/132kV Substation comprises 6 x 330 kV feeders, 1 x 330/132/33 kV transformer and 3 x 132 kV feeders including Taralga Wind Farm connection. The substation was established in 1992. The existing transformer was relocated from Dapto and installed at Marulan substation in 1991. This Hitachi made transformer was first installed and placed in service at Dapto substation in 1962.

Marulan Substation is a customer connection point supplying both Essential Energy and Endeavour Energy 132 kV networks in the area inclusive of Moss Vale, Goulburn and connection to Taralga Wind Farm. The site will remain a connection point to Essential Energy and Endeavour Energy into the foreseeable future as outlined in the load forecasts of the 2015 Transmission Annual Planning Report.

2. Need/opportunity

Marulan 330/132 kV substation is equipped with a single 160 MVA transformer which is currently 54 years old and nearing the end of its serviceable life. As per the Health Index (HI) analysis, the remaining life is estimated to be two years at the end of 2018/19- 2022/23 regulatory period.

The Network Asset Condition Assessment (NACA) identified several condition issues, which require to be addressed to reduce safety, reliability and environmental risks. Increasing risk of failure exists.

Need Drivers:

- Age, transformer will be 62 years old at the end of next regulatory period with estimated remaining life of two years.
- Defect history suggests high incidences of oil leaks, present all over the transformer and accessories.
- Equipment is no longer supportable by the original equipment manufacturer (OEM), Hitachi.
- Spare bushing is in poor health and cannot be used as long term replacement.
- Uniqueness of components such as tapchanger fitted to bushings - technological obsolescence.
- Paint is in poor condition leading to failure due to corrosion.
- Poor oil quality with resistivity at low level (Danger range).
- Poor DGA results with Ethane and Methane in Danger range.
- Increased cost of maintenance.

The associated risk cost of No. 4 transformer is **\$584,002** per year. Risk exposure is required to be minimised prior to June 2023.

3. Related needs/opportunities

The following opportunities are available to improve safety and reliability at Marulan substation:

1. Replace the auxiliary transformer associated with No. 4 transformer due to ageing issue.
2. Replace 330 kV circuit breaker (EC00022697) due to type and ageing issue.

Related Need in the 2018/19-22-23 regulatory period has been established by the Secondary Systems Assets group is NS-1266 Marulan Secondary Systems Renewal.

4. Recommendation

It is recommended that options be considered to address the identified need/opportunity in the 2018/19-2022/23 regulatory period.

Attachment 1 - NACA-DCN242 Marulan No. 4 Transformer Condition Assessment



NACA-DCN242
Marulan No Rev 0 - M

Attachment 2 – Risk Cost Summary



MRN Risk Cost
Summary 160519.pdf