

## International Service Network



Service Agency Engineer Training

### The Global Reach of JRCS's Service Network

JRCS is dedicated to providing the highest level of customer service in the most efficient and timely manner in Japan and around the world. Licensed service agencies based in major ports the world over are always ready to respond to any issues, and highly-skilled and experienced service engineers are on hand to deal with a variety of special circumstances aboard a vessel.



### The JRCS Worldwide Service Network

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Belgium	IMTECH MARINE BELGIUM N. V.	South Africa	GLOBE ENGINEERING WORKS (PTY) LTD L. H. MARTHINUSEN ENGINEERING SERVICES
Brazil	METALOCK DO BRASIL LTDA.	Spain	AAGE HEMPEL
China	JRCS (Shanghai) Co.,Ltd.	Taiwan	LEEDER ELECTRONICS CO., LTD.
Hong Kong	HOSTMOST ENGINEERING LTD	Turkey	STT DENIZ TICARET VE SERVIS LTD
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Toyouira Training Center



## System Retrofitting & Regular Maintenance



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# System Retrofitting

## Why Is System Retrofitting Necessary?

In order to ensure safe and efficient navigation at sea, JRCS recommends that systems be replaced over time as the vessel ages. If you encounter one or more of the following issues, we can provide a retrofitting solution which meets all of your needs:

- Systems fail frequently
- Supply of maintenance parts has been discontinued
- Parts manufacturer has withdrawn from the marine market
- Dissatisfaction with the functionality of present equipment
- Continued use of a system is necessary even after vessel has aged

## What Are the Benefits of JRCS System Retrofitting?

The following are just a few of the benefits of system retrofitting performed by JRCS:

- The latest systems can be introduced
- JRCS systems can be introduced even if the original systems were not made by JRCS
- Maintenance becomes more convenient and user-friendly
- Maintenance costs are reduced
- Maintenance services can be performed at major ports around the world
- Updating old systems contributes to safe and efficient navigation

## Why Choose JRCS to Perform Your System Retrofitting?

JRCS has a proven track record in the retrofitting field, having taken part in a wide range of different and special projects. Our engineers rely on a knowledge base cultivated over many years of experience and have achieved substantial retrofitting results with a wide variety of vessels, including foreign and domestic vessels, as well as vessels which are at sea or docked. Our expert engineers install and test the system based on the customer's instructions, location, and timeframe, always striving to provide the highest degree of customer satisfaction.

## Our Retrofitting Track Record (Excerpt)

Vessel type	System
Fisheries research vessel	AMS (SMS-22-K), PMS (JACOM-22)
Container vessel	AMS (SMS-22-K)
LNG vessel	AMS (SMS-22), PMS (JACOM-22)
FPSO	AMS (SMS-22), PMS (JACOM-21)
Patrol boat	AMS (SMS-32)
Training vessel	AMS (SMS-32)
Whaling research vessel	AMS (SMS-32)
Platform	PMS (JACOM-21)
Bulk carrier	PMS (JACOM-21)
Car carrier	AMS (SMS-22-K) (and many more)

\*AMS: Alarm & Monitoring System  
\*PMS: (Generator) Power Management System

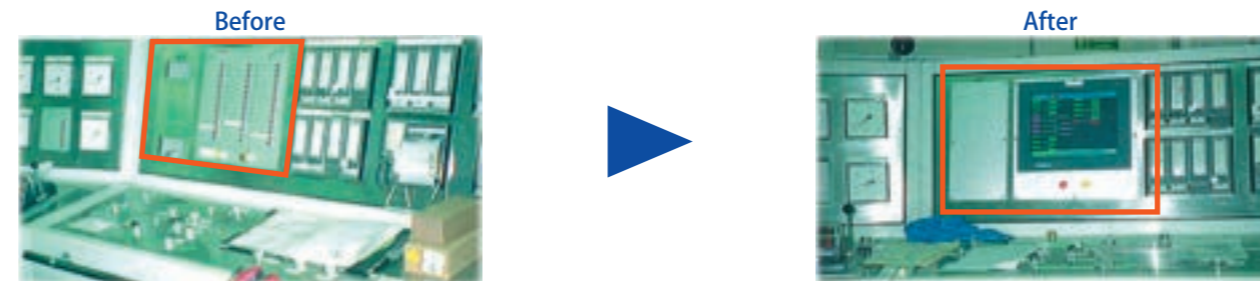


Alarm & Monitoring System Retrofitting Work (Engine Control Room)

## Retrofitting Aboard an LNG Vessel

### New Alarm & Monitoring System with Full Maintenance Capability

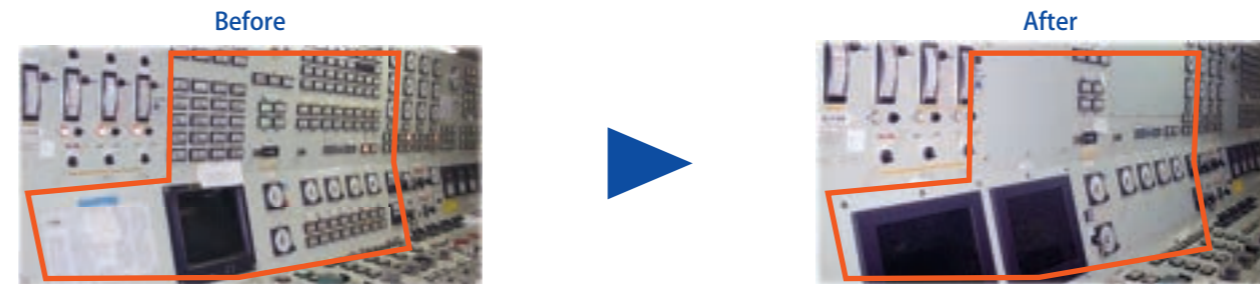
After 20 years of use, maintenance could no longer be performed on a different manufacturer's Alarm & Monitoring System. JRCS replaced the old system with its own AMS, all while using the original system's sensors, cables, and related engine extension alarm systems. The retrofitting work was performed by some of the many overseas service engineers in JRCS's global service network, and was completed in three weeks during regular docking.



## Retrofitting Aboard a Container Vessel

### New Alarm & Monitoring System with Superior Functionality

This vessel went into service featuring a state-of-the-art automation system provided by another manufacturer. After a period of time, the Alarm & Monitoring System became outdated, and JRCS was asked to install its own AMS featuring touch-panel LCDs. The use of LCDs enabled centralized monitoring on two operation stations. Retrofitting work was performed at an overseas repair yard over a period of two weeks.



## Retrofitting Aboard an FPSO

### Additional Generator Panels to Satisfy Increased Load Demand

In response to an increased load demand aboard an FPSO (Floating Production Storage and Offloading Unit), JRCS improved the original two-generator design by adding two generator panels and a synchronizing panel.



# Regular Maintenance



## What are the Benefits of Regular Maintenance?

1. Reduce costs incurred by unexpected problems
2. Ensure a superior level of navigational safety
3. Prevent problems caused by malfunctioning or worn-out parts before they happen

After a consultation, JRCS will recommend a regular inspection and maintenance schedule that is best suited to your vessel's unique layout and needs.

## Alarm & Monitoring Systems

- Inspection of cooling fans and printers
- Inspection of CRT and LCD display units
- Replacement of worn-out power supply units (all types)
- Replacement of memory backup battery and UPS battery
- Calibration of display data using machine-side test signal input

## Main and Emergency Switchboards

- Disassembly, inspection, and maintenance of moving parts for each Air Circuit Breaker (ACB) (Regular inspection is especially necessary for vessels such as ferries whose crew often open and close the ACBs)
- Inspection of Generator Power Management System
- Replacement of worn-out power supply units (all types)
- Replacement of memory backup battery and governor relay

## Starter Panels

- Prevention of open-phase operation and starter burnout due to electromagnetic contactor wear-out
- Replacement and cleaning of high-voltage electromagnetic contactors for equipment such as side thrusters

## Regular Inspection and Maintenance Plan (Example)

JRCS takes into account the individual situation and needs of each vessel when designing a regular inspection and maintenance plan, ensuring that all parts are kept in working order and contributing to safe and efficient navigation.

JRCS Maru  
Began service in November of 2010

Details	Interval	Year Age	Procedure Abbreviation																			
			2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
MSB internal cleaning	1 year	Plan Done	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	CLN	
Inspection of entire switchboard based on JRCS inspection guidelines	1 year	Plan Done	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	
Inspection of all MCCBs and control parts for excess heat or discoloration	1 year	Plan Done	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	
Tightening of terminals and connectors	1 year	Plan Done	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	RTN	
On-board check of the three AE 1600-SS ACBs for generator use	1 year or 300 open/closes	Plan Done	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	
On-board inspection of the two AE1250-SS ACBs for thruster use	1 year or 300 open/closes	Plan Done	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	
Replacement of the four SC-0 AC 100 V governor aux. control relays	2 years	Plan Done				REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Replacement of the three SRC 50-2U/X AC100 V ACB control relays	4 years	Plan Done				REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Inspection of the generator PMS (JACOM-21) based on JRCS standards	1 year	Plan Done	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	INS	
Replacement of the four GB6-2114P JACOM-21 governor control relays	2 years	Plan Done				REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Replacement of the six GB6-2114P JACOM-21 ACB control relays	4 years	Plan Done				REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Replacement of the GMS-M100A-R1 JACOM-21 power supply unit	8 years	Plan Done								REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Replacement of the two LWT-11A0-B-X JACOM-21 power converters	8 years	Plan Done								REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	REP	
Replacement of the two ER-2X (004B) governor control switches	10 years	Plan Done														REP	REP	REP	REP	REP	REP	