Network Capability Incentive Parameter Action Plan (2014-2019)

Project Number	3
Project Priority	17
Transmission Circuit / Injection Point	Sheffield–Farrell No. 1&2 220kV, Farrell–Reece No. 1&2 220kV, Farrell–John Butters 220kV, (radial single circuit to generator) Farrell–Rosebery–Queenstown 110kV (radial single circuit to load)
Project	Transmission line surge diverter installation and tower footing earthing improvements
Scope of works	Install transmission line surge diverters, and improve footing earthing at selected towers on the circuits identified as having unacceptable lightning outage performance.
Reasons to undertake the project	In the last 10 years the circuits identified above have experienced 28 sustained fault outages due to lightning. This performance is suboptimal with a significant proportion of these outages suspected to be due to 'back-flashover'. This has resulted in a number of double circuit outages and subsequent placement of these circuits on the vulnerable status list, resulting in network constraints during lightning storm activity. The installation of surge diverters in strategic locations and the improvement of tower footing earthing will reduce the voltage surge to which a transmission circuit is subjected as a result of a lightning strike, minimising the likelihood of flashover and subsequent unplanned circuit outage.
Current value of the limit	Unacceptable transmission line lightning performance at an average of 2.8 sustained fault outages due to lightning per annum on the circuits identified above.
Target limit	Reduce unplanned outage frequency due to lightning by up to 25%, reducing the fault outage frequency down to 2.1 sustained fault outages due to lightning per annum on the circuits identified above.
Priority project improvement target	Reduced unplanned outage frequency due to lightning.
Completion date	June 2017
Capital cost	$550K
Operational cost	$0
Market benefit	Improved availability and reduced fault outage frequency for the 220 kV circuits identified above. It is anticipated that this improved lightning performance will also minimise the number of market constraints resulting from the declaration of credible contingencies due to lightning. It is estimated that this project will result in an annual market benefit of approximately $68,000.