

# NEED/OPPORTUNITY STATEMENT (NOS)



Sydney East 415V AC Dist Replacement

NOS- 000000001516 revision 4.0

**Ellipse project no.:** P0008760

**TRIM file:** [TRIM No]

**Project reason:** Capability - Asset Replacement for end of life condition

**Project category:** Prescribed - Replacement

## Approvals

|                                    |                  |                                                    |
|------------------------------------|------------------|----------------------------------------------------|
| <b>Author</b>                      | Annie Welvaert   | Secondary Systems Analyst                          |
| <b>Endorsed</b>                    | Mark Jones       | Secondary Systems and Communications Asset Manager |
| <b>Approved</b>                    | Lance Wee        | M/Asset Strategy                                   |
| <b>Date submitted for approval</b> | 16 November 2016 |                                                    |

## Change history

| Revision | Date             | Amendment                 |
|----------|------------------|---------------------------|
| 0        | 17 May 2016      | Initial issue             |
| 1        | 17 October 2016  | Update to 2016/17 dollars |
| 2        | 16 November 2016 | Update to format          |

## 1. Background

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Sydney East Substation was originally constructed in 1976. It is a main point of interconnection for the supply to the eastern region of Sydney and connects to Ausgrid at 132kV.

TransGrid has experienced an increase in the number of safety incidents related to the 415V AC systems across all substation sites over the past two years. The investigation into these incidents has highlighted the poor condition of aging 415V AC distribution infrastructure as a major contributing factor to these incidents. A project was initiated to identify all defects on the 415V systems across the network and Sydney East was identified as one of the sites with a high concentration of defects.

The 415V AC distribution at Sydney East Substation powers all non-critical systems at the site including GPOs, lighting, air conditioners, security and transformer cooling. It will remain an integral component of a substation site for the foreseeable future.

## 2. Need/opportunity

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TransGrid is currently managing the defects on its 415V AC distribution systems that were identified as the highest risk to safety through a mixture of corrective maintenance and changes to work practices. However, these measures are not addressing the structural deficiencies in the infrastructure and a more holistic approach to bring systems up to current requirements as per AS3000 will likely achieve better safety outcomes.

The Sydney East site has 20% of all 415V AC distribution defects across the network. The original system will be over 45 years old by 2023.

The risk cost associated with the 415V distribution system at Sydney East is \$24m per annum. The most significant element of concern is the reliability consequence associated with an unplanned outage of a primary asset due to malfunction of the 415V AC distribution. The risk costs are based on 2015/16 probabilities of failure as extrapolated from the 415V Safety Survey conducted in 2015.

## 3. Related needs/opportunities

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NIL

## 4. Recommendation

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It is recommended that options be considered to address the identified need/opportunity.

## Attachment 1 – Risk costs summary

Summary of results is attached below. Refer to supporting document in PDGS for full risk assessment.

### Current Option Assessment - Risk Summary

Project Name: Sydney East 415V AC Dist Replacement

Option Name: 1516 - Base Case

Option Assessment Name: 1516 - Base Case - Assessment 1

Rev Reset Period: Next (2018-23)



| Major Component       | No. | Minor Component                | Sel. Hazardous Event                                                | LoC x CoF (\$M) | Failure Mechanism | NoxLoC xCoF (\$M) | PoF (Vr 1) | Total Risk (\$M) | Risk (\$M) (Rel) | Risk (\$M) (Op) | Risk (\$M) (Fin) | Risk (\$M) (Peo) | Risk (\$M) (Env) | Risk (\$M) (Rep) |
|-----------------------|-----|--------------------------------|---------------------------------------------------------------------|-----------------|-------------------|-------------------|------------|------------------|------------------|-----------------|------------------|------------------|------------------|------------------|
| Low Voltage AC Supply | 1   | AC Low Voltage Board/Panel/Box | Uncontrolled Electrical Contact / Discharge (Low Voltage AC Supply) | \$15.76         | Failure           | \$15.76           | 19.95%     | \$3.14           | \$2.78           |                 | \$0.36           |                  |                  | \$0.00           |
| Low Voltage AC Supply | 1   | AC Low Voltage Board/Panel/Box | Unplanned Outage - HV (Low Voltage AC Supply)                       | \$43.62         | Failure           | \$43.62           | 19.95%     | \$8.70           | \$8.34           |                 | \$0.36           |                  |                  | \$0.00           |
| Low Voltage AC Supply | 1   | AC Low Voltage Cable           | Uncontrolled Electrical Contact / Discharge (Low Voltage AC Supply) | \$15.76         | Failure           | \$15.76           | 19.95%     | \$3.14           | \$2.78           |                 | \$0.36           |                  |                  | \$0.00           |
| Low Voltage AC Supply | 1   | AC Low Voltage Cable           | Unplanned Outage - HV (Low Voltage AC Supply)                       | \$43.62         | Failure           | \$43.62           | 19.95%     | \$8.70           | \$8.34           |                 | \$0.36           |                  |                  | \$0.00           |
|                       |     |                                |                                                                     |                 |                   |                   |            | \$23.69          | \$22.24          |                 | \$1.45           |                  |                  | \$0.00           |

Total VCR Risk: \$22.23      Total ENS Risk: \$0.00