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The Five Most Common Uses for a NOJA Power OSM Recloser

8 July 2020 –With over 64,000 installations in more than 92 countries worldwide, the OSM Recloser has been used as the key protection and control device for the medium voltage distribution network in many different applications.

The core benefit of this unit is it prevents [80% of overhead distribution outages](#).

The popularity of this primary plant is enabled by the long feature set of the standard product, enabled by the RC controller that is bundled with the switchgear. The NOJA Power RC10, RC15 or RC20 controllers have an extensive feature set, and this enables the equipment to be configured for many different applications.

Here we share some of the most common applications for the equipment in the electricity distribution network:

1. Overhead Lines Protection
2. Renewable Energy Connection
3. Sectionalising Applications
4. Protecting Underground Cables
5. Connecting Three Phase Mining Equipment

1 – Overhead Lines Protection



A NOJA Power OSM Recloser protecting Overhead Lines

This is the core, original application of Reclosers, and it is the most common application for the equipment today. Power systems' research [says 80% of overhead network faults are transient](#). This implies they only exist for a short period of time.

Practically speaking, these sorts of faults include vegetation or wildlife coming into contact with overhead powerlines, causing a short circuit. 80% of these faults will “self-clear”. That is, the branch or fauna will fall off the line after the first short circuit.

Without reclosers, the protection circuit breaker upstream would simply trip to open, protecting the network. However, then most faults then cause extended outages for customers, even though the fault is long gone. Reclosers detect the faults and reclose, to mitigate the 80% of momentary

faults, and advanced ones like the [OSM Recloser](#), can determine the fault type and respond in a safe way.

NOJA Power's OSM Recloser can detect most faults on the network and allow for configurable reclosing based on the kind of fault that is present on the network. That way, you get a balance of safety and reliability

Installing a NOJA Power OSM Recloser allows you to remove 80% of faults leading to outages, saving you a fortune in lost revenue and reliability penalties.

“Installing reclosers on overhead medium voltage feeders eliminates 80% of the faults on those feeders,” reports NOJA Power Group Managing Director Neil O’Sullivan, “and increases network reliability far more than any other smart grid solution will. Smart Grid Automation ready devices like our OSM reclosers can also help reduce that last 20% as well.”

2- Renewable Energy Connection



A NOJA Power OSM Recloser connecting Renewable Generation Energy to the Distribution Grid

Connecting renewable generation to the distribution grid has its own challenges. Most electricity distribution networks were originally designed to take electricity from generators via the transmission grid (the big towers), and distribute it to all the lower voltage customers, where it would be stepped down to residential and commercial voltages for consumption.

Today, the electricity industry is transitioning at a very high rate to using large volumes of renewable and distributed generation. In Queensland Australia, there is more than 2000 MW of Solar power generation on rooftops alone, where an average winter day the demand is around 7000 MW { <https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/data-nem/data-dashboard-nem> }. Some nations are even running on 100% renewables today.

The challenge with renewables is they behave differently to centralized power plants, and the projects are commonly connected at the distribution network, instead of the transmission network. Accordingly, these connections need special protection, control and metering. NOJA Power OSM Reclosers are commonly used as the grid connection point for renewable energy such as [solar](#) and [wind](#), as the product includes most of the technical control requirements for this distributed generation connection.

The reason NOJA Power OSM Reclosers are used for this application is that the standard product includes [ROCOF](#) and [VVS](#) protection. Therefore, most engineering businesses that are building these projects can be compliant with utility requirements to connect the renewable energy to the distribution grid. Also, with all connection requirements in a single switchgear device, this saves a fortune in site engineering works.

[Some of these sites](#) also call for revenue metering or additional protection. Typically, these applications then use a [NOJA Power GMK](#) which is an OSM

Recloser in a pad mounted kiosk. This [kiosk](#) allows engineers to custom add features such as revenue metering, advanced power quality metering or an earth switch, to meet the operational, grid connection or bespoke project requirements in a [single integrated product](#).

3- Sectionalising Applications



A [sectionaliser](#) is an automatic switch that opens when the power lines are not energized to isolate faulted sections .

Typically, they are used to break up distribution lines into sections (that is, feeder “sectionalization”, hence the name). When a fault occurs, the protection recloser or substation breaker opens, and all the devices along the line will see a loss of voltage.

Devices that saw high current followed by a loss of voltage are clearly “upstream” of the fault. They can then open while the upstream device is open, and when it recloses, the fault is then “isolated”. This gives major reliability benefits to utilities, as the outage area is minimized. Furthermore, there are almost zero constraints on how many sectionalisers you can install on a network – they act on loss of voltage and accordingly suffer much less [grading](#) issues.

Many years ago, there used to be a major price difference between a Pole Mounted Sectionalisers and Pole Mounted Reclosers. This is no longer true for modern devices of those classes. Likewise, since a sectionaliser is a Recloser that waits for the lines to be dead to operate, it is easy for NOJA Power OSM Reclosers to be configured to act this way.

There are two main reasons for this:

1. You can install more reclosers and sectionalisers on your lines, breaking up the network into smaller zones and providing better reliability in each of those zones. Outages affect smaller and smaller groups, the more reclosers and sectionalisers you have on your network
2. Standardization. If a recloser, such as the OSM Recloser, can fulfil both roles, utilities can standardize on installation, warehousing, parts, training, and a whole host of scale advantages. The upfront cost is offset by the [extensive savings in operational expenses](#).

4 – Protecting Underground Cables



Whilst underground cables do not have the same momentary fault profile as overhead lines, they still need protection. Fundamentally, protection for underground cable still needs a circuit breaker, sensors to detect faults, and protection relays to take the signals and actuate the circuit breaker.

Accordingly, the [NOJA Power GMK](#) was invented to bring the overhead protection capabilities to the underground domain.

There are 2 main variants of this product, a simple compact version (the 1000 series) and a fully customizable system with [type tested Internal Arc Classification](#).

Aside from [renewable generation applications](#), these units have been used on mines, underground cable protection and railway power supply environments. They use the same standard equipment as the overhead unit. This gives the equipment economies of scale, providing a flexible off-the-shelf product that solves most of these applications.

5 – Connecting Three Phase Mining Equipment



A common application in the resources sector for electrical engineering, heavy mining machinery that connects at the medium voltage level also requires connection control and protection. Accordingly, there are many successful [use cases of NOJA Power OSM Reclosers in Mining applications](#).

These units often require specialist Sensitive Earth Fault Protection at 500mA, a unique capability of NOJA Power's OSM Recloser with SEF option. Accordingly, electrical engineers in the mining sector can use the NOJA Power OSM Recloser as a system to protect their mining equipment.