

RFP-SINAR-SIF-2023-003 AMENDMENT 03

Supply, Installation and Commissioning of Automatic Generation Control (AGC) and Automatic Dispatching Systems (ADS) at the Kutampi Power Plant in the Indonesian island of Nusa Penida Bali

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The purpose of this amendment to RFP-SINAR-SIF-2023-003 is to provide information from the site visit and provide answers to questions received from bidders.

Information from Site Visit

1. PT Cogindo is the asset owner and operator of PLTD Kutampi Nusa Penida. PT Cogindo is the subsidiary of PT PLN Indonesia Power.
2. PLTD Kutampi is the main power plant providing electricity in Tiga Nusa which consists of three islands: Nusa Penida, Nusa Lembongan and Nusa Ceningan. The Automatic Dispatching Systems (ADS) pilot project will be implemented in this facility.
3. As per the original RFP document, the peak load in Tiga Nusa is 10MW. However, post-pandemic development in the island, especially in the tourism and hotel industry, increased electricity demand significantly. Based on the site visit, the highest peak load was recorded at 12 MW.
4. The electricity demand in Tiga Nusa is mainly supplied by PLTD Kutampi (7 x 1,700 kW) and supported by a variable renewable energy (VRE) power plant, PLTS Suana. Since the rise of electricity demand, PLN Indonesia Power and PT Cogindo decided to import diesel-based generation (PLTD) from a project relocation in Pasuruan Grati with a capacity of 1,000 kW. The PLTD also covers the intermittency of PLTS Suana.
5. The Automatic Generation Control (AGC) and ADS is planned to be installed on all 7 generators. However, in the first phase of implementation, only 3 generators will be subject to AGC and ADS installation to avoid disruption in daily operations, given PLTD Kutampi's role as the main source of electricity in Tiga Nusa. PLN has requested that the implementation of the AGC and ADS shall not interfere with the existing defense scheme. PLN has allocated block 1 of 2 blocks of engines in the facility which consists of 3 generators to be equipped with the ADS.
6. PLTD is operated in load-sharing mode with a droop level of 4%. In the RFP document, daily operations consisted of 5 operating generators and 2 generators on stand-by. However, the latest update is that all 7 generators operate everyday with 1 additional generator as backup.
7. The operation is still manual since the plant adjusted the requirement of the grid operator. PLN expects to have a display mechanism that could select mode of operation between manual and remote.

8. One of the main issues the installation of the AGC and ADS is the availability of space in each generator. PLTD Kutampi is quite dense, and each generator has an Engine Control Unit (ECU) room that is packed with control panels. Therefore, it will be difficult to add another panel for the AGC and ADS. There is an option to build another separate shell to house all AGC and ADS panels. However, the location needs to be determined carefully since the PLTD Kutampi area is already dense with equipment and piping systems.
9. Communication protocols used in each ECU is Modbus. In each generator's ECU, there are RS-232 communication ports – one port in Hyundai's Automatic Voltage Regulator (AVR) and one in Siemens's Programmable Logic Controller (PLC). The maximum length of communicable cable for this type of communication port is less than 50 feet or 17 meters. Thus, this type of communication limitation could be challenging for extending the communication cable.
10. Fiber optic (FO) communication is available but only for office use. It is possible to use FO communication in the generator's ECU room by installing the RS-232 to FO adapters. This adapter usually consists of two parts, namely a converter device that converts the RS 232 signal into a fiber optic signal, and a connector that connects the converter device to the RS 232 device and the fiber optic device. To utilize this type of communication, coordination with PLN ICON+ should be arranged.
11. Bidders shall be aware that generic programmable PLC solutions are not acceptable. The proposed architecture must be based on application-specific computer and software.
12. Bidders may request documentation from the site visit via email to SINAR.bids@tetrattech.com.

Questions and Answers

- **Q1: What is the DMN (*Daya Mampu Netto* or Net capacity) of each generator of PLTD Kutampi and is there any minimum DMN where there is a limit of the lowest permissible operating capacity?**
 - The DMN of each generator of PLTD Kutampi is 1,400 kW. However, since the PLTD is operating in an isolated grid they do not set a minimum standard. The lowest recorded capacity was 400 kW.
- **Q2: What happens if there's an engine trip?**
 - If there is an engine trip, then the scheme commands for load shedding.
- **Q3: Can we extract data from PLTS Suana?**
 - Yes, data from PLTS Suana can be requested to PLN Indonesia Power.
- **Q4: What is the deadband of the 4% droop mode operation of the PLTD Kutampi?**
 - Further details will be provided by PLN during the implementation of the scope of work.
- **Q5: Is it possible to modify control panel in ECU room of the generator for placing AGC/ADS control panel?**
 - Based on our visual observation into the ECU room of each generator, it is challenging to install the AGC and ADS control panel nearby or within the ECU control panel due to limited available space. We suggest installing the AGC and ADS control panel of each generator in a separated/isolated compartment/shell. However, few modifications in

the ECU control panel in each generator are needed such as for fiber optic communication in PLC and AVR.

- **Q6: Is the software of the controller in the generator's ECU control room locked?**
 - Further details will be provided by PLN during the implementation of the scope of work.
- **Q7: Is access to PLC memory and program locked?**
 - Yes. The PLC memory address and program are password protected. However, SINAR can coordinate with PLN IP once an interaction with PLC is required.
- **Q8: Are there manuals and technical specifications for ECU control of each generator, especially for AVR?**
 - Further details will be provided by PLN during the implementation of the scope of work.
- **Q9: There are three operation modes in each generator of PLTD Kutampi namely load sharing mode, isochronous and droop. Currently the engine is operating in load sharing mode with 4% droop. Is there an ECU control manual and setting to set the operation mode?**
 - Further details will be provided by PLN during the implementation of the scope of work.