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#### **01**-1 Company Overview



Company Status Established: 1979.03.30.

Location Busan\_ 6, Noksansandan, 77-Ro, Gangseo-Gu, Busan 46752

Ulsan\_ 250, Gacheongeumsa-Gil, Samnam-Myeon, Ulju-Gun,

Ulsan

#### Factory Status

|        | Product     |        | Application |       |
|--------|-------------|--------|-------------|-------|
|        | Product     | Vessel | Industry    | KEPCO |
| Busan  | Mold/Dry TR | •      | •           |       |
| DUSAIT | Electric    | •      |             |       |
|        | 154kV       |        | •           | •     |
| Ulsan  | Oil TR      |        | •           | •     |
|        | BCT         |        | •           |       |

#### Product by Division

| Division | Application       | Product   | Major Customer   |
|----------|-------------------|---|--|
| Land     | Industry<br>KEPCO | <ul><li>154kV</li><li>TR(Mold/Dry/Oil)</li><li>Electric etc</li></ul> | <ul><li>KEPCO, SKEnergy, POSCO</li><li>Hyundai Elec, LS Elec, Hyosung</li></ul>                  |
| Marine   | Vessel            | <ul><li>TR(Mold/Dry)</li><li>Electric, etc</li></ul>                  | <ul><li>3 Major Shipyard<br/>(Hyundai, Samsung, Daewoo)</li><li>Japan Imabari Shipyard</li></ul> |





#### History

1979 Foundation Obok Electric

1999 Change the company name to KOC Electric

2012 500-Million-Dollor Export Tower Award from the Korean government

**2015** Merger of management from SKYLAKE INVESTMENT Co.

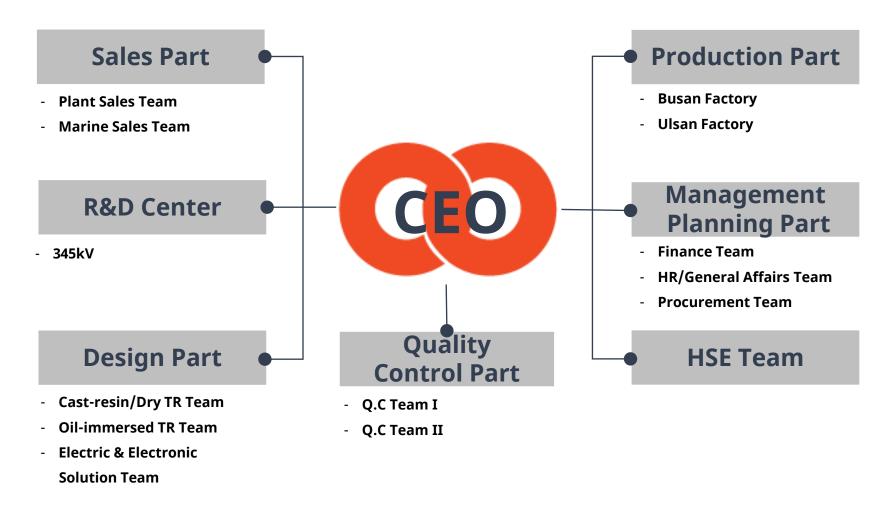
2020 Supply of 154kV transformer to KEPCO

2021 Merger of management from LB PRIVATE EQUITY

# **01**-2 Company Overview



# # Organization Chart



## **01**-3 Company Overview



[UNIT: USD]

# # Financial Report



77M? 60.9M **58M** 54M 52M 48.7M 44.1M 40.4M 2015 2017 2022 2016 2018 2019 2020 2021

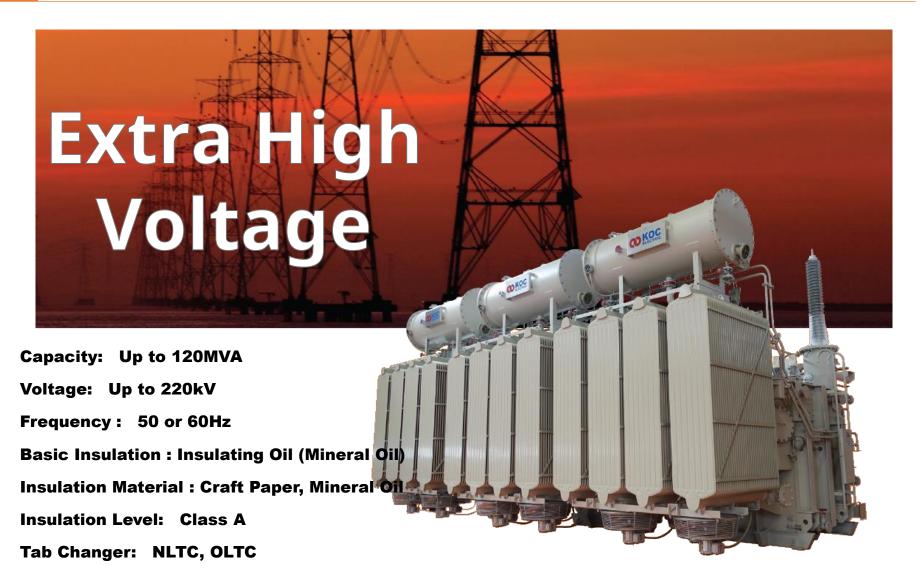
# **02**-1 Major Products



|                                | Product | Insulating<br>Method        | Voltage     | Advantage   | Disadvantage  |
|--------------------------------|---------|-----------------------------|-------------|---|---|
| Extra<br>High<br>Voltage<br>TR |         | Insulating<br>Oil           | Up to 220kV | <ul> <li>Possible large capacity</li> <li>Superior stability</li> <li>Possible installation outdoors</li> <li>Possible add protection</li> </ul>            | <ul> <li>Expensive price</li> <li>Need large installation place</li> <li>Risk of fire and explosion</li> <li>Risk of oil leak</li> </ul>                      |
| Oil<br>TR                      |         | Insulating<br>Oil           | Up to 69kV  | <ul> <li>Possible large capacity</li> <li>Superior stability, low noise</li> <li>Possible installation outdoors</li> <li>Possible add protection</li> </ul> | <ul> <li>Expensive price</li> <li>Need large installation place</li> <li>Risk of fire and explosion</li> <li>Risk of oil leak</li> </ul>                      |
| Mold<br>TR                     |         | Epoxy<br>Resin<br>(Molding) | Up to 36kV  | <ul> <li>Reasonable Price(vs oil TR)</li> <li>Easy maintenance</li> <li>Low possibility of fire and explosion</li> </ul>                                    | <ul> <li>low quality stability<br/>(vs oil TR)</li> <li>Impossible large capacity<br/>and installation outdoors</li> <li>Impossible add protection</li> </ul> |
| Dry<br>TR                      |         | Varnish<br>(Impregnation)   | Up to 11kV  | <ul><li>Easy maintenance</li><li>Low possibility of fire and explosion</li></ul>  | <ul><li>Large noise and vibration</li><li>Weak at <u>surge</u></li><li>Hard of large capacity</li></ul>   |

## **02**-2 Major Products





Applicable Specification: IEC 60076-11, IEEE C57.12.01,

**NEMA ST-20** 

#### **02**-3 **154kV Reference for KEPCO**



#

Supplied 154kV transformer to KEPCO for the first time in korea as a small company. (15 substation, 23 set of transformers)



# **02-4 Major Products**





Type: Oil immersed type

Capacity: Up to 120MVA

Voltage: Up to 69kV

Frequency: 50 or 60Hz

**Insulation Level: Class A** 

Tab Changer: NLTC, OLTC

# **02**-5 Major Products





Frequency: 50 or 60Hz

Insulation Level: Class B/F/H

**Enclosure: IP23/IP44** 

# **02**-6 TR for Shaft Generator System



#### Representative Reference



**Ship Yard: SAMSUNG HAEVI INDUSTRY** 

**Owner: AET Tankers** 

**Ship Type: Suttle tanker** 

Hull No.: SN2375/76/77

**Customer: C&A Electric co., Itd.** 

Type: Cast resin type

Capacity: 4MVA/2.8MVA/2.6MVA

**Qty.: 24set** 

Voltage: AC6600/2200/2200V

**Connection: D+7.5 or -7.5d0y11** 

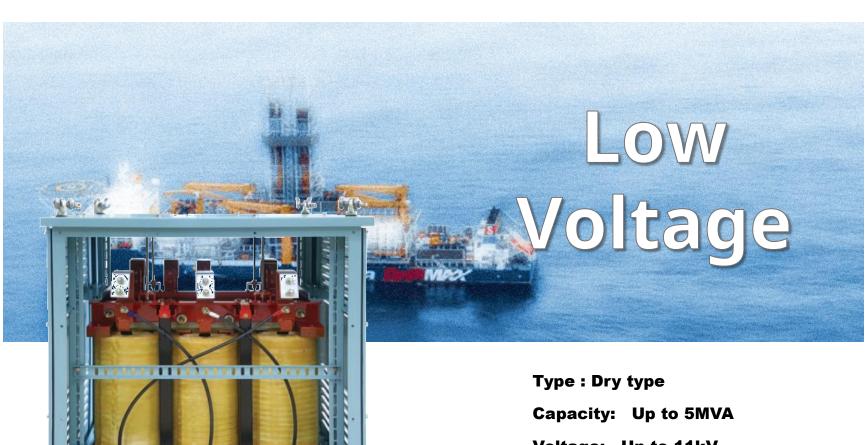
Frequency: 60Hz

Cooling: AF/WF

**Enclosure: IP44** 

# **02**-7 Major Products





Voltage: Up to 11kV

Frequency: 50 or 60Hz

Insulation Level: Class B/F/H

**Enclosure: IP23/IP44** 

#### **02-8 Other Products**



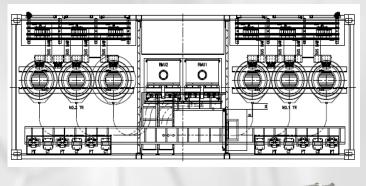


#### Special type transformer (Containerized transformer/PPS)

#### Containerized H/V System

| Installation place          | Outdoor                    |  |  |  |
|-----------------------------|----------------------------|--|--|--|
| Installation type           | Self standing              |  |  |  |
| Protection grade            | IP44                       |  |  |  |
| System rating               | 11kV / 400V, 50/60Hz, 3P4W |  |  |  |
| Outside incoming connection | Front                      |  |  |  |
| Outgoing connection         | Front                      |  |  |  |

| Casting under vaccum system |
|-----------------------------|
| Impregnated in epoxy resin  |
| 3РН                         |
| 50/60Hz                     |
| AN 2500kVA X 2sets          |
| AN/AF                       |
| Pri. 11kV / Sec. 400V       |
| Pri. 131.2A / Sec. 3608.4A  |
| F/F                         |
| YNyn0                       |
|                             |

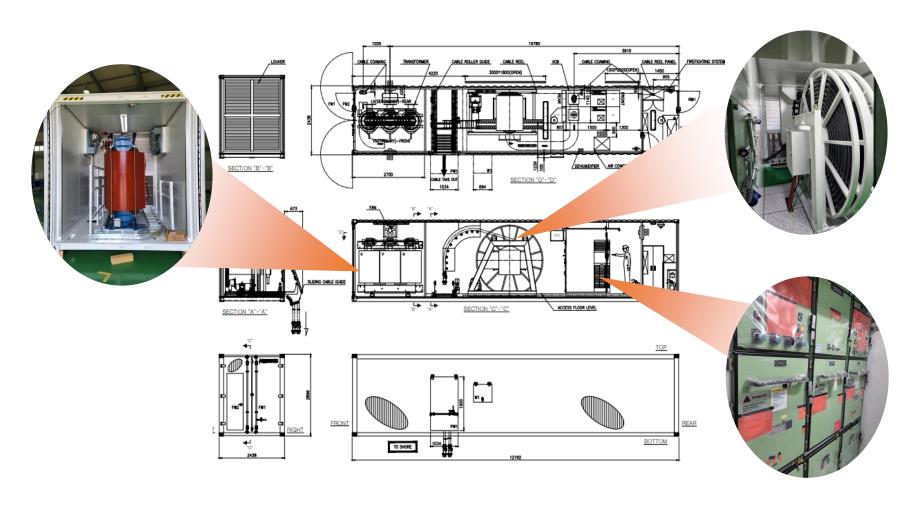




#### -9 Other Products



# Special type transformer (Containerized transformer for AMP system)



#### **02-10 Other Products**



# #

#### **Electric Equipment**



Signal Light Column



Navigation Light Control Panel



Uninterruptible Power Supply



Battery charger



Public Address



Main Switch Board



Starter & Dist board



Heli Starter System

#### 03-1 Sales Market





Navy Coast Guard INDUSTRIAL EPC

**Power Station** 





Navy



SK Energy



**KEPCO** 



Russia ARCTIC LNG

**KOREA NAVY** 

SK Energy Desuifurization equipment

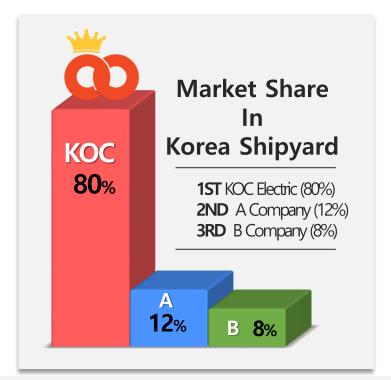
**KEPCO 154kV substation** 

#### 03-2 Sales Market



No.1 of transformer market share in Korea shipyard which is No.1 of shipbuilding industry





Due to transformer specialized for ship result/recognition/technology

Top-Tier in Korea

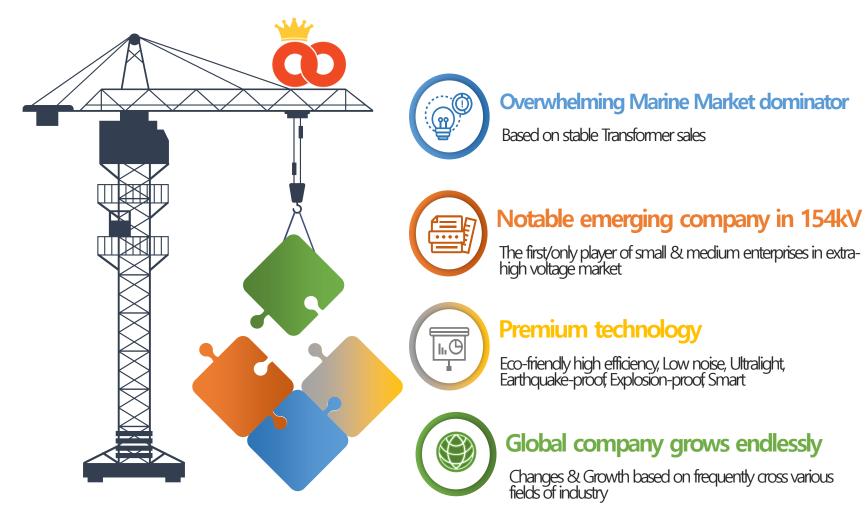
Sturdy market power Big 3 shipyard in Korea



# -2 Core Competitiveness

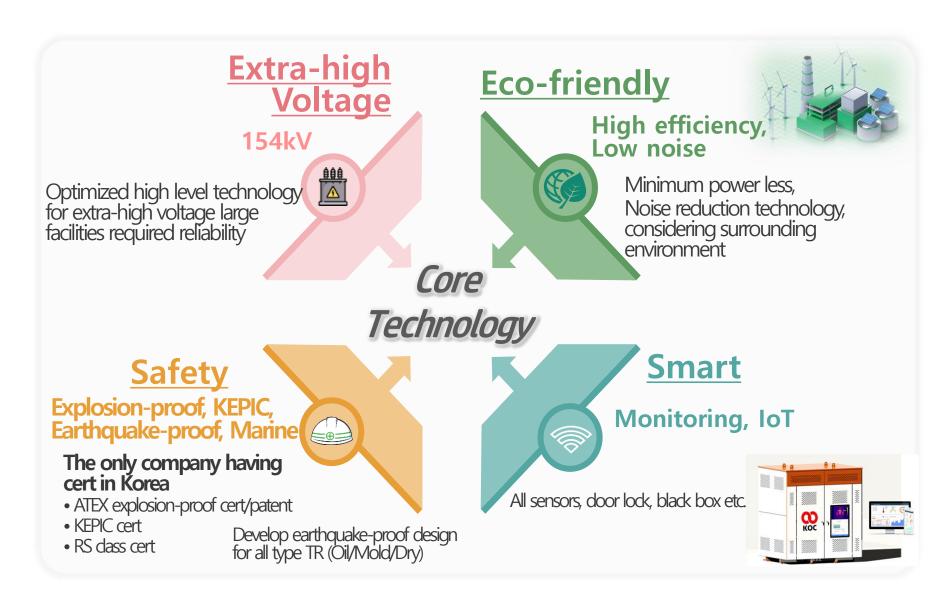


#### Global Electric Company grows endlessly based on first class technique



# -3 Core Technology





# 03-4 Main Project Career



# # Supply optimized product to various industry field based on high level technology

#### 154kV substation



#### Large plant



#### Multipurpose



#### **Marine Industry**



#### **KEPCO 154kV substation**

- Supply KEPCO 154kV extra-high voltage TR
- 2020\_ Supplied 6 TR2021\_ Will supply 6 TR2022 Will supply 11 TR

# SK Energy Desuifurization equipment

- Supply large scale ecofriendly production facility's main TR
- VRDS\*

#### POSCO Yeouido Parc1

 Supply main TR of skyscraper multipurpose building in Yeouido

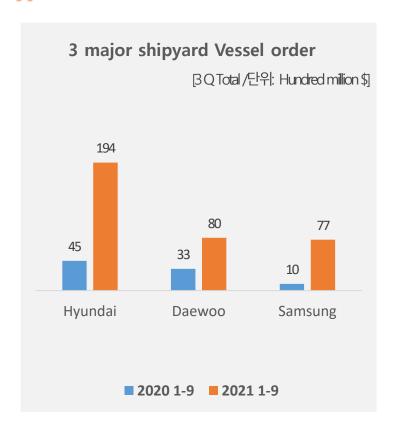
#### Russia ARCTIC LNG

- World first icebreaker vessel sailing LNG production base in Russia Yamal Pen. Where is extremely low temp.
- Supply high stability TR optimized environmental extreme

#### 04-1 Business Status (1)



# # 2021~2031 Shipbuilding Industry Super Cycle revival



- Recovery global business condition, Increase

  Global trade
- Follow to <u>IMO</u> **environmental regulation**, increase demand of change worn-out Vessel
- ✓ Major shipyard's **orders on hand 2.5 year** → **Rising** Vessel price
- Main on Korea's focused Vessel; Container, LNG

  Expect Shipbuilding industry's long term boom

[Ref. Clarkson Research / JoongAng Ilbo, 2021]

# 04-2 Business Status (2)



#### **KOC** dominate Eco-friendly Vessel(methanol fuel) Market in advance

#### **Eco-friendly Vessel?**

Vessels use eco-friendly fuel like LNG, hydrogen, electric etc, or equip air pollutant reduction device



▲ Bunker fuel oil C vessel
Emission CO2 causes air pollution



 Develop low carbon, ecofriendly vessel fuel
 (LNG, hydrogen, ammonia, electric, etc.)

Most spreaded fuel LNG
Most spotlighted fuel Methanol



Denmark Mearsk ordered World's first methanol fuel container to 'Hyundai'

#### Shipowner(Mearsk) strongly prefer KOC TR

- 5 of world's first methanol fuel container ordered to Hyundai(2,000TEU),
   appointed TR maker as KOC
- KOC is likely to win follow up PJT, 8 of 16,000TEU large container
- Reconfirm **KOC's influence to shipowner** who is final owner in vessel market nominate methanol fuel vessel market in advance

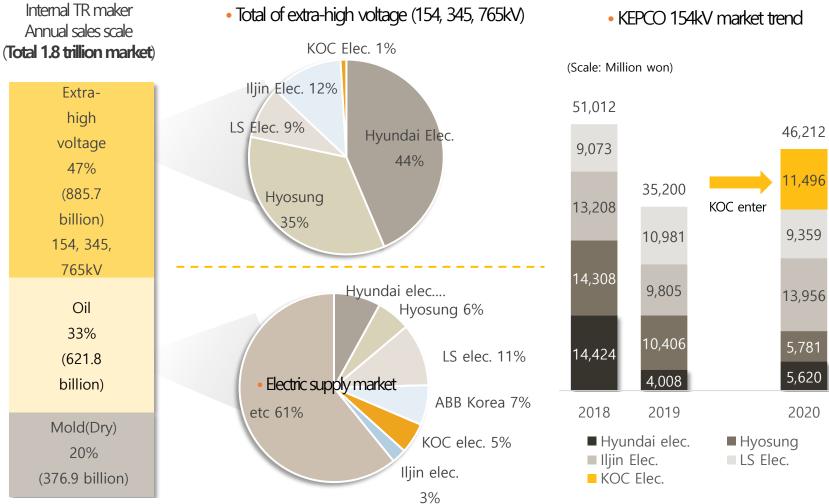


Methanol is trend in container, which is KOC's main market

#### -3 Business Status (3)



# Get out from saturation state electric supply market, process entering & expanding extra-high voltage market for the first of smaller enterprises



#### 04-4 Business Status (4)



#

As 154kV extra-high voltage market's newcomer, strategy to win first place.

Manufacturer produces maximum efficiency & eco-friendly 154kV TR made by

Manufacturer produces maximum efficiency & eco-friendly 154kV TR made by modern equipment



Price advantage over competitors



High efficiency & eco-friendly Premium 154kV



**Technology**Lowest loss/Highest efficiency in the industry (based on KEPCO high efficiency 154kV)

**Service** Free regular inspection, Fast AS response

Identity\_ Speciality Factory for 154kV TR

(Competitor's main: 345kV, 765kV)



# **05**-1 Expansion of Marine Market



# Based on normal Vessel part's overwhelming market dominating power, Expand high value market

Marine Plant

#### World Marine plant market size

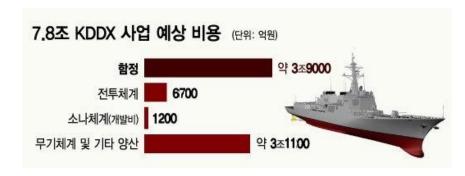


- ✓ International oil prices rise
- ✓ Demand increases of Marine plant

Appeal KOC's record & technical skills & price plant market

#### Special Ship

#### Korean NAVY has plan to build mini Aegis cruiser



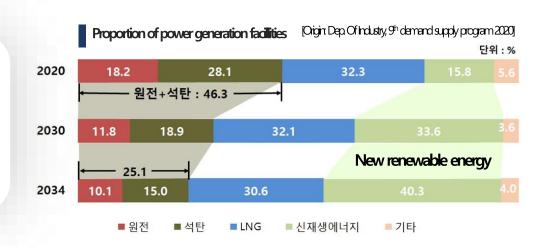
- Possible to predict demand following to Navy vessel building plan
- ✓ High price Niche Market where having record and technology response is the key
- Retain high profit by TR & Electric product (ABT, BATTERY CHARGER, Heli-starter, frequency converter)

# 05-2 New renewable energy market



Follow government eco-friendly green new deal policy, active response to increasing demand of new renewable energy

Solution of eco-friendly high efficiency TR & electric product



#### **01** Sunlight generation

- Stability proven by large capacity record
- High efficiency TR maximized generating efficiency

# Anjwa-do 100 IVIV sunlight generation KOC Mold TR (2020)

#### **02** Wind power generation

- Have reference of land/marine
- KOC's technical skill & record are specialized at marine wind power generation's trend, enlargement/high efficiency
  - High level of difficulty, high profit market
    - Need technology of response to vibration
    - Overcome installation space restriction
    - Minimized receiving A/S



# Global electric/power system company \_\_\_\_\_



growing infinitely by world first class technique







# **06-1 Reference\_LNGC**



| Hull No.             | Shipyard | Owner                   | Kind of Vessel  | Vessel | Repre      | esentative Supply | Product.    | Order Year |
|----------------------|----------|-------------------------|-----------------|--------|------------|-------------------|-------------|------------|
| Hull No.             | Shipyaru | Owner                   | Killa of Vessel | Q'ty   | Туре       | Capacity(kVA)     | Voltage(kV) | Order rear |
|                      |          |                         |                 |        |            |                   |             |            |
| H8117~H8118          | HSHI     | Hyundai LNG<br>Shipping | 86K LNGC        | 2      | Dry        | 150               | 0.44/0.23   | 2021       |
| H8300                | HMD      | koera Lines             | 18K LNGC        | 1      | Cast Resin | 2,000             | 0.44/6.6    | 2021       |
| H2509/H2510          | DSME     | BW                      | 174K LNGC       | 2      | Cast Resin | 3,500             | 6.6/0.45    | 2021       |
| SN2425/SN2426        | SHI      | Maran Gas               | 174K LNGC       | 2      | Cast Resin | 3,300             | 6.6/0.45    | 2021       |
| H3221~H3223/H8100    | HSHI     | Shell                   | 174K LNGC       | 4      | Cast Resin | 4.100             | 6.6/0.45    | 2021       |
| H3243/H3244          | HHI      | Knutsen                 | 174K LNGC       | 2      | Cast Resin | 4,100             | 6.6/0.45    | 2021       |
| H3189~H3191/H3198    | HHI      | Shell                   | 174K LNGC       | 4      | Cast Resin | 4,100             | 6.6/0.45    | 2021       |
| H8095/H8096          | HSHI     | Shell                   | 174K LNGC       | 2      | Cast Resin | 4,100             | 6.6/0.45    | 2021       |
| SN2403~SN2412        | SHI      | Novatek                 | 172K LNGC       | 10     | Cast Resin | 4,750             | 6.6/0.45    | 2020       |
| SN2315               | SHI      | Gazocean                | 174K LNGC       | 1      | Cast Resin | 3,300             | 6.6/0.45    | 2020       |
| H2508                | DSME     | Maran Gas               | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2020       |
| SN2319               | SHI      | Nisshin Shipping        | 174K LNGC       | 1      | Cast Resin | 3,300             | 6.6/0.45    | 2020       |
| SN2366/SN237~SN2374  | SHI      | Novatek                 | 172K LNGC       | 4      | Cast Resin | 4,750             | 6.6/0.45    | 2020       |
| H8298                | HMD      | koera Lines             | 180K LNGC       | 1      | Cast Resin | 1,900             | 0.44/6.6    | 2020       |
| H8091~H8094          | HSHI     | Shell                   | 174K LNGC       | 4      | Cast Resin | 4.100             | 6.6/0.45    | 2020       |
| H3185~H3188          | HHI      | Shell                   | 174K LNGC       | 4      | Cast Resin | 4,100             | 6.6/0.45    | 2020       |
| SN2336/SN2337        | SHI      | Cardiff                 | 174K LNGC       | 2      | Cast Resin | 3,300             | 6.6/0.45    | 2020       |
| SN2355               | SHI      | NYK                     | 174K LNGC       | 1      | Cast Resin | 3,300             | 6.6/0.45    | 2020       |
| SN2332               | SHI      | Minerva                 | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| SN2341/SN2342        | SHI      | Enesel                  | 174K LNGC       | 2      | Dry        | 150               | 0.44/0.225  | 2019       |
| SN2306/SN2307        | SHI      | NYK                     | 174K LNGC       | 2      | Cast Resin | 3,300             | 6.6/0.45    | 2019       |
| SN2310               | SHI      | Navigara                | 174K LNGC       | 1      | Cast Resin | 3,000             | 6.6/0.45    | 2019       |
| H3137/H3138          | HHI      | Daiganas                | 180K LNGC       | 2      | Cast Resin | 4,100             | 6.6/0.45    | 2019       |
| H2501~H2507          | DSME     | Maran Gas               | 174K LNGC       | 6      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| H8232                | RENK     | RENK                    | 30K LNGC        | 1      | Cast Resin | 1,320             | 0.69/0.45   | 2019       |
| H8032                | HSHI     | NYK                     | 174K LNGC       | 1      | Cast Resin | 4,100             | 6.6/0.45    | 2019       |
| S971                 | HSHI     | NYK                     | 174K LNGC       | 1      | Cast Resin | 3,600             | 6.6/0.45    | 2019       |
| H2495                | DSME     | Maran Gas               | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| H2500                | DSME     | Alpha Gas               | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| SN2308               | SHI      | Cardiff                 | 174K LNGC       | 1      | Cast Resin | 3,300             | 6.6/0.45    | 2019       |
| H2496/H2497          | DSME     | BW                      | 174K LNGC       | 2      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| H2492                | DSME     | Flex                    | 173K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| H2487                | DSME     | Maran Gas               | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2019       |
| H8029~31             | HSHI     | NYK                     | 174K LNGC       | 3      | Cast Resin | 4,100             | 6.6/0.45    | 2019       |
| H2481~H2486          | DSME     | Minerva                 | 174K LNGC       | 6      | Cast Resin | 3,500             | 6.6/0.45    | 2018       |
| SN2271/SN2275/SN2276 | Cardiff  | Cardiff                 | 174K LNGC       | 3      | Cast Resin | 3,300             | 6.6/0.45    | 2018       |
| H3095                | HHI      | Botas                   | 170K LNGC       | 1      | Cast Resin | 4,200             | 6.6/0.45    | 2018       |
| H2489~H2491          | DSME     | BW                      | 173K LNGC       | 3      | Cast Resin | 3,500             | 6.6/0.45    | 2018       |
| H2479/H2480          | DSME     | Seatanker               | 173K LNGC       | 2      | Cast Resin | 3,500             | 6.6/0.45    | 2018       |
| SN2255               | SHI      | jawa                    | 170K LNGC       | 1      | Cast Resin | 2,800             | 6.6/0.45    | 2018       |
| SN2262/SN2213/SN2274 | SHI      | Gaslog                  | 174K LNGC       | 3      | Cast Resin | 2,800             | 6.6/0.45    | 2018       |
| S970                 | HSHI     | NYK                     | 174K LNGC       | 1      | Cast Resin | 3,600             | 6.6/0.45    | 2018       |
| H2477/H2478          | DSME     | Maran Gas               | 174K LNGC       | 2      | Cast Resin | 3,500             | 6.6/0.45    | 2018       |
| H2469                | DSME     | Maran Gas               | 174K LNGC       | 1      | Cast Resin | 3,500             | 6.6/0.45    | 2018       |

# -2 Reference\_Container carrier



| Hull No.                       | Chinned                        | Const. Mad of Vessel        | Vessel                      | Representative Supply Product. |            |               | Order Veer  |            |
|--------------------------------|--------------------------------|-----------------------------|-----------------------------|--------------------------------|------------|---------------|-------------|------------|
| Hull No.                       | Shipyard                       | Owner                       | Kind of Vessel              | Q'ty                           | Type       | Capacity(kVA) | Voltage(kV) | Order Year |
|                                |                                |                             |                             |                                |            |               |             |            |
| H8360~H8365                    | HMD                            | Grimaldi                    | 45,700TEU Container Ro-Ro   | 6                              | Cast Resin | 3,280         | 0.45/0.1    | 2021       |
| H3388~H3392                    | HHI                            | Wan Hai                     | 13,200TEU Container Carrier | 5                              | Cast Resin | 3,700         | 6.6/0.45    | 2021       |
| S5387/S5388                    | Imabari<br>Shipbuilding        | One                         | 24,000TEU Container Carrier | 2                              | Cast Resin | 4,000         | 6.6/0.45    | 2021       |
| S1901~S1902<br>S8251~S8252     | Imabari<br>Shipbuilding        | One                         | 24,000TEU Container Carrier | 4                              | Cast Resin | 4,000         | 6.6/0.45    | 2021       |
| S2449~S2472                    | SHI                            | Evergreen                   | 15,500TEU Container Carrier | 20                             | Cast Resin | 3,600         | 6.6/0.45    | 2021       |
| H3272~H3275                    | HHI                            | Sidoship                    | 15,900TEU Container Carrier | 4                              | Cast Resin | 4,400         | 6.6/0.45    | 2021       |
| H8070~H8073<br>H8103~H8104     | HIS                            | Capital                     | 13,200TEU Container Carrier | 6                              | Cast Resin | 4,550         | 6.6/0.45    | 2021       |
| SN2434~SN2448                  | SHI                            | Seaspam                     | 15,000TEU Container Carrier | 10                             | Dry        | 220           | 0.44/0.225  | 2021       |
| S2712/S2713                    | Imabari<br>Shipbuilding        | YangMing                    | 11,000TEU Container Carrier | 2                              | Cast Resin | 4,000         | 6.6/0.45    | 2021       |
| H4360~H4365                    | DSME                           | Hapag Lloyd                 | 23,000TEU Container Carrier | 6                              | Cast Resin | 3,500         | 6.6/0.45    | 2021       |
| H8070~H8073                    | HSHI                           | Capital                     | 13,200TEU Container Carrier | 4                              | Cast Resin | 4,550         | 6.6/0.45    | 2021       |
| H1864A~H8167A                  | Hudong<br>Shipyard             | MSC                         | 24,100TEU Container Carrier | 4                              | Dry        | 250           | 0.45/0.23   | 2021       |
| H4354~H4359                    | DSME                           | Zodiac                      | 15,000TEU Container Carrier | 6                              | Cast Resin | 4,000         | 6.6/0.45    | 2021       |
| SN2428~SN2429<br>SN2442~SN2443 | SHI                            | Capital                     | 13,100TEU Container Carrier | 4                              | Cast Resin | 3,600         | 6.6/0.45    | 2021       |
| YZJ2020-1293/1294              | Jiangsu<br>New Yangzi Shipyard | Greathorse<br>International | 14,000TEU Container Carrier | 2                              | Cast Resin | 4,800         | 6.6/0.45    | 2020       |
| H4325~4329                     | SHI                            | MSC                         | 23,000TEU Container Carrier | 5                              | Cast Resin | 4,000         | 6.6/0.45    | 2020       |
| SN2358~2363                    | SHI                            | Evergreen                   | 23,000TEU Container Carrier | 5                              | Cast Resin | 4,500         | 6.6/0.45    | 2019       |
| H2640~H2644                    | Jiangnan Shipyard              | Maersk                      | 22,000TEU Container Carrier | 5                              | Dry        | 150           | 0.45/0.225  | 2019       |
| H3038~H3042                    | Jiangnan Shipyard              | CMA-CGM                     | 15,000TEU Container Carrier | 5                              | Dry        | 250           | 0.45/0.23   | 2019       |
| S1864~S1869                    | Imabari<br>Shipbuilding        | Evergreen                   | 11,000TEU Container Carrier | 12                             | Cast Resin | 3,600         | 6.6/0.45    | 2019       |
| S2633~S2677                    | Imabari<br>Shipbuilding        | Evergreen                   | 11,000TEU Container Carrier | 12                             | Cast Resin | 3,600         | 6.6/0.45    | 2019       |
| YZJ2015-2057~2061              | Jiangsu<br>New Yangzi Shipyard | Costamare                   | 11,600TEU Container Carrier | 5                              | Cast Resin | 4,500         | 6.6/0.45    | 2018       |
| SN2288~2292                    | SHI                            | HMM                         | 23,000TEU Container Carrier | 5                              | Cast Resin | 3,800         | 6.6/0.45    | 2018       |
| H4318~4324                     | DSME                           | HMM                         | 23,000TEU Container Carrier | 7                              | Cast Resin | 3,500         | 6.6/0.45    | 2018       |
| SN2263~SN2270                  | SHI                            | Evergreen                   | 12,000TEU Container Carrier | 8                              | Cast Resin | 4,500         | 6.6/0.45    | 2018       |
| H4313~H4317                    | DSME                           | MSC                         | 22,000TEU Container Carrier | 5                              | Cast Resin | 4,000         | 6.6/0.45    | 2018       |
| SN2248~SN2253                  | SHI                            | MSC                         | 23,000TEU Container Carrier | 6                              | Cast Resin | 3,800         | 6.6/0.45    | 2018       |
| H3033~3037                     | Hudong Shipyard                | CMA-CGM                     | 22,000TEU Container Carrier | 5                              | Dry        | 300           | 0.45/0.23   | 2018       |
| H1471~1474                     | Hudong Shipyard                | CMA-CGM                     | 22,000TEU Container Carrier | 5                              | Dry        | 300           | 0.45/0.23   | 2018       |
| H3025~3028                     | HHI                            | Zodiac                      | 11,100TEU Container Carrier | 4                              | Cast Resin | 3,200         | 6.6/0.45    | 2018       |
| S985~S959                      | HHI                            | EPS                         | 15,100TEU Container Carrier | 5                              | Cast Resin | 3,200         | 6.6/0.45    | 2018       |

# -2 Reference\_Offshore



| Delivery | Customer                          | Project Name                        | Project No   | Capacity | Voltage     | Insulation | IP      | Q'ty |
|----------|-----------------------------------|-------------------------------------|--------------|----------|-------------|------------|---------|------|
| 2007.01  | SHI                               | FPSO (MODEC)                        | H1579        | 2000KVA  | 11KV/450V   | F          | IP23    | 1    |
| 2008.04  | SHI                               | FPSO (NEXUS)                        | H1716        | 3300KVA  | 11KV/690V   | F          | IP23    | 2    |
| 2008.06  | SHI                               | P&M PETROBRAS DRILLSHIP             | H7057/61     | 2700KVA  | 11KV/460V   | F          | IP23    | 4    |
| 2010.05  | SHI                               | SCHAIN DRILLSHIP                    | H7079        | 2700KVA  | 11KV/460V   | F          | IP23    | 2    |
| 2012.01  | SIEMENS                           | DSME-Odfjell#3 Semi Rig             | H3033        | 3500KVA  | 11KV/690V   | F          | IP23    | 4    |
| 2012.03  | SHI                               | FPSO (NEXUS)                        | H1767        | 3300KVA  | 11KV/690V   | F          | IP23    | 2    |
| 2012.07  | SIEMENS                           | DSME TRANSOCEAN DEEPWATER DRILLSHIP | H3612/13     | 3500KVA  | 11KV/710V   | F          | IP23 12 |      |
| 2012.07  | SIEMENS                           | DSME TRANSOCEAN DEEPWATER DRILLSHIP | H3612/13     | 2500KVA  | 11KV/710V   | F          | IP23    | 6    |
| 2012.09  | S ONE M&O                         | SU TU NAU SOUTH&NORTH PLATFORM      |              | 3500KVA  | 11KV/710V   | F          | IP23    | 2    |
| 2013.02  | MT TECHNIQUES & COMMERCE PTE LTD  | WHITE TIGER PLATFORMS               |              | 6300KVA  | 6.3KV/22KV  | Н          | IP23    | 1    |
| 2013.02  | MT TECHNIQUES & COMMERCE PTE LTD  | WHITE TIGER PLATFORMS               |              | 4000KVA  | 6.3KV/22KV  | Н          | IP23    | 1    |
| 2013.02  | MT TECHNIQUES & COMMERCE PTE LTD  | WHITE TIGER PLATFORMS               |              | 3200KVA  | 22KV/6.3KV  | Н          | IP23    | 1    |
| 2013.02  | MT TECHNIQUES & COMMERCE PTE LTD  | WHITE TIGER PLATFORMS               |              | 5000KVA  | 22KV/6.3KV  | Н          | IP23    | 1    |
| 2013.04  | SIEMENS                           | DSME ATWOOD DRILLSHIP               | H3614/17     | 3500KVA  | 11KV/710V   | F          | IP23 12 |      |
| 2013.04  | SIEMENS                           | DSME ATWOOD DRILLSHIP               | H3614/17     | 2500KVA  | 11KV/710V   | F          | IP23    | 6    |
| 2013.08  | SHI                               | SCHAIN DRILLSHIP                    | H7082        | 2700KVA  | 11KV/460V   | F          | IP23    | 2    |
| 2014.04  | MT TECHNIQUES & COMMERCE PTE LTD  | DRAGON OIL FIELD                    |              | 4000KVA  | 6.3KV/22KV  | Н          | IP23    | 1    |
| 2014.04  | MT TECHNIQUES & COMMERCE PTE LTD  | DRAGON OIL FIELD                    |              | 1600KVA  | 22KV/400V   | Н          | IP23    | 1    |
| 2014.04  | MT TECHNIQUES & COMMERCE PTE LTD  | DRAGON OIL FIELD                    |              | 1600KVA  | 22KV/6.3KV  | Н          | IP23    | 1    |
| 2014.04  | SIEMENS                           | DSME VANTAGE ENHANCED DRILLSHIP     | H3618        | 3500KVA  | 11KV/710V   | F          | IP23    | 3    |
| 2014.04  | SIEMENS                           | DSME VANTAGE ENHANCED DRILLSHIP     | H3618        | 3000KVA  | 11KV/710V   | F          | IP23    | 6    |
| 2015.01  | SIEMENS                           | DSME V DRILLSHIP                    | H3620        | 3500KVA  | 11KV/710V   | F          | IP23    | 6    |
| 2015.01  | SIEMENS                           | DSME V DRILLSHIP                    | H3620        | 2500KVA  | 11KV/710V   | F          | IP23    | 3    |
| 2015.01  | SIEMENS                           | DSME V DRILLSHIP                    | H3620        | 2500KVA  | 11KV/710V   | F          | IP23    | 3    |
| 2015.06  | BPE ENGINEERING                   | FPSO - Cendor Phase 2 (PETROFAC)    |              | 5650KVA  | 6.6KV/460V  | F          | IP44    | 2    |
| 2015.06  | BPE ENGINEERING                   | LAYANG FPSO CONVERSION              |              | 4000KVA  | 13.8KV/460V | F          | IP23    | 2    |
| 2015.06  | BPE ENGINEERING                   | LAYANG FPSO CONVERSION              |              | 3500KVA  | 13.8KV/460V | F          | IP23    | 2    |
| 2015.06  | BPE ENGINEERING                   | LAYANG FPSO CONVERSION              |              | 2500KVA  | 13.8KV/460V | F          | IP23    | 2    |
| 2014.10  | SIEMENS                           | DSME Atwood Admiral Drillship       | H3619/22     | 3500KVA  | 11KV/710V   | F          | IP23 12 |      |
| 2014.10  | SIEMENS                           | DSME Atwood Admiral Drillship       | H3619/22     | 2500KVA  | 11KV/710V   | F          | IP23    | 6    |
| 2015.10  | GE Energy Power Conversion UK Ltd | TRANSOCEAN GRS DRILLSHIP (4 SHIPS)  | H3057/8/9/10 | 5000KVA  | 11KV/720V   | F          | IP23    | 12   |
| 2015.10  | GE Energy Power Conversion UK Ltd | TRANSOCEAN GRS DRILLSHIP (4 SHIPS)  | H3057/8/9/10 | 3500KVA  | 11KV/720V   | F          | IP23    | 12   |
| 2015.10  | GE Energy Power Conversion UK Ltd | TRANSOCEAN GRS DRILLSHIP (4 SHIPS)  | H3057/8/9/10 | 2500KVA  | 11KV/720V   | F          | IP23    | 12   |
| 2016.12  | SIEMENS                           | SMOP Culzean Project                |              | 75kVA    | 690/430V    | F          | IP00    | 10   |
| 2016.12  | SIEMENS                           | SMOP Culzean Project                |              | 45kVA    | 690/430V    | F          | IP00    | 2    |
| 2016.12  | SIEMENS                           | SMOP Culzean Project                |              | 30kVA    | 690/430V    | F          | IP00    | 10   |
| 2016.12  | SIEMENS                           | SMOP Culzean Project                |              | 15kVA    | 690/430V    | F          | IP00    | 3    |
| 2017.09  | GE Energy Power Conversion UK Ltd | Z-210 Working Jackup                |              | 25kVA    | 690/501V    | F          | IP23    | 2    |
| 2019.12  | SIEMENS                           | DE-NOX PJT                          |              | 4500kVA  | 6.9/3.3kV   | F          | IP23    | 5    |
| 2020.03  | SIEMENS                           | BW Opportunity FPSO PJT             |              | 4000kVA  | 6.6KV/460V  | В          | IP23    | 1    |
| 2020.03  | SIEMENS                           | BW Opportunity FPSO PJT             |              | 400kVA   | 440/220V    | В          | IP23    | 2    |
| 2020.03  | SIEMENS                           | BW Opportunity FPSO PJT             |              | 300kVA   | 440/220V    | F          | IP23    | 1    |

# -2 Reference\_UPS



| Hull No. | Shipyard                       | Owner            | Kind of Vessel | Description   | Class  | Order Year |
|----------|--------------------------------|------------------|----------------|---|--------|------------|
| SN1405   | SHI                            | SK Sunrise       | Unknown        | 30kVA, 3PH, (AC220) With Battery                                  | ABS+KR | 2021       |
| SN2314   | SHI                            | Celsius Shipping | 174K LNGC      | 15kVA 1PH (AC220V) With Battery                                   | LR     | 2020       |
| SN2313   | SHI                            | Celsius Shipping | 174K LNGC      | 15kVA 1PH (AC220V) With Battery                                   | LR     | 2020       |
| H2510    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| H2509    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| H2508    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| H2507    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| H2506    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| H2503    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2020       |
| SN2298   | SHI                            | Unknown          | Unknown        | 15kVA 1PH (AC220V) With Battery                                   | LR     | 2019       |
| SN2297   | SHI                            | Unknown          | Unknown        | 15kVA 1PH (AC220V) With Battery                                   | LR     | 2019       |
| H2504    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2019       |
| H2502    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2019       |
| H2501    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2019       |
| H2500    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2019       |
| H2497    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2019       |
| H2496    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH. (AC230V) With Battery                                  | DNV-GL | 2019       |
| H2495    | DSME                           | Maran Gas        | 174K LNGC      | 30kVA 3PH. (AC230V) With Battery                                  | ABS    | 2019       |
| H2492    | DSME                           | Unknown          | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2019       |
| H2487    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | LR     | 2019       |
| H2486    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | LR     | 2019       |
| H2485    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | LR     | 2019       |
|          |                                | Alphia Gas       |                | 7kVA 3PH (AC440V) With Battery                                    |        |            |
| SN2234   | SHI                            | Unknown          | 7.5K LNGC      | 30kVA 3Ph (AC220V) With Battery                                   | KR     | 2018       |
| H2491    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH (AC230V) With Battery                                   | DNV-GL | 2018       |
| H2490    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2018       |
| H2484    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | BV BV  | 2018       |
| H2483    | DSME                           | Alpha Gas        | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | BV     | 2018       |
| H2482    | DSME                           | Minerva          | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2018       |
| H2481    | DSME                           | Minerva          | 174K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2018       |
| H2480    | DSME                           | Unknown          | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2018       |
| H2479    | DSME                           | Unknown          | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | DNV-GL | 2018       |
| H2478    | DSME                           | Maran Gas        | 174 LNGC       | 30kVA 3PH (AV220V) With Battery                                   | ABS.   | 2018       |
| H2470    | DOME                           | Maran Gas        | 174 LNGC       | 30kVA 3PH (AV220V) With Battery                                   | ABS    | 2018       |
| H2477    | DSME                           | Maran Gas        | FSRU           |   | DNV-GL | 2018       |
| 112450   | DOLLE                          |                  | 474 1100       | 10kVA 3PH (AV220V) With Battery                                   | - 10   | 2040       |
| H2469    | DSME                           | Maran Gas        | 174 LNGC       | 30kVA 3PH (AV220V) With Battery                                   | LR     | 2018       |
| 2100     | Mitsubishi<br>Heavy Industries | Unknown          | Unknown        | 120kVA 3PH (AC220V) With Battery                                  | LR     | 2018       |
| SN2233   | SHI                            | Unknown          | 7.5K LNGC      | 7kVA 3PH (AC440V) With Battery<br>30kVA 3Ph (AC220V) With Battery | KR     | 2017       |
| H2471    | DSME                           | Unknown          | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2017       |
| H2470    | DSME                           | Unknown          | 173K LNGC      | 30kVA 3PH, (AC230V) With Battery                                  | ABS    | 2017       |
| H2467    | DSME                           | Maran Gas        | 174 LNGC       | 30kVA 3PH, (AC230V) With Battery                                  | LR     | 2017       |
| H2466    | DSME                           | Maran Gas        | 174 LNGC       | 30kVA 3PH, (AC230V) With Battery                                  | LR     | 2017       |
| H2389    | DSME                           | BW               | 173K LNGC      | 30kVA 3PH (AV220V) With Battery                                   | DNV-GL | 2017       |

# **Appendix 1. Sales Market**



# # Korea Major Customers

























































# **Appendix 1. Sales Market**



#### # Overseas Major Customers







































































# **Appendix 2. Quality Assurance**











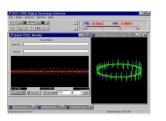




#### Under the Slogan of 「Quality First」, We Do Our Best in order to Manufacture Better Products

| No | Test Type  | Note         |
|----|--|--------------|
| 1  | Measurement of Winding Resistance  | Routine Test |
| 2  | Measurement of Voltage Ratio and Testing of Voltage<br>Vector Relationship | Routine Test |
| 3  | Measurement of Impedance Voltage, Short-circuit<br>Impedance and Load Loss | Routine Test |
| 4  | Measurement of On-load Loss and Current Dielectric<br>Tests                | Routine Test |
| 5  | Separate Source Voltage Withstand Test                                     | Routine Test |
| 6  | Induced over Voltage With Stand Test                                       | Routine Test |
| 7  | Temperature Rise Test  | Type Test    |
| 8  | Lightning Impulse Test   | Type Test    |
| 9  | Short Circuit Test   | Special Test |

<sup>\*</sup> These Tests are Carried out in accordance with the Relative IEC 60076 STD





**Partial Discharges Measurement** 



**Lightning Impulse Test** 

# **Appendix 2. Quality Assurance**



# # High Voltage TR(for oil immersed) Testing

- Test Equipment capability: Up to 60MVA 200kV (HAEFELY/DKSH aKOREA)
- First Time to Adopt Frequency Transition Device as 154kV Test Equipment in Korea
- Activation of Auto-calculation & Auto Setting





#### ISO 9001 CERTIFICATE



#### **ISO 14001 CERTIFICATE**





#### **ABS CERTIFICATE**



#### **DNVGL CERTIFICATE**

| Vendor reference:  Purchaser reference:  Particulars of Product The product is intended for Vard:  Vard:  Vard:  Vard No:  Var |   |
|--|---|
| Particulars of Vendor and Purchaser  Vendor: KQC Electric Co., LV Vendor reference: Purchaser: GE ENERGY POWE Purchaser: GE ENERGY POWE Purchaser reference: Particulars of Product The product is intended for Vard: Quewoo Shipbuild Vard No: 3599. Name of vessel: "DEFPWATER PON DIV GL Id No: 33160.  This is to certify that the product: A2 X Ubility Transfor Type designation: TMQ-55000N. Application/context: Lap No. 99.15E-11 Serial/tag no: M1307078-11 to 3 Has been found to comply with relevant requirements in: DIV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27   |   |
| Particulars of Vendor and Purchaser  Vendor: KOC Electric Co. L. Vendor reference: Purchaser: GE ENERGY POWE: Purchaser reference: Particulars of Product The product is intended for Vard: Qsewoo Shipbuild; Jasop. Name of vessel: "DEFEWATER PON DNY GL Id No: 33160  This is to certify that the product: 1a x Utility Transfor Type designation: TMO-95000N. Application/context: Lao No. 961-ET-TI Serial/tag no: M1307078-11 to 3 Has been found to comply with relevant requirements in: DNY Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27   | Certificate No:<br>PUS-1552399-1                                    |
| Vendor: KQC Electric Co. L. Vendor reference: Purchaser: GE ENERGY POWE! Purchaser reference: Particulars of Product The product is intended for Vard: Qaewoo Shipbuild: Vard No: 3509. "DEFEWATER PON Name of vessel: "DEFEWATER PON Name of vessel: "DEFEWATER PON This is to certify that the product: 1 2 k Utility Jeans for Type designation: The product Tag No. 961-EFT: M1307078-11 to 3 Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10) The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27   |   |
| Vendor reference:  Purchaser reference:  Particulars of Product The product is intended for Vard:  Vard:  Vard:  Vard No:  Var |   |
| Purchaser:  GE ENERGY POWE  Purchaser reference:  Particulars of Product  The product is intended for  Vard  Vard No:  3599  DNV GL Id No:  33160  This is to certify  that the product:  Type designation:  Application/context:  Serial/lag no:  M1307078-11 to 3  The product / material has been marked: PUS-1552399-1 or  Issued at Pusan on 2015-04-27   | td.   |
| Particulars of Product The product is intended for Vard:   |   |
| Particulars of Product The product is intended for Vard:  - Queveos Shipbuild Vard No: - 3599  Name of vessel: - "DEEPWATER PON ONV GL Lid No: - 33160  This is to certify that the product: - 3 x Utility Transfor Type designation: - 1M0-95000N 1Ago, 961-ET-TI Serial/tag no: - M1307078-11 to 3 Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or   | CONVERSION  |
| The product is intended for Vard:  Vard:  3599   |   |
| Vard:  Quewpo Shipbuild:  Vard No:  3599  DNS GL Id No:  This is to certify that the product:  Type designation:  Application/context:  Eag.No. 90.151-103  Has been found to comply with relevant requirements in:  DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or  Issued at Pusan on 2015-04-27  |   |
| Vard No:    35.99  |   |
| Name of vessel: "DEFEWATER PON 33160   | ng & Marine Engineering Co., Ltd                                    |
| DNV GL Id No:  This is to certify that the product:  12 x Utility Transfor Thm 55000N Application/context:  Lag No. 961-ET-TI M1307078-11 to 3. Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27  |   |
| This is to certify that the product:  Type designation:  Application/context:  Tag No. 961-EF-TI Serial/tag no:  M1307078-11 to 3  Has been found to comply with relevant requirements in:  DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or  Issued at Pusan on 2015-04-27   | TUS"  |
| that the product:  Type designation:  Type designation:  TMQ-\$50000.  TAB_Ne_90_EE_TI Serial/tag no:  M1307078-11 to 3  Has been found to comply with relevant requirements in:  DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or  Issued at Pusan on 2015-04-27   |   |
| Type designation: TMC-95000M. Application/context: Tag.No. 961-EF-TT Serial/tag no: M1307078-11 to 3  Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27  |   |
| Application/context: Tag No. 961-ET-TI M1307078-11 to 3. Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27   | mer-A (No.1 ~ 3)  |
| Serial/tag no: M1307078-11 to 3  Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27   |   |
| Has been found to comply with relevant requirements in: DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27  This docu   | 1/_П2/_П3   |
| DNV Offshore Service Specifications (2011-10)  The product / material has been marked: PUS-1552399-1 or Issued at Pusan on 2015-04-27  This docu   |   |
| Issued at Pusan on 2015-04-27  |   |
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| The same of the sa | signatures.   |
|  | Choi, Chi Hyun<br>Survevor  |
|  | Sarveyor  |
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|  |   |



#### LR CERTIFICATE



#### **BV CERTIFICATE**





#### **CE CERTIFICATE**

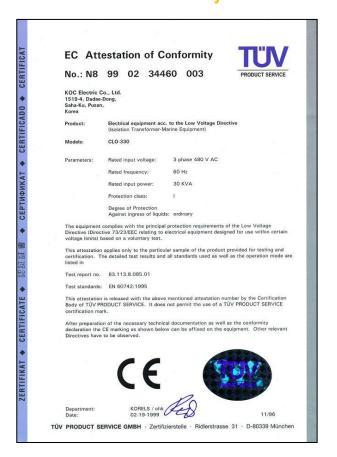


#### RMRS TYPE CERT.





#### EC Attestation of Conformity



# KEPIC CERTIFICATION (For Nuclear power Gen.)







#### **Hazardous Area Oil Immersed TR**



- ATEX Certified By INERIS (Annex VIII Directive 94/9/EC)
- Ex Code: Ex d nA nL IIB T3 (Group II Zone 2)
- Patent registration (Korean Intellectual Property Office)



# # Hazardous Area Dry TR



- Spec. : 480/220V, 15/20/30kVA
- Ex Code : Ex ec IIC T3 Gc (Group II Zone 2 )
- Enclosure : IP66(Water resistant against powerful jets)