GELECTRIC

IoT Solutions

- **Condition Monitoring**: Develop a system utilizing IoT sensors for real-time machinery and equipment monitoring onboard, enabling predictive maintenance, and reducing downtime.

    - Real-time data collection on machinery health.

    - Predictive maintenance alerts to prevent failures.

    - Dashboard for performance metrics and trends.

- **Electrical Energy Monitoring**: Implement an IoT solution tracking electrical energy usage, offering insights into consumption patterns for energy savings and efficiency improvements.

    - Detailed tracking of energy consumption onboard.

    - Analysis tools for identifying saving opportunities.

    - Reports on efficiency improvements over time.

- **Remote Monitoring**: A comprehensive remote monitoring platform for oversight of all connected systems from a central location, facilitating early detection of issues and supporting decision-making.

    - Centralized control of all IoT-enabled systems.

    - Alerts and notifications for system anomalies.

    - Support for remote troubleshooting and adjustments.

Needs for installation:

- Sensors for data receiving, vibration and temperature sensors are must.

- Gateway(s) for data collection

- Onboard PC(s) for data analyzing

- Network connection. Wifi or wired. This network connection is important if the vessel doesn't have any working network, system needs a modem to connect properly.

For the Installation

- At least two sensors mounting on the electrical machines

- Gateway and onboard PC mounting within connectivity range.

Connection and receiving the data

- Network connection and approval of data receiving.

- Those parts can be done remotely.

- **EEXI Calculator**: A tool aiding clients in calculating their Energy Efficiency Existing Ship Index (EEXI) compliance, incorporating the latest regulations, and offering improvement suggestions.

  - User-friendly interface for EEXI compliance checks.

  - Recommendations for achieving or improving compliance.

  - Updates based on the latest regulatory changes.

  (under development)

All IoT solutions are based on yearly subscription model.

Installation takes half a day.

Limitations:

- Complete machine learning model is still under development. System can understand base failures and determine it 10 days before.
- All systems can be connected to AMS of vessels, but it needs additional workmanship.
- Predictive analyses of main engines and propellers cannot be done with that model (Condition monitoring can be done)
- All sensors are wireless but proper network connection should be made by vessel personnel.
  - For the network it could be an internal connection without connection, but proper network is preferable.
- If sensors delivered by another 3rd party, Gelectric needs to informed beforehand the installation

Sustainability Solutions

- **Cold Ironing**: Solutions for cold ironing implementation at ports to allow ships to shut down their engines and connect to onshore power, reducing emissions while docked.

  - Infrastructure planning and implementation support.

  - Reduction of emissions and noise pollution at ports.

  - Compatibility assessments for ships and ports.

- **RPM Limitation for Shaft Alternator**: A control system limiting the RPM of shaft alternators to optimize energy production and consumption, reducing wear and tear on machinery.

    - Optimization of energy production and consumption.

    - Extension of machinery lifespan through reduced stress.

    - Automated adjustments based on operational data.

- **RPM Limitation for Pumps or Fans**: Similar system for pumps or fans to enhance energy efficiency and prolong component life.

    - Energy efficiency improvements for ancillary systems.

    - Prolonged equipment life through operational optimization.

    - Customizable settings for several types of equipment.

Sustainability solutions need to price separately for each project.

Installation time can be different.

- The limitation of pumps can take maximum 2 days.
- Limitation for shaft can take 10 days.
- Cold Ironing can take 15 – 20 days. (Depends on the works on the vessel.)

Notes: All sustainability solutions can take class approval following during the project.

Needs for installation:

- Project design

- Switchboard

- Cable way arrangement

- PLC project

For the Installation

- Switchboards need to be prepared

- At least two technician need to be at vessel to workmanship

- Power and information cables need to installed

- If the any IoT solutions added to the vessel as well, installation steps need to take action

Limitations:

- Most of the sustainability projects need inspection. Offers can be made only after the inspection for cold ironing and shaft limitation.

- Without any partnership for installation only 2 vessels can be done at the same time.

- Installation workmanship and offers depends on the installation place

- Port side of cold ironing not included to the system