

**Kokusai Kogyo to carry out practical demonstration of Quasi-Zenith Satellite System
Michibiki-based positioning systems in Southeast Asia**

**- Awarded by Cabinet Office and Quasi-Zenith Satellite System Services Inc. as one of “FY2019
Application Demonstrations using *Michibiki*” projects -**

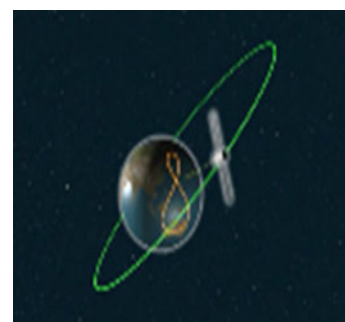
With the aim to create Green Communities on a global scale, Japan Asia Group Limited (Japan Asia Group)’s subsidiary Kokusai Kogyo Co. Ltd. (Kokusai Kogyo)’s proposal “Practical Demonstration of *Michibiki*’s Centimeter Level Augmentation Service (MADOCA¹) in the Development of Positioning Systems Outside Japan”, to be carried out in Southeast Asia, has won the 2019 public competition for “Application Demonstrations using *Michibiki*” organized by the Cabinet Office and Quasi-Zenith Satellite System Services Inc.

The project aims to increase confidence in Quasi-Zenith Satellite System (QZSS) *Michibiki*’s practical applicability, to encourage businesses and academic institutions looking to innovate services and applied technology based on *Michibiki*. (https://qzss.go.jp/overview/information/applidemo_191024.html)

Background

The Japanese government has been operating its QZSS *Michibiki* as a four-satellite constellation since November 2018. One of the four is in geostationary equatorial orbit above Kalimantan Island, Indonesia, and the other three in quasi-zenith orbits. Thus three satellites are visible at all times from locations in the Asia-Oceania region.

Highly precise positioning will become even more readily available throughout Southeast Asia by 2023, by which time *Michibiki* is expected to operate as a seven-satellite system.



Michibiki’s satellite orbits (Images courtesy of Cabinet Office)

Project overview

Coverage by large-scale (highly detailed) maps, necessary for the massive regional development proposed by Indonesia’s President Joko Widodo, currently remains at 2%. Challenges to conducting high precision mapping in regional areas of Indonesia include the scarcity of GPS-based control stations and underdeveloped land-based communication networks. The project will demonstrate the utility of the precise positioning system developed by Kokusai Kogyo, based on *Michibiki*’s augmentation service (MADOCA), in large-scale topographical mapping and other field survey applications, as a practical solution to high-precision mapping in Indonesia. It is also expected to serve as an effective demonstration of technology for other countries in Southeast Asia.



Kokusai Kogyo aims to develop and make available a commercialized application of the high-precision position system, to be demonstrated in Indonesia through this project, to Southeast Asian countries facing similar challenges, including the Philippines, Vietnam, Cambodia, Myanmar, and Papua New Guinea, in addition to the range of geospatial information-based solutions already offered through our subsidiaries in Taiwan, Singapore and Vietnam.

¹ Multi-GNSS Advanced Demonstration tool for Orbit and Clock Analysis (MADOCA) is a precise GNSS orbit and clock estimation system developed by Japan Aerospace Exploration Agency (JAXA), which calculates augmentation information (precise current position, precise time, etc.) based on GNSS-based control stations for highly precise satellite positioning. The augmentation information is transmitted by QZS, making it possible to carry out highly precise positioning in areas lacking GPS-based control stations or coverage of land-based communication networks.

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