

**FOR IMMEDIATE RELEASE**

October 17, 2018

Marketing contact:  
[Martin Van Der Linde](mailto:martinv@nojapower.com.au)  
Global Marketing Manager

Tel : +61 7 3907 8777  
Mob. +61 438 690 116  
Fax : +61 7 3399 6777  
[martinv@nojapower.com.au](mailto:martinv@nojapower.com.au)  
[www.nojapower.com.au](http://www.nojapower.com.au)

# Exploring Uncommon Protection Elements

Some practical applications for less-commonly deployed features

Electrical protection engineering has a list of favourite features which are commonly applied in distribution networks. Omnipresent features such as Overcurrent and conventional Earth Fault are ubiquitous in network protection assets, but improvements in protection technologies are continuous and a vast new list of protection capabilities are now available. Today, we can explore a few of the less commonly applied protection elements which feature in the OSM Recloser system, available to all users of this system through current firmware or by means of a simple upgrade.

## Voltage Sag

Dubbed UV4 in NOJA Power's OSM Recloser, Voltage Sag protection provides a technique for distinguishing between a conductor down scenario and a blown fuse or bridge. Based on a Cigre paper presented at the 2015 SEAPAC event (Kairys, McClure, 2015), the fundamental principle of operation is the difference in voltage signature between the two scenarios. UV4 evaluates voltage sags on individual phases of the protected line, categorising them as blown fuses or downed conductors. As the detection is at a downstream unit, the information is fed back via SCADA allowing for operators to trip upstream breakers, isolating the fault. Traditional overcurrent would not catch this fault, and earth fault may not be sufficiently sensitive to detect either of the scenarios.



NOJA Power OSM Recloser Installation in Georgetown, Queensland, Australia

### ANSI 46 BC – Broken Conductor Protection

Broken Conductor Protection is ratio analysis for Power Systems engineers. By dividing the Negative Sequence Current by the Positive Sequence Current, the magnitudes of either quantity is removed. In cases of broken conductors, the ratio tends to be above 20% I<sub>2</sub>/I<sub>1</sub>. Therefore, regardless of load current or network impedance, the ratio allows for detection of faults which conventional Overcurrent and Earth Fault miss. With an operating quantity estimate of 20%, utilities can gain visibility of this class of faults.

### Harmonic Protection

In a network operating environment with increased penetration of Power Electronics in inverters and other non-linear loads, harmonics are becoming a greater issue on the medium voltage distribution grid. Harmonic issues often go undetected, until a costly failure of capital equipment such as a transformer

due to excess heating from harmonics. NOJA Power's OSM Recloser provides harmonic protection, allowing utilities to alarm via SCADA or even trip the Recloser based on the Harmonic levels present. Harmonic Protection can be a simple method for mitigating the risk of costly equipment failure, and also provides insights for problem connection sites.

“As distribution networks become more complicated with more distributed generation connected every month the protection schemes necessary to protect our distribution networks are also becoming more complicated and require these advanced elements to provide the required solution,” says NOJA Power Group Managing Director Neil O’Sullivan.

These three protection elements are a few of the less commonly applied features in the NOJA Power OSM Recloser, but each provide significant value in their own niche. If you have any further questions or would like to learn more, contact your local NOJA Power distributor or visit [www.nojapower.com.au](http://www.nojapower.com.au)