

NEED/OPPORTUNITY STATEMENT (NOS)



Various Location Disconnecter Renewal

NOS- 000000001357 revision 3.0

Ellipse project no.: P0007982

TRIM file: [TRIM No]

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

Project category: Prescribed - Asset Renewal Strategies

Approvals

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Date submitted for approval	22 November 2016	

Change history

Revision	Date	Amendment
0	3 May 2016	Initial issue
1	14 November 2016	Update to 2016/17 dollars
2	22 November 2016	Update to format

1. Background

Disconnectors are typically used within substations to provide visible isolation of associated switchgear from the network to allow work to be performed. As the isolation point itself cannot be worked on, the network outage required to access the disconnector itself is often wider due to the need to isolate via upstream disconnectors. As a result, preventative maintenance is not performed on most disconnectors and the disconnectors are essential run until failure.

Earth switches are often integrated into the disconnector construction, being procured at the same time from the same manufacturer. Therefore replacement of the disconnector routinely requires the replacement of the associated earth switch where fitted.

TransGrid has a total of approximately 3700 disconnectors with a significant portion beyond their nominal technical life of 40 years.

2. Need/opportunity

A broad condition assessment of disconnectors has been undertaken to identify those with issues presenting a risk. The following issues are associated with aging disconnectors:

- > Difficulty or inability in operation due to corrosion or poor contact alignment
- > Failure of mechanical drive components including turnbuckles, bearings and motors
- > Degradation of contacts leading to sticking or hot joints
- > Lack of manufacturer support and the inability to procure required parts for maintenance activities

Failure of disconnectors typically occurs during an outage for the associated switchgear (e.g. circuit breaker maintenance) either when the disconnector is attempted to be opened at the commencement of the outage or closed at the completion. Poor electrical contact between the disconnector contacts may cause heating and failure in service, although this is rare, and thermovision survey is relied upon to detect this failure mechanism.

The identified disconnectors present the following risks:

- > Safety – injury due to difficulty in operation
- > Outage – increased outage times due to inability to return associated by into service
- > Financial – increased costs associated with defects

Although specific disconnectors have been identified in this needs statement and are listed in Attachment 1, it should be noted that reprioritisation of disconnectors may be undertaken in the future. This is because mechanical failure is difficult to predict, and feasibility of repair may be dependent on the actual failure mechanism.

A risk assessment has been conducted and results in a risk cost of \$17.4m.

This need should be addressed by 2023.

3. Related needs/opportunities

NIL.

4. Recommendation

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

Attachment 1 – Risk costs summary

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

PIC Number (or alt. reference)	Bay Reference	Name	Voltage
NNSTRE2BB3-DIS 4443	NNSTRE2BB3	DIS 4443	132
NNSTRE2BB3-DIS 9633	NNSTRE2BB3	DIS 9633	132
NNSTRE2BB3-DIS 4026	NNSTRE2BB3	DIS 4026	132
NNSTRE2BB3-DIS 4118	NNSTRE2BB3	DIS 4118	132kV+1esw
SWSGRF2J1-DIS 99K3	SWSGRF2J1	DIS 99K3	132
SWSGRF2J1-DIS 4413	SWSGRF2J1	DIS 4413	132
SWSGRF2J2-DIS 4423	SWSGRF2J2	DIS 4423	132
SWSGRF2J2-DIS 4106	SWSGRF2J2	DIS 4106	132
SWSGRF2J2-DIS 4117	SWSGRF2J2	DIS 4117	132
SWSTU22F1-DIS 97B3	SWSTU22F1	DIS 97B3	132
SWSTU22F1-DIS 4413	SWSTU22F1	DIS 4413	132
SWSTU22F2-DIS 4423	SWSTU22F2	DIS 4423	132
SWSTU22F1-DIS 99P3	SWSTU22F1	DIS 99P3	132
SWSTU22F2-DIS 9923	SWSTU22F2	DIS 9923	132
SWSTU22F2-DIS 4108	SWSTU22F2	DIS 4108	132
SWSTU22F1-DIS 4107	SWSTU22F1	DIS 4107	132kV+1esw
CMSSYW1H1-DIS 321	CMSSYW1H1	DIS 321	330kV+1Esw
CMSSYN1K2-DIS 283	CMSSYN1K2	DIS 283	330kV+1Esw
CMSSYN1J2-DIS 273	CMSSYN1J2	DIS 273	330kV+1Esw
CMSSYW1K1-DIS 383	CMSSYW1K1	DIS 383	330kV+1Esw
CMSSYW1M-29 VINEYARD 330KV FEEDER	CMSSYW1M	29 VINEYARD 330KV FEEDER	132kV+1esw
CMSSYW1K1-DIS 303	CMSSYW1K1	DIS 303	330kV+1Esw
H71507/3	CMSSYN2N	92B LANE COVE 132KV FEEDER	132kV+1esw
H71502/1	CMSSYN2P	92A LANE COVE 132KV FEEDER	132kV+1esw

PIC Number (or alt. reference)	Bay Reference	Name	Voltage
A06589/4	SYSCA12L	NO2 LATHAM 132KV FEEDER	132kV+1esw
A06585/1	SYSCA12M	976/1 QUEANBEYAN 132KV FEEDER	132kV+1esw
A06587/1	SYSCA12R	NO3 GOLD CREEK 132KV FEEDER	132kV+1esw
NTSTA11F2-DIS 883	NTSTA11F2	DIS 883	330
NTSTA11F1-DIS 5413	NTSTA11F1	DIS 5413	330
NTSTA11F2-DIS 5423	NTSTA11F2	DIS 5423	330
A08677/2	NTSTA11F1	TA1 843	330
NTSTA11F1-DIS 863	NTSTA11F1	DIS 863	330
NTSTA11F2-TA1 853	NTSTA11F2	TA1 853	330
NTSTA11F1-DIS 5107	NTSTA11F1	DIS 5107	330kV+1Esw
NTSTA11F2-DIS 5108	NTSTA11F2	DIS 5108	330kV+1Esw
CMSSYN2F-DIS 9271	CMSSYN2F	DIS 9271	132kV+1esw
CMSSYN1K2-DIS 5433	CMSSYN1K2	DIS 5433	330kV+1Esw
CMSSYN1J2-DIS 5443	CMSSYN1J2	DIS 5443	330kV+1Esw
CMSSYN1K2-DIS 5118	CMSSYN1K2	DIS 5118	330kV+1Esw
CMSSYN1J2-DIS 5108	CMSSYN1J2	DIS 5108	330kV+1Esw
A05948/5	CMSAVS1A	AVS 171	330kV+1Esw
TBA-VP1-95T7	NNSVP12E3	VP1 95T7	132
H71494/3	CMSSYN2R	250 BEROWRA 132KV FEEDER	132kV+1esw
TBA-VP1-4938	NNSVP12E3	VP1 4938	132kV+1esw
A03077/1	CMSSYW2E	93X NEPEAN 132KV FEEDER	132kV+1esw
A08675/1	NTSTA12E	97C TAMWORTH132 132KV FEEDER	132kV+1esw
A06588/1	SYSCA12S	977/1 QUEANBEYAN 132KV FEEDER	132kV+1esw
A07223/4	SWSALB2H1	997/1 COROWA 132kV FEEDER	132kV+1esw
CMSSYN1L1-DIS 211	CMSSYN1L1	DIS 211	330kV+1Esw
TBA-VP1-4937	NNSVP12E3	VP1 4937	132kV+2esw

PIC Number (or alt. reference)	Bay Reference	Name	Voltage
SWSHU22BB-995 ALBURY 132kV FEEDER	SWSHU22BB	995 ALBURY 132kV FEEDER	132
SWSHU22BB-NO2 TX	SWSHU22BB	NO2 TX	132
SWSHU22BB-NO3 TX	SWSHU22BB	NO3 TX	132
A07223/9	SWSALB2L	995 HUME 132kV FEEDER	132kV+1esw
SWSWG11F1	SWSWG11F1	WG1 621	330
CMSAVS1BB-AVS 173	CMSAVS1BB	AVS 173	330
TBA-VP1-4947	NNSVP12F3	VP1 4947	132kV+1esw
TBA-VP1-4948	NNSVP12F3	VP1 4948	132kV+1esw
A08675/2	NTSTA12M	97D TAMWORTH132 132KV FEEDER	132kV+1esw
CMSSYN1B2-DIS 4429	CMSSYN1B2	DIS 4429	132
CMSSYN1C2-DIS 4439	CMSSYN1C2	DIS 4439	132
TBA-VP1-9577	NNSVP12F3	VP1 9577	132