

# **Retrofitting BWMS with ClassNK-PEERLESS**

16 November 2015

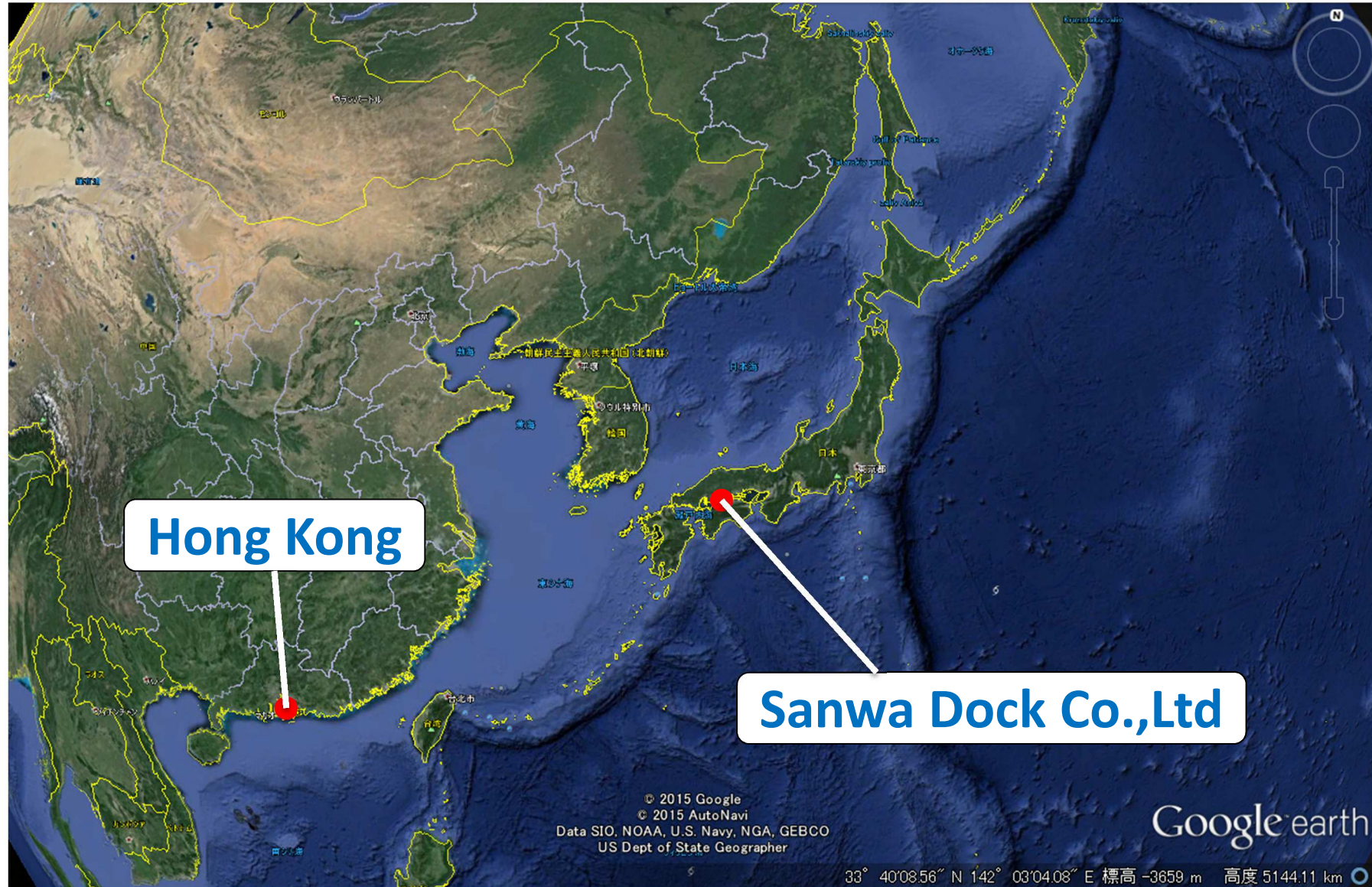
Isamu Teranishi, CEO  
SANWA DOCK CO., LTD

- I. About “Sanwa Dock Co., Ltd”**
- II. BWMS Retrofitting**
- III. Summary**



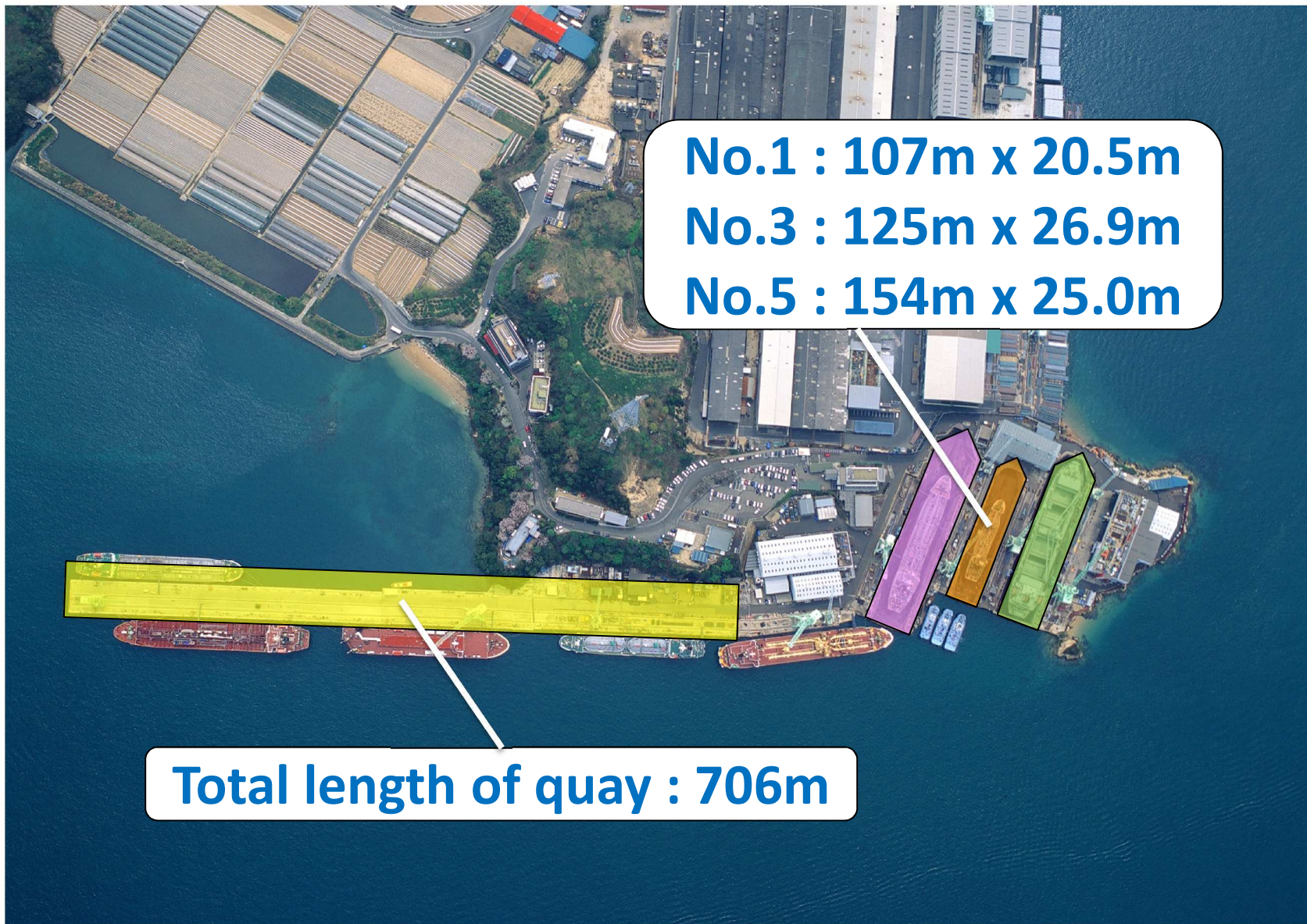
# Located at Hiroshima Pref., Japan

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# 3 docks and 1 long rigging pier





# Clean & Comfortable Facilities

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# Clean & Comfortable Facilities

6





# Clean & Comfortable Facilities





# Shipbuilding Skill Training center

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**Entrance Ceremony**



**Gas Cutting Training**



**Welding Training**



**Plate Bending Training**





# Outline of Sanwa Dock

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**A brief introduction of Sanwa Dock Co. Ltd.:**

- ✓ **Specialized “Ship Repair” Dock**
- ✓ **Family-owned business**
- ✓ **Always in profit since establishment**
- ✓ **Long-term focus on investment of new facilities and technologies**
- ✓ **Highly skilled engineers and workers**



# New Dock, Factory, Office for 2016

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# New Dock, Factory, Office for 2016

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**Large size Dry dock  
under construction**

**(Docking capacity 63,000G/T)**

**Scheduled Completion Date:  
May 2016**



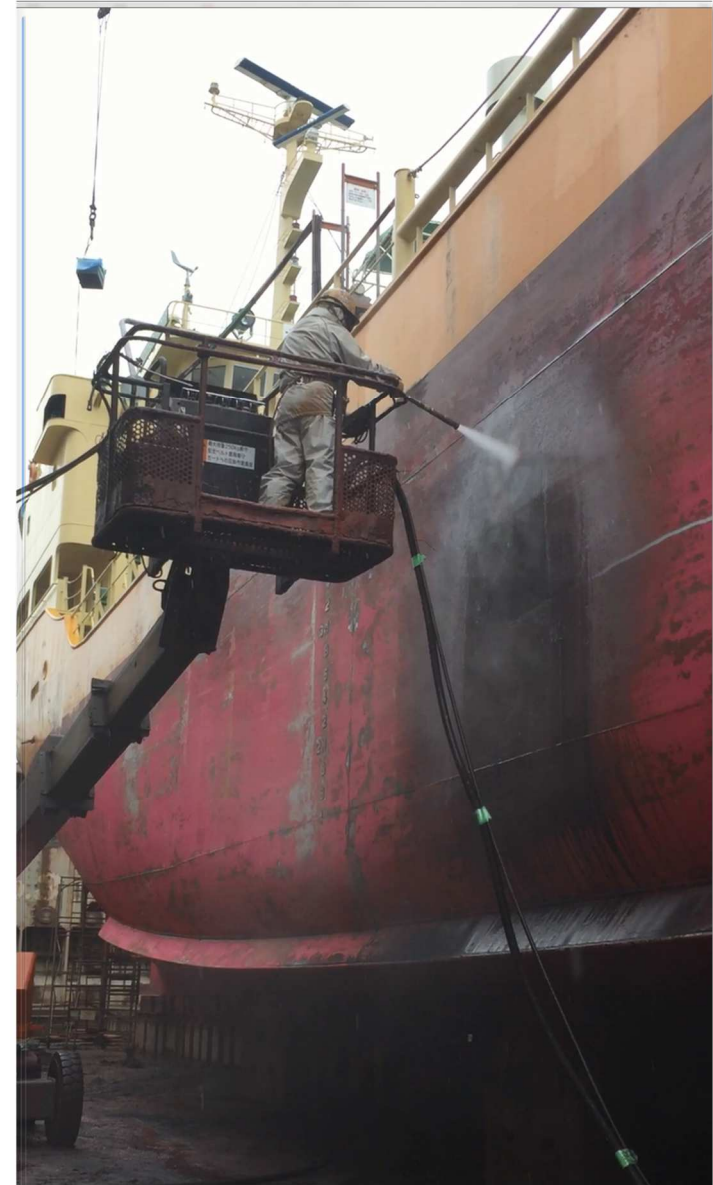
# Environmentally friendly shipyard

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## Konki-Jet Blast System

- ✓ Reduce blast media use
- ✓ Reduce powder dust





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**II. BWMS Retrofitting**

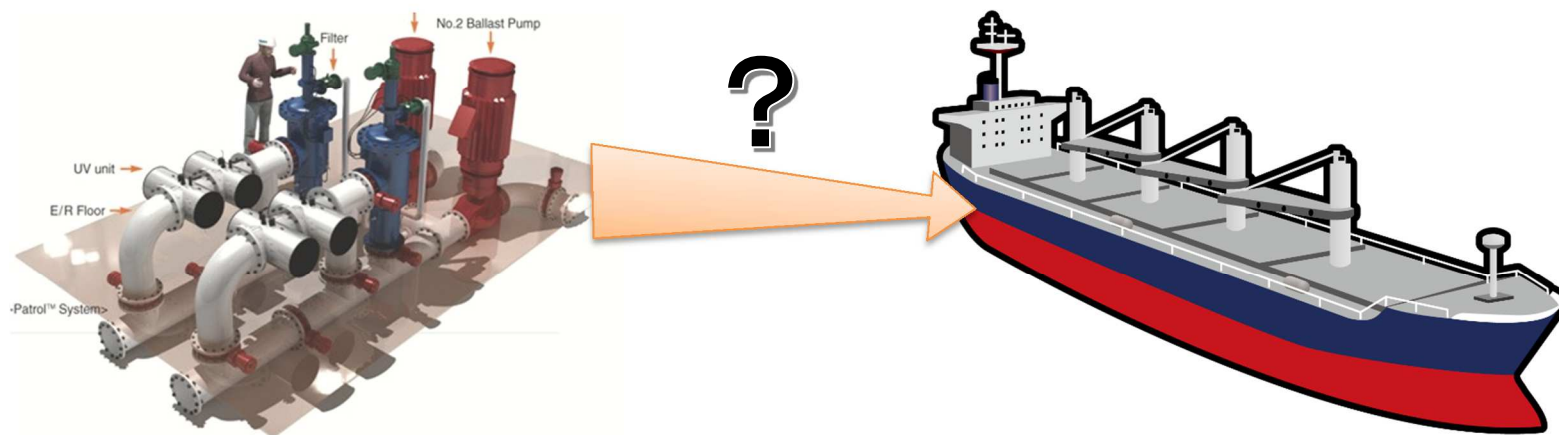
III. Summary



# Difficulty of BWMS Installation

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- a) **Confined engine room space (already optimized to house existing machinery, with no additional space for BWMS)**
- b) **BWMS equipment is large and installation of extensive network of connection pipes is challenging**
- c) **Difficult to obtain accurate 3D models of engine rooms required for detailed planning**





# Difficulty of BWMS retrofitting

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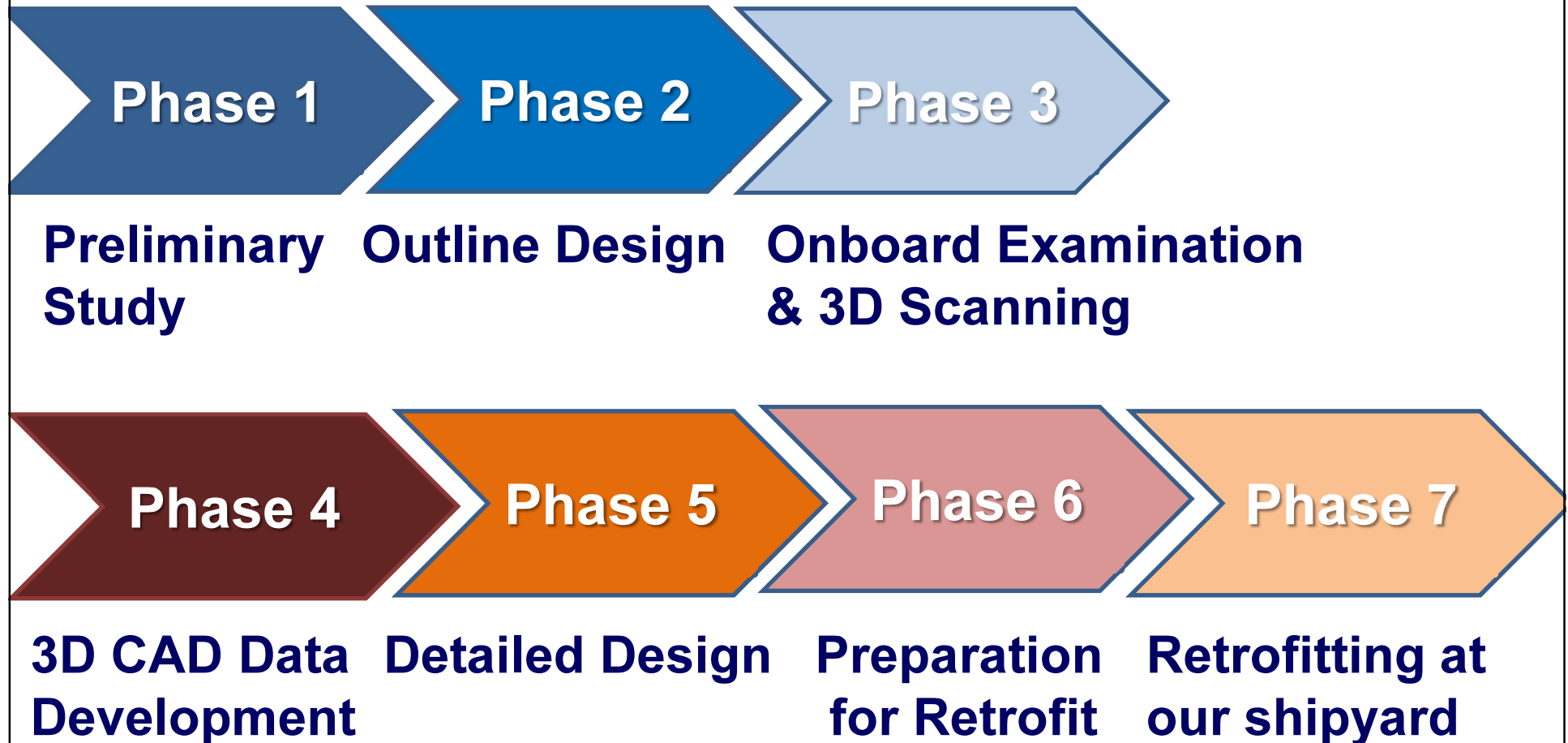


**LOWER FLOOR in ENGINE ROOM**  
(Before & After floor plates taken out)



# Process of BWMS Retrofitting

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# Preliminary Study

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**Preliminary Study**

- ✓ There are over 40 kinds of BWMS which have already approved by IMO.
    - ✓ UV
    - ✓ Chemical
    - ✓ Electrolysis
    - ✓ Ozone
- etc....

## Check Points

- ◆ Space assessment of engine room and pump room for BWMS location
- ◆ Electrical capacity assessment for BWMS
- ◆ Assessment of ballasting/de-ballasting speed, capacity etc.
- ◆ Cost assessment including running costs

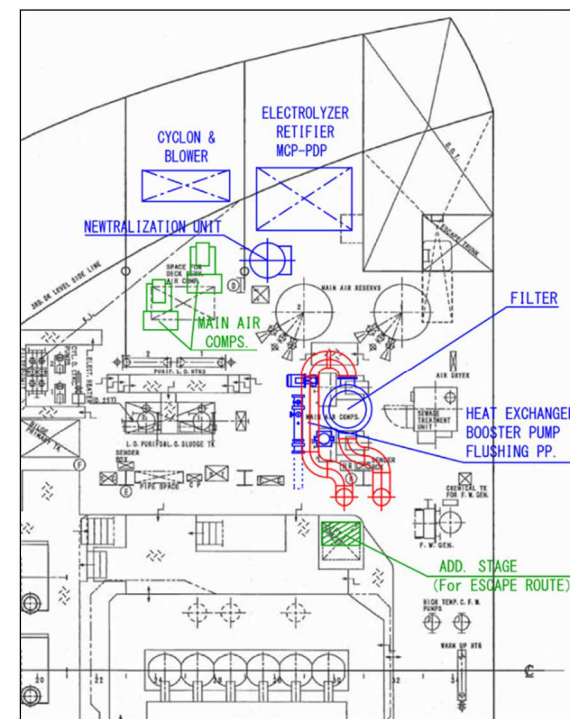
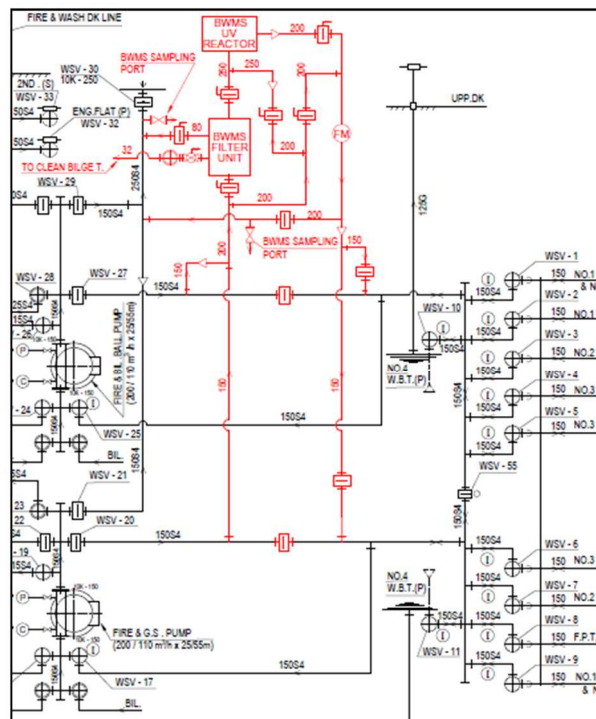


**Decision on which type of BWMS to install**



Phase 2

Outline Design



- ✓ Rough planning BWMS Retrofitting, such as BWMS location, piping arrangement, etc., according to existing 2D plans



## Phase 3

### Onboard Examination

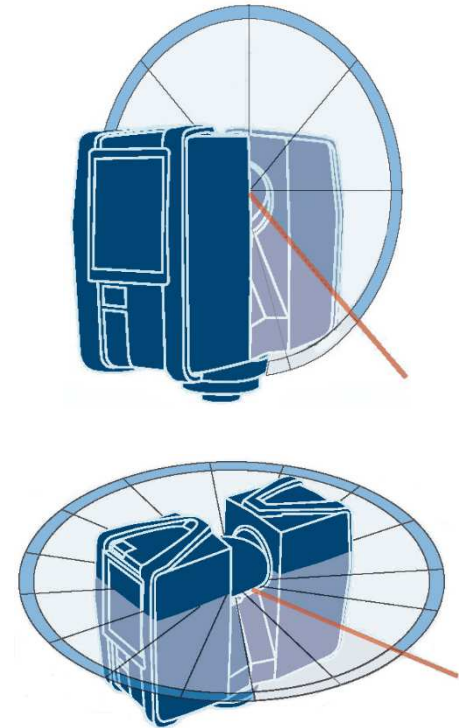


### Check Points

- ◆ Deciding installation locations and ancillary work for machinery installation
- ◆ Pathway planning of additional pipes
- ◆ Electrical modifications including ballast control system
- ◆ Onboard delivery route of machinery



## Onboard 3D Scanning



Scanning Range	: 0.6 - 330m
Scanning Angle	: Horizontal ; 360 , Vertical ; 305
Scanning Speed	: Max 976,000pt / Sec
Accuracy of measurement	: +/-2.0mm



# Onboard 3D Scanning

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**Video of 3D Scanning (1 min.)**



# Onboard 3D Scanning

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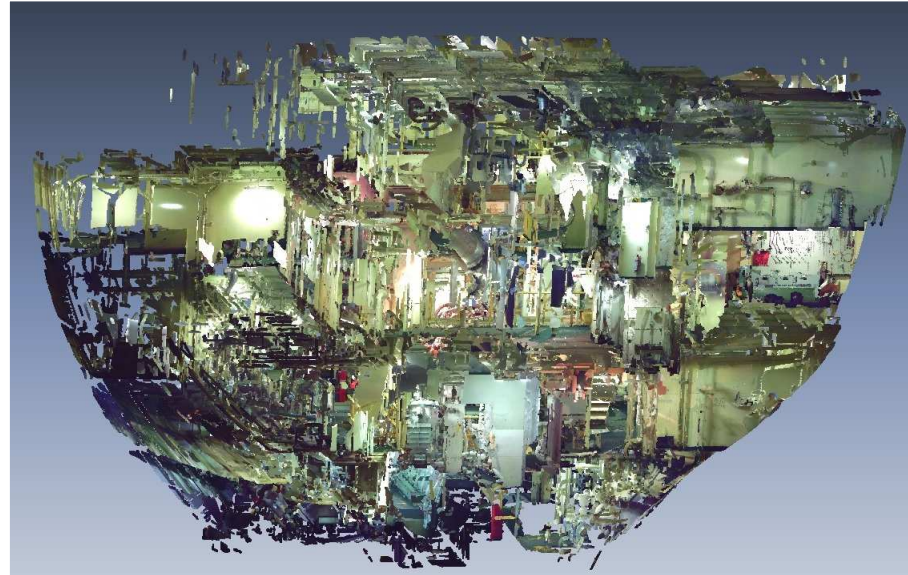
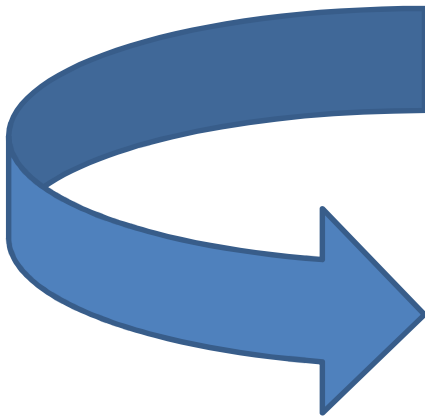


- a) **Collected data consists of between billions of point data coordinates containing XYZ and RGB information.**
- b) **3D scanning is carried out according to the design outline developed during the onboard examination stage.**
- c) **Complete scan can be carried out in 3 to 6 hours by just two engineers.**

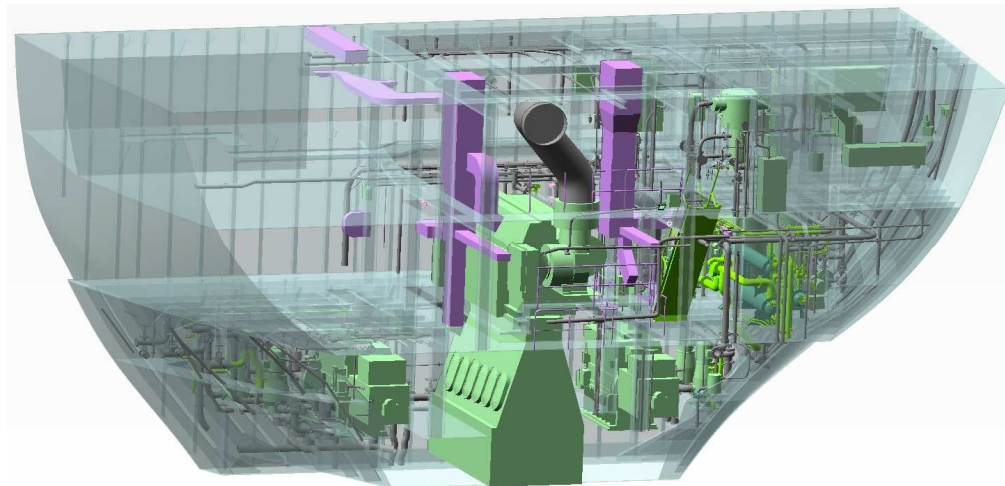


**Phase 4**

**3D CAD Data  
Development**



**Point Cloud Data**



**3D CAD Data**



# Need for New Software

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- ✓ **Conventional software takes many hours to process data (No database for pipes, valves or structural components. Developing 3D models is difficult.)**
- ✓ **Conventional software is not suited to processing large amount of point data required in engine room**



**ClassNK-PEERLESS**

Plant and Entire Environment Reversing with Lean Engineering System Solution





- a) Software can be used on basic computers**
- b) Can handle vast amounts of data required for BWMS installation planning**
- c) Database of standardized components allows for easy insertion of suitable objects, such as pipes, valves, etc.**
- d) Automatic pipe recognition function**
- e) Automatically deletes point data after modeling completion (unfinished modeling prevention function)**
- f) Easy transfer of 3D CAD data to Marine 3D CAD Software**



# Advantage of ClassNK-PEERLESS

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- ◆ More accurate 3D modeling can be streamlining the after process and lowering costs
- ◆ Processing period of one month using conventional methods shortened to one week



For more details  
Please contact  
**ClassNK**



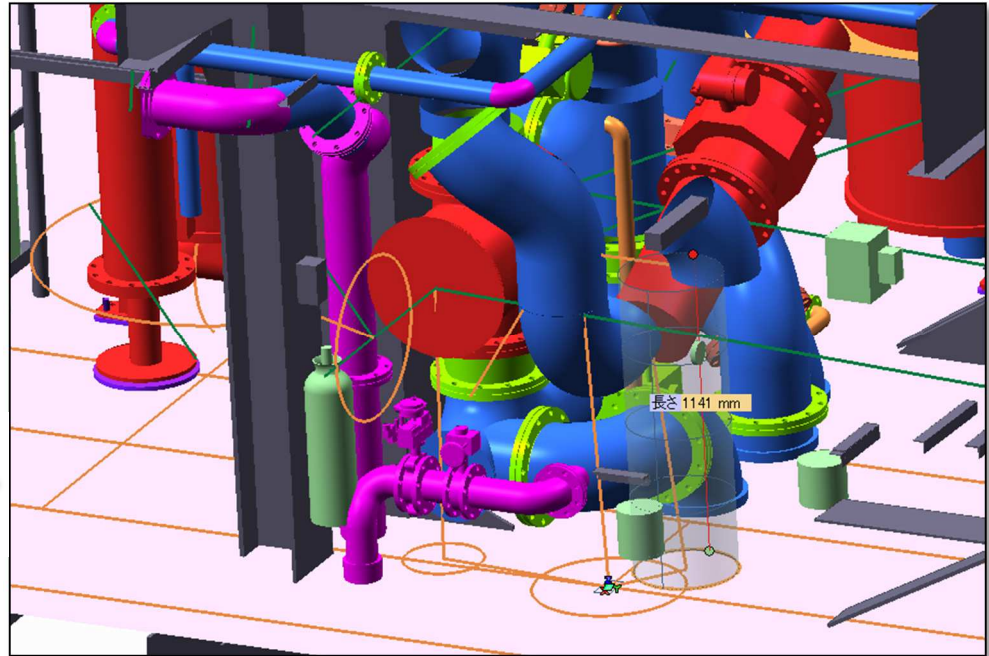
# Detailed Design



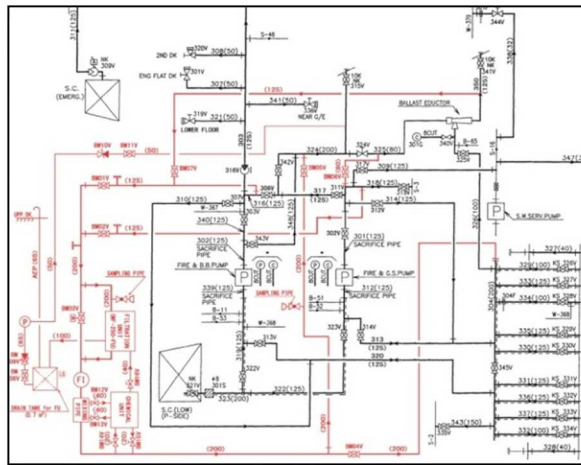
Phase 5

Detailed Design

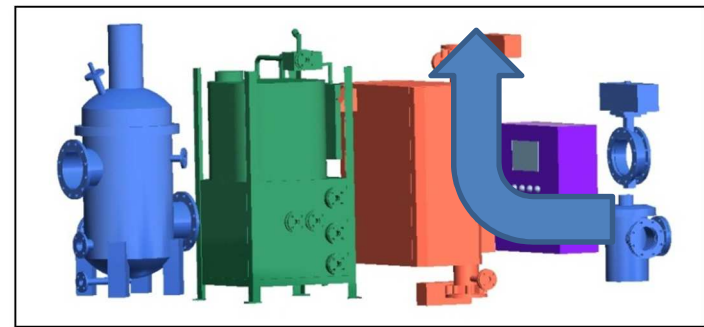
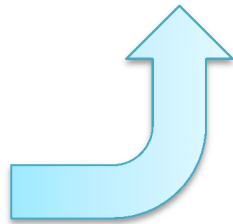
3D Data created by  
ClassNK-PEERLESS



3D Design Model



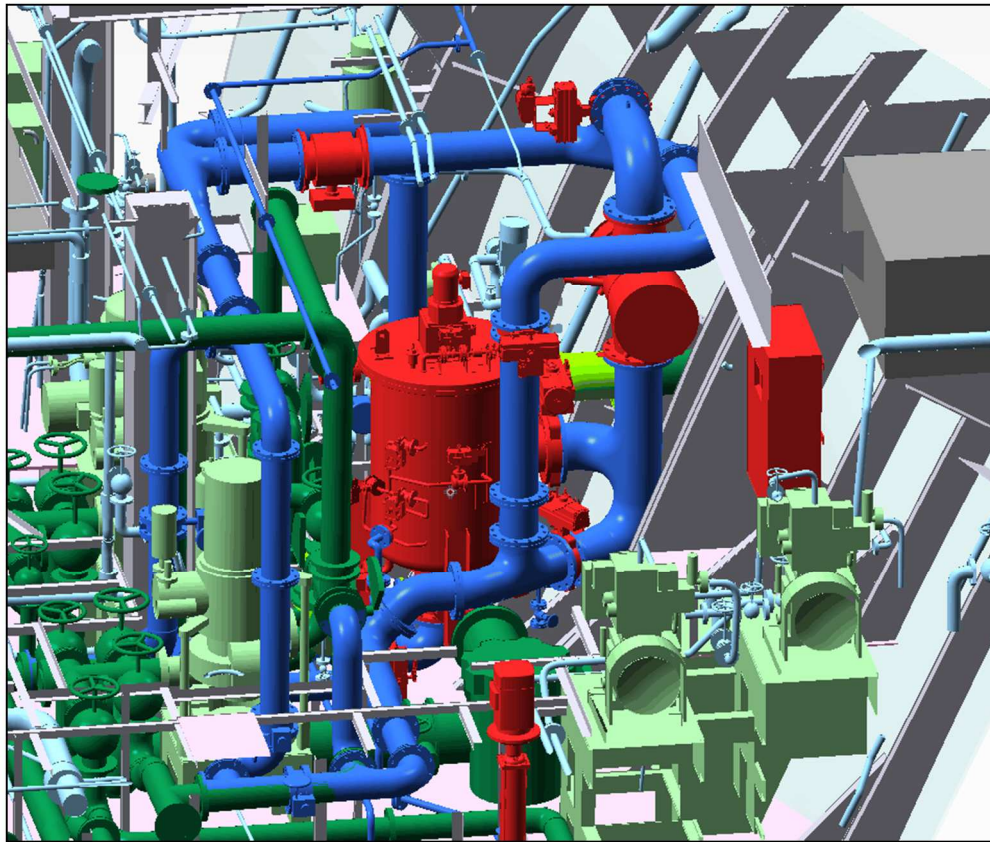
Basic design



BWMS 3D Model

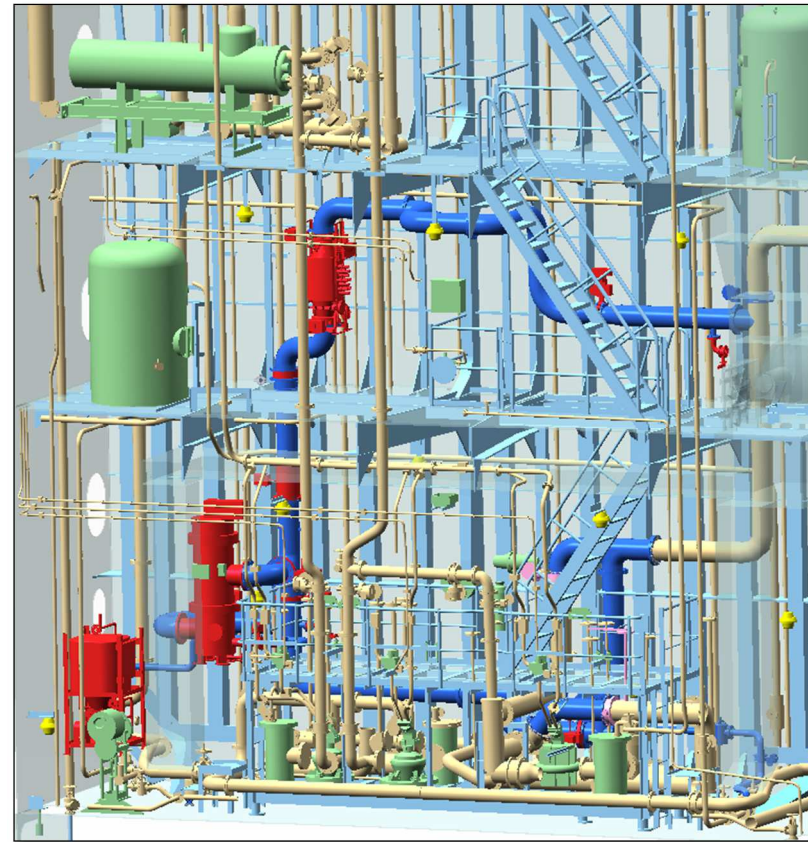


# Detailed Design



**Engine room**

**(for Bulk carriers, PCC, etc.)**



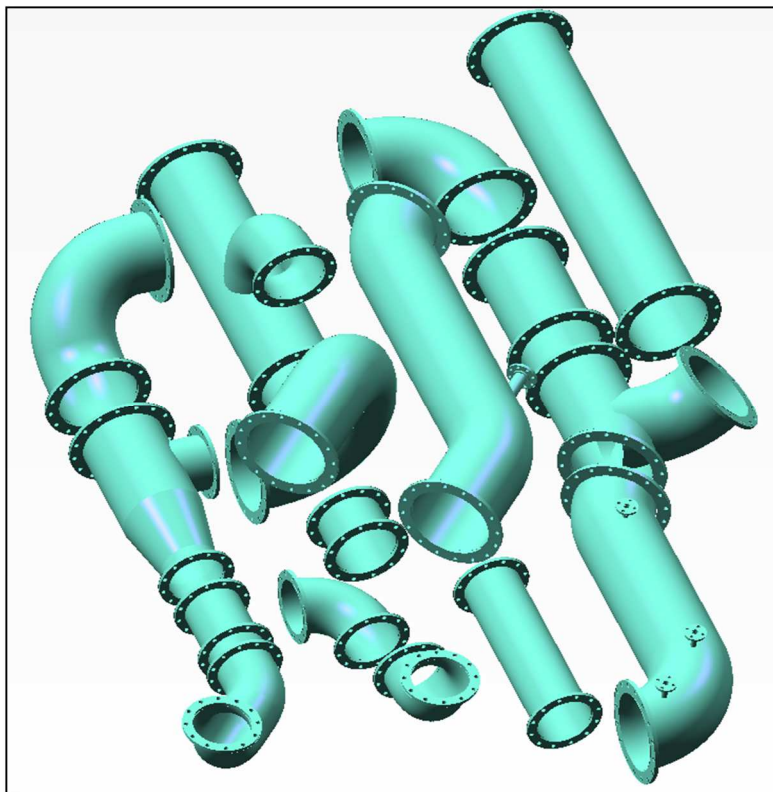
**Pump room**

**(for Oil Tankers, Chemical Tankers)**

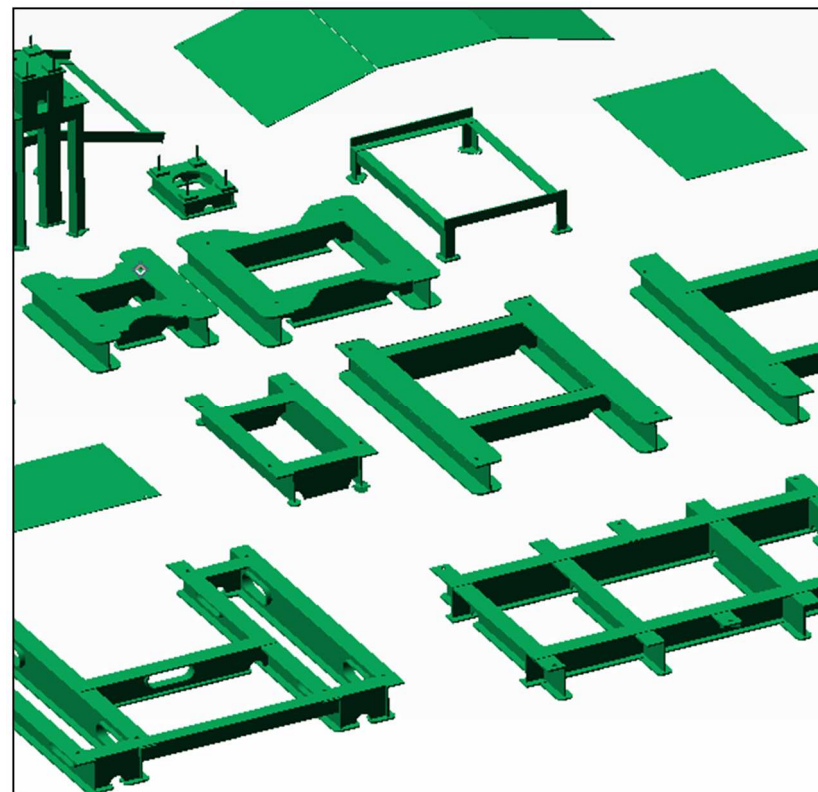


# Detailed Design

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3D model of distribution pipes



3D model of Machinery stands

**Can create highly detailed designs including Distribution pipes, Pipe support, Machinery stands, etc.**



# New Machines for Pipe Works

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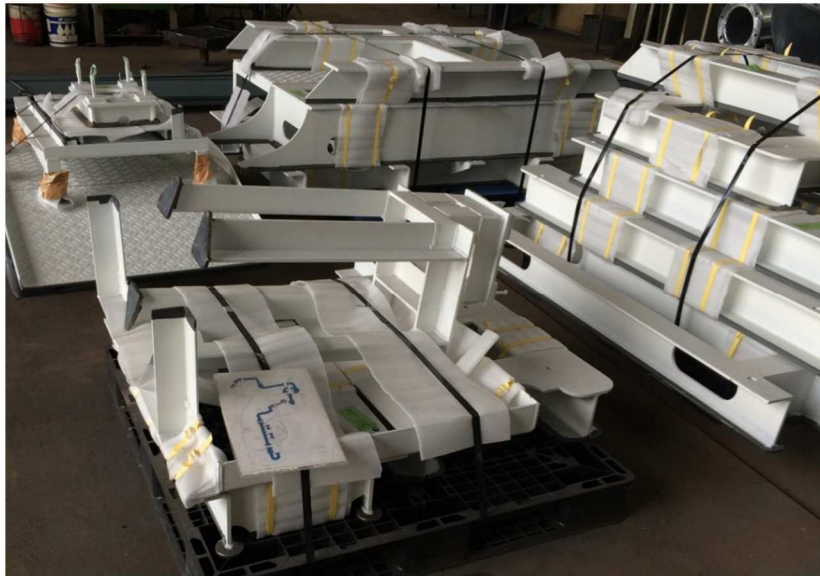




# Preparation work for retrofits

Phase 6

Preparation  
for Retrofitting





# Retrofitting at our shipyard

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Phase 7

**Retrofitting in  
our shipyard**



- ✓ **Highly experienced engineers and onsite staff provide high quality construction services**
- ✓ **Short docking period (depends on complexity of work, but only takes 10 days to 3 weeks on average)**





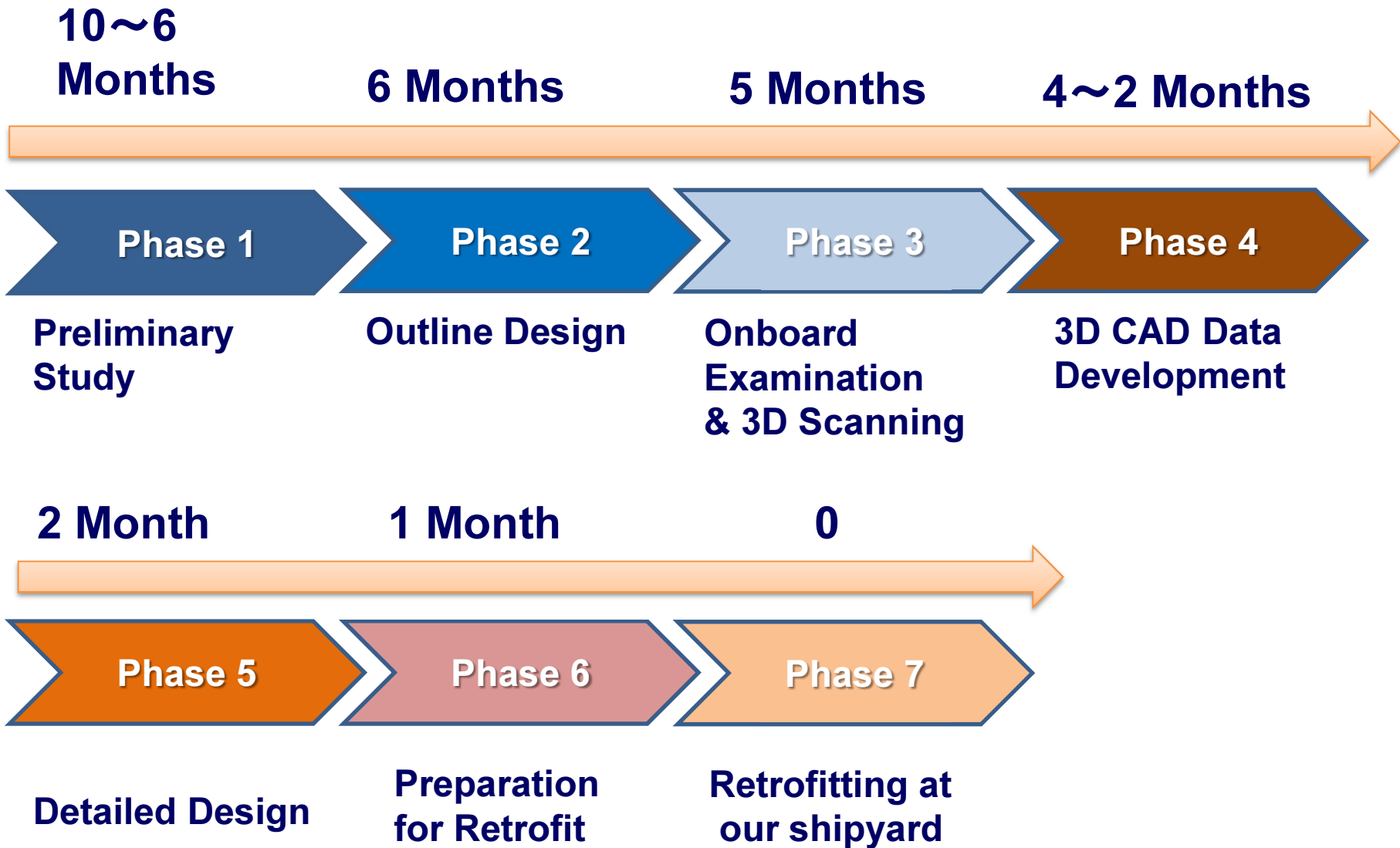
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# Time schedule





## **Strength of our company in BWTS retrofit.**

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- 1. We identify the key positions for scanning, rather than just scanning at random.**
- 2. The merits of 3D modeling with ClassNK-PEERLESS**
- 3. Onboard examinations and detailed 3D design are carried out by design engineers as well as construction engineers.**
- 4. Our state-of-the-art pipe processing machinery and techniques**
- 5. Highly skilled design engineers and construction engineers**
- 6. Experience workers**



**High quality BWMS retrofit  
in a short period at low cost**



# **SANWA DOCK is competitive**

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- 1. Our high level of design capabilities for BWMS work and others**
- 2. Our highly skilled hull, machinery, electrical, and pipe engineers**
- 3. Our young and highly skilled workers**
- 4. The latest machinery and dock facilities**
- 5. The introduction of environmentally-friendly technologies such as the Konki-Jet Blast System**



**Thank you for your kind attention.**



This technology was developed with the support of ClassNK  
as part of the ClassNK Joint R&D for Industry Program.