

Proven Reliability in Harsh Tropical Environment

## Morningstar Controllers Product of Choice for Marine Aids to Navigation in Harsh Environments

"Because Morningstar controllers are manufactured to operate reliably in tropical environments, have a long operational life and an extremely low failure rate, we feel that they are far and away the best solar controller option for marine aids to navigation installations."

**Adrian van Boven**

Director, M-Nav Solutions, Inc.

### Summary

- Marine Aids to Navigation (AtoN) are crucial for assisting navigators in choosing a safe course of passage.
- AtoN systems require an operational availability rate of between 97.0% and 99.8%.
- Morningstar controllers have been used in Papua New Guinea Marine Aids to Navigation for over 10 years.
- Based on the experience in Papua New Guinea, M-NAV Solutions made the decision to offer Morningstar ProStar Controllers for any Marine Aids to Navigation contracts in the Philippines.

### Situation

Lighthouses, buoys and beacons are an iconic part of seascape imagery, celebrated in photography, portraits and poems of seafaring vessels. But beyond the romantic image in popular culture, this equipment today serves a vital role in assisting navigators in three areas: navigation and location, plotting safer courses, and providing warnings of dangers and obstructions. Officially known as Marine Aids to Navigation (AtoN), these systems are most often located in remote and unforgiving environments that are difficult to access, and exposed to climate extremes of heat or cold, heavy winds, storms, ocean swells, and other severe environmental conditions.

AtoN structures are also often regularly used as platforms for other electronic equipment, such as communication, surveillance or weather and ocean monitoring. All this critical equipment requires a source of power, and that power source must be equally reliable.

The consequences of a non-operational AtoN in a key location could be catastrophic leading to loss of life and severe environmental damage. In this application, system reliability is so critical that the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the international body that sets standards for the operation of AtoN, requires an operational availability rate of between 97.0% and 99.8%.

Meeting that level of reliability requires the use of high quality equipment and componentry designed to withstand harsh marine environments. While the solar charge controller, or regulator, is a small component in the overall solar power system, it plays a crucial and central role in maintaining peak output and ensuring optimal functioning.

# Project

Adrian van Boven and Adam Hay were senior managers working for a marine construction company in Papua New Guinea that carried out extensive AtoN work throughout the country. Their experiences with Morningstar products during that time led them to make Morningstar their supplier of choice in the Philippines when they founded M-NAV Solutions in 2016. One such project was The Jomard Island Coastal Monitoring Station (CMS) in Milne Bay Province, Papua New Guinea.

Located on the Eastern Side of the Jomard Passage, a major international shipping lane between Australia and Asia, the station sees a huge volume of heavy tanker and container traffic. The area has been designated by the International Maritime Organization (IMO) as a Particularly Sensitive Sea Area (PSSA) due to the high environmental value of the pristine marine environment.

The CMS was installed to monitor shipping through the passage and has a large array of equipment installed, including a lantern, weather station, CCTV, radars, AIS / VHF communication equipment and satellite dish with a 24/7 live satellite feed to a central monitoring station in Port Moresby.

The only feasible and environmentally responsible option for powering the site was to install a large solar array and battery bank. One challenge is that the site is prone to extremely high temperatures and humidity and high winds, and due to power supply restrictions air conditioning at the site was not possible. So, all equipment specified had to be exceptionally rugged and suited for harsh conditions. For this type of system, the choice of regulator was critical.

# Solution

The Morningstar TriStar-MPPT 60 amp (TS-MPPT-60) Charge Controller handily met system design requirements. Its MPPT functions allowed for advanced battery management with a high peak efficiency. An ethernet connection and web-enabled interface allowed for daily remote monitoring of the power supply, ensuring there were no issues and that the site was reliably powered.

Morningstar controllers have been used in Papua New Guinea for their Marine Aids to Navigation Light Stations for over 10 years and have proven their reliability in the harsh tropical environment.

Because of the reputation of the brand, M-NAV Solutions is currently supplying the National Maritime Safety Authority twenty (20) more SunSaver 10 units.

The success of their project in Papua New Guinea prompted M-NAV Solutions to make the decision to offer Morningstar ProStar Controllers for any Marine Aids to Navigation contracts in the Philippines. M-NAV Solutions specializes in the design, supply and installation of AtoN products and services and their clients often require installations in some of the harshest and most remote environments on the planet.

In the past there had been major failure issues with other solar controllers, which has led to a greater emphasis in Government Procurement on quality and reliability. M-Nav Solutions supplied 5 x Morningstar ProStar 15M units in 2017 and an additional 10 x Morningstar ProStar30M units in 2018, with a current supply contract for 590 x Morningstar ProStar30-M units, with the end-user being the Philippine Coast Guard.

In addition, M-NAV Solutions was awarded the contract to rehabilitate the Pico de Loro Lighthouse in the Philippines in late 2018 where a Morningstar ProStar 30M Solar Controller was used.

"Because Morningstar controllers are manufactured to operate reliably in tropical environments, have a long operational life and an extremely low failure rate, we feel that they are far and away the best solar controller option for marine aids to navigation installations," said Adrian van Boven, Director, M-Nav Solutions, Inc.