SYSTEM HEALTH CHECK

Maximising your performance

Let us **navigate** you through this document

We are keen to show and explain our system Health Check, a crucial step in creating a benchmark for safety for your ship and personal.

Topics discussed in this document:

1   **Introduction to the system Health Chec**k, what are the advantages?
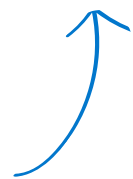
2   **Explanation of the elements**; Interviews and a comprehensive Health Check.

3   **How does the Health Check work**, an explanation of the different steps.

When opening this document digitally, click the topics to easily navigate through the document.

Safety and reliability at its best

Ultimately, each crew desires to optimise the ship's automation and bridge operations to sail safely and efficiently. At RH Marine, want to ensure that each RH Marine solution onboard is maximised to it potential value.

Experience worry-free performance with our system Health Check, designed to keep your applications run smoothly.

Advantages

☑

Eliminate risk of system failure

☑

Receive guidance on best-practice methods for records recovery

☑

Receive hands-on advice for optimizing system usage

☑

Receive expert recommendations for possible enhancements

Next steps

Based on the collected data and conducted tests, RH Marine provides a strategic advice document for future maintenance or replacements.

Understanding the current status and life cycle of onboard systems and hardware, provides valuable insights for further action in maintaining a healthy, sustainable system on board.

Keep your personnel safe

Plan your next system Health Check

Know the condition of your ship

The system Health Check consists of two elements; interviews and a comprehensive Health Check.

The elements are explained below.

1 **Interviews**

Our service engineers conduct detailed and documented interviews with the system operators.

This includes an evaluation of:

- User experiences
- Cybersecurity
- Regular issues

2 **Comprehensive system Health Check**

We check Windows logs, recording system logs, database sizes and archive storage sizes to identify existing or potential issues. Our service engineers will run a comprehensive number of tests to evaluate the overall health of your system.

This includes:

- Functionality tests
- Action plans initiated for major faults
- Identification and resolution for minor equipment issues
- Visual inspection for any damages or dust/dirt
- A full report detailing all learnings, discoveries and suggestions for optimization
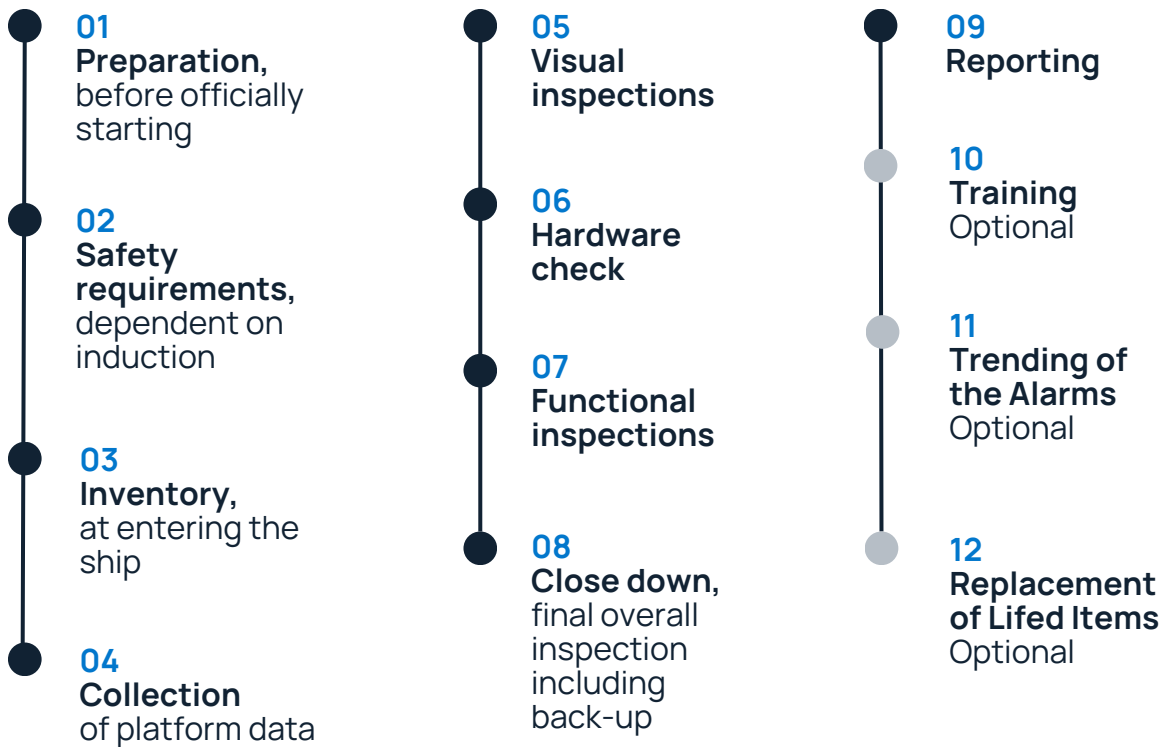- Obsolescence management

The system Health Check

Our system Health Check offers a comprehensive assessment of your ships overall health.

The full check has been split up in the following stages:

When opening this document digitally, click the topics to easily navigate through the document.

01
Preparation,
before officially starting

02
Safety requirements,
dependent on induction

03
Inventory,
at entering the ship

04
Collection
of platform data

05
Visual inspections

06
Hardware check

07
Functional inspections

08
Close down,
final overall inspection including back-up

09
Reporting

10
Training
Optional

11
Trending of the Alarms
Optional

12
Replacement of Lifed Items
Optional

Phase 1
Preparation

RH Marine will undertake the following activities as part of the preparation.

Topics in this phase:

✓ **Defining the scope of the Health Check**
(IPMS, # workstations, #LPU, #PC's, CCTV, etc)

✓ **Planning a date and period**
when the ship is available for the Health Check.

✓ **Verification that security measures have been arranged**.
Both the engineers and the equipment will be approved and checked for the required security level (if needed).

✓ **Collecting all necessary tools that are required for a proper Health Check.**
(Test software, RS-LINX, Deployment tools, etc) and ensuring that these are present and available during the Health Check. This may also include equipment from the customer (special approved service laptops, vacuum cleaner, etc.).

✓ **Checking with the customer**
that all necessary requirements are met to conduct the Health Check and that access to the ship, passwords and other security related issues are available to perform the Health Check.

Phase 2
Induction

Before boarding (subject to safety requirements), RH Marine ensures that its technical specialists undergo screening and possess the necessary competence for system maintenance on board.

Additionally, specialists may participate in safety or security training as an extra requirement. If required, this will be part of the planning of the Health Check.

Main takeaways:

✓

Specialists are screened

✓

Specialists will attend safety training

Phase 3
Initial inventory

Upon boarding, the first step involves conducting interviews with the crew to identify common issues and gather user experiences related to the IPMS system. The results from the interviews guide the next phases of the Health Check.

As part of the interviews and the physical check, an assessment of virus checks and the status of the latest system backups will be conducted. It is assumed that the systems are virus-free (crew's responsibility) and recent complete backups are available. If not, RH Marine provides advise and optionally perform back-ups before starting the Health Check. A complete back-up (of the as-is situation) is made after virus scans and allows for a seamless return to the initial conditions it needed.

Main takeaways:

Interview with crew

Status of virus checks and latest system backup

Phase 4
Collecting all available platform system data

During this phase, we gather the available platform system data.

The following data is collected:

☑ **Network mimic check-up**
(collecting network information)

☑ **IPMS status information**
(logging as-is, the list of known alarms)

☑ **System-log files**
(HD problems, internal battery damage, CPU issues, FAN/heating, etc of all the PC & Servers)

☑ **Switches log data**

☑ **Network load from the IPMS**
(if possible during operation)

☑ **Check the existing Network** Configuration.

☑ **Check System-IO Configuration**
(PC-overview, Switches Ports)

Phase 5
Visual inspections

We conduct thorough inspections of cabinets and consoles where system components are installed.

Any damage, corrosion will be reported. Dirt and other issues that can be solved will be solved immediately, with assistance from the crew if needed.

They will be inspected for:

✓ **Cabinets and consoles where system components have been installed**

- Damage
- Corrosion
- Dirt / dust
- Condense
- Proper tightening of all I/O cards, cabling, wiring, connectors and system modules or parts

✓ **Cables related to the IPM**S

- Over-bending
- Stretching
- Damage

✓ **Work stations**

Visual inspection of all work stations, server and peripherals (monitors, keyboards, etc.)

Phase 6
Hardware check

Following the visual inspection, we process with hardware checks.

* Replace broken and or damaged products.

The following checks are performed:

☑ **Check of the PSU**
for being within their specified range *

☑ **Inspection of keyboards and trackballs** *

☑ **Perform the following services for the Servers/PCs**

- Clean the internal cabinet
- Check the internal cooling
- Clean FAN unit and or replace filter *
- Check all device connections
- Check Hard Disk condition and remaining storage capacity *
- Check the Memory condition *
- Replace the CMOS battery
- Check temperature(s)

☑ **Inspect the printers**

☑ **Inspect the Network switches**

☑ **Inspect the Camera's**

☑ **Inspect the UPS units for operation and status**

Phase 7
Functional inspections

RH Marine also inspects PCs/Servers/
Alarm Units/Displays/Networks and
Printers (system elements).

The following elements are inspected:

✓ **Functional start-up and check** for normal operation

✓ **Test of the system networks** with network checkers

✓ **Test of the display unit** of the workstations and verification that brightness and contrast are in optimal condition

✓ **Inspect errors logged** by switches and or workstations. Investigate reason and if possible correct them

✓ **Investigate operating system** event logs for any abnormalities

✓ **Clean-up logging and cache disk areas** of the operating system directories

✓ **Test maintenance functionality** within IPMS for proper functioning

✓ **Check functionality** of consoles buttons and lamps/displays of IPMS components

✓ **Restore and verify PC / Server BIOS settings (clock, etc.)**

✓ **Check functionality of the CCTV-camera's**

✓ **Test UPS functionality** with a mini test; Shut down power and verify UPS taking over

Phase 8
Close down

Concluding the process, a set of final checks are needed.

Final on board activities of the Health Check are:

✓ **Check existing SW** version and settings

✓ **Check if the cleaned PCs & Servers** are free of any alarm in the log-files

✓ **Check that causes of alarms** that have been found at the beginning of the Health Check have either been solved or are understood

✓ **A complete final backup** of the new checked status of the system

Phase 9
Reporting

After completing the Health Check, a detailed service report will be made. This comprehensive document includes abnormalities or malfunctions found during the checks, along with recommendations for repair and maintenance - such as HDD or PCs/Servers - depending on the component lifetime. Additionally, the service report includes guidance on necessary updates and modifications essential for future OS support, mandatory IMO regulations and/or class requirements.

Main takeaways:

A comprehensive report will be made

Report includes abnormalities and advice

Optional phase 10
Training

Phase 10 is optional and includes three trainings. The trainings can be offered on request.

The three trainings:

✓ Alarm Handling Training

- Extension of the Health Check visit with two days for training the crew for handling of alarms/defects at the beginning of the Health Check is an optional activity.
- This alarm handling training is to be executed at the start of the Health Check, allowing the crew to handle all existing alarms.

✓ Refresher training

- Training for current crews in operating and/or maintaining the IPMS system and its components.

✓ Operator/Maintainer training

- Operator and/or Maintainer training for new crews

Optional phase 11
Trending of the Alarms

During the Health Check visit, RH Marine will gather all alarms from the month before the assessment. Optionally, we can analyse potential causes at our office in Schiedam.

A detailed report with recommendations will be created. The costs for these services will be specified based upon the number of alarms after collection during the visit.

Main takeaways:

Optionally analyse possible causes of alarms

Report may contain advice generated from alarm analysis

Costs depend on the number of alarms

Optional phase 12
Replacement of
Lifed Items

Before the execution of the Health Check, RH Marine checks the lifetime of the current devices (HD, PSU, and Server), using its ILS database, providing an advice for replacement of components.

Optionally, the replacement of these components can be combined with the Health Check service visit.

The advice is based on the following interval:

☑ **Each 3 years**

- Replace the HDD, transferring all data from the old disk to the new one.
- Replace the CMOS BIOS battery

☑ **Each 5 years**

- Replace Computers/Servers

Let's keep in
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