GLOBAL NEW LEADER FOR CLEAN ENVIRONMENT

EnFac
Engineering Factory Korea

CONTENTS

INTRODUCTION

We have good partnerships
with major BWMS makers around the world.
If you consider to select from our partners,
it would be **the best choice to do engineering with us.**

With EnFac,
you will find one-stop solution for retrofit market.

By *Matt Kim*, MD

BUSINESS FIELD

BWMS RETROFIT

1. 3D Scanning
2. Design Engineering
3. Retrofit Material
4. Installation
5. Supervision
6. Inspection
7. Delivery

BWMS A/S & COMMISSIONING

1. BWMS A/S
2. BWMS Commissioning
3. Training vessel crews
4. Program update

SCRUBBER RETROFIT & AMP ENGINEERING, ETC.

1. 3D Scanning
2. Design Engineering
3. Material
4. Installation
5. Supervision
6. Inspection
7. Delivery

SPARE PARTS

1. BWMS Spares
2. Spares for other equipment on vessel

ORGANIZATION

Matt Kim

Chris Ha

- SALES
- PM
- DESIGN
- INSTALLATION

BWMS RETROFIT

Eric Jeon

- A/S
- COMMISSIONING

BWMS A/S

- FINANCE
- MARKETING
- SPARE PARTS

MANAGEMENT

- R&D

R&D

WHY ENFAC ?

01

EXPRIENCE

Over 10 years
experiences from
BWMS field

02

EXPERTISE

Specialized in
BWMS retrofit with
lot of knowledge
from many cases

03

EFFECTIVE

Work by
the most
time & cost effective way

JOB CAREER

× Retrofit team : Thirty(35) main engineers (over 10-20 years)

× Design team : Ten(25) main engineers (over 10-15 years)

Achievement as of Nov. 2020,

1. BWMS Commissioning : 136 Ships
2. BWMS A/S : 390 Ships
3. BWMS Retrofit : 124 Ships

MAKER PARTNERS

01 UV TYPE

1. PANASIA (KOREA)
2. SK CENTURY (KOREA)
3. MIURA (JAPAN)
4. ALFA LAVAL (DENMARK)
5. LEES GREEN (CHINA)

02 ELECTROLYSIS TYPE

1. TECHCROSS (KOREA)
2. SUNRUI (CHINA)
3. HEADWAY T/C (CHINA)
4. ERMA FIRST (GREECE)
5. HI-BALLAST (KOREA)
6. PURIMAR (KOREA)

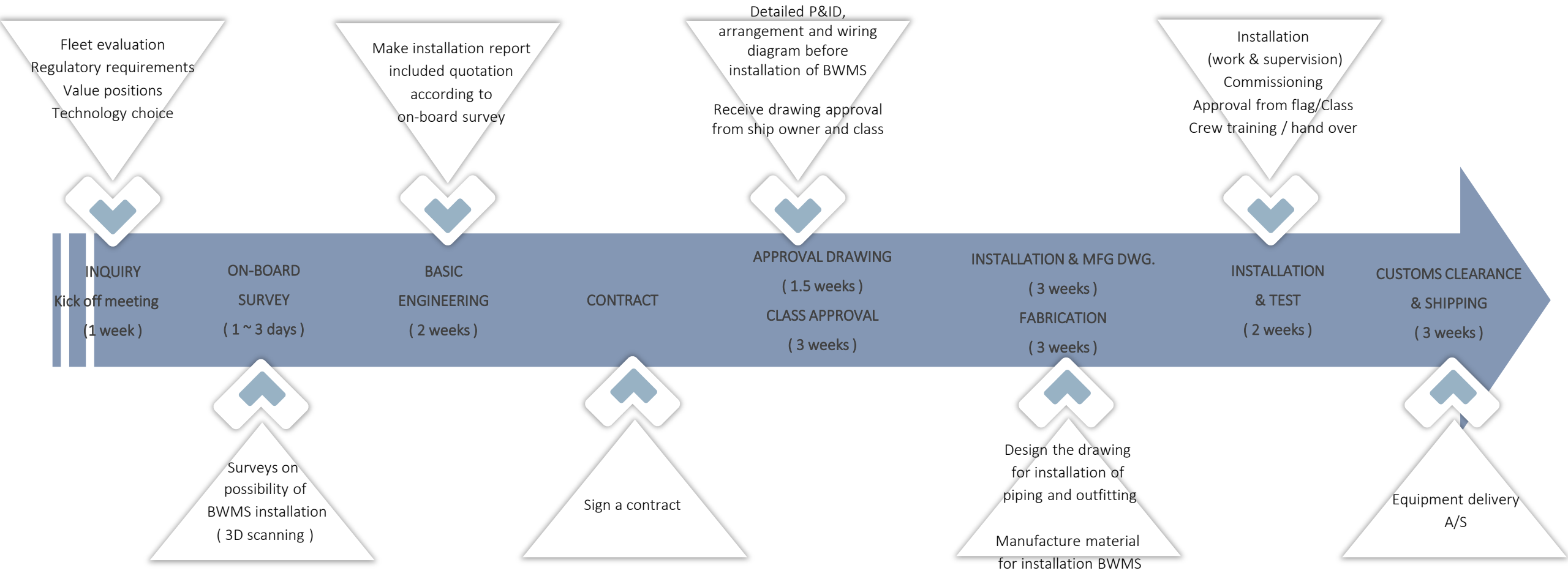
03 OZONE TYPE

1. NK (KOREA)

EARLY RETROFIT ADVANTAGE

	ITEM	Before bottleneck (2018 ~ 2020)	During bottleneck (2021 ~)
COMPARISON	Price	Lower price	Extremely high engineering price
	Service	1) Guarantee extension 2) Additional spare parts 3) Good quality crew training 4) Easy available for repair shipyard	1) No guarantee extension 2) No spare parts 3) Normal crew training 4) No construction place
	Equipment Management	1) Enough equipment education 2) Sufficient being skilled engineers	1) Minimum equipment education 2) Lack of being skilled engineers
	CONCLUSION	 Time ticking	 ENFAC IS THE BEST CHOICE

RETROFIT SCHEDULE



Total around 20 weeks after kick-off meeting
About 14 weeks after contract

3D SCANNING & MODELING

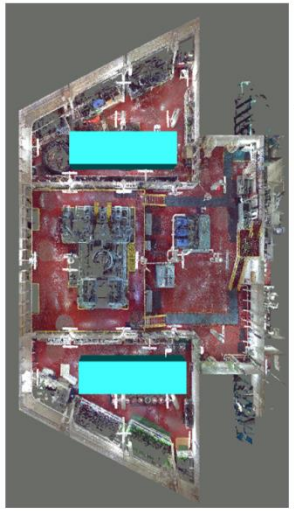
2. Installation Proposal – S/G Room

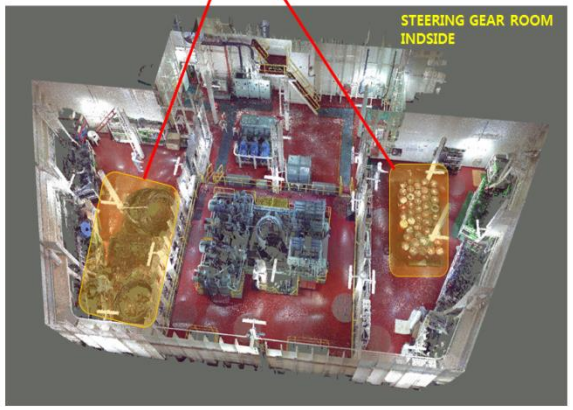
The reason why it is impossible to install NK system in E/R

4. Not easy to maintain and operate -> It would be easier to install at S/G Room

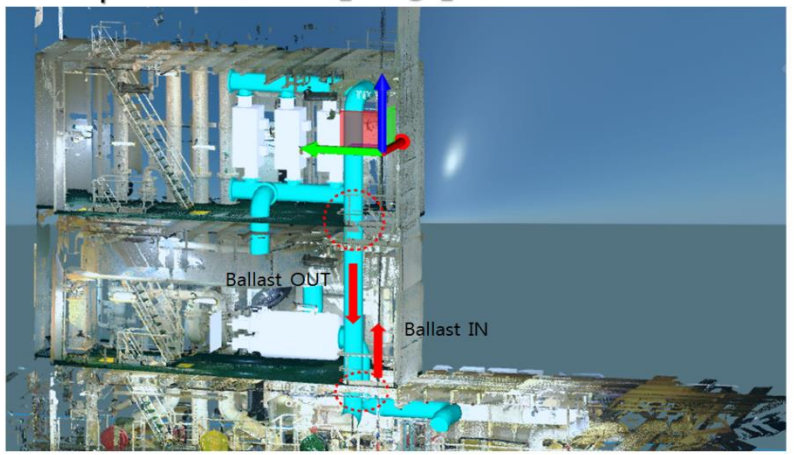
Moving the rope and chemical drum location makes possible to design + install for maintaining and operating as one stop.

WIRE, ROPE, OIL DRUM should be removed

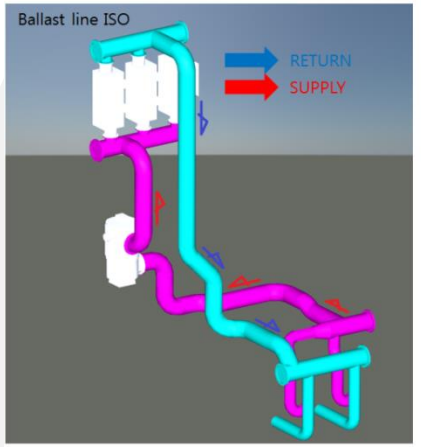




Concept for P/R Piping part –1



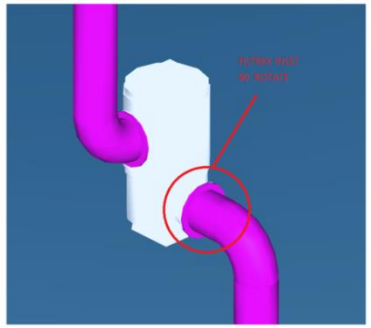
Concept for P/R Piping part –2



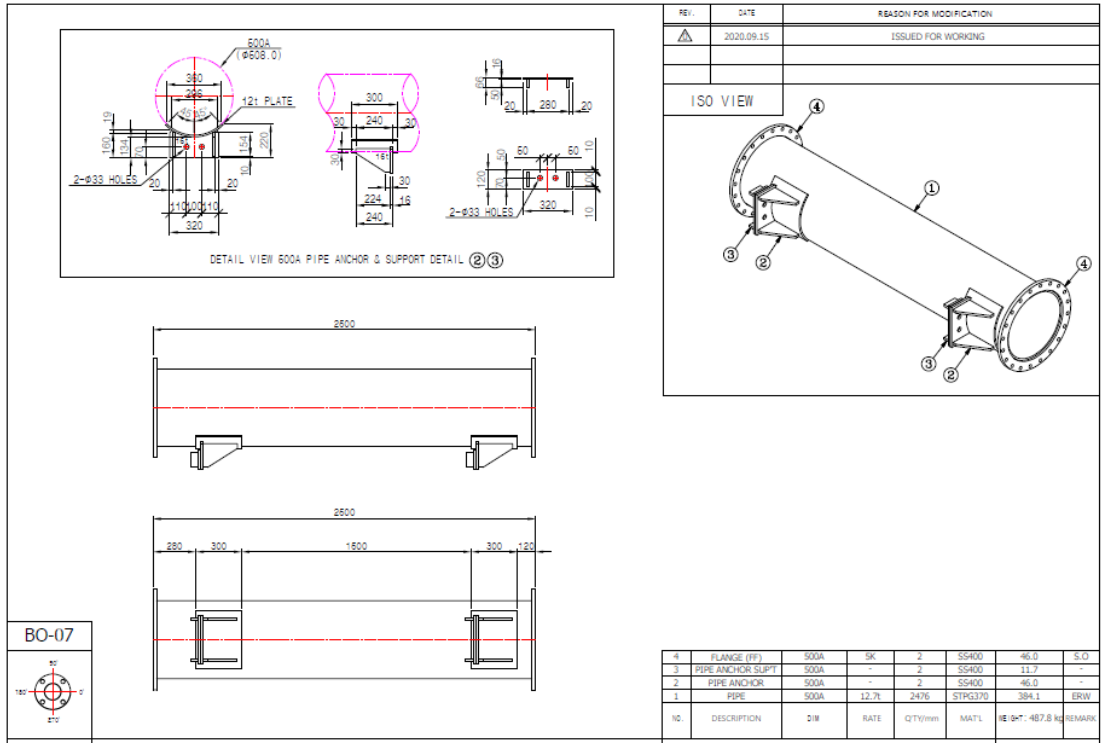
Filterx

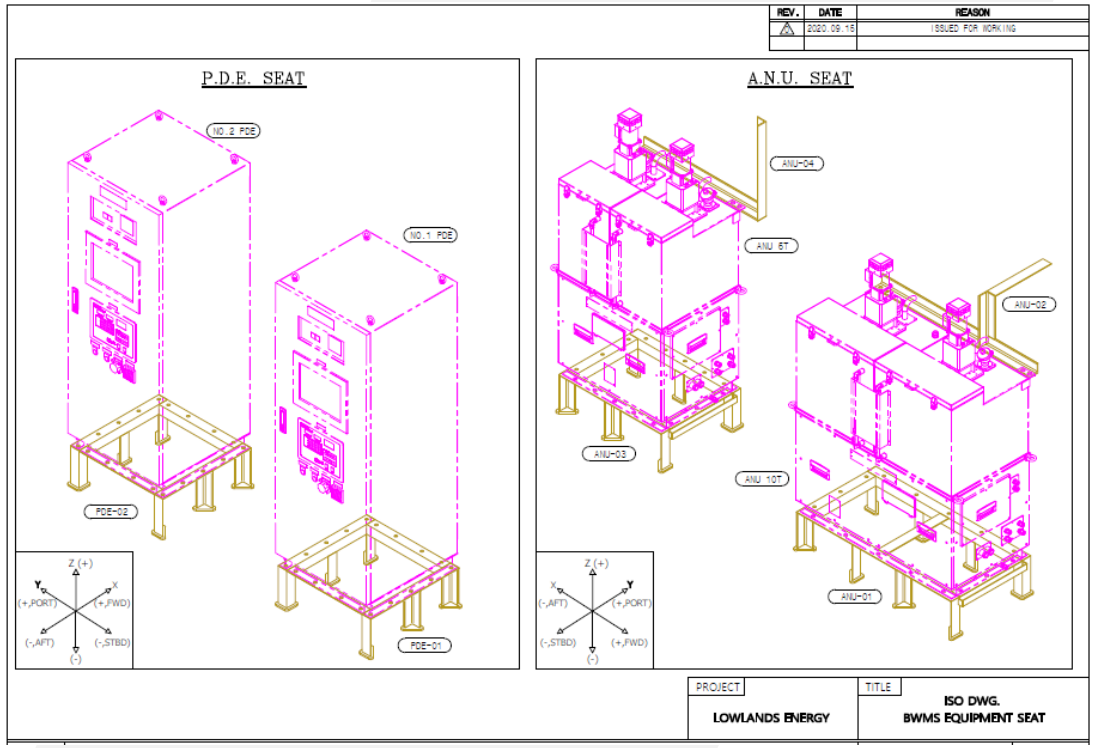
- Ballast main line will be installed without problem in p/r

*Filtrex inlet connection should be rotated 90'



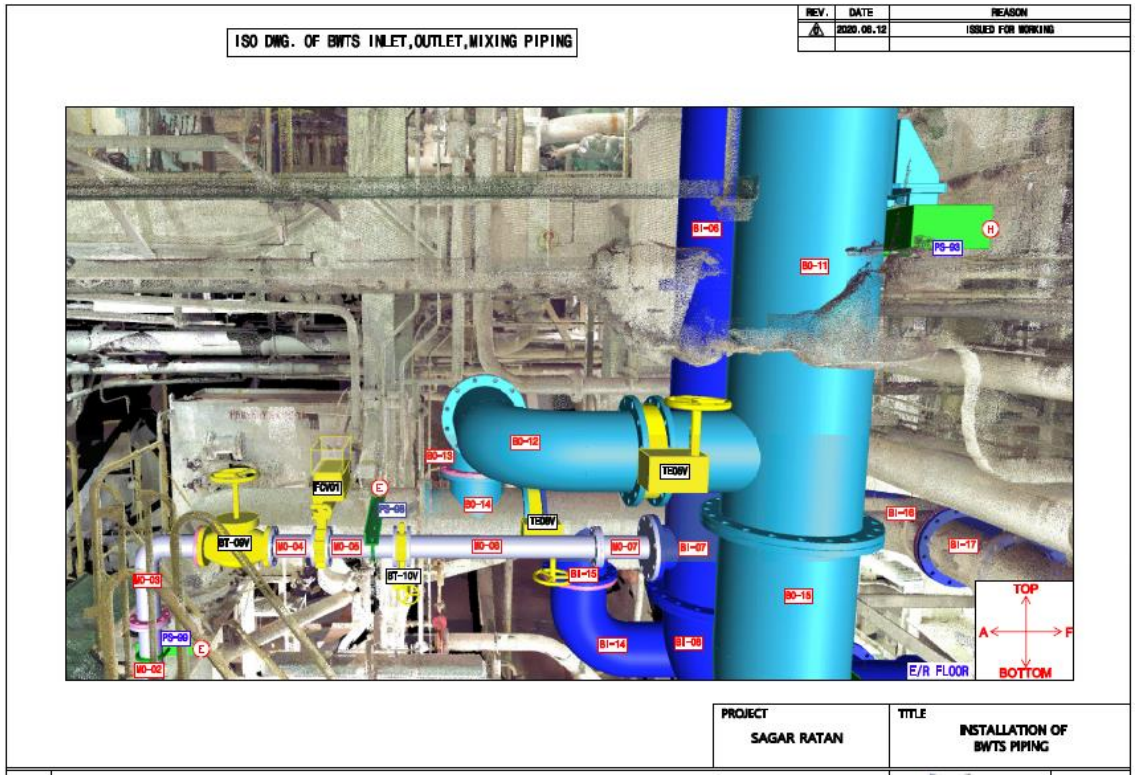
DRAWING

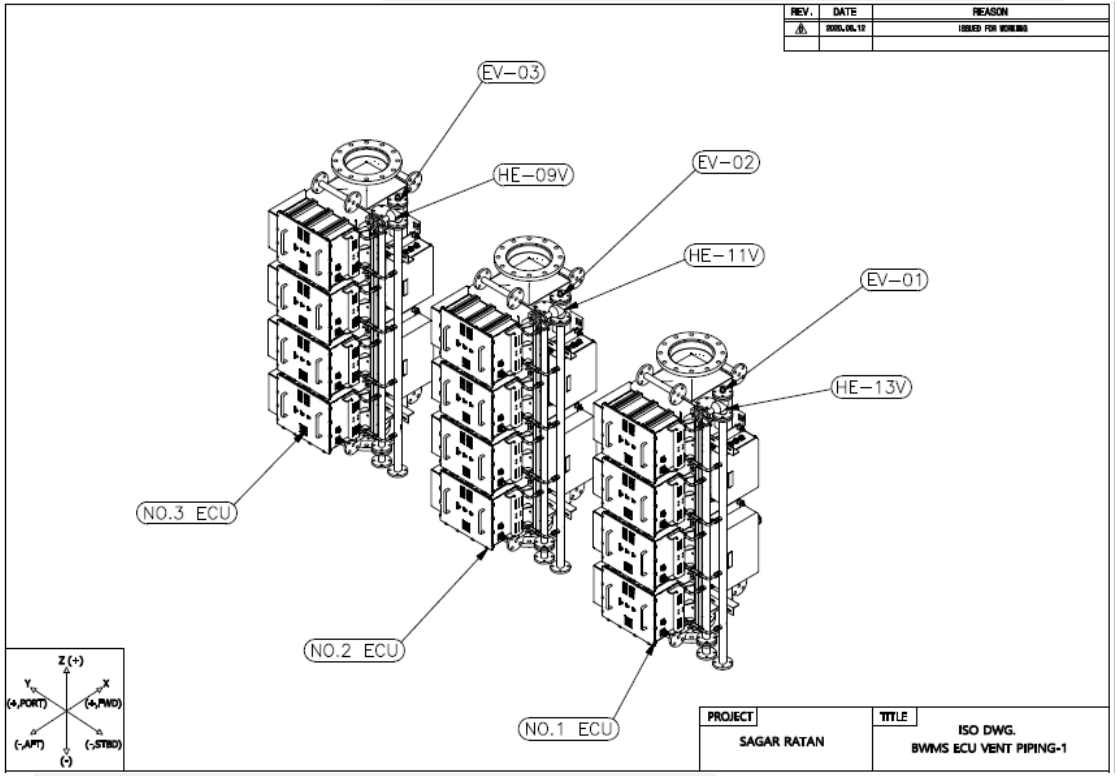




Manufacture Drawing

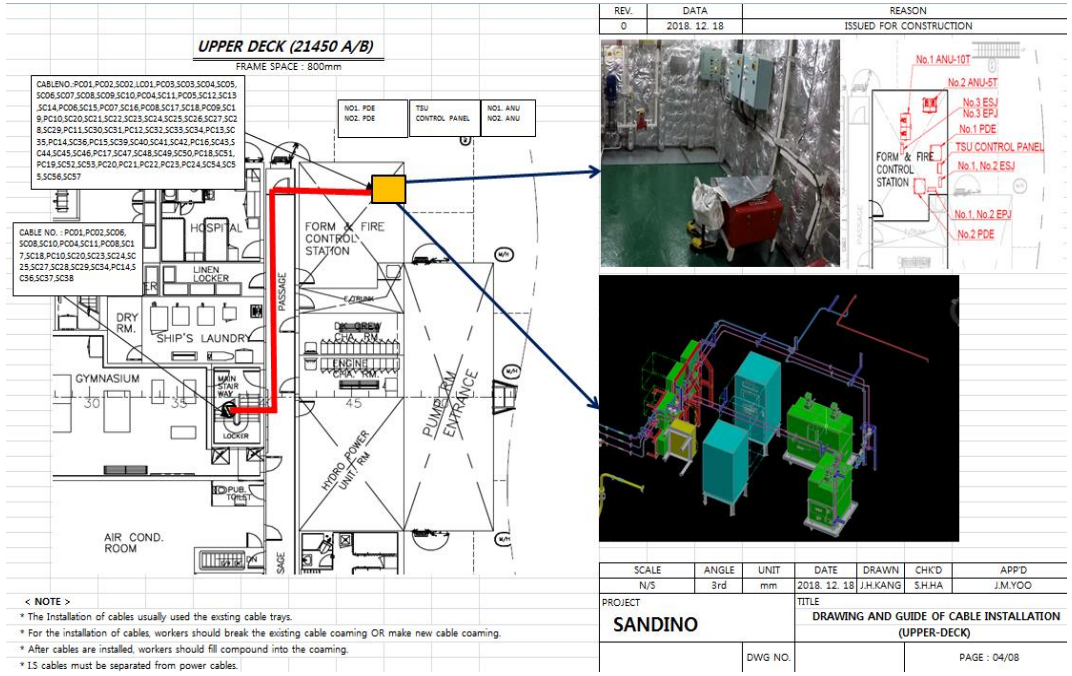
DRAWING

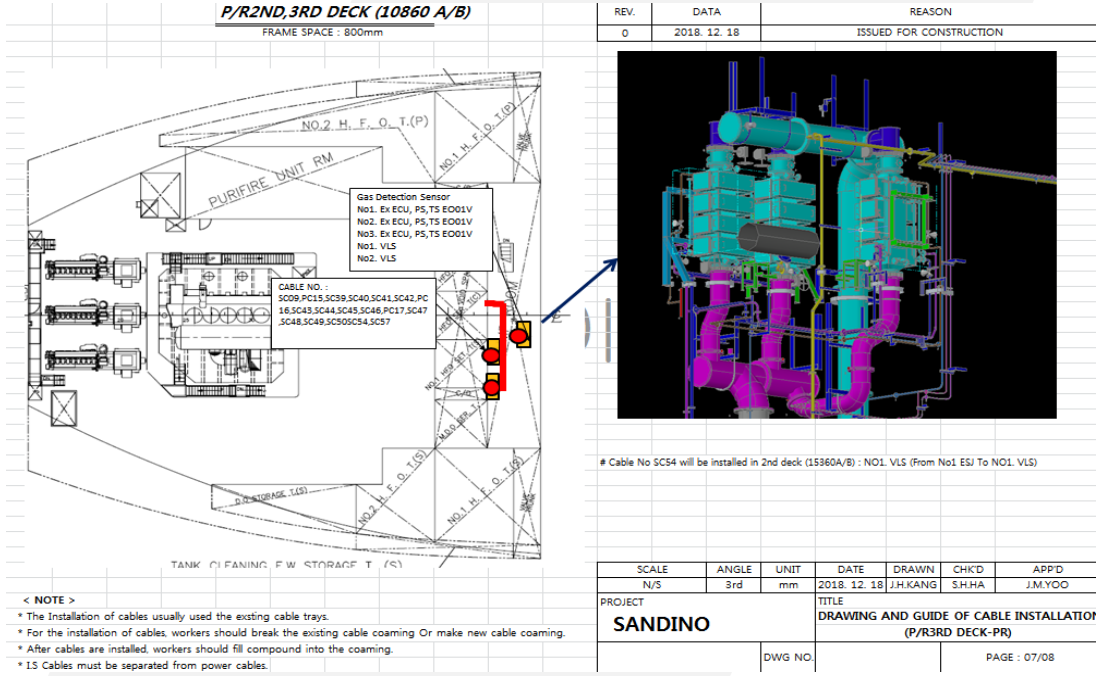




Installation Drawing

DRAWING





Cable Installation Guide

DRAWING

Interface with AMS

3. A.M.S

NK System need to the some alarm signal for abnormal function

1) Wiring diagram

NK –BULE BALLAST SYSTEM
MAIN CONTROL PANEL
(Position : Steering Gear Room)

AMS MAIN MONITOR
ALARM BUS
(Position : ECR AND BESIDE TO

2) Screen shot for AMS

AMS Main monitor located in ECR

BWTS any alarm check and see to main monitor

AMS MAKER : SAMSUNG

BWTS alram appear to the main monitor.

3) AMS Method : Dry contact for alram signal

(Position : Steering Gear Room) (Position : beside to the ECR)

Generally, AMS signal will recive from main alram bus to BWTS control panel
And spare digital input card connect to new bwts cable of alarm, and will upgard by AM

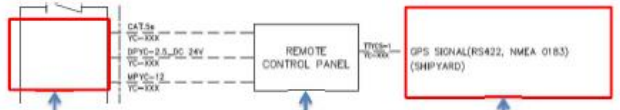
Please contact to the ams maker (Samsung) and discuss to the concept

Interface with GPS

4. GPS

NK System need to GPS signal

1) Wiring diagram



NK –BULE BALLAST SYSTEM
MAIN CONTROL PANEL
(Position : Steering Gear Room)

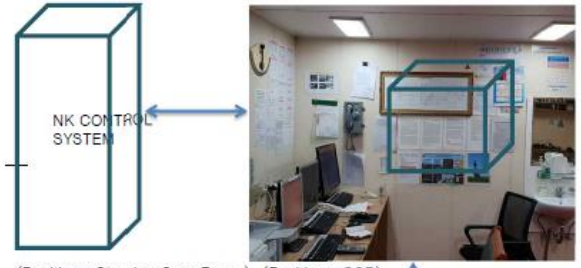
NK REMOTE
CONTROL PANEL
(Position : CCR)

DGPS OUTBUFFER

(Position : Wheel House)

2) Screen shot for GPS

GPS monitor located in wheel house



(Position : Steering Gear Room)
NK –BULE BALLAST SYSTEM
MAIN CONTROL PANEL

(Position : CCR)
NK REMOTE
CONTROL PANEL

BWTS recive from signal of GPS output buff (Position : CCR)
NK REMOTE
CONTROL PANEL

Interface

1) AMS & 2) GPS

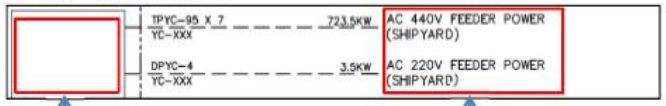
DRAWING

Interface with MSBD for 440V & 220V

1. MAIN SWITCH BOARD (MSBD)

1) Main Switch Board located in ECR
NK system need to the 440V & 220V power from main switch board in ECR

2) Wiring diagram for NK



NK –BULE BALLAST SYSTEM
MAIN CONTROL PANEL
(Position : Steering Gear Room)

440V FEED PANEL
220V FEED PANEL
(Position : Engine Control Room)

NK BWTS system will recive to the 440V for 1180A (723.5kw)
NK BWTS system will recive to the 220V for 16A (3.5kw)

3) Screen shot for MSBD in ECR
No 440V spare Circuit Braker for 1200A in ECR

NO1,2,3 AC440V FEEDER PANEL are not installed for spare C.B for 1200A
Need to install new 440V Feed Panel at ECR
Scrubber – 630A x 3sets
bwts – 1180A x 1set
Need new 440V power C.B additionally.
Existing feed panel does not have extra C.B.
C.B size of newly installed 630A, 1180A is big, so cannot be installed at existing pan

The location of 440V Feed panel which will be newly installed.

220V spare Circuit Braker of 16A used to exsting spare C.B in ECR

4) Circuit Breaker Maker : Schneider

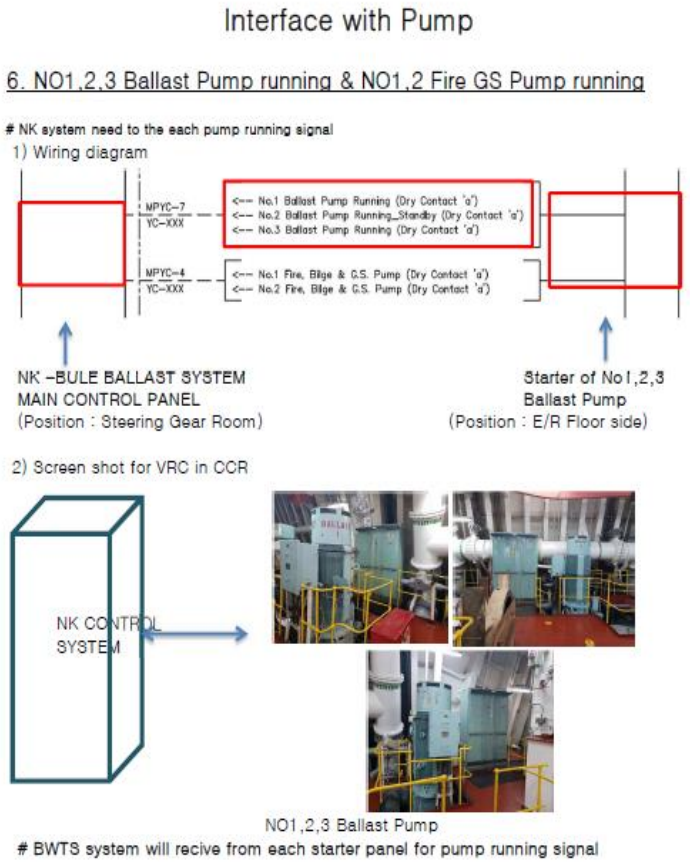
For new installation of 440V Feed Panel will contact to MSBD Maker with Schneider

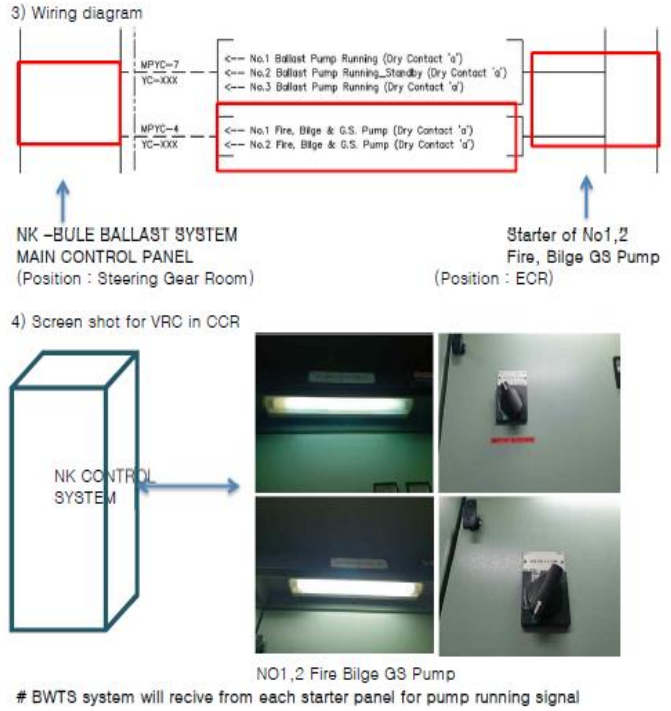
4) Cable work process
Ship side block out for 2hour or 3hour during connection of power cable with BWTS
From S/G room to ECR by yard

Interface

3) MSBD

DRAWING





Interface

4) Ballast Pump

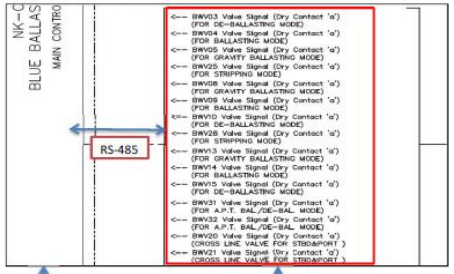
DRAWING

Interface with VRC

2. V.R.C (Valve Remote Control)

NK system need to the Valve signal for operation of BWTS System

1) VRC Method : Communication type (No dry contact)



NK –BULE BALLAST SYSTEM MAIN CONTROL PANEL (Position : Steering Gear Room)

VRC MAIN MONITOR IAS System (Position : Cargo Control Room)

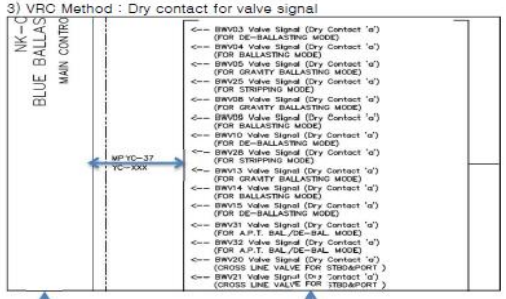
NK BWTS system will recive to the valve signal (open/close)

2) Screen shot for VRC in CCR

VRC maker (Samsung) will be upgard for the vrc system

No mimic board method, VRC System is communcaiton mothed for valve signal in CCR

3) VRC Method : Dry contact for valve signal



NK –BULE BALLAST SYSTEM MAIN CONTROL PANEL (Position : Steering Gear Room)

AMS MAIN MONITOR (Position : Engin Control Room)

NK BWTS Valve Siganl

4) Screen shot for AMS in ECR

Generally, VRC signal recived from AMS System, So BWTS VRC signal will recive from the AMS panel Also, signal will recive from alarm bus for connection of cable.

Interface with S/G Room ventilation Fan

5. FAN

NK System need to the S/R room ventilation fan running signal

1) Wiring diagram

NK –BULE BALLAST SYSTEM MAIN CONTROL PANEL (Position : Steering Gear Room)

S/G RM. EXH. FAN STARTER (Position : Steering Gear Room)

2) Screen shot for FAN

S/G RM. EXH FAN Starter panel located in S/G Room

BWTS Main system install in S/G Room, so need to the exh fan signal

(Position : Steering Gear Room) NK –BULE BALLAST SYSTEM MAIN CONTROL PANEL

(Position : Steering Gear Room)

BWTS system will recive from s/g rm exh fan running signal

Interface

5) VRC & 6) Fan

SUPERVISOR

DAILY WORK REPORT

1. SHIP'S NAME : SERI ANGGUN
2. INSTALLED EQUIPMENT : ECS 1000B X 6 sets
3. DATE : 6th June, 2019
4. PROJECT MANAGER : Chris Ha, Jason Yi, Bonnie Kim

CATEGORY	CONTENTS	REMARK
WORK PROGRESS	1. Full welding the adjustable pipes for poly pipe fabrication (2 welder keep welding at night) 2. Electric engineers finished to install the additional circuit breakers on MSBD NO1 and finished connect power cable 3. Install to cable FB in E/R 4. Preparation of power cable for circuit breakers on MSBD NO2 (additional staging would be installed on 7th of June: lack of man power in shipyard) 5. Continue to install BA pipes. (Inclued for adjust pc's) 6. Small pipes and some of equipment were brought on E/R. 7. Check the strainer maintenance under the BA pipe. (possible to open that) 8. Installation of CPC.	*working day to install additional circuit breaker (ship provide to carry out black out as below) 1) MSBD NO2(PORT) :3set ->2day (4th~5th, June)-> finished until lunch 2) MSBD NO1(STBD) :1set-> 1days (6th, June)
ALL WORK PROGRESS STATUS	◆ TOTAL : 50 % 1. EQUIPMENT INSTALLATION : 30% 2. MAIN PIPE : 80 % 3. SMALL PIPE : 5 % 4. CABLE PULLING : 55% 5. CABLE CONNECTION : 10 % 6. OUTFITTING INSTALLATION : 30 % 7. SUPPORT INSTALLATION : 50 %	
PENDING ITEMS	1.When the existed pipe take out from butter fly valve (BA025 5k 600A), the rubber that is in valve is damaged. ->Need to repair the rubber from shipyard. 2. One of fire line (50A) need to modify because of touching BA4-16 pipe. (when adjustable 4pc's galvanize fabrication, carry out together) 3. Need to submit the compound powder CERT.(Refer to attached files) 4. Some equipment can be brought into E/R by rain	
NEXT DAY WORKING PLAN	1. Pulling power cable in E/R. 2. Weld adjustable pipes as full welding (nightshift-until 7th of June) 3. Put Equipment and install in E/R 4. Connect power cable on circuit breakers (MSBD NO2) 5. Install the small pipes	
ETC.	ESTIMATED SCHEDULE : 27th May ~ 24th June(include commissioning) DOCK IN : 2nd June (16:00) DOCK OUT : 12th June	

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E-mail : matt.kim@enfac.kr, sales@enfac.kr

WORK COMPLETION REPORT

1. Report title	WORK COMPLETION OF BWTS INSTALLATION
2. Client	Anglo Eastern Group
3. Vessel name	GEORGE N
4. Location	Lisnave shipyard, Portugal
5. Period	2019.2.4 ~ 2019.2.18

A. BALLAST WATER TREATMENT SYSTEM INSTALLATION

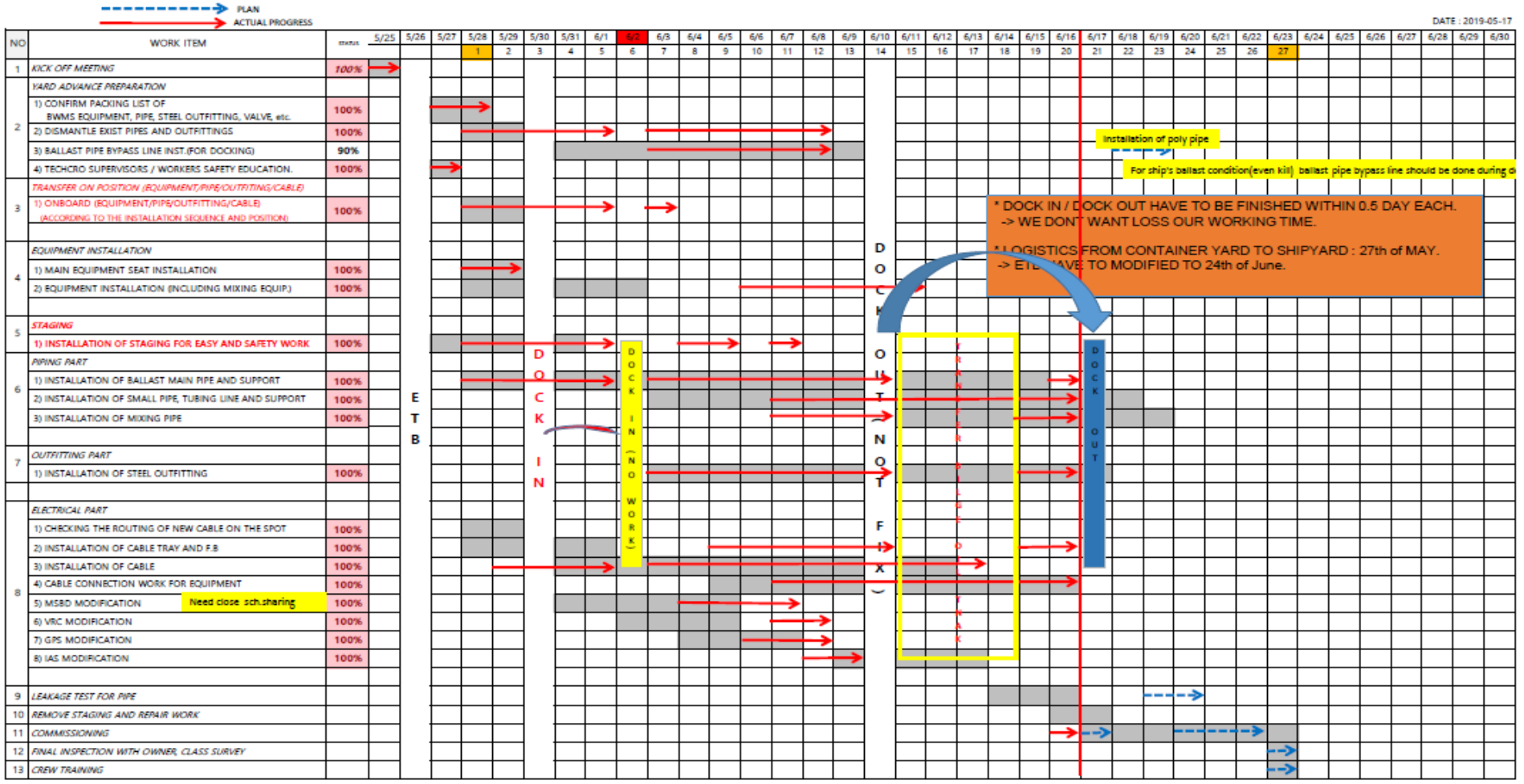
- Please refer to daily work report for details
- All planed work has been completed (Piping system, Electric system, Outfitting system installation)
- If incomplete work is found, additional work will be performed under mutual agreenent.

B. ADDITIONAL INFORMATION

Prepared by		Client	
Name	James Moon	Name	Manish Panchal
Designation		Designation	SR. VESSEL MANAGER
Date	19th Feb. 2019	Date	23/02/19.

Daily Work Report (Signed)

SUPERVISOR



Master Schedule

MAJOR ACHIEVEMENT

ELECTROLYSIS TYPE

1) SERI ANGGUN

2) LNG JUPITER

3) N Series

- GEORGE N / ERNEST N / TOKYO (JENNY N)

  KAROLINE N / FRITZI N

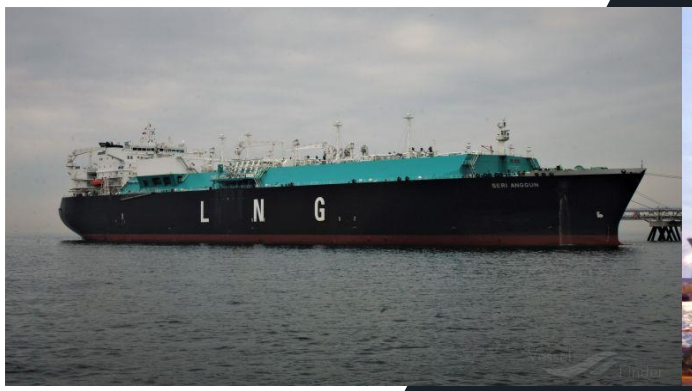
4) SERENE SEA

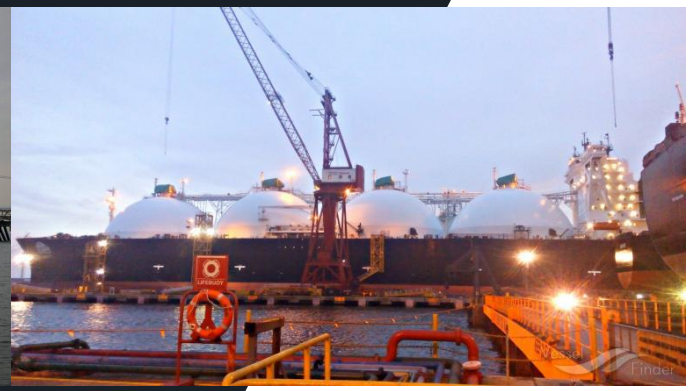
5) MANATEE / CALA PAGURO / CALA PINGUINO /

LUCKY MERRY / HAPPY BEE

6) HYNDAI SPLENDOR / HYUDAI GLOBAL

7) etc.





MAJOR ACHIEVEMENT

UV TYPE

1) TY Series

   - TY JOY / TY EVER / TY HAPPY

2) DAEWON

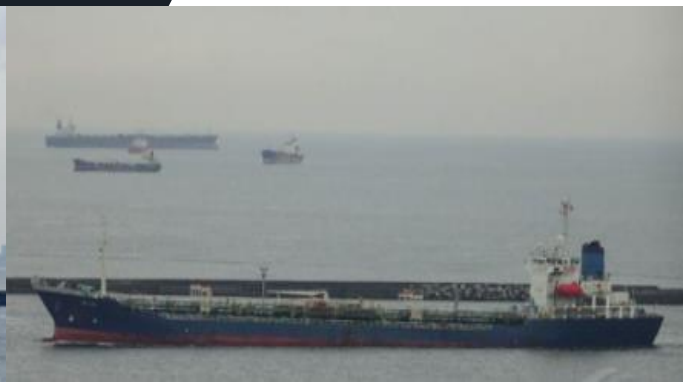
3) MARIGOLD

4) BAL STAR

5) DONG-A GLAUCOS

6) AS OLIVIA

7) etc.



MAJOR ACHIEVEMENT

OZONE & CHEMICAL TYPE

1) PACIFIC SERIES

- PACIFIC MERCHANTS / PACIFIC WINNER /

  PACIFIC MARINER

2) RAYSUT

3) NORD INSPIRATION

4) etc.

A/S & COMMISSIONING

COMMISSIONING & A/S MANAGEMENT

Swift Correspondence & Action
Well-organized teamwork

PROFESSIONALITY

Professional engineers
with plenty of experiences
Expertise in BWTS

WORLDWIDE ENGINEERING SERVICE

Proficient in English
Travel most of countries
without visa

GLOBAL NETWORK

Effective follow-up service
Prompt action in local
Global New Leader for Clean Environment

EnFac Korea

THANK YOU

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