



台灣國際造船股份有限公司
CSBC CORPORATION, TAIWAN

機艙管路系統介紹

Introduction on Piping System in E/R

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設計處 輪機設計課 工程師

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講者簡歷

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90年航海人員考試一等管輪及格



Something Amazing





Stock on Marine Transport

長榮海運

98.80 TWD

TPE: 2603

+82.55 (501.82%) ↑ 過去 1 年

10月6日 上午11:32 [GMT+8] · 免責聲明

1 天 | 5 天 | 1 個月 | 6 個月 | 本年迄今 | 1 年 | 5 年 | 最久



開盤	104.50	市值	5232.65億	52 週高點	233.00
最高	104.50	本益比	5.14	52 週低點	16.05
最低	97.50	殖利率	2.51%		





Maritime transport

- Maritime transport is essential to the world's economy as over 90% of the world's trade is carried by sea. (IMO, (International Maritime Organization))



Emission by Marine Industry

CO₂ 2.2%

NO_x 15%

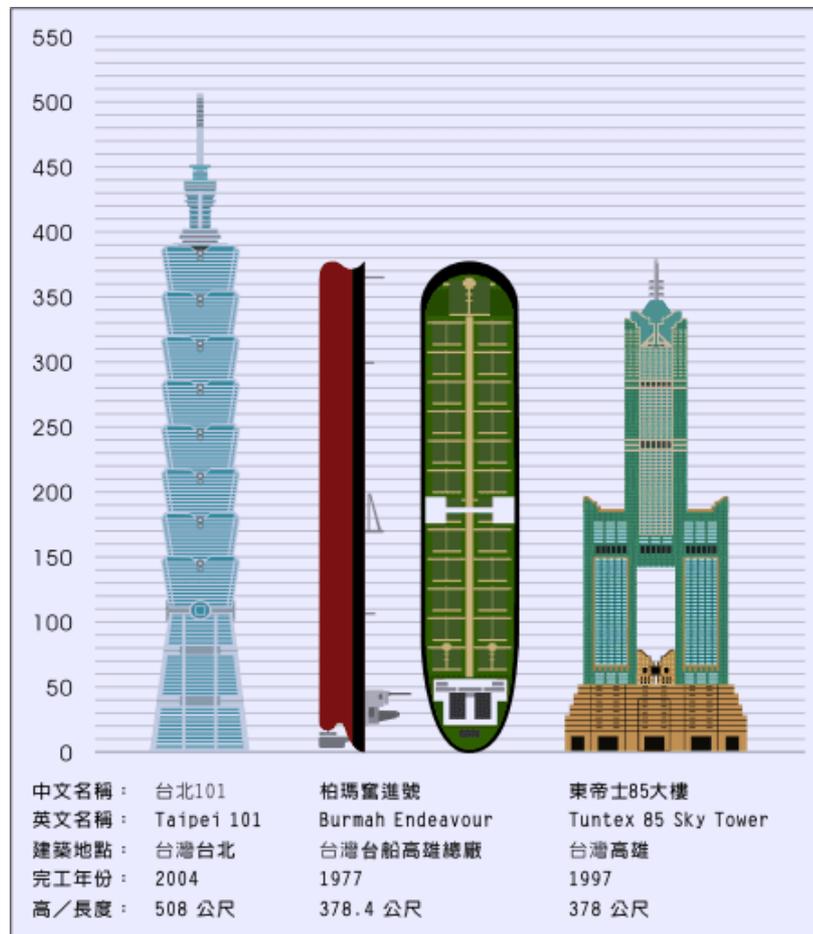
SO_x 13%





Seaspan 14000 TEU Container Vessel

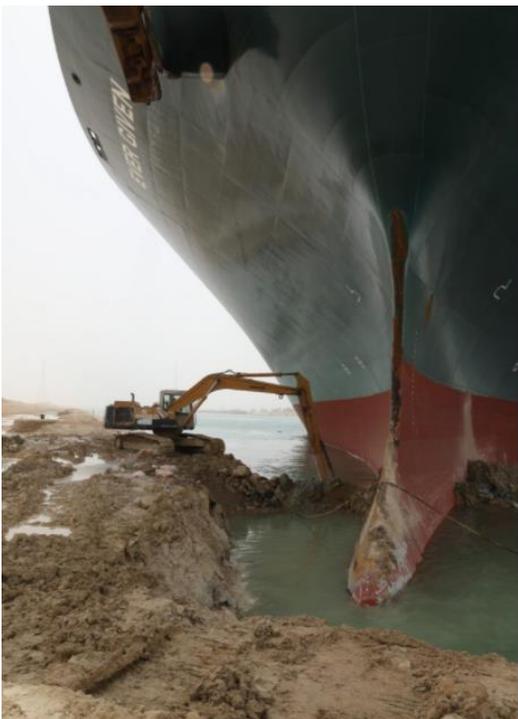
Overall length 368M
Load 145,000 DWT
Speed 23 knots





EVER GIVEN STUCKED at SUEZ CANAL on Mar. 23, 2021

Overall length 400M
20,000 TEU

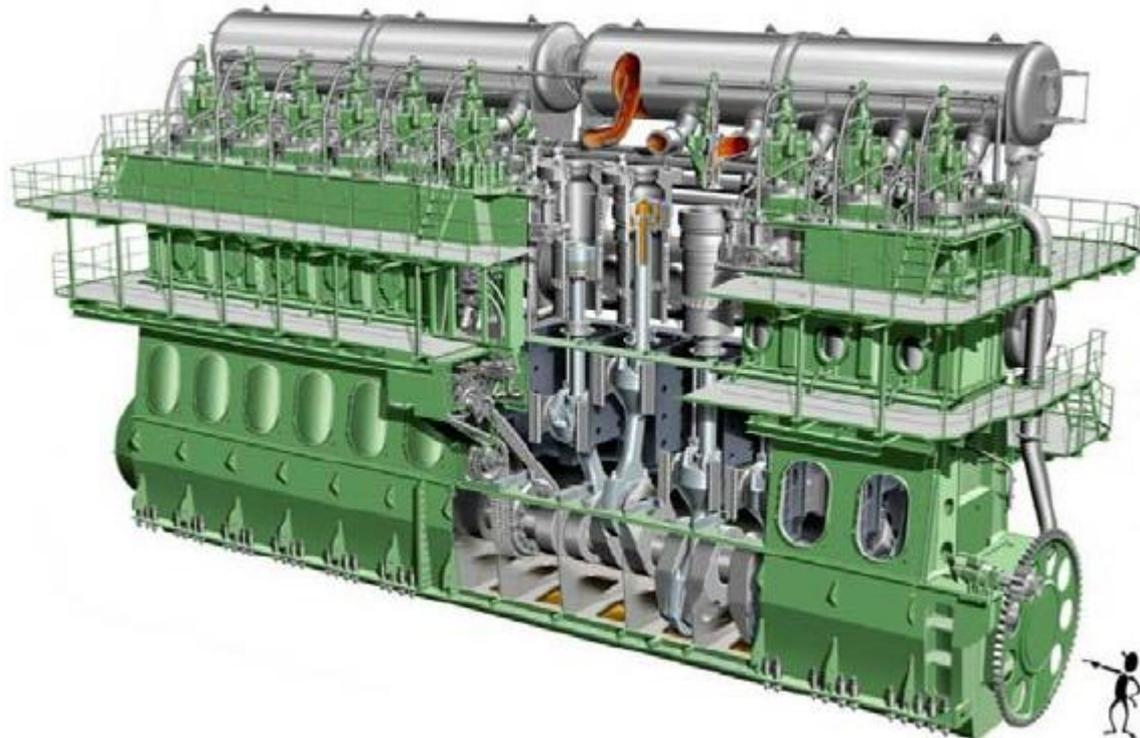




Engine Comparison

MAN B&W 11S90ME-C10.2

MCR 50,760kW @ 78 RPM (Nominal 67100 kW)



GOGORO 2

6.2kW @ 3000 RPM





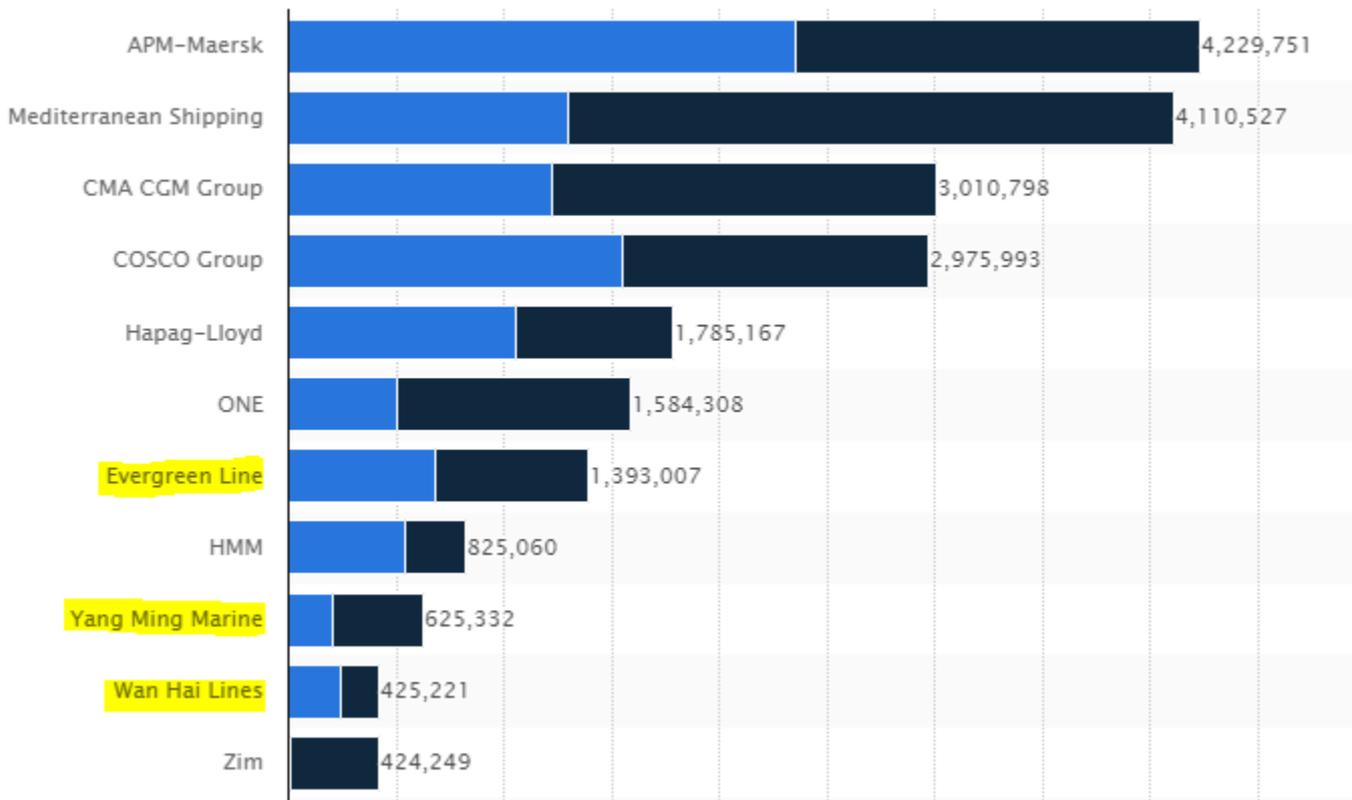
Commercial Ship at Present

- 20-30 Crews
- Above 100-200k NTD pay per month
- Convenience flag
ex. Panama, Marshall , Liberia, Cyprus,
Malta & Mongolia
- 24-7 stand-by
- Long stay at sea





Taiwan Owner Contribution



Until Sept. 01, 2021

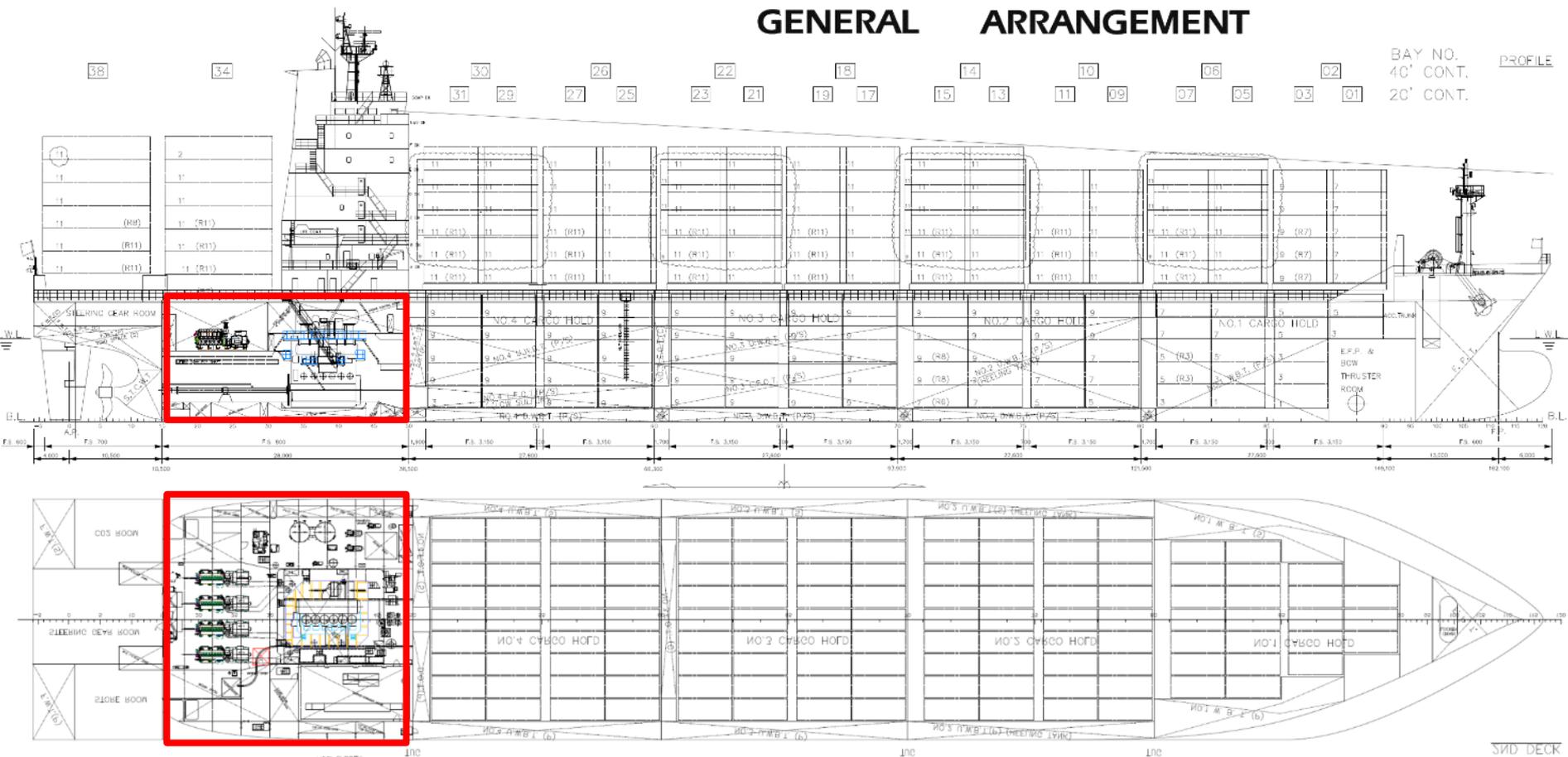




Marine engineering in yard

GENERAL ARRANGEMENT

BAY NO.
40' CONT.
20' CONT. PROFILE





PART I INTRODUCTION

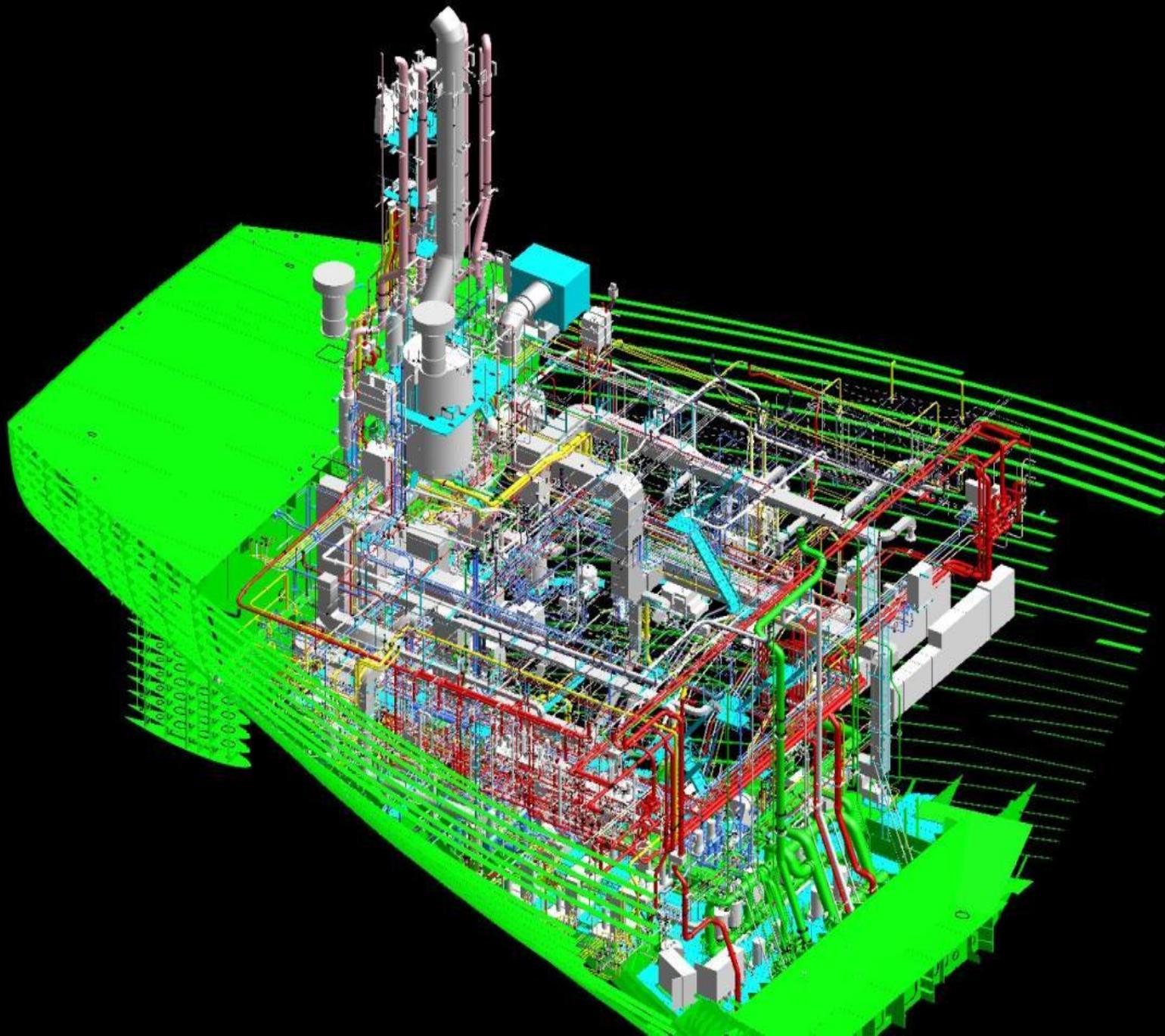




系統、管路系統

- 系統(system)：由一群有關聯的個體組成，依據某種規則運作，能完成個別元件不能單獨完成的工作的群體。
- 管路系統(Piping & Instrument Diagram, P&ID)：由管(pipe)、管件(pipe fitting)及閥(valve)等組成。管路系統指利用壓差將不同的液體輸送到各裝備，完成一定任務的管路、設備以及儀表的總稱。除船舶機艙外，亦常見於動力廠或化工廠。





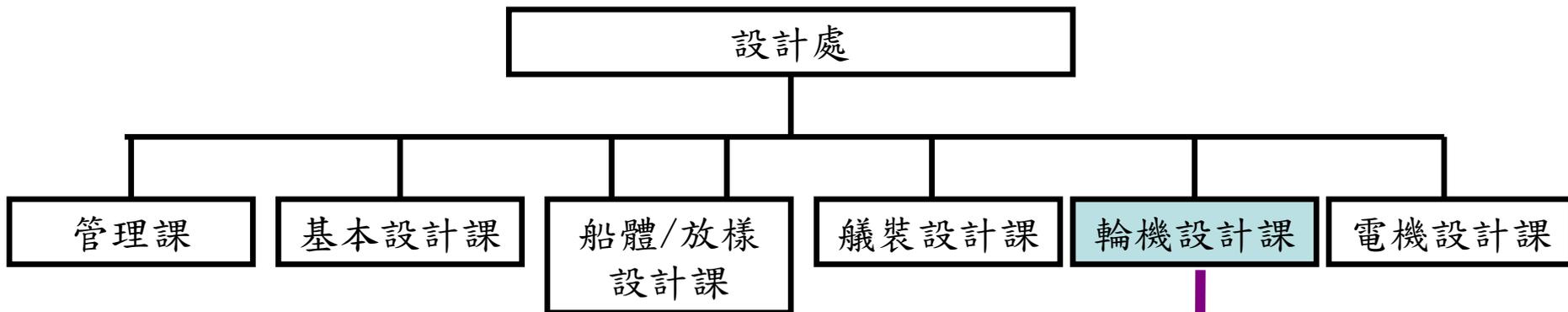


HOW

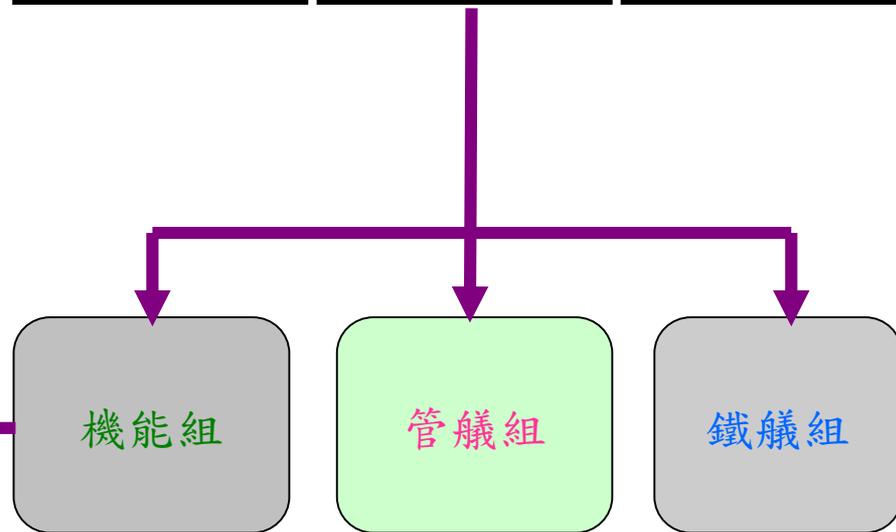




Key plan、Working design

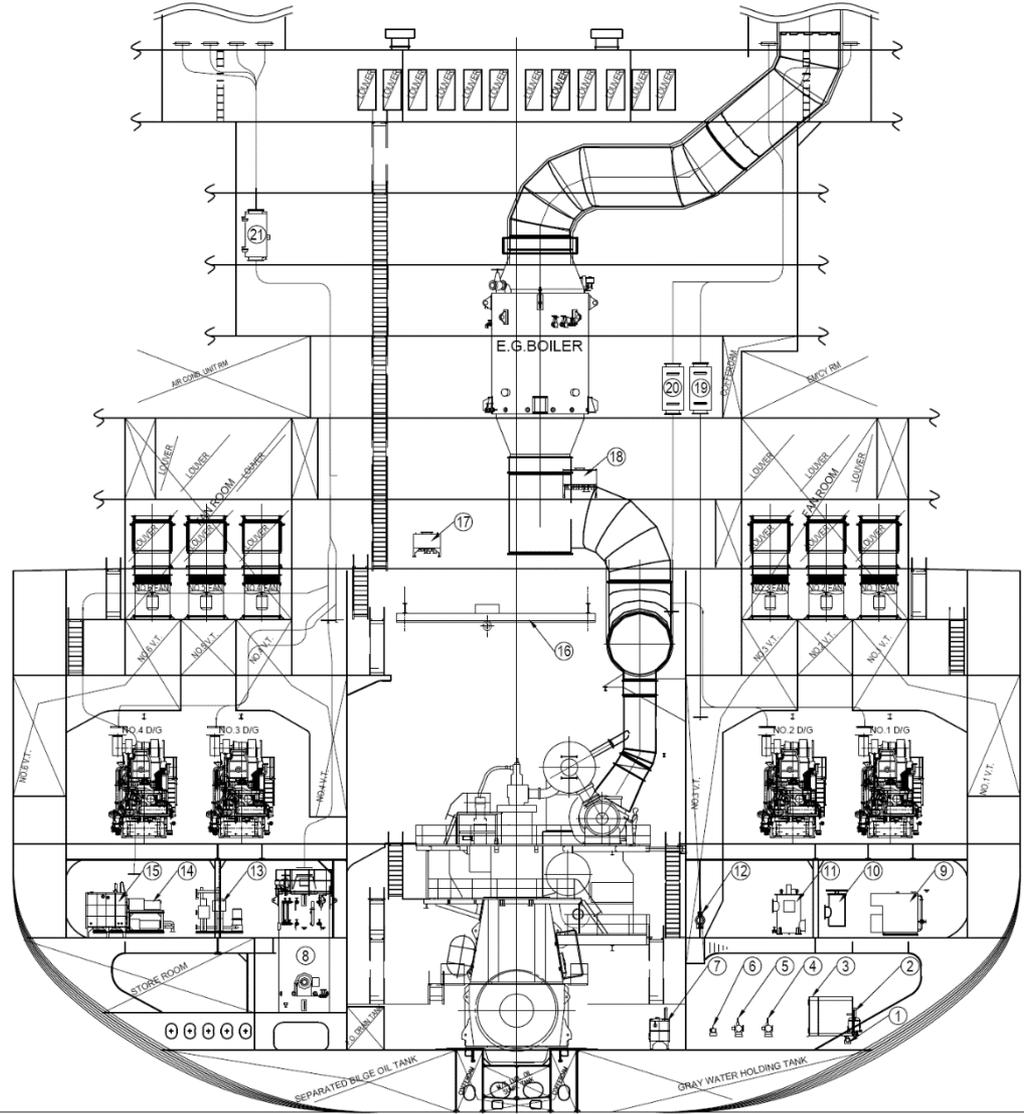


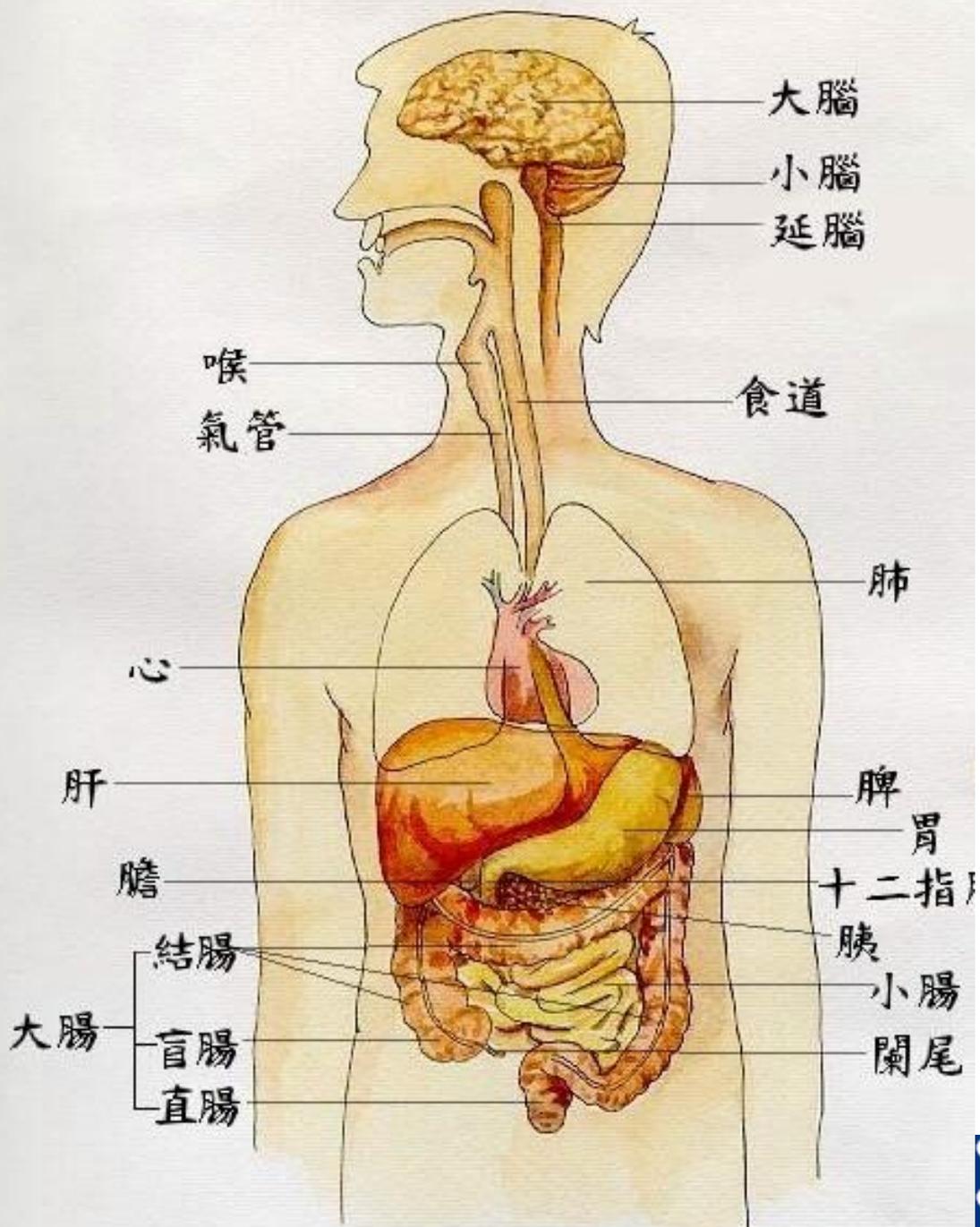
- 1. 輪機基本計算
- 2. 建造規範編製(輪機部份)
- 3. K圖設計
 - (1) 機艙佈置
 - (2) 系統圖
 - (3) 軸系
 - (4) 自動控制
 - (5) 通風
- 4. N圖設計
裝備採購
- 5. 試俾





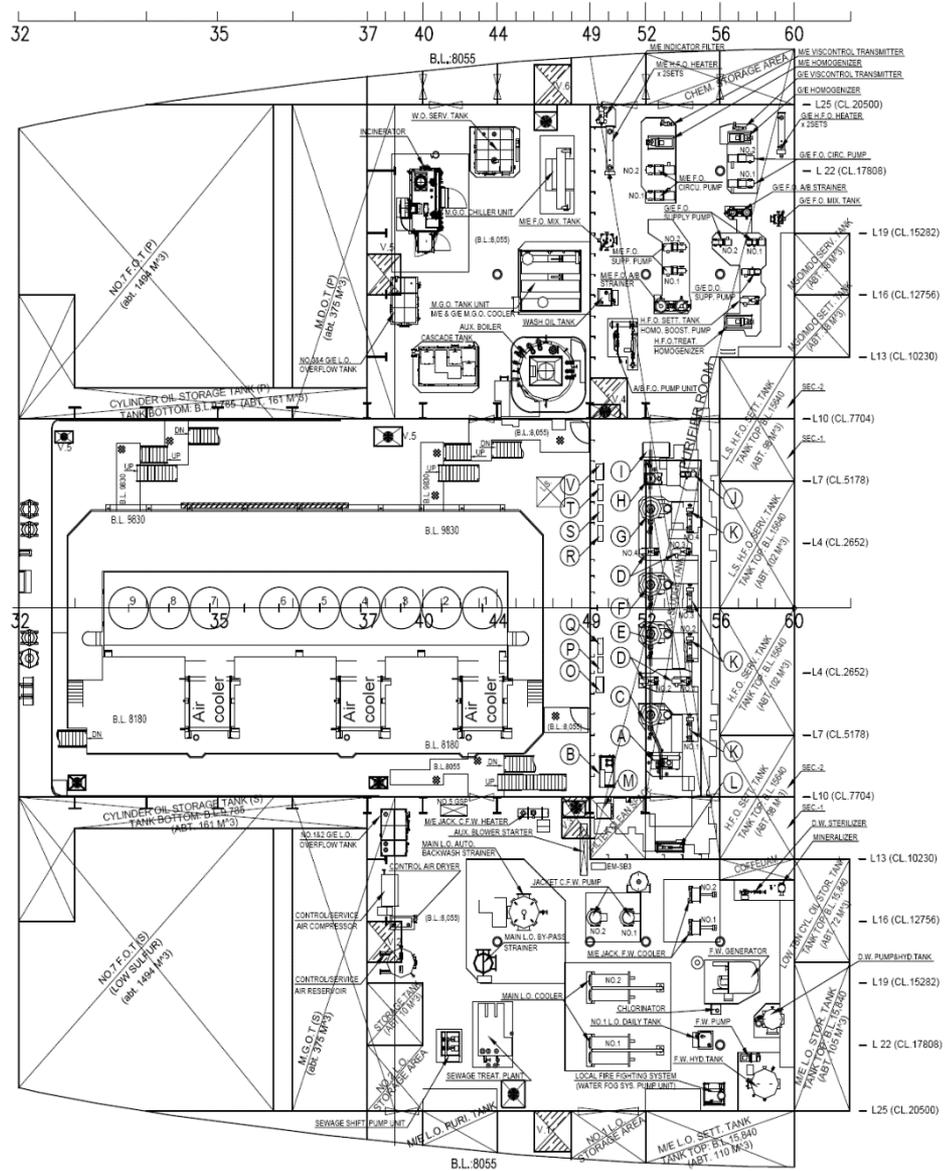
1. 機艙佈置







- (A) SLUDGE OIL SEPARATOR
- (B) SLUDGE OIL SEPARATOR HEATER
- (C) NO.1 H.F.O. PURIFIER
- (D) H.F.O. PURIFIER SUPPLY PUMP
- (E) NO.2 H.F.O. PURIFIER
- (F) NO.3 H.F.O. PURIFIER
- (G) NO.4 H.F.O. PURIFIER
- (H) M.D.O. PURIFIER
- (I) WORKING TABLE
- (J) M.D.O.PURI.FEED PUMP
- (K) H.F.O. PURIFIER HEATER
- (L) SLUDGE PUMPING MODULE
- (M) CLEANING TANK(RESERVE SPACE)
- (O) P-42D
- (P) NO.1 H.F.O. PURIFIER CONTROL PANEL
- (Q) NO.2 H.F.O. PURIFIER CONTROL PANEL
- (R) NO.3 H.F.O. PURIFIER CONTROL PANEL
- (S) NO.4 H.F.O. PURIFIER CONTROL PANEL
- (T) M.D.O. PURIFIER CONTROL PANEL
- (V) P-43D



SCALE: 1:200

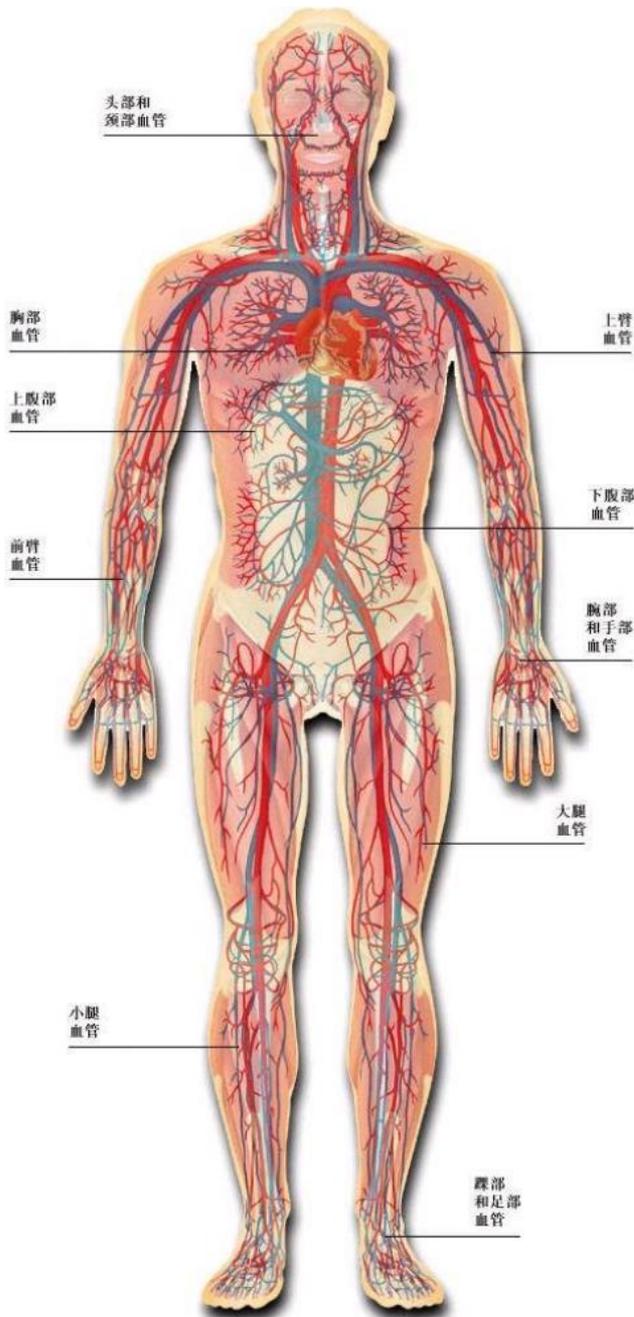
H.NO. 1007 ~ 1016

DWC NO.: K4000400

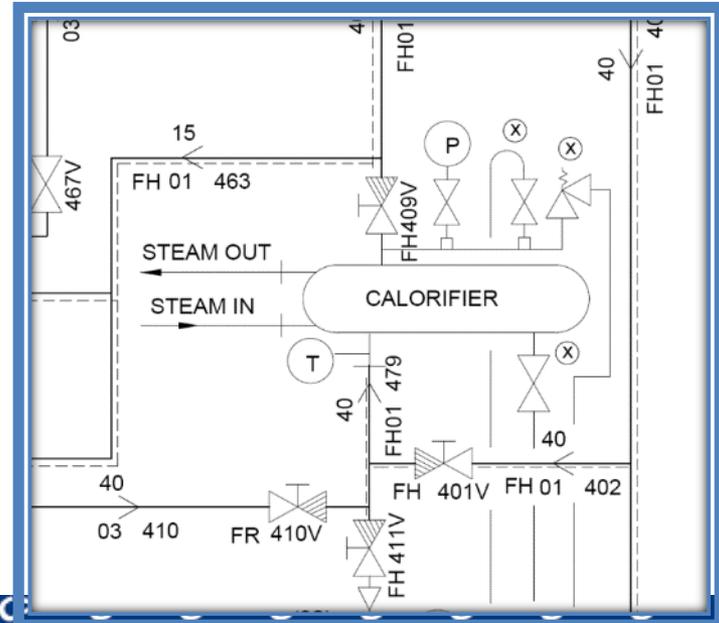
5 /

4TH DECK
ABOVE B.L. 8055 mm

2. (管路)系統設計

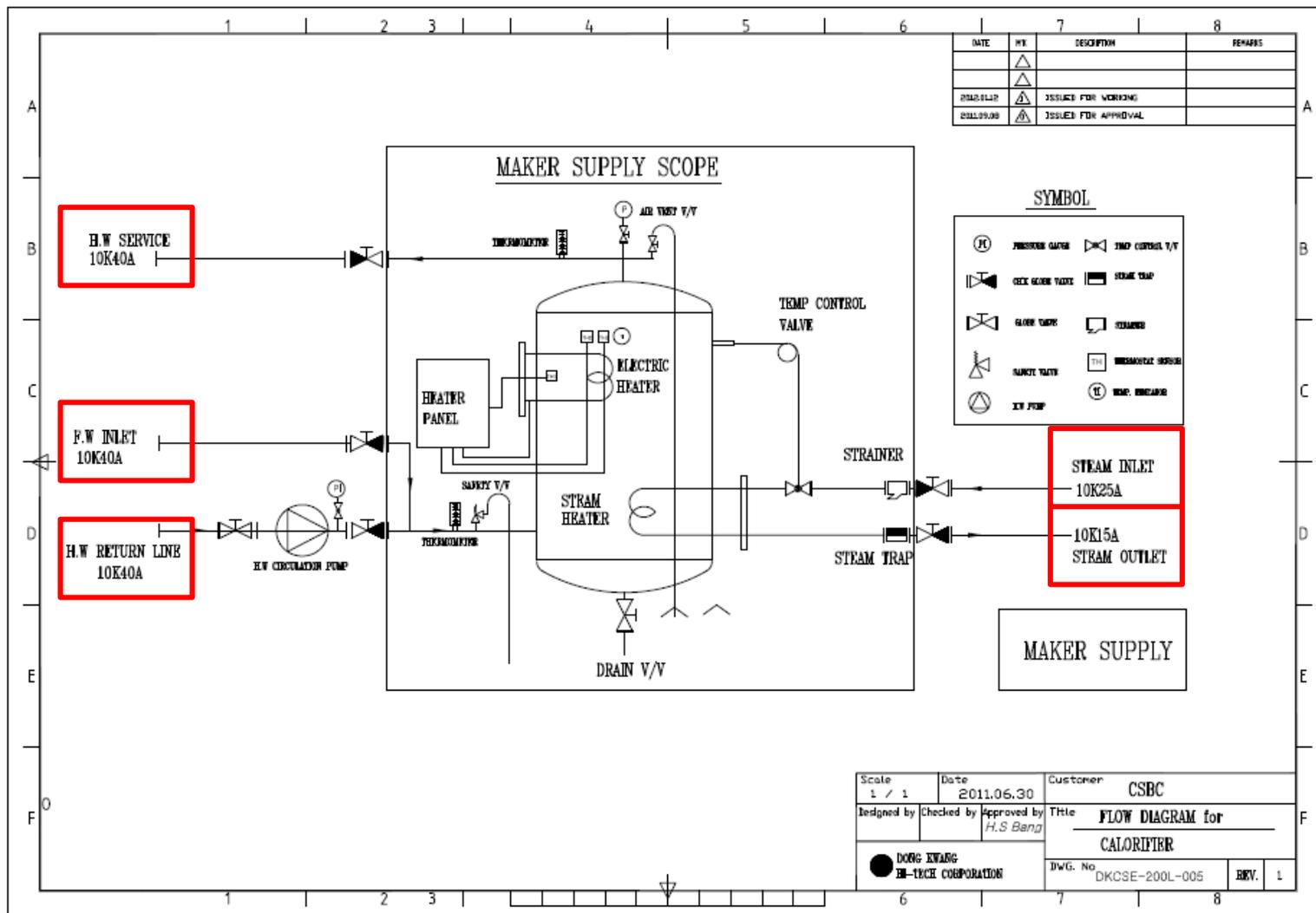


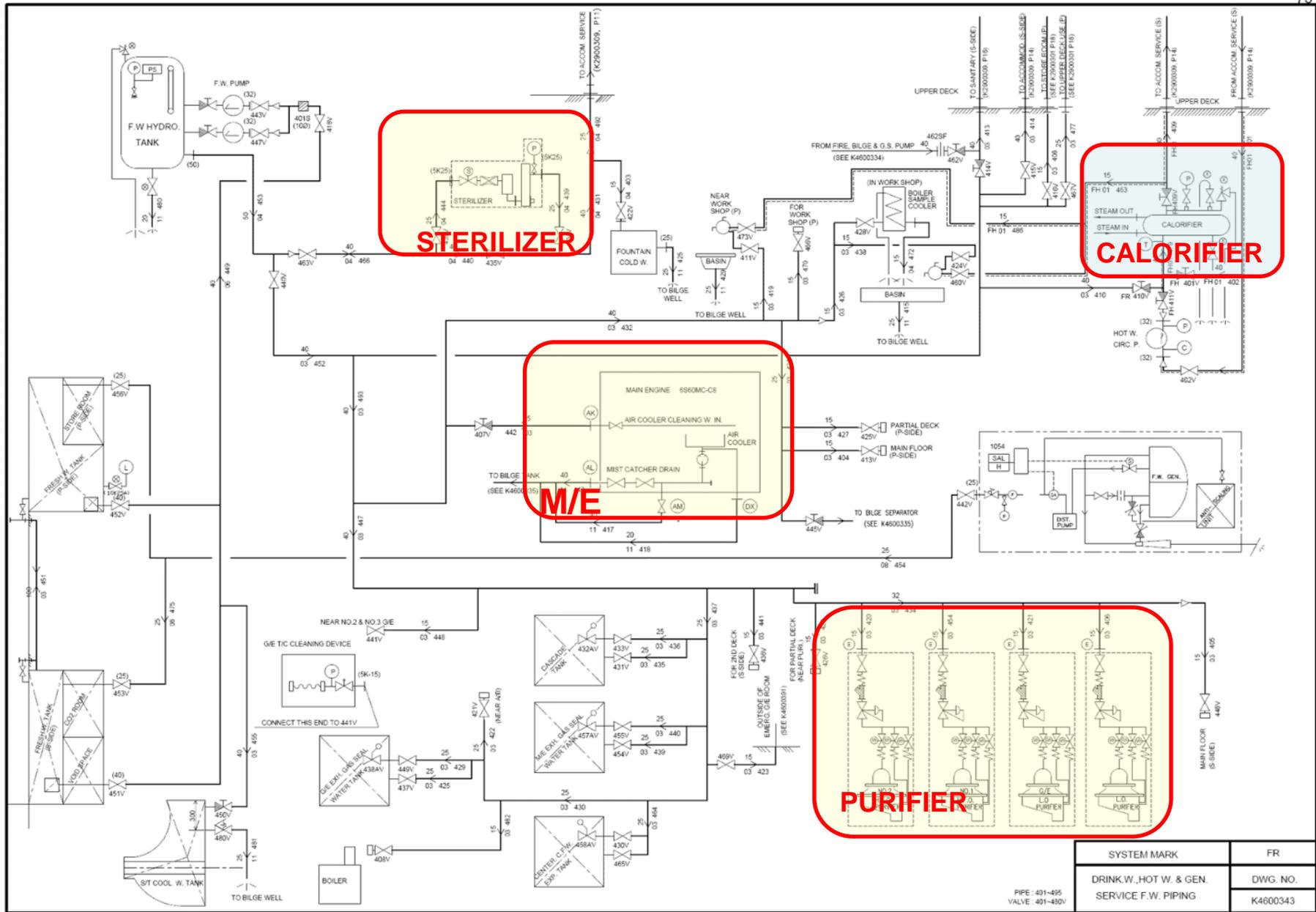
- 血管、神經、淋巴...
- 燃油、滑油、海水、淡水、空氣、蒸汽、泌水、穢水





Ex. 熱水器管路





SYSTEM MARK	FR
DRINK W. HOT W. & GEN. SERVICE F.W. PIPING	DWG. NO. K4600343

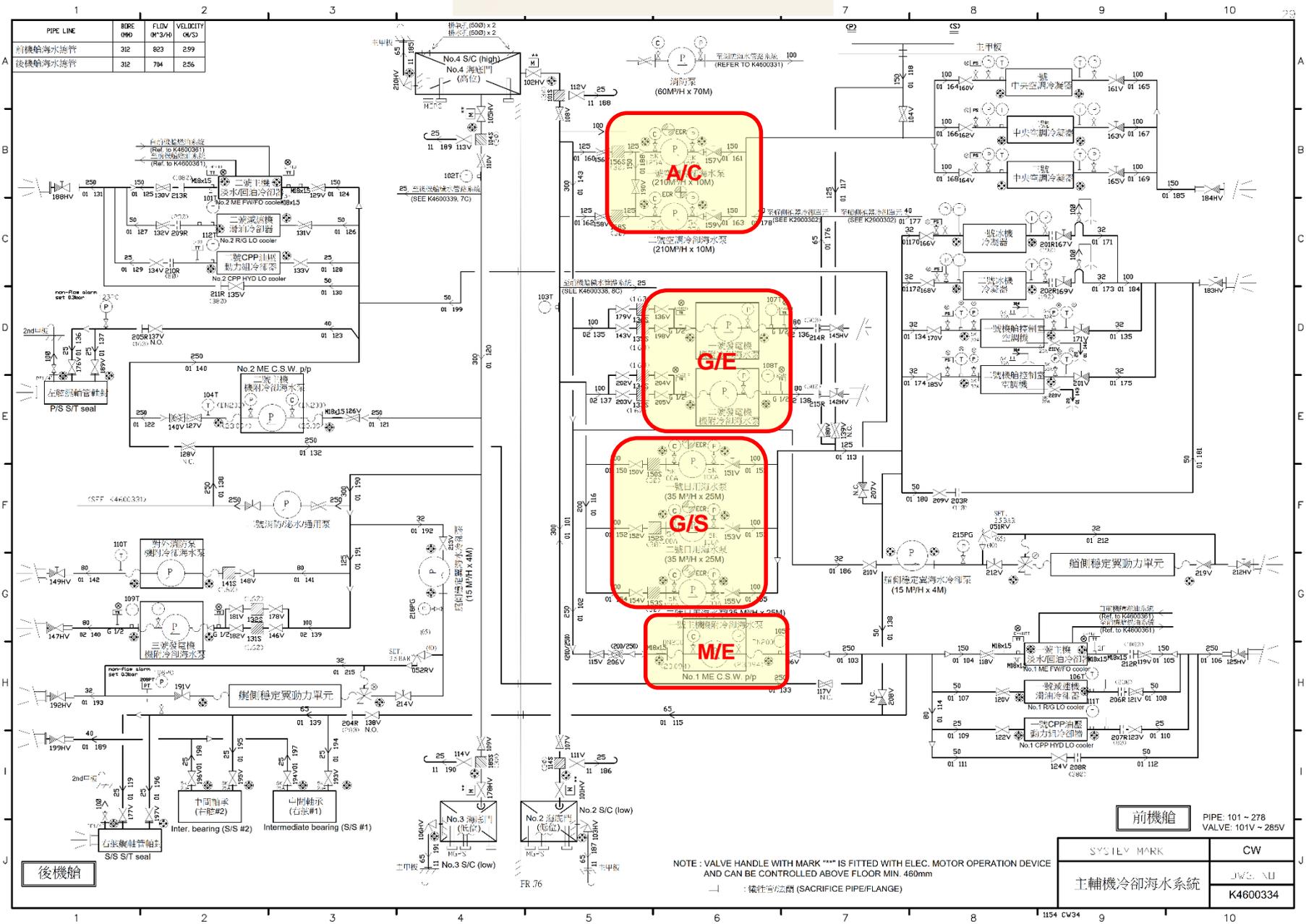
PIPE: 401-496
VALVE: 401-490V



4000噸級海巡署嘉義艦



剩下就是你們的事了。





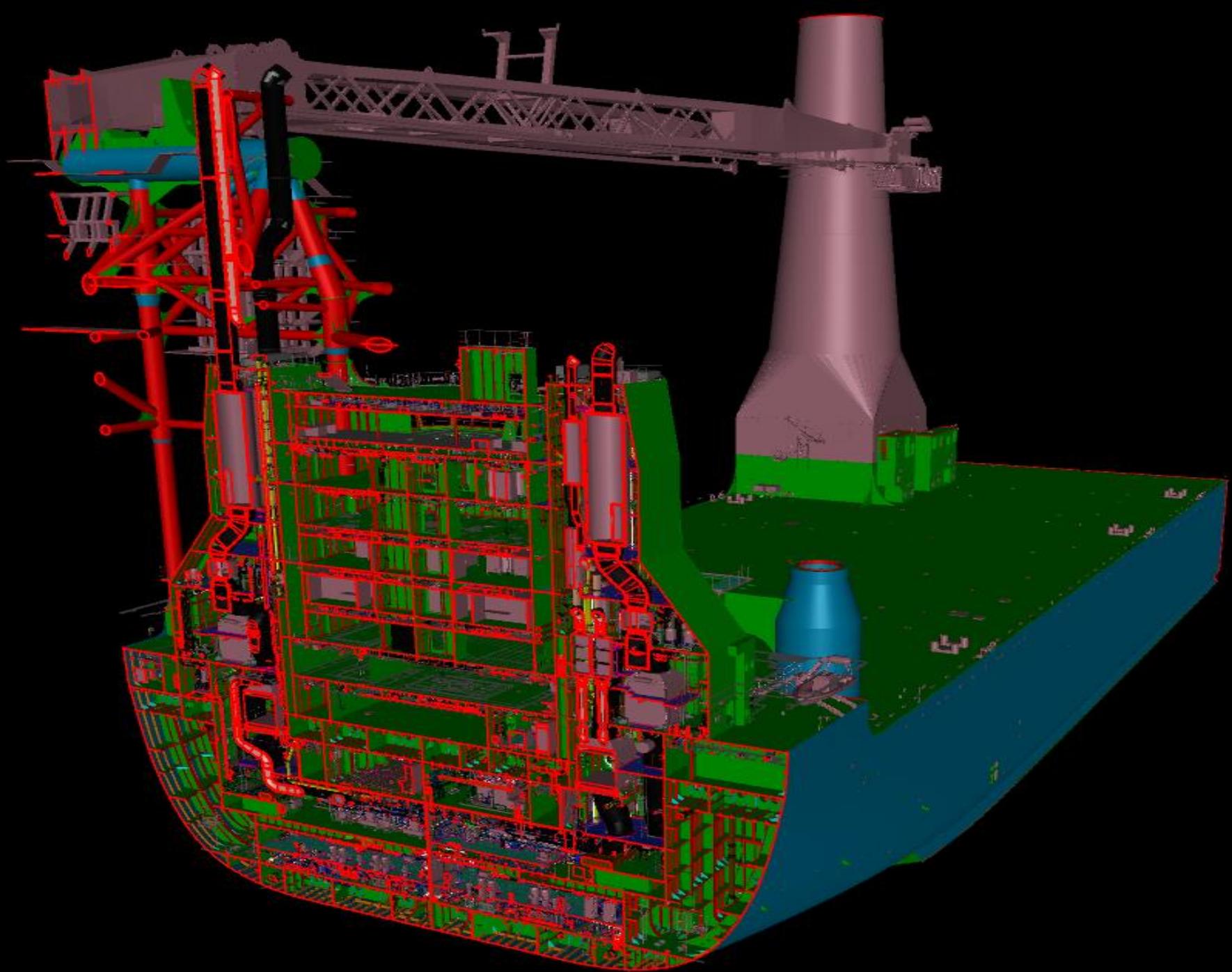
Something Amazing from P/D

- ◆ Maintenance UNTIL ship delivery, but modification is not a big deal
- ◆ Trouble on cooling water system
 - ◆ Flow rate balance (pump capacity & pipe resistance)
 - ◆ Heat balance (cooler capacity)
- ◆ Piping in E/R is usually independent from vessel variation
- ◆ Anxiety on engine
 - ◆ Lube oil more important than fuel
 - ◆ Don't worry long term running 24/7



Green Jade (4000T crane)







影響管路系統因素

- ◆ 國際公約(IMO)、船級協會法規要求 (安全、環保)
- ◆ 船東、船廠慣用方式 (建造規範)
- ◆ 裝備廠家建議值 (廠家圖)
- ◆ JIS (Japan industrial standard) 等各國國際標準。





鐵艙組-工作項目

- 油水櫃(Tank)設計
- 機器裝備底座(Seat)
- 機艙通風(Vent)
- 交通(Floor)
- 雜艙(Miscellaneous)





鐵艙施工設計-交通裝置

規劃機艙人員通行、逃生路線及各裝備的維修保養之空間。





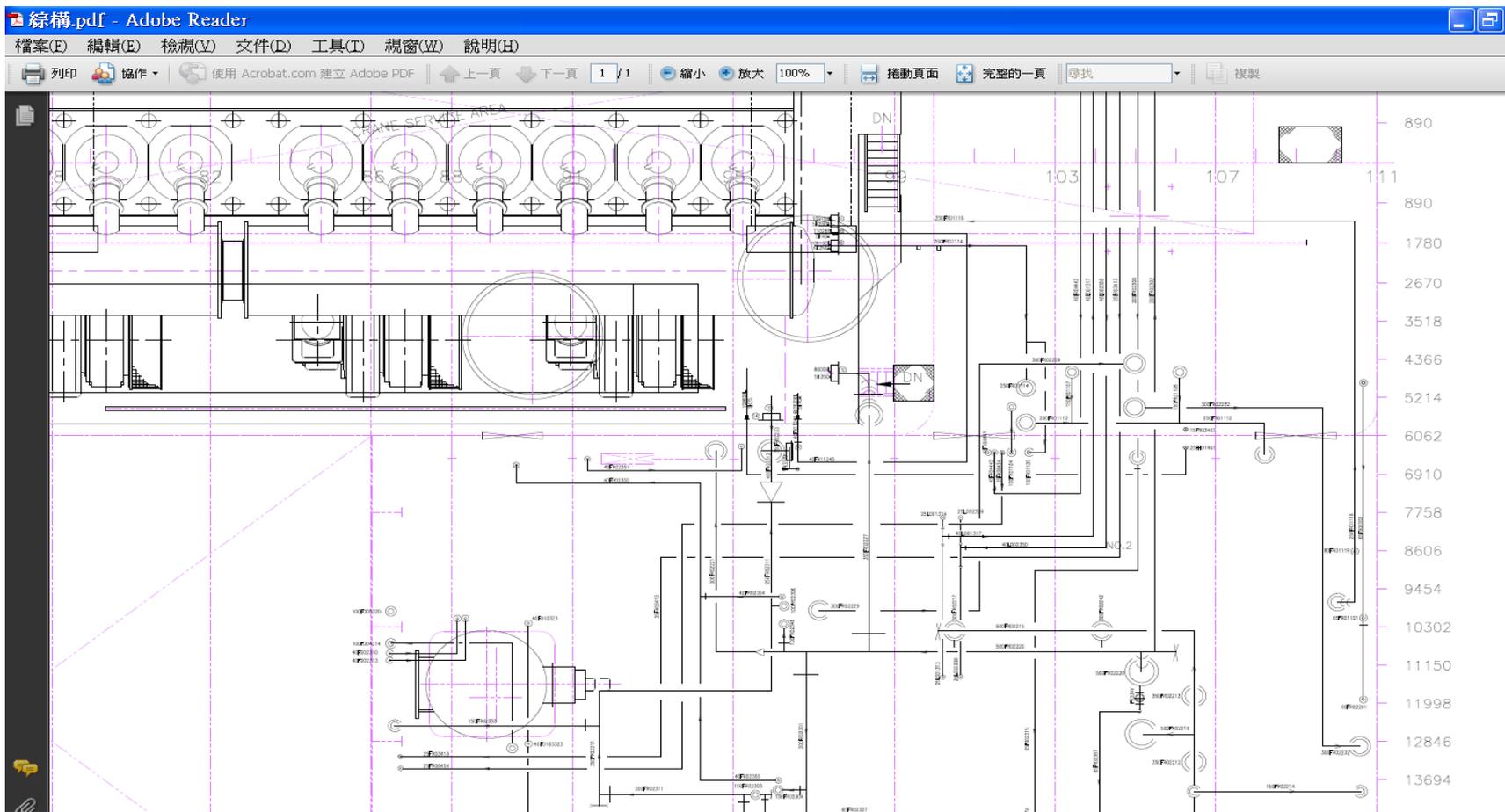
管艙組-工作項目

- 管路綜合構想佈置設計
- 細部管路佈置設計
- 艙品設計製作圖



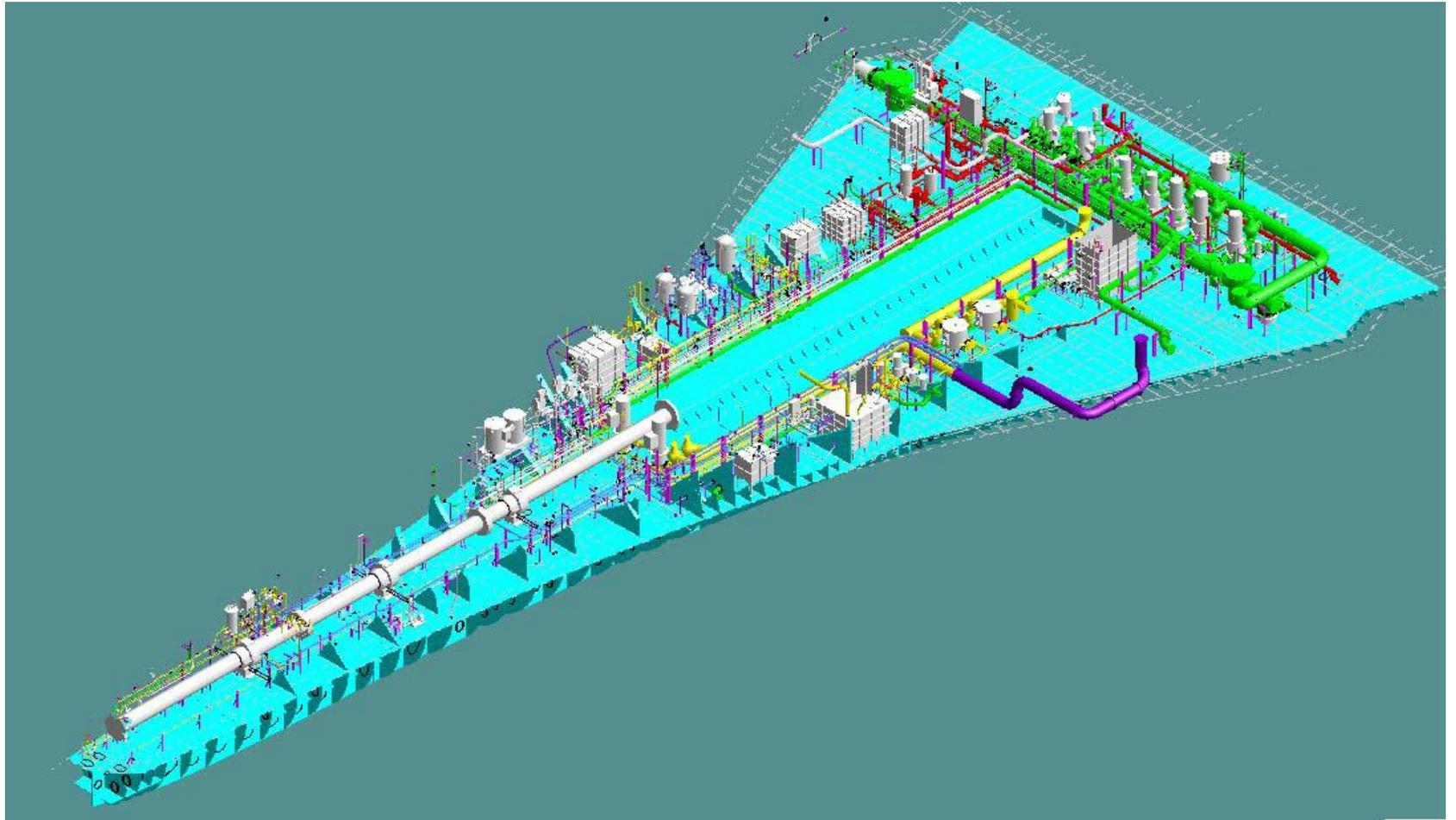


管艙組-綜合構想圖



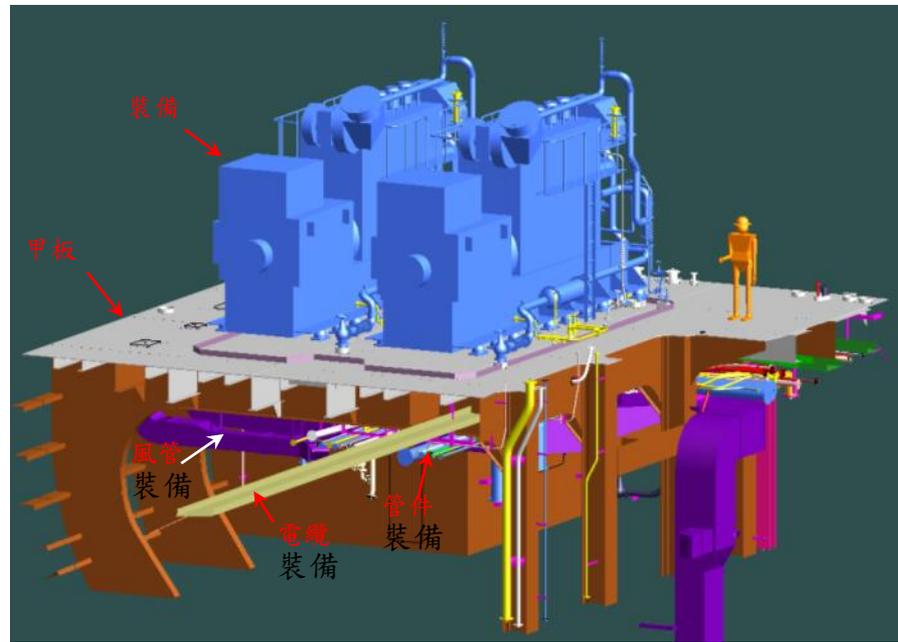


管艙組-細部管路設計

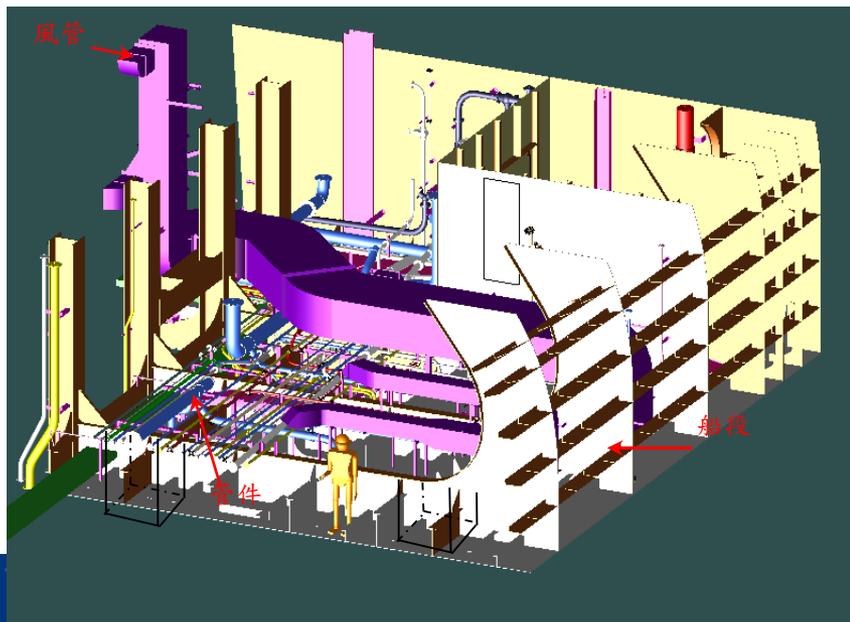




管艙組-管路佈置設計



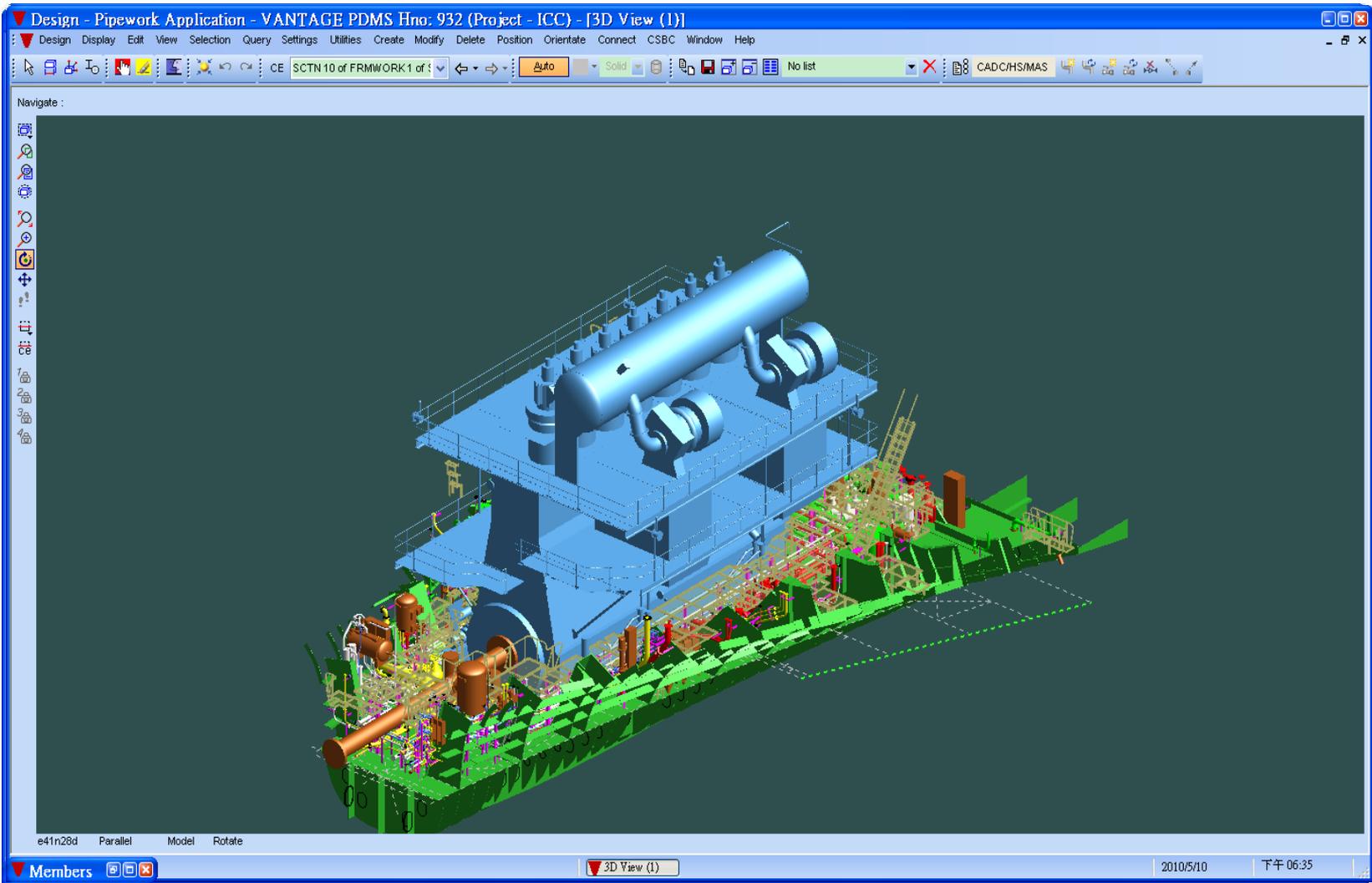
Unit 佈置設計



Under Deck 佈置設



船體範圍 → 船體載入 → 裝備建置 → 管路佈置
→ 管支架設計 → Floor佈置設計
→ Floor佈置設計側視 → 主機安裝





PART I I CASE STUDY

H1154 COAST GUARD ADMINISTRATION
4000T FRIGATE





Q & A

Thanks For Your Attention