



Johnson Controls International, Maritime & Offshore Solutions

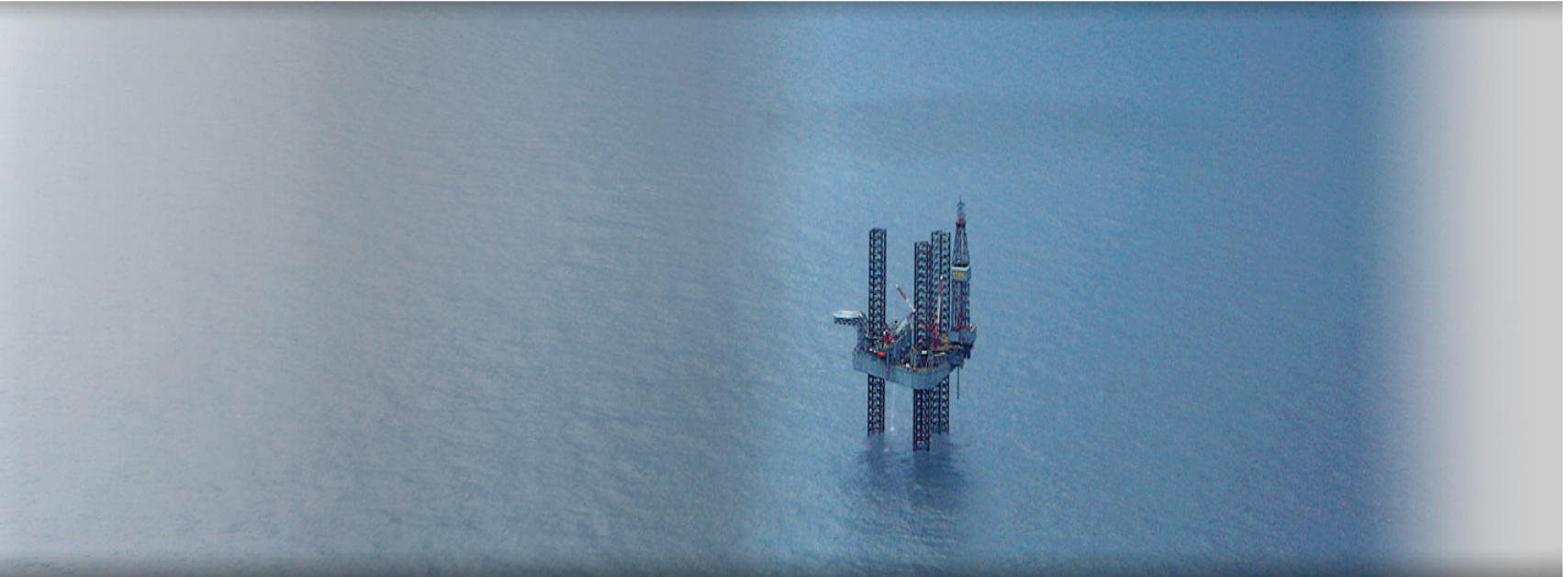
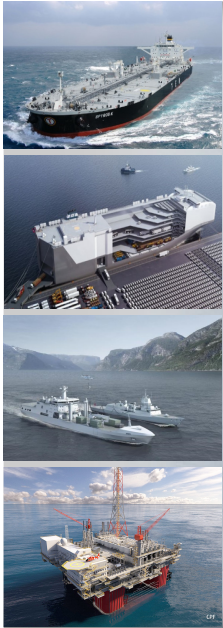
**Maritime & Offshore Solutions,
JCI Asia Introduction**



Updated 05. Feb.'2018

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- ▶ JCI Maritime & Offshore (M&O) Solutions Introduction
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About Johnson Controls International...





Johnson Controls and Tyco Merge

A global industrial leader for safety, security and sustainability

ABOUT THE MERGER

Johnson Controls, a global multi-industrial company, and Tyco, a global fire and security provider, have combined to create Johnson Controls International plc, a global leader in building products and technology, integrated solutions and energy storage.

This merger brings together best-in-class product, technology and service capabilities across controls, fire, security, HVAC, power solutions and energy storage, to serve various end markets including large institutions, commercial buildings, retail, industrial, small business and residential in land and marine & off-shore market.

CREATING A GLOBAL INDUSTRIAL LEADER

Through a Merger of Complementary Businesses

Uniting global leaders uniquely positioned in buildings and energy markets



DISTINCT INDUSTRY EXPERTISE

- Leader in **building technology** and **energy storage**

- Leader in **fire protection, security** and **life safety**



EXPANDS BUILDINGS PORTFOLIO & UNITES INNOVATION PIPELINES

- World-class buildings and automation control technology
- Integrated solutions for smart buildings, campuses and cities
- Value-added services driven by advanced data, analytics and connectivity

- Unique offerings in asset tracking and protection
- Leading innovations in sensing and video technologies
- Advanced analytics-based retail solutions



LINKS COMPLEMENTARY GEOGRAPHIC FOOTPRINTS & OPERATIONAL CAPABILITIES

- Strong presence in North America and Asia
- Unique application knowledge and expertise
- World-class engineering, installation and service capabilities

- Strong presence in North America and Europe
- Distinct design, engineering, installation and service capabilities in fire protection and security



STRONG LEADERSHIP & BALANCED OWNERSHIP

- Johnson Controls shareholders will own 56% of combined company
- Alex Molinaroli will serve as Chairman and CEO
- 6 current directors from Johnson Controls

- Tyco shareholders will own 44% of combined company
- George R. Oliver will serve as President and COO and become the next CEO
- 5 current directors from Tyco



\$30 BILLION IN REVENUE WITH STRONG GROWTH POTENTIAL

The combined company will pair leading businesses with best-in-class product, technology and service capabilities to deliver greater value to customers, shareholders and employees. The company will continue its commitment to innovation and growth in the United States and globally.



117,000 GLOBAL EMPLOYEES

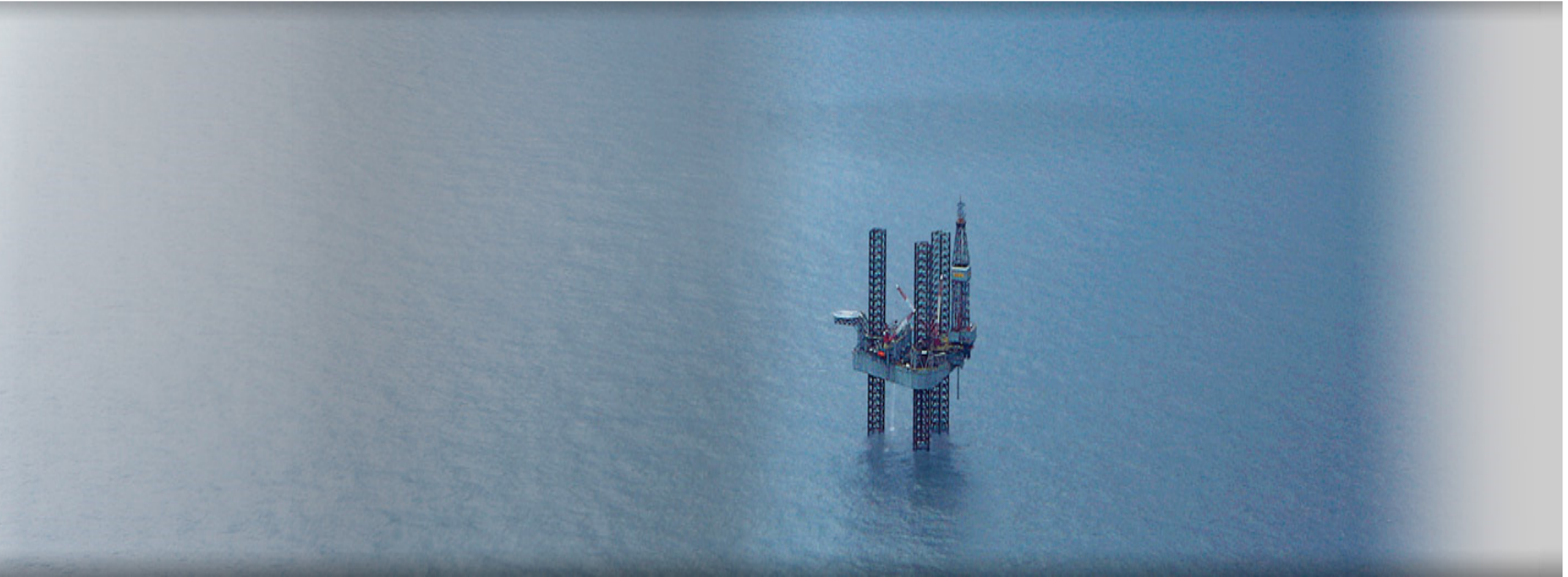
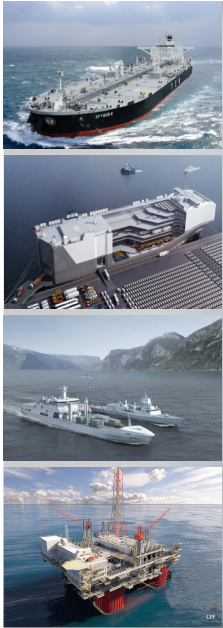
Who We Are Together



Leading Brands Portfolio of Products and Services



#1 in HVAC, Controls, Fire, Security and Power Solutions



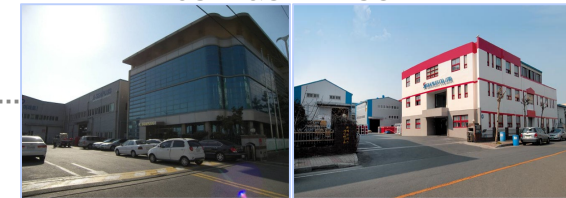
JCI Maritime & Offshore Solutions Introduction



JCI M&O Solutions Asia Introduction



JCI M&O NEA COE



JCI M&O Asia HQ



JCI M&O SEA COE



Introduction – JCI M&O Solutions Korea

Maritime & Offshore Korea



- Marine & Offshore total fire protection system provider for design, manufacturing, installation and service.
- COE (Center of Excellence) in NEA (North East Asia) Business in Korea, Japan and China

Company information

- Address : Johnson Controls, 21,Noksansandan 261-ro
13 beon-gil, Gangseo-gu, Busan, Korea

- Contact : +82 0)51 (Marine) 970 3932 / (Offshore) 899 5304

- Last 3 years revenue Unit ; Mil USD

Description	'2015	'2016	'2017
Revenue	71.9	60.6	32.2

Key References for last 3 years

Delivery time	Shipowner	Shipyard	Type	Class	Supply Item
2014-2016	ENI Goliat	HHI	FPSO	DNV	Deluge, Loose
2015-2017	Inpex Ichthys project	DSME, SHI	CPF, FPSO	DNV	Deluge, Inergen, Foam package, Loose & Life saving equipment
2015-2017	Total EGINA	SHI	FPSO	BV	Deluge, Inergen, Foam package, Loose equipment
2015-2019	Petronas	SHI	LNG FPSO	ABS	Deluge, Inergen, Low&High Foam, Local Water mist, Dry Powder, Loose FF.
2017-2019	ENI Mozambique	SHI	LNG FPSO	LLOYD	Inergen, High Foam, DP, LWM
2018	Odfjel	Hudong Zhonghua	49K Tanker	DNV	CO2, Deck Foam
2018-2019	Maersk Tanker	DSIC	113K Tanker	LR	CO2, Water mist Deck foam
2017-2018	MOL	Imabari	20000TEU Cotainer	ABS & LR	HP CO2
2017-2018	Maersk	DSME	20120TEU Cotainer	ABS	LP CO2

Introduction – JCI M&O Solutions China

Maritime & Offshore China



- Johnson Control Asia HQ in Shanghai, China
- Around 12 branch / agent / distributors national wide in China

Company information

- Address : Johnson Controls, Floor 4B, No. 518-11, North Fuquan Road Changning District, Shanghai, China, 200335

• Contact : (Email) david.yao@jci.com (Call)

- Last 3 years revenue Unit ; Mil USD

Description	'2015	'2016	'2017
Revenue	8.1	4.7	3.5

Key References for last 3 years

Delivery time	Ship owner	Shipyard	Type	Class	Supply Item
2014-2016		COSCO	JU2000E	ABS	FM200, Foam
2015	HODI	ZPMC	400ft Jack Up	ABS	Deluge, Helideck Foam, Mud Tank Foam, Sprinkler, Wet Chemical
2015	COSL	CIMC	Deep sea Semi-Submesible drilling unit	DNV	Novtec1230, Deluge
2015-2017	Beacon Atlantic	CIMC	GM4D	DNV	Fire Detection, Sprinkler, Deluge, Foam, Foam, Dual Agent
2016	KS Drilling	ZPMC	400ft Jack Up	ABS	Fire Detection, Deluge, Helideck Foam, Mud Tank Foam, Sprinkler, Wet Chemical
2016	Royal IHC	Nantong Rainbow Offshore & Engineering Equipment	4000T Heavy Lift vessel	BV	Fire Detection, Novtec1230
2016-2017	Maersk	SWS	JU2000E	ABS	Sprinkler / Deluge / Foam
2016-2018	Maersk	COSCO	3600TEU	LR	CO2

Introduction – JCI M&O Solutions SEA

Maritime & Offshore SEA



- Diverse Team, well trained engineers for Fire Detection, Fire Protection, Gas Suppression, Security & Production Systems
- COE (Center of Excellence) of SEA, business in Singapore, Malaysia, Indonesia, Philippine, Vietnam and India

Company information

• Address : 31, International Business Park, #03-02, Singapore, 609921

• Contact :

• Last 3 years revenue Unit ; Mil USD

Description	'2015	'2016	'2017
Revenue	14.2	11.0	9.7

Key References for last 3 years

Delivery time	Ship owner	Shipyard	Type	Class	Supply Item
2015	Bumi Amada	MMHE Shipyard, Malaysia	E-House	BV ABS / USCG	Inergen 300 Bar, Deluge System Novec 1230
2015	AET Ship management, Singapore	Dry Dock World, Dubai	Modular Capture Vessel	UL / BOMBA	F&G, Alarm Devices, HSSD, Inergen 300Bar, Fire Fighting Equipment
2016	Royal Malaysia Navy	Boustead Naval Shipyard, Malaysia	Littoral Combat Vessel	BV	Novec 1230, CO2, Foam, Twin Agent, Fire Detection
2016	EnQuest / Bumi Armada Berhad	Keppel Shipyard, Singapore	FPSO	DNV	Inergen 300Bar, AFDS, Manual Alarm Call points & Field Devices
2017	Maersk Oil UK	Sembcorp, Singapore	Platform	DNV	Inergen 300Bar, Wet Chemical, Chemical Injection Unit
2017	Republic of Singapore Coast Guard	Brani Yard, Singapore	Patrol Boat	ABS	AFDS

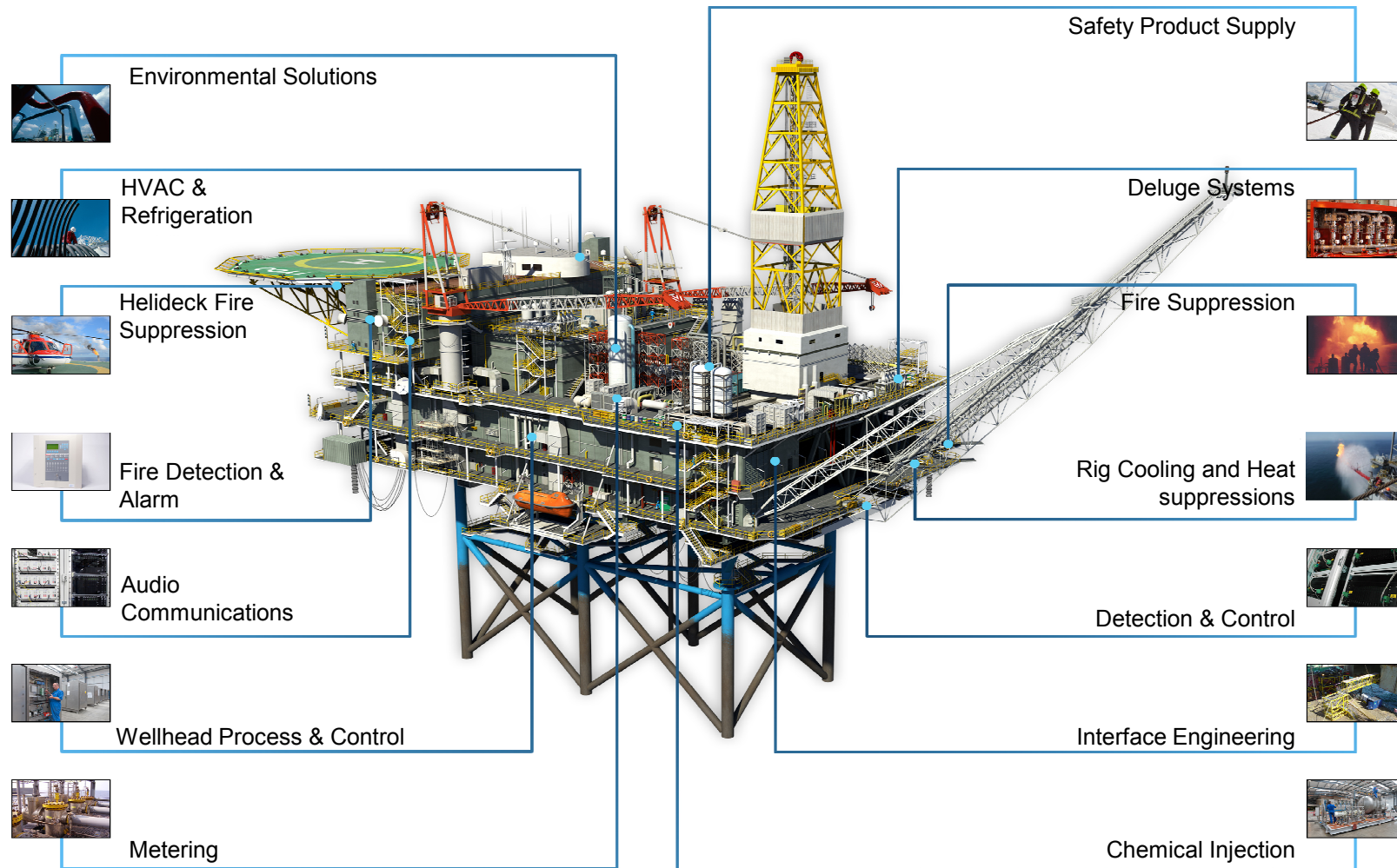
JCI M&O Solutions Market Leading Brand

Specialists in Fire, Security & Life Safety from ship to shore

We have one of the most extensive fire, life safety and security solutions portfolio in the world with the most recognized brands in the marketplace

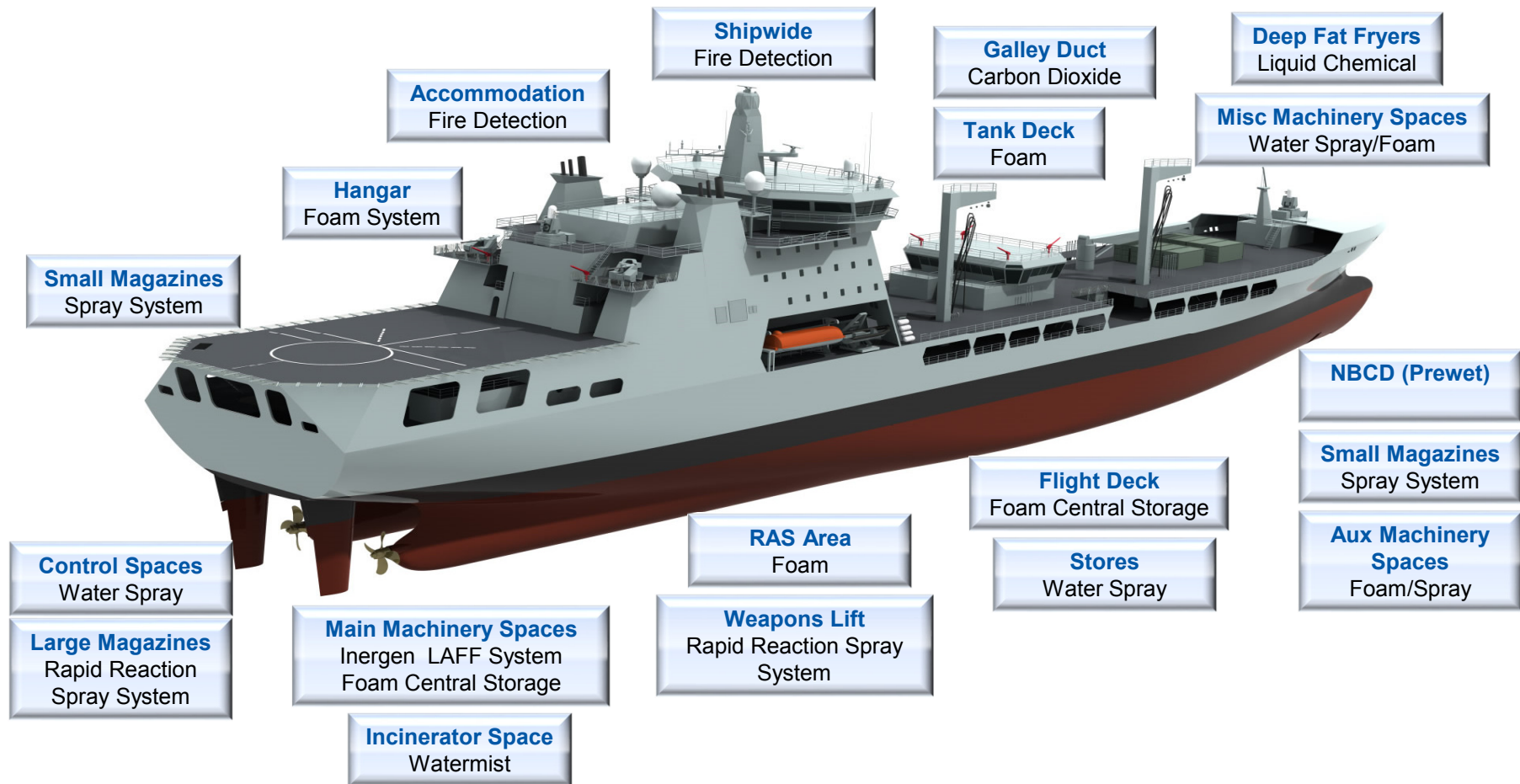


JCI M&O Integrated Services for Oil & Gas Assets

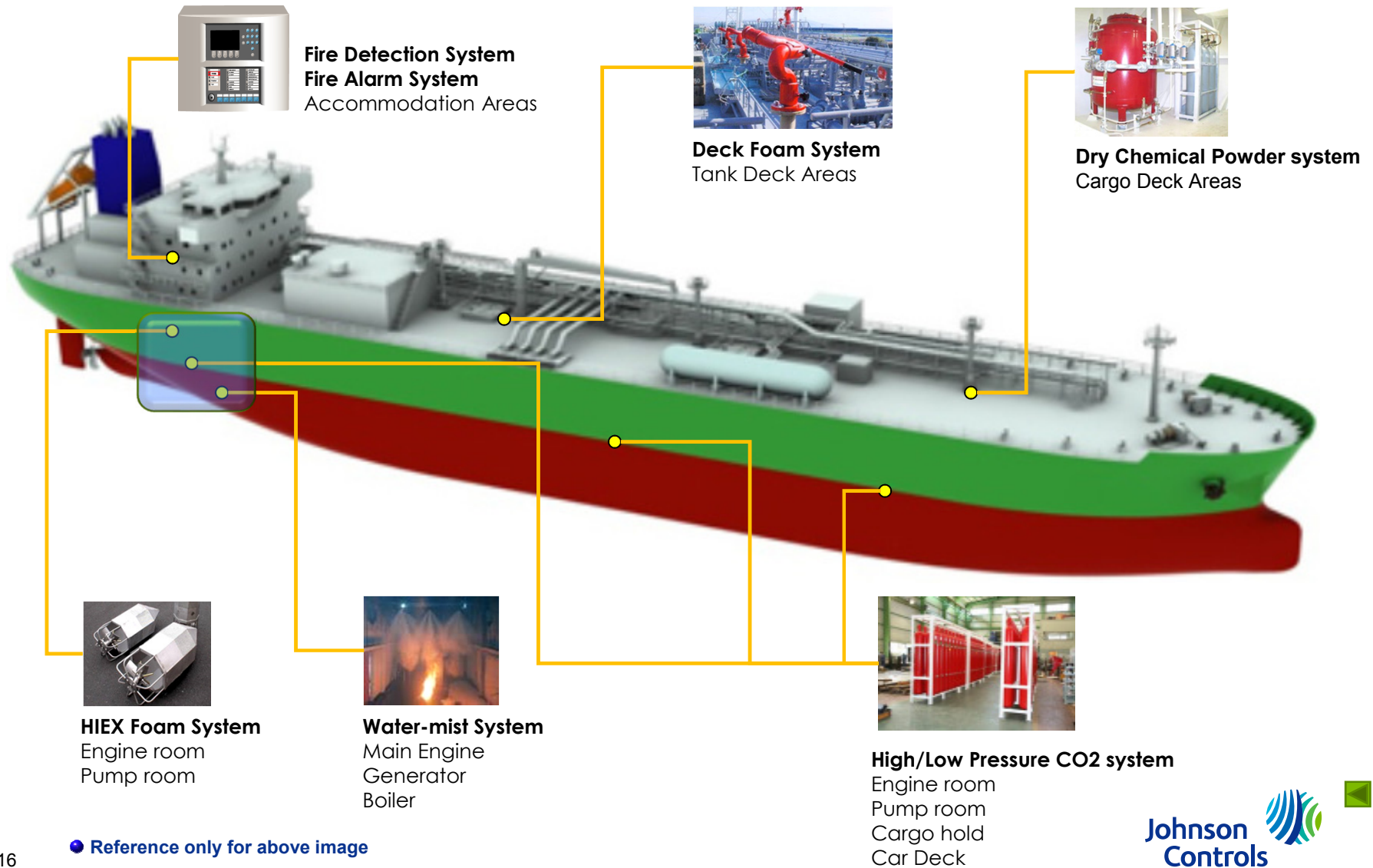


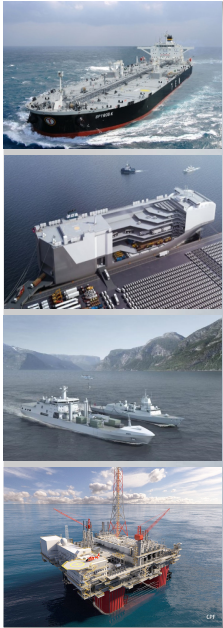
Total capability from One source
Servicing mature assets

JCI M&O Integrated Services for Navy



JCI M&O Integrated Services for Commercial Vessels

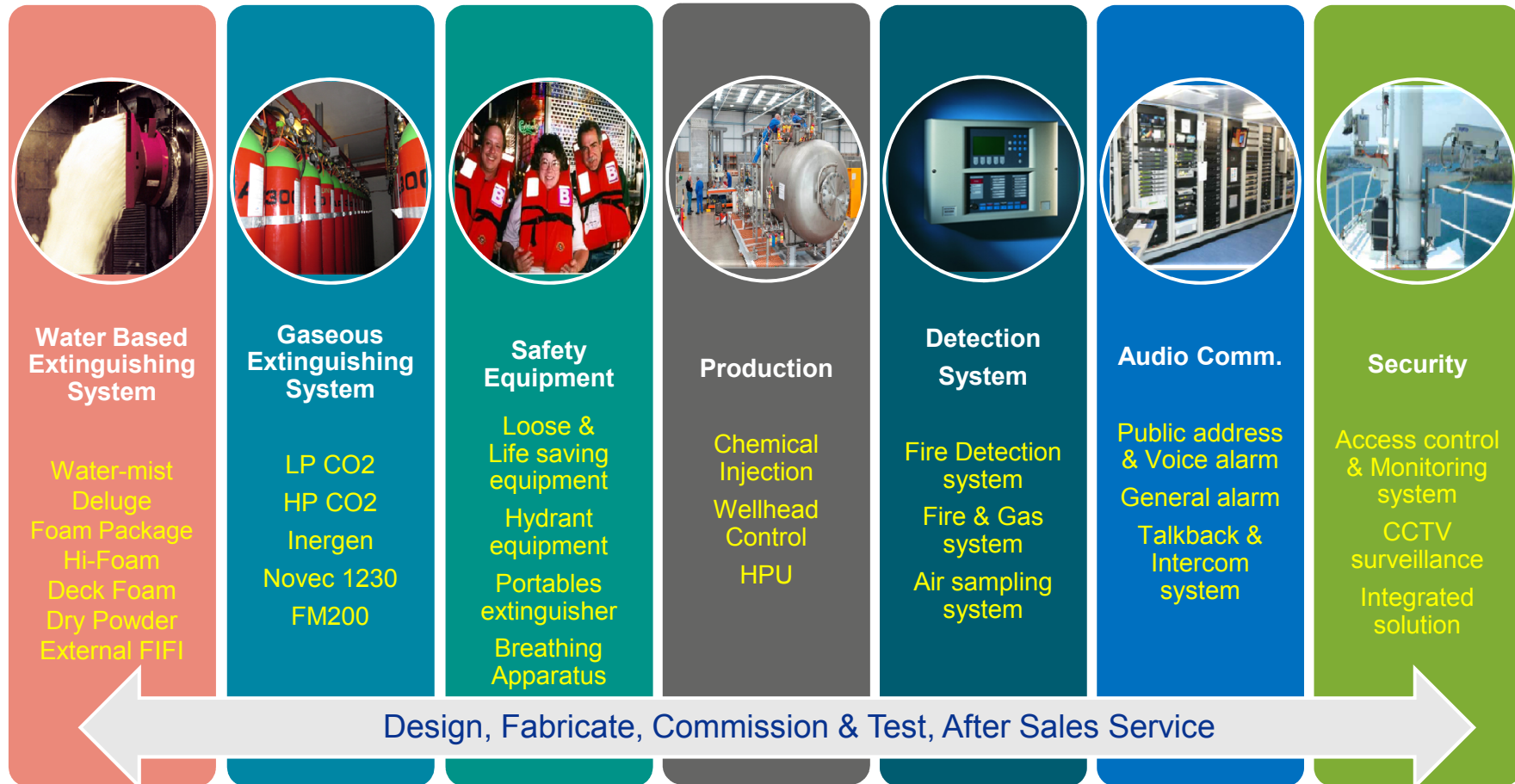




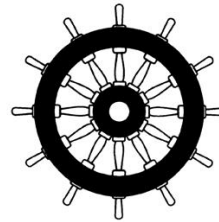
Product & System Portfolio



Product & System Portfolio



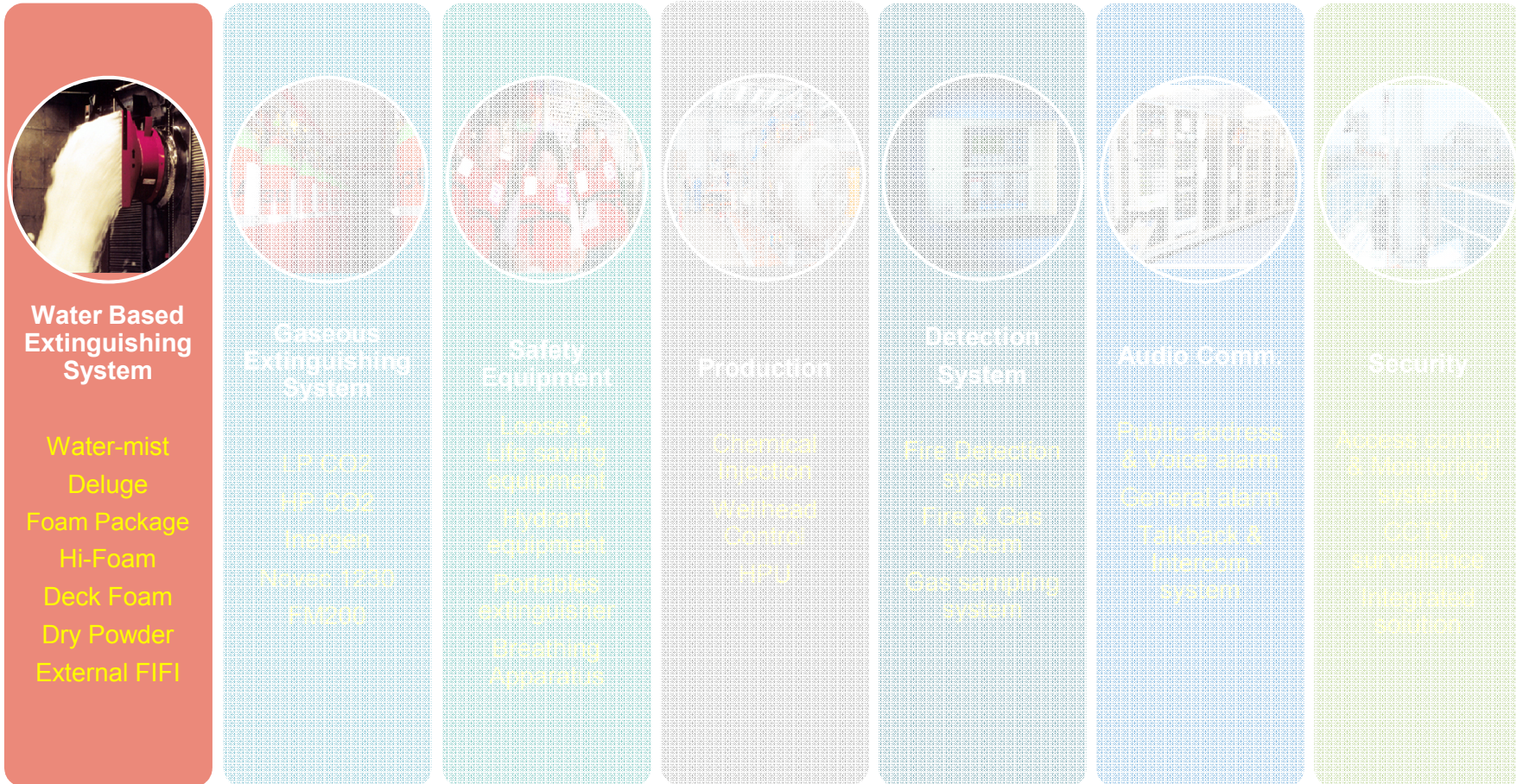
JCI M&O Solutions that comply with



- British Royal Navy Ministry of Defense
- The Royal Australian Navy
- Royal Netherlands Navy
- Indian Navy
- NATO (North Atlantic Treaty Organization)



Water based Extinguishing System



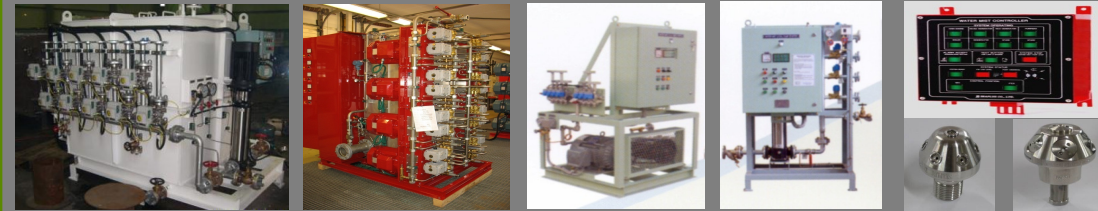
Water Based Extinguishing System

Key Word

- Operating Pressure
- Local / total flooding
- Fog Nozzle

Water-mist System

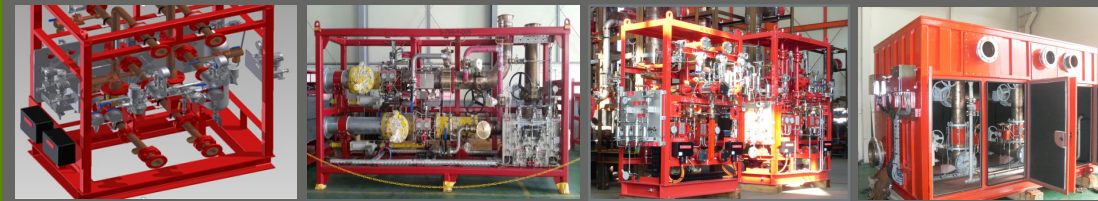
- High & low Pressure
- Machinery Space
- Main Engine, Boiler, Generator



- ✓ Various material
- ✓ Fast opening

Deluge System

- Process Area



- Regulating
- Foam tank
- Foam Package, Hi / Low and Heli deck Foam

Foam System

- Machinery Space
- Engine Room
- Cargo Pump Room
- Deck, Heli Deck Area



- ✓ LNG / LPG
- ✓ Chemical Agent

Dry-Powder System

- Process Area
- Cargo Deck Area



- Pump & Gear Box
- Water Monitor
- Remote Control

External Fire Fighting

- Deck Area



Local Water-Mist System

General

Water mist system is to suppress and fight all fires in protected areas. In this fire extinguishing system, water is sprayed in high or low pressure to make small water droplets.

Water mist is sprayed into flame so that to promote vaporization and decrease in oxygen concentration as suffocation.

Application area

Main Engine, Generator, Purifier, Incinerator, Boiler

Regulation

1. **SOLAS regulation II-2/10 - Fire Fighting**
2. **FSS code** (International Code for Fire Safety Systems) - Chapter 5.2.5 Equivalent fixed gas fire-extinguishing systems for machinery spaces and cargo pump-rooms
3. **IMO MSC/Circ. 1165**
(Revised guidelines for the approval of equipment water-based fire-extinguishing systems for machinery spaces and cargo pump-rooms)
4. **IEC 60945** (Maritime navigation and radio communication equipment and systems)

Class Approval Certificates

MED, LR, ABS, DNV-GL, BV, CCS, NK, KR, KG, RINA, CE



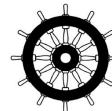
(Low Pressure)

Local Water-mist Package

(High Pressure)



Pump Room
Engine Room
Machinery Space
Engine/Generator/Boiler



Lloyd's Register

ABS
AMERICAN BUREAU OF SHIPPING & AFFILIATED COMPANIES

DNV-GL

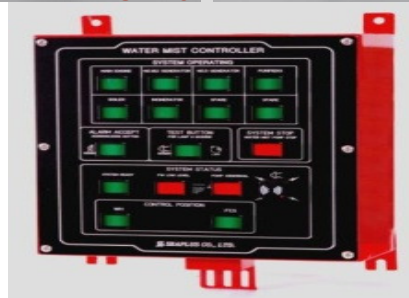


KR
KOREAN REGISTER



Johnson Controls

Local Water-Mist System



Water-mist Controller



Pump Unit
(High Pressure Type)

Pump Unit
(Low Pressure Type)

Application area

Main engine, Generator, Purifier, Incinerator, Boiler etc.

Deluge Valve Skid

General

Deluge Valve is known as a system control valve in a deluge system, used for fast application of water in a spray system. *Deluge valve* protects areas such as power transformer installation, storage tank, conveyor protection and other industrial application etc. With the addition of foaming agent they do protect aircraft hanger. Fast Opening time

Application area

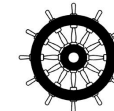
Top & Hull Process Facility Area



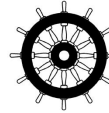
Deluge Valve Skid

Class Approval Certificates

UL, VdS, Ghost, ABS, Lloyds, DNV-GL, BV, MED



Deluge Valve Skid



Deluge valve(Inbal)



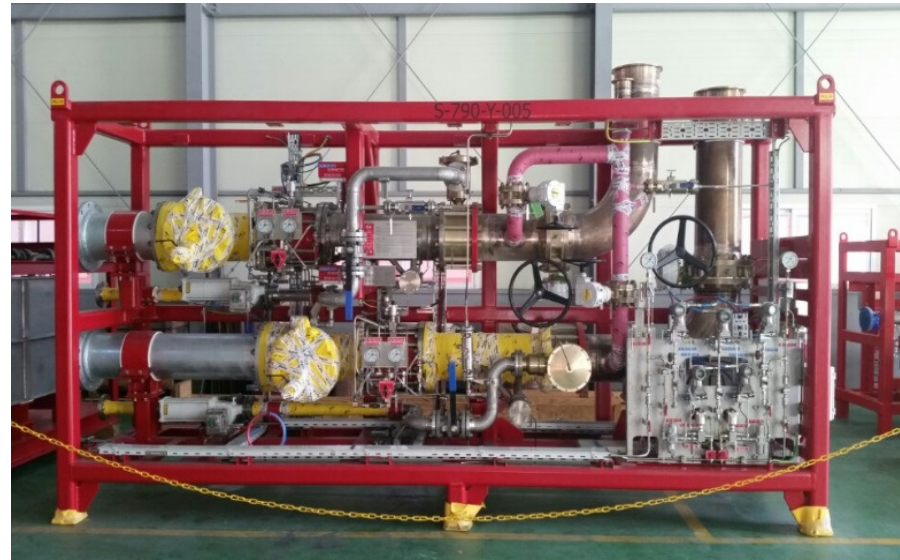
Deluge valve (Claval)
Globe type



Butterfly valve



Foam Proportioner



Deluge Valve Skid (Titanium valve and Pipe) for Inpex project

Application area

Top & Hull Process Facility Area

Foam Package System

General

Fire suppression foam is comprised of three parts: foam concentrate, water, and air. When mixed correctly, these parts form a homogeneous foam blanket that extinguishes flames by the combined mechanisms of cooling, separating the flame source from the product surface, suppressing vapors, and smothering. This makes foam suppression systems an effective option for protecting flammable and combustible liquids.

Application area

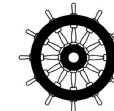
Upper Deck Area, Cargo Deck Area, Helideck Area



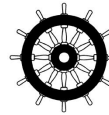
Foam Package Skid

Class Approval Certificates

UL, VdS, Ghost, Lloyds, ABS, DNV-GL, BV, MED



Foam Package System



Foam Liquid 3%



Ball Valve(SRI)



Pump & Motor



Instrument Board



Foam Tank (110m³) for Egina FPSO

Application area

Upper Deck Area, Cargo Deck Area, Helideck Area

High Expansion Foam System

General

High expansion foam system is applied for total flooding system of engine and pump room as alternative system for Halon & CO2 extinguishing system. As halon & CO2 system will be phased out due to global warming restriction, this system could be one of ideal substitution.

Application area

Engine Room & Pump Room & etc.

Regulation

1. SOLAS regulation II-2/10 - Fire Fighting
2. FSS code (International Code for Fire Safety Systems) - Chapter 6: Fixed high expansion foam systems
3. IMO MSC.1/Circ. 1384 (Dec. 2010) – Fire Test Standard
4. IMO MSC/Circ. 1165 (June, 2005) – Environment Test for foam generator
5. EN 1365-1 (2003) – Environment Test for foam generator
6. IMO MSC/Circ.670 (1994) – Foam concentrate test

Class Approval Certificates

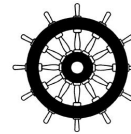
MED, ABS, LR, DNV-GL, KR, BV, NK, CCS, RINA



LNG Carrier



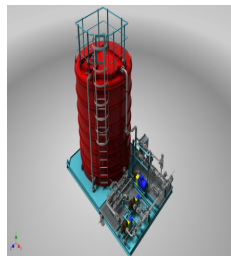
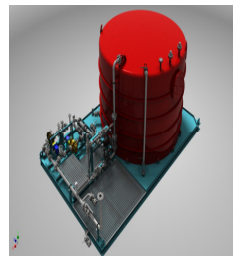
High Expansion Foam System



Foam Generator
SPF-25 / 50 / 100



Foam Pump Skid



Foam Pump Skid
3D Modeling



Fire extinguishing test

Application area

Engine Room, Pump Room & etc.

Deck Foam System

General

Foam system is used for the protection of chemical and oil tank decks or heli-decks in accordance with class requirements and IBC code.

The foam monitors may be delivered as manually operated . (electric or hydraulic type)

Application area

Chemical and Oil Tank Deck, Heli-deck areas

Regulation

1. **SOLAS regulation II-2/10 - Fire Fighting**
2. **FSS code** (International Code for Fire Safety Systems) - Chapter 14: Fixed deck foam systems
3. **IMO MSC.1/Circ. 1312**
(Revised guidelines for the performance and testing criteria, and surveys of foam concentrates for fixed fire-extinguishing systems)



Chemical tanker

Class Approval Certificates

RINA, NK, KR



Deck Foam System



Helidack Foam Skid
: Helicopter Deck



Foam Monitor



Proportioner



Deck Foam Unit

Application area
Tank Deck areas

Dry-Chemical Powder System

General

Dry powder system is designed specifically for marine application so that can be met with SOLAS requirements for LPG and LNG tankers.

Application area

Cargo Deck for gas tankers



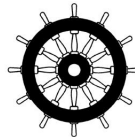
LNG Carrier

Regulation

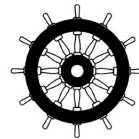
1. **SOLAS regulation II-2/1.6.2 - Application of Requirements for Tankers**
2. **IGC Code** (International Code for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk)
3. **IMO MSC.1/Circ. 1315**
(Guidelines for the approval of fixed dry chemical powder fire-extinguishing systems for the protection of ships carrying liquefied gases in bulk)
4. **DNV F-AMC** Duration time 60 sec.
5. **EN 615** (Fire extinguishing media – Specifications for powders)

Class Approval Certificates

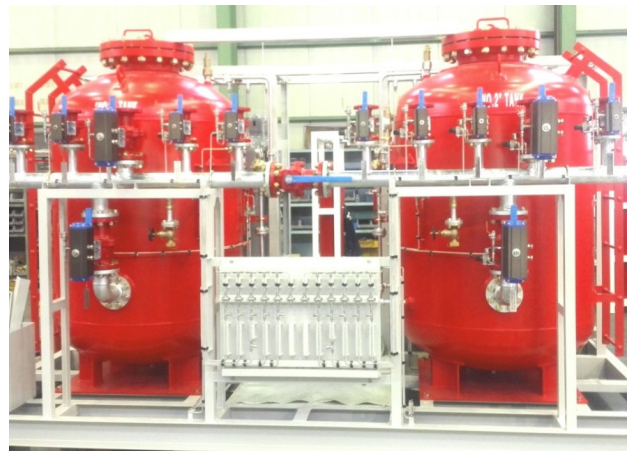
- **New product world #1 largest size**
MED, LR, DNV-GL, BV, NK



Dry-Chemical Powder System



Hand Hose Cabinet



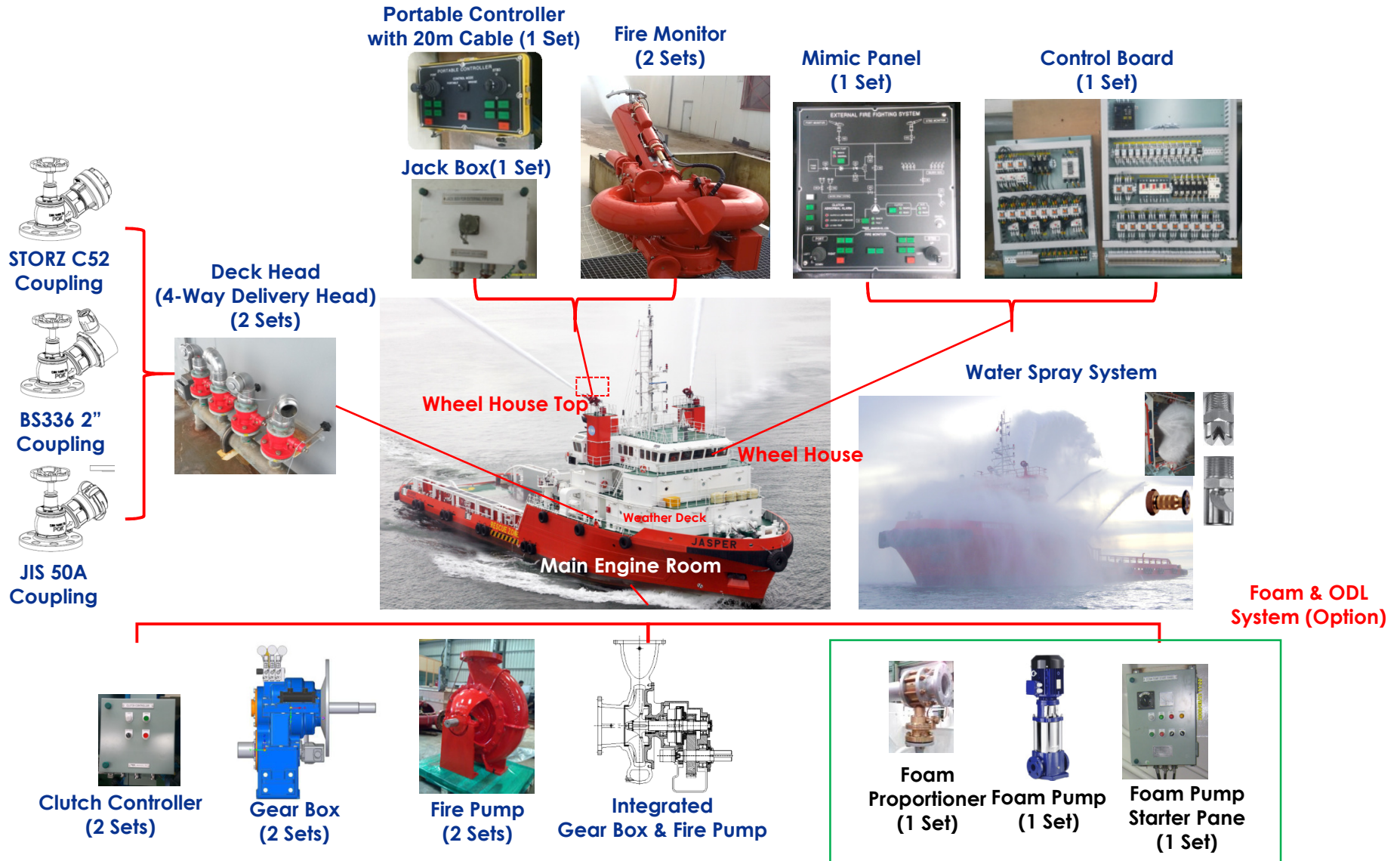
Tank Unit



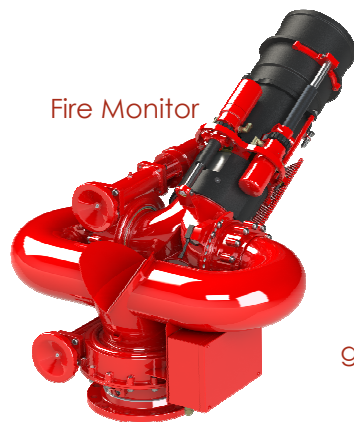
N2 Cylinder

Description	NEW	Improvements
TANK size	Max. 3,250 liter	Largest tank size over the world until now (Mar. 2018)
Capacity scope	200L/260L/400L/750L/960L/1290L/1530L/1830L/1970L/2170L/2490L/2540L/2750L/3000L/3250L	Available various tank capacity requirements from ship owners (small to large)
Temperature	Up to -20 °C	Able to apply ships navigating cold area
Monitor	10Kg/s, 12.5Kg/s, 16kg/s, 20Kg/s, 25Kg/s	<ul style="list-style-type: none"> Generally 45 sec discharge (DNV F_AMC only for 60 sec.) Provide extra allowance +5%
Hose Gun	3.5Kg/s	

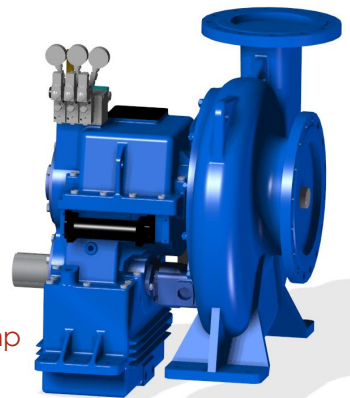
External Fire Fighting System



External Fire Fighting System



Fire Monitor



Integrated gearbox-pump



**A new compact
INTEGRATED gearbox-pump**

co-produced by L-Tyco & KUMERA
with its renowned quality in marine
transmission systems

Application area
Other vessels

Gaseous Extinguishing System



Gaseous Extinguishing System

Key Word

- PCTC (Ro-Ro)
- Super-Ultra Container
- Release by 1/3

- ✓ Cost efficiency
- ✓ Rapid effect

- Clean
- Safe
- Inert-gas
- 300 bar
- Excellent

- ✓ Clean
- ✓ Safe
- ✓ 15 bar
- ✓ Compact
- ✓ Excellent

LP CO2 System

- Main Engine, Pump Room
- Cargo Hold, Car Deck



HP CO2 System

- Main Engine, Pump Room
- Cargo Hold, Car Deck



INERGEN System

- Control Room
- Cargo Pump Room



NOVEC System

- Control Room
- Cargo Pump Room



FM-200 System

- Control Room
- Cargo Pump Room



Properties	INERGEN	NOVEC	FM200
ODP (Ozone Depletion Potential)	0.0	0.0	0.0
GWP (Global Warming Potential-IPCC2)	0.0	1	3220
ALT (Atmospheric Lifetime (Years))	0.0	0.014 (5days)	34.2 (33.5 Y)

LP CO2 System

General

Low pressure CO2 tank unit is furnished with its own refrigeration machinery to keep the temperature and also to adjust the pressure at the correct level.

The system is designed and installed so that CO2 gas can be discharged into relevant protected area using control cabinet.

Application area

Engine Room, Pump Room, Cargo Hold, etc.



Engine room

Regulation

1. SOLAS regulation II-2/10 - Fire Fighting
2. FSS code (International Code for Fire Safety Systems) - Chapter 5: Fixed gas fire-extinguishing systems

Class Approval Certificates

BV, CCS, KR, CE



LP CO2 System



Control Panel



Refrigerating unit

*Newly developed
in compliance with...*

- SOLAS II-2/10: Fire Fighting- IMO Res. MSC. 339(91)
- FSS Code chapter 5: Fixed gas Fire extinguishing system

Application area

Engine Room, Emergency Room, Cargo Hold, etc.

HP CO2 System

General

Carbon Dioxide(CO2) Gas, the fastest and most efficient extinguishing agent against fires in protected spaces, suffocates the fire within designated time and minimize the damage in protected spaces.

Application area

Engine Room, Pump Room, Cargo Hold, etc.



CO2 room

Regulation

1. SOLAS regulation II-2/10 - Fire Fighting
2. FSS code (International Code for Fire Safety Systems) - Chapter 5: Fixed gas fire-extinguishing systems

Class Approval Certificates

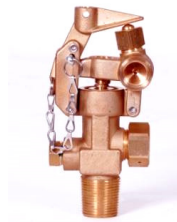
DNV-GL, CCS and LR, BV, ABS, NK, RINA, KG, KR, CE



HP CO2 System



MCC



Cylinder V/V



BCC



POD V/V



Cylinder Rack Unit

Application area

Engine Room, Pump Room, Cargo Hold, etc.

Inergen System

General

INERGEN® is a mixture of 52% Nitrogen, 40% Argon and 8% CO₂. This discharge mixture makes INERGEN® singularly unique. No other inert gas has the unique ability to rapidly extinguish a fire yet at the same time provide a safe environment for any person within the occupied area by actually decreasing cardiac distress and maintaining arterial blood oxygenation and mental performance in low oxygen levels.

Application area

Electric & Instrument room, Machinery space, Control room



Inergen (300bar)

Class Approval Certificates

UL, VdS, Ghost, Lloyds, ABS, DNV-GL, BV



Inergen System



Inergen Cylinder



Pressure Gauge and Manifold



Pilot Cabinet



Nozzle



Inergen Skid (300bar)

Application area

Electric & Instrument room, Machinery space, Control room

Novec1230 System

General

Novec 1230, C6F12O, (3M Novec 1230) fluid is a low global warming potential Halon replacement for use as a gaseous fire suppression agent. Novec 1230 is manufactured by 3M. It is generally used in situations where water from a fire sprinkler would damage expensive equipment or where water-based fire protection is impractical, such as Electric & Instrument room, Machinery space, Control room.



Application area

Electric & Instrument room, Machinery space, Control room

Class Approval Certificates

UL, VdS, Ghost, Lloyds, ABS, DNV-GL, BV



Novec1230 System



Novec 1230



Nozzle



Novec1230 Cylinder

Engineered to save space



Halon

NOVEC
1230

CO2

Inert Gas

Application area

Electric & Instrument room, Machinery space, Control room

Safety Equipment and Production



Safety Equipment



- Fire Fighting Equipment
 - Fire fighters equipment (Hydrant, Fire hose, Hose reel, Fire Monitor, Water Nozzle, Fire man outfit, etc.)
 - Fire Extinguishers
- Life Saving equipment
 - EEBD, CABA, SCBA
 - First Aid Kit
 - LV, JV Rescue Kit
 - Chemical Spillage Kit



Well Head Control Panels (WHCP)



- Provides hydraulic, pneumatic and/or electrical operator interface and ESD to wellhead valves and chokes (SCSSV,SSV,WSV, etc.). Responds to monitored wellhead pressures and other process conditions.



Hydraulic Power Units (HPU)



- Create hydraulic pressure head used to control valves, and drilling equipment.



Chemical Injection Packages (CIP)



- Perform from topside or surface mounted skids - injection and storage of chemical agents and/or hydrate inhibitors into the well stream to enhance production.

Electrical System and Devices

Key Word

- F&G System
- System Integration
- Smoke Sampling System

Fire Detection System



- ✓ PAGA (Public Address General Alarm)
- ✓ Intercom

Audio Communication System



- Access Control
- CCTV
- System Integration

Security System



Fire Detection System

General

Fire detection system is used for automatic monitoring of temperature and smoke concentration in the protected area and provide early warning of the fire alarm in accordance with class requirements and FFS code.

Application area

Vessel & offshore accommodation area & engine room



RO-RO Vessel

Regulation

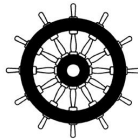
1. SOLAS Chapter II-2 PART C 7 Detection and alarm
2. FFS CODE Chapter 9 - Fixed Fire Detection and Fire Alarm Systems
3. IMO MSC+311(88) MSC.339(91)

Class Approval Certificates

MED, NK, RINA classes



Fire Detection System



T1200 conventional system



T2000 addressable system



Point Type Detectors

Sounders, Beacons, Bells

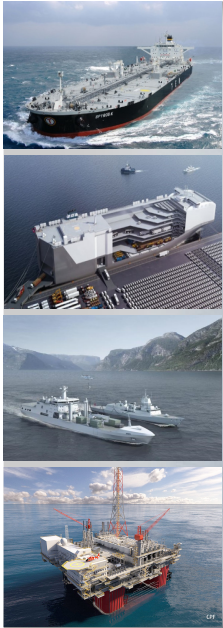


Call points

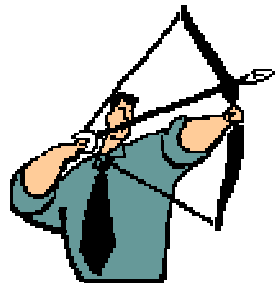


Flame Detectors

Application area
Accommodation & Engine room



Why JCI M&O.....



Maximize Customer Satisfaction

Total Solution Provider

Integrated Solutions & Services



Fire Detection



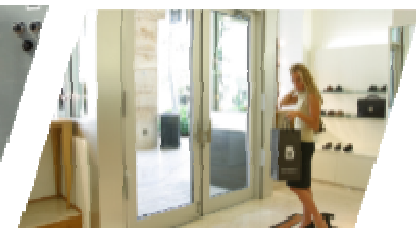
F&G System



Fire Protection



Life safety



Security

Lead Product Innovation

Package System Single Source Provider

Worldwide Service Network

True 24/7 and experienced technical support

With more than 18,000 equipment installations world-wide, our customer base includes more than 20% of all ocean going vessels



▪ Asia

- China
- Hong Kong
- Korea
- Singapore
- Japan
- Taiwan
- Philippines
- Vietnam
- Malaysia
- India
- Thailand
- Indonesia

▪ Europe

- France
- Germany
- Holland
- Italy
- Norway
- United Kingdom

▪ Pacific

- Australia
- New Zealand

▪ America

- USA
- Caribbean
- Chile

Engineering Capability - Offshore

- ✓ Fuels-In-Depth
- ✓ 3-Dimensional Fires
- ✓ Vapor Air Explosions
- ✓ BLEVEs (Boiling Liquid Expanding Vapor Explosion)
- ✓ Seal Fire
- ✓ Running Fuel Fires
- ✓ Thin Skinned Fires

- ✓ Hydrocarbons
- ✓ Polar Solvents



Oil and gas offshore facilities including drilling, refinery/gas process, storage and transfer from FPSO mooring represent significant fire risk. A Fire event in the offshore areas can be difficult to manage and can become rapidly uncontrollable. Robust automated systems are ideal given the limited accessibility and frequently high volume of flammable liquids/gas.

Recommended Equipment

- Fire detection & alarm system
- Deluge valve skids
- Foam package system
- High expansion foam system
- Deck foam system
- Inergen system
- Helideck fire fighting system
- Loose & Life saving equipment
- F&G system

Engineering Capability - Vessel

- ✓Thin Skinned fire
- ✓3-Dimensional fire
- ✓Pool & jet fire
- ✓Vapor Explosion

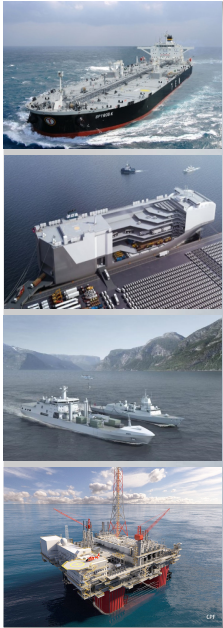
- ✓Hydrocarbon
- ✓Polar Solvent



Fire hazards include hydro carbon fire of machinery spaces such as engine room, pump room, cargo hold as well as gas fire on deck of gas carriers.

Recommended Equipment

- Fire detection & alarm system
- HP/LP CO2 fire fighting system
- Local water mist system
- Deck foam system
- High expansion foam System
- Dry chemical powder system
- Clean agent system (Inergen, Novec, FM200)
- Automatic sprinkler system
- EEBD, SCBA, CABA
- Portable fire extinguishers



References



JCI M&O References for Offshore Project

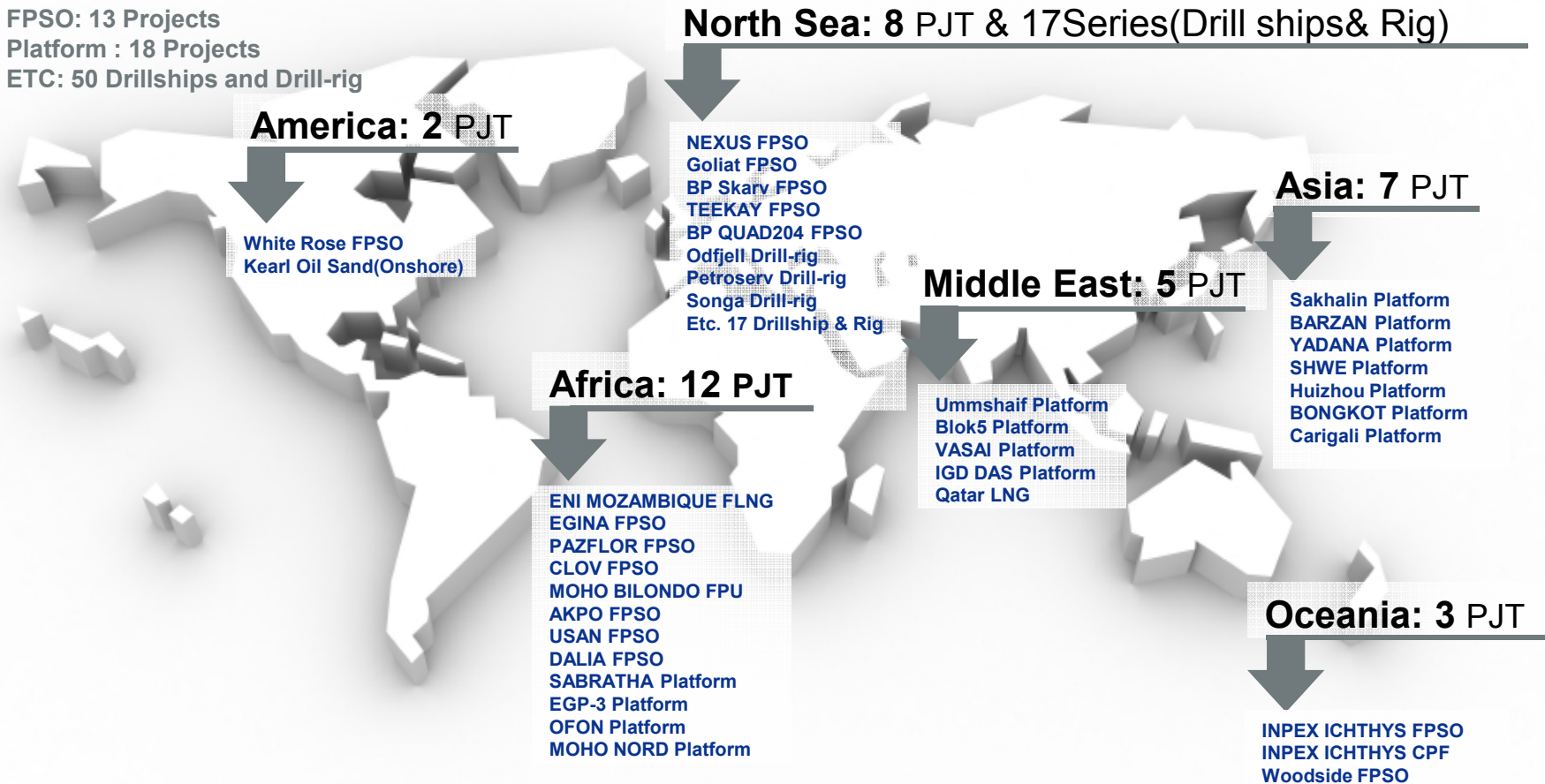


This prestigious qualification assures the quality of services and systems for oil companies operating in Europe.

JCI M&O References for Offshore Project

TOTAL: 44 PROJECTS

FPSO: 13 Projects
 Platform : 18 Projects
 ETC: 50 Drillships and Drill-rig



● Updated 2016Y sail away from 2006Y

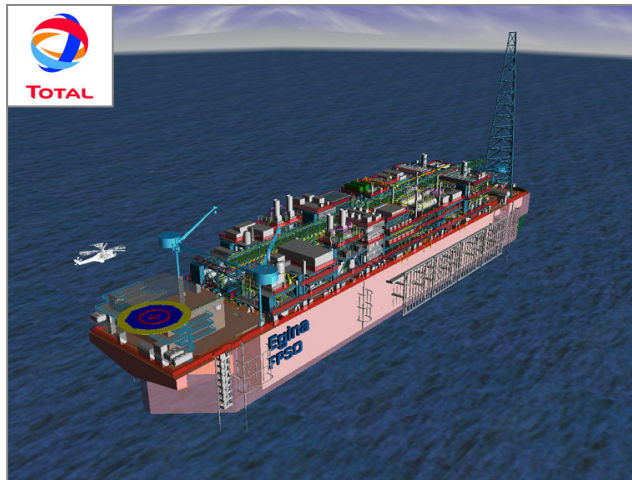
JCI M&O References



Project: ENI GOLIAT FPSO

Ship Owner: ENI
 Ship yard: Hyundai Heavy Industries Co., Ltd. (HHI)
 Ship type: FPSO [Floating Production Storage Offloading]
 Location: North Sea
 Contract date :March. '2011
 Estimated hand over date: '2017 ~

JCI M&O KR	1. Deluge System	2. Fixed Fire Fighting System
Supplied Item	3. Portable Fire Fighting System	4. Life Saving Equipment



Project: TOTAL EGINA FPSO

Ship Owner: TOTAL
 Ship yard: Samsung Heavy Industries, Co., Ltd. (SHI)
 Ship type: FPSO [Floating Production Storage Offloading]
 Location: Nigeria Lagos
 Contract date : October. '2014
 Estimated hand over date: '2017 ~

JCI M&O KR	1. INERGEN System	2. Deluge System
Supplied Item	3. Foam Package System	4. Fixed Fire Fighting System

JCI M&O References



Project: INPEX ICHTHYS FPSO

Ship Owner: INPEX

Ship yard: Daewoo Shipbuilding & Marine Engineering, Co., Ltd. (DSME)

Ship type: FPSO [Floating Production Storage Offloading]

Location: Browse Basin, offshore Western Australia

Contract date : March. '2013

Estimated hand over date: Middle of '2017

JCI M&O KR Supplied Item	1. INERGEN System	2. Deluge System
	3. Foam Package System	4. Helideck Foam System
	5. Life Saving Equipment	6. Fixed Fire Fighting System.
	7. Portable Fire Fighting System	



Project: INPEX ICHTHYS CPF

Ship Owner: INPEX

Ship yard: Samsung Heavy Industries, Co., Ltd. (SHI)

Ship type: CPF [Floating Central Processing Facility]

Location: Browse Basin, offshore Western Australia

Contract date : March. '2013

Estimated hand over date: Middle of '2017

JCI M&O KR Supplied Item	1. INERGEN System	2. Deluge System
	3. Foam Package System	4. Helideck Foam System
	5. Fire Detection System	6. Life Saving Equipment
	7. Fixed Fire Fighting System	8. Portable Fire Fighting System

JCI M&O References



Project: PETRONAS FLOATING LNG 1
 Ship Owner: **PETRONAS**
 Ship yard: **Daewoo Shipbuilding & Marine Engineering, Co., Ltd. (DSME)**
 Ship type: **FLNG [Floating Liquefied Natural Gas]**
 Location: **Malaysia**
 Contract date : **March. '2013**
 Estimated hand over date: **March. '2016**

- | | | |
|-----------------------------|-------------------------------|----------------------------------|
| JCI M&O KR
Supplied Item | 1. INERGEN System | 2. Water-Mist System |
| | 3. Foam Package System | 4. Helideck Foam System |
| | 5. Fixed Fire Fighting System | 6. Portable Fire Fighting System |



Project: PETRONAS FLOATING LNG 2
 Ship Owner: **PETRONAS**
 Ship yard: **Samsung Heavy Industries, Co., Ltd. (SHI)**
 Ship type: **FLNG [Floating Liquefied Natural Gas]**
 Location: **Malaysia**
 Contract date : **July. '2014**
 Estimated hand over date: **'2017 ~**

- | | | |
|-----------------------------|-------------------------------|----------------------------------|
| JCI M&O KR
Supplied Item | 1. INERGEN System | 2. Deluge System |
| | 3. Foam Package System | 4. Helideck Foam System |
| | 5. Fire Detection System | 6. Life Saving Equipment |
| | 7. Fixed Fire Fighting System | 8. Portable Fire Fighting System |

JCI M&O References



Project: MOHO NORD FPU, TLP
 Ship Owner: TOTAL
 Ship yard: Hyundai Heavy Industries Co., Ltd. (HHI)
 Ship type: TLP [Tension Leg Platform] / FPU [Floating Product Unit]
 Location: Congo Offshore
 Contract date : March. '2013 / October. '2014
 Estimated hand over date: Middle of '2017

JCI M&O KR Supplied Item	1. Inergen System	2. Fixed Fire Fighting Equipment
	3. Portable Fire Fighting System	
	1. CO2 System	2. Water-Mist System
	3. Deluge System	4. Fixed Fire Fighting System
	6. Portable Fire Fighting System	



Project: DOMESTIC SUPPLY OBLIGATION PLATFORM
 Ship Owner: CHEVRON
 Ship yard: Hyundai Heavy Industries Co., Ltd. (HHI)
 Ship type: Platform
 Location: Nige
 Contract date : March. '2013
 Estimated hand over date: '2016 ~

JCI M&O KR Supplied Item	1. CO2 Snuffing	2. Deluge System
	3. Fixed Fire Fighting System	4.. Portable Fire Fighting System

JCI M&O References



Project: BP QUAD 204 FPSO
Ship Owner: BP
Ship yard: Hyundai Heavy Industries Co., Ltd. (HHI)
Ship type: FPSO [Floating Production Storage Offloading]
Location: North sea
Contract date : March. '2012
Estimated hand over date: '2016 ~

- | | | |
|-----------------------------|------------------|-------------------------------|
| JCI M&O KR
Supplied Item | 1. Deluge System | 2. Fixed Fire Fighting System |
|-----------------------------|------------------|-------------------------------|



Project: TOTAL USAN FPSO
Ship Owner: TOTAL
Ship yard: Hyundai Heavy Industries Co., Ltd. (HHI)
Ship type: FPSO [Floating Production Storage Offloading]
Location: Nigeria Offshore
Contract date : 2010Y October.
Estimated hand over date: '2014 ~

- | | | |
|-----------------------------|--|--|
| JCI M&O KR
Supplied Item | 1. INERGEN System
3. Water-Mist System
5. Fixed Fire Fighting System | 2. Deluge System
4. Foam Package System |
|-----------------------------|--|--|

JCI M&O References



Project: KEARL OIL SAND PROJECT PHASE 1&2

Ship Owner: EXXON MOBIL

Ship yard: AMEC Natural Resources Americas

Ship type: Onshore

Location: Browse Basin, offshore Western Australia

Contract date : May. '2011

Estimated hand over date: '2017

JCI M&O KR
Supplied Item 1. Deluge System



Project: TOTAL CLOV FPSO

Ship Owner: TOTAL E&P

Ship yard: Daewoo Shipbuilding & Marine Engineering, Co., Ltd. (DSME)

Ship type: FPSO [Floating Production Storage Offloading]

Location: Offshore Angola CLOV Field

Contract date : April. '2011

Estimated hand over date: '2014

JCI M&O KR	1. INERGEN System	2. Deluge System
Supplied Item	3. Water-Mist System	4. Hi-Ex Foam System
	5. Fixed Fire Fighting System	6. Life Saving Equipment
	7. Portable Fire Fighting Equipment	

JCI M&O References



Project: BP Mad dog2 FPU
 Ship Owner: BP
 Ship yard: SHI (Samsung Heavy Industry)
 Ship type: FPU [Floating Production Unit]
 Location: Offshore Field
 Contract date : Sep. '2017
 Estimated hand over date: '2020

JCI M&O KR	1. Top side HPU	2. Valve Control HPU
Supplied Item	3. Sub-Sea HPU	

● Under bids for Fire Protection System in present (Jan. '2017)



Project: ENI Coral Mozambique FLNG
 Ship Owner: ENI
 Ship yard: SHI (Samsung Heavy Industry)
 Ship type: FLNG (Floating Liquide Natural Gas Plant)
 Location: Mozambique
 Contract date : Nov. '2017
 Estimated hand over date: '2020

JCI M&O KR	1. INERGEN System	2. Local Water-mist System
Supplied Item	3. Dry-Powder System	4. Hi-Ex Foam System

● Under bids for Top-side Fire Protection System in present (Jan. '2017)

JCI M&O References



Project: KRAKEN FPSO

Ship Owner: EnQuest / Bumi Armada Berhad

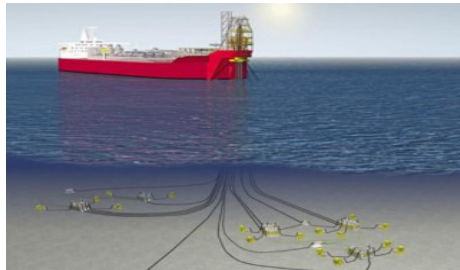
Ship yard: Keppel Shipyard

Ship type: FPSO (DNV Approved)

JCI M&O SG
Supplied Item

- 1. INERGEN System
- 3. Fire Detection System

- 2. Deluge System
- 4. AFDS



Project: Madura FPSO

Ship Owner: Husky-CNOOC Madura Limited (HCML) / Bumi Armada Berhad

Ship yard: Keppel Shipyard

Ship type: FPSO (ABS Approved)

JCI M&O SG
Supplied Item

- 1. Deluge System
- 3. F&G System

- 2. Fire Detection System



Project: ENI Angola FPSO

Ship Owner: ENI Angola S.P.A / Bumi Armada Berhad

Ship yard: Keppel Shipyard

Ship type: FPSO (ABS Approved)

JCI M&O SG
Supplied Item

- 1. Deluge System

- 2. Foam System



Project: ABO FPSO

Ship Owner: BW Offshore / AGIP

Ship yard: Keppel Shipyard

Ship type: FPSO (DNV Approved)

JCI M&O SG
Supplied Item

- 1. Fire Detection System

JCI M&O References



Project: Xikomba FPSO

Ship Owner: SBM Offshore / Sonangol

Ship yard: Keppel Shipyard

Ship type: FPSO in Angola

JCI M&O SG
Supplied Item

1. Upgrading of Fire Detection System



Project: Ichthys FPSO

Ship Owner: INPEX & Total

Ship yard: Keppel Shipyard, EPC: SBM Offshore

Ship type: FPSO (DNV Approved)

JCI M&O SG
Supplied Item

1. Fire Fighting Equipment

2. F&G System



Project: BC-10 FPSO

Ship Owner: Shell

Ship yard: Keppel Shipyard, EPC: SBM Offshore

Ship type: FPSO (ABS Approved)

JCI M&O SG
Supplied Item

1. Fire Fighting Equipment

2. F&G System



P61, E-House

Project: P-61 TLWP

Ship Owner: Petrobras & Chevron

Ship yard: Keppel Fels Engineering/Operator: Floatec / J. Ray McDermott

Ship type: FPSO (ABS Approved) in Brazil

JCI M&O SG
Supplied Item

1. CO2 System

JCI M&O References



Project: FPSO Cendor

Ship Owner: Petronas Carigali, KUFPEC (Kuwait Foreign Petroleum Exploration Company) and PetroVietnam

Ship yard: MISC Berhad

Ship type: FPSO in Malaysia

JCI M&O SG
Supplied Item

1. INERGEN (300 Bar)System

2. Addressable F.D.S



Kaombo, E-House

Project: Kaombo FPSO, E-House (by Schneider Electric)

Ship Owner: Sonangol P&P, Sonangol Sinopec International, Esso, Galp

Ship yard: Sembawang Shipyard

Ship type: FPSO (BV Approved)

JCI M&O SG
Supplied Item

1. INERGEN System



Project: Jangkrik Complex

Ship Owner: ENI Muara Bakau

Ship yard: Balik Papan Indonesia

Ship type: FPSU (DNV-GL Approved)

JCI M&O SG
Supplied Item

1. INERGEN (300 Bar) System

2. Fire Fighting Equipment

3. Fire Hose reel / Fire Extinguishers



Project: Su Tu Trang Gas Field

Ship Owner: Su Tu Trang Gas Field, Cuu Long Basin, Vietnam

Ship yard: Vietsovpetro Vietnam

EPC: Latech Co., Ltd

Ship type: FPSO (DNV Approved)

JCI M&O SG
Supplied Item

1. FM200 System

JCI M&O References



Project: OSX-1 FPSO

Ship Owner: OSX Brazil S.A

Ship yard: Keppel Fels, Singapore Engineering / P.M: B/W Offshore Ltd

Ship type: FPSO in Brazil

JCI M&O SG
Supplied Item

1. Deluge System
3. Hose reel Cabinet

2. INERGEN System



Project: OSX-2 FPSO

Ship Owner: OGX Perroleo e Gas

Ship yard: Keppel Shipyard, FPSO Conversion: SBM Offshore

Ship type: FPSO in Brazil (ABS Approved)

JCI M&O SG
Supplied Item

1. CO2 System



Project: FPSO OKHA

Ship Owner: Swoodside, BHP, BP, Chevron, Australia LNG

Ship yard: Keppel Shipyard, FPSO Conversion: SBM Offshore

Ship type: FPSO in Australia (DNV Approved)

JCI M&O SG
Supplied Item

1. INERGEN (300 Bar) System



Project: PFLNG 1

Ship Owner: Petronas Carigali Sdn Bhd

Ship yard: DSME / Technip

Ship type: FLNG (ABS Approved)

JCI M&O SG
Supplied Item

1. INERGEN System

2. Fire Fighting Equipment

JCI M&O References



Project: Triyards Sofel H1025
 Ship Owner: Sofel
 Ship yard: Saigon Shipyard Co. Ltd
 Ship type: Self Elevating Unit (ABS Approved)

JCI M&O SG
 Supplied Item

1. Helideck Foam System
3. CO2 System
5. AFDS

2. Wet Chemical System
4. Gas Detection



Project: Culzean Field Development
 Ship Owner: Mearsk Oil UK
 Ship yard: SMOP Pte Ltd (Sembcorp Marine Platforms Pte. Ltd.)
 Ship type: Platform (DNV Approved)

JCI M&O SG
 Supplied Item

1. Chemical Injection Unit
3. Wet Chemical System

2. INERGEN System



Project: Sagar Uday Drilling Rig
 Ship Owner: ONGC
 Ship yard: L&T Shipyard in India
 Ship type: Drilling Rig (ABS Approved)

JCI M&O SG
 Supplied Item

1. Addressable Fire Detection System

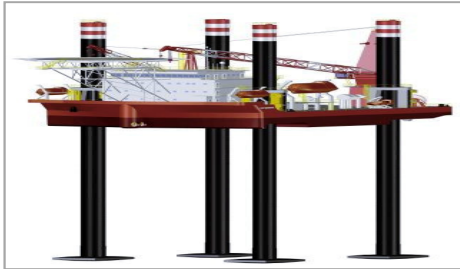


Project: Bekok C Platform
 Ship Owner: Petronas Carigali Sdn Bhd
 Ship yard: Kemaman in Malaysia
 Ship type: Platform (ABS Approved)

JCI M&O SG
 Supplied Item

1. Upgrading of Addressable Fire Detection System

JCI M&O References



Project: A3001 Lift-boat Project (Blue Titanium)

Ship Owner: Baker Engineering Pte. Ltd.
 Ship yard: Sea Deep Shipyard Pte. Ltd. in Singapore
 Ship type: Lift-boat (ABS Approved)

JCI M&O SG Supplied Item 1. Fire & Gas System 2. CCTV System



Project: Hull-B320 and Rig Hull-B321

Ship Owner: Mermaid Maritime Public Company Limited
 Ship yard: Keppel Fels in Singapore
 Ship type: Class B Jack-up Rig (ABS Approved)

JCI M&O SG Supplied Item 1. Addressable Fire Detection System



Project: Hull-B319

Ship Owner: S.D. Standard Drilling
 Ship yard: Keppel Fels in Singapore
 Ship type: Class B Jack-Up Rig(ABS Approved)

JCI M&O SG Supplied Item 1. Addressable Fire Detection System



Project: WHP-BK10 & BK3

Ship Owner: Vietcovpetro
 Ship yard: Vietsovpetro in Malaysia
 Ship type: Well Head Platform (ABS Approved)

JCI M&O SG Supplied Item 1. Addressable Fire Detection System

JCI M&O References



Project: Conversion FSO Bergading

Ship Owner: Hess
 Ship yard: MMHE Shipyard
 Ship type: FSO (BV Approved)

JCI M&O SG Supplied Item	1. Deluge System 3. NOVEC System	2. Foam System 4. Fire Fighting Equipment
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Project: Petrobras Pre-Salt FPSO x 8 (P66 to P73)

Ship Owner: Petrobras
 Ship yard: Ecovix
 Ship type: FPSO

JCI M&O SG Supplied Item	1. Addressable Fire Detection System
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Project: APLNG

Ship Owner: ConocoPhillips, Origin, Sinopec
 Ship yard: Siemens Batam Yard
 Ship type: APLNG

JCI M&O SG Supplied Item	1. NOVEC System	2. F&G System
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Project: Maintenance Service for FSO Puteri Cakerawala

Ship Owner: CHOC (Carigali Hess Operating Company)
 Ship yard: CHOC
 Ship type: FSO (BV Approved)

JCI M&O SG Supplied Item	1. Addressable Fire Detection System and Field Devices
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JCI M&O References



Project: Cendor FPSO

Ship Owner: **Petronas Carigali, KUFPEC (Kuwait Foreign Petroleum Exploration Company) and PetroVietnam**

Ship yard: **MISC Berhad (BV Approved)**

JCI M&O SG
Supplied Item

1. INERGEN 300 Bar System

2. Addressable Fire Detection System



Project: TGT E-House

Ship Owner: **Bumi Amada**

Ship yard: **MMHE Malaysia**

Ship type: **FPSO (BV Approved)**

JCI M&O SG
Supplied Item

1. INERGEN 300 Bar System



Project: Life Extension of Well Platform Project (LEWPP)

Ship Owner: **Oil & Natural Gas Corporation Ltd (ONGC)**

Ship yard: **National Petroleum Construction Company (NPCC)**

Ship type: **Platform (UL/FM BASEEFA Approved)**

JCI M&O SG
Supplied Item

1. Gas Detection System



Project: Kinabalu Redevelopment & Bunga Pakma Platform

Ship Owner: **Talisman / Repsol**

Ship yard: **Oceanmight Sdn Bhd, East Malaysia**

Ship type: **Platform**

JCI M&O SG
Supplied Item

1. Fire Fighting Equipment

JCI M&O References



Project: 20,120 TEU Container 11 shipset (Jul. 2015)
 Ship Owner: A.P. Moller Maersk
 Ship yard: DSME Shipyard
 Ship type: ULCS (Ultra Large Container Ship) (ABS Approved)

JCI M&O KR Supplied Item 1. Low Pressure CO2 System 2. Local Water-mist System
 3. Loose equipment



Project: 20,000 TEU Container 11 Shipset (Apr. 2016)
 Ship Owner: MOL (Mitsui OSK Lines)
 Ship yard: Imabari Shipyard
 Ship type: Container Ship (ABS & LR Approved)

JCI M&O KR Supplied Item 1. High Pressure CO2 System



Project: 180,000 cbm LNG Carrier 1 shipset (Jun. 2016)
 Ship Owner: MOL (Mitsui OSK Lines)
 Ship yard: MHI (Mitsubishi) Shipyard
 Ship type: LNG Carrier

JCI M&O KR Supplied Item 1. Dry-Powder System



Project: 180,000 cbm LNG Carrier 1 shipset (Aug. 2016)
 Ship Owner: NYK
 Ship yard: MHI Nagasaki Shipyard
 Ship type: LNG Carrier

JCI M&O KR Supplied Item 1. Dry-Powder System 2. HP CO2 System

JCI M&O References



Project: 300,000 dwt VLCC 4 shipset (Sep. 2016)
 Ship Owner: GC Tanker
 Ship yard: Jinhai Shipyard
 Ship type: VLCC (Very Large Crude-Oil Carrier)

JCI M&O KR
 Supplied Item 1. Addressable Fire Detection System



Project: Navy LPX Dokdo #2 (S139) (Oct. 2016)
 Ship Owner: Korean Navy
 Ship yard: Hanjin Heavy Industry
 Ship type: Large Platform Experimental



JCI M&O KR
 Supplied Item 1. Total Water-mist System



Project: 81,000 dwt BC 6 shipset (Dec. 2016)
 Ship Owner: Golden Union Shipping
 Ship yard: AVIC Weihai Shipyard
 Ship type: Bulk Carrier

JCI M&O KR
 Supplied Item 1. Addressable Fire Detection System and Field Devices



Project: 13,000 Crude Oil Tanker 10 shipset (Dec. 2016)
 Ship Owner: Shanghai DingHeng
 Ship yard: Tongbao Shipyard
 Ship type: Oil Tanker

JCI M&O KR
 Supplied Item 1. HP CO2 System 2. Deck Foam System
 3. Local Water-mist System

JCI M&O References



Project: Fisheries Patrol Vessel (3 Shipset) (Feb. 2017)
 Ship Owner: West Sea Fisheries Management
 Ship yard: Daesun Shipyard
 Ship type: Patrol Vessel

JCI M&O KR Supplied Item	1. Fire Detection System 3. HP CO2 System	2. Water-mist System 4. External Fire Fighting System
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Project: Chemical Tanker (49K) (Oct. 2017)
 Ship Owner: Odfjel
 Ship yard: Hudong Zhonghua Shipyard
 Ship type: Chemical Tanker (DNV Approved)

JCI M&O KR Supplied Item	1. HP CO2 System	2. Deck Foam System
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JCI M&O References



Project: Eagle Texas & Eagle Louisiana
 Ship Owner: AET Shipmanagement Singapore
 Ship yard: Dry-dock World Dubai
 Ship type: Modula Capture Vessel (ABS & USCG Approved)

JCI M&O SG
 Supplied Item 1. NOVEC System



Project: RNB Littoral Combat Vessel 6 shipset
 Ship Owner: Royal Malaysian Navy
 Ship yard: Boustead Naval Shipyard, Lumut
 Ship type: Navy Vessel (BV Approved)

JCI M&O SG 1. NOVEC System 2. CO2 System
 Supplied Item 3. Foam System 4. Fire Detection System



Project: Ice Class Multipurpose Vessel (H389)
 Ship Owner: New Orient Marine
 Ship yard: Keppel Singmarine, Singapore
 Ship type: Multipurpose Ice Class Ship

JCI M&O SG 1. CCTV System
 Supplied Item



Project: 78m Landing Craft
 Ship Owner: Sealink Sdn Bhd
 Ship yard: Sealink Shipyard Miri
 Ship type: Landing Craft

JCI M&O SG 1. Addressable Fire Detection System 2. CO2 System
 Supplied Item

JCI M&O References



Project: 52.35m Off-take Support Vessel (Hull 1040)

Ship Owner: Mermaid Marine Australia Limited

Ship yard: ASL Shipyard, Singapore

Ship type: OSV (ABS Approved)

JCI M&O SG
Supplied Item 1. NOVEC System



Project: 64.8m AHTS 2 Shipset (SK900, 902)

Ship Owner: Nam Cheong Group

Ship yard: Nam Cheong Dockyard

Ship type: Anchor Handling Tug Supply Vessel (ABS Approved)

JCI M&O SG 1. Fire Alarm System 2. Gas Detection System
Supplied Item 3. CO2 System 4. Local Water-mist System



Project: 50m Tug Boat 2 Shipset(H1462, 1463)

Ship Owner: POET Shipbuilding, Singapore

Ship yard: Jiangsu Suyang Marine

Ship type: Tug ship (ABS Approved)

JCI M&O SG 1. NOVEC System 2. Fire Detection System
Supplied Item 3. Gas Detection 4. Wet Chemical System



Project: Fast Patrol Ship 20 Shipset

Ship Owner: India Coast Guard

Ship yard: Cochin Shipyard, India

Ship type: Patrol Ship

JCI M&O SG 1. FM200 System
Supplied Item

JCI M&O References



Project: FDS Upgrading System for Landing Ship Tanks 4 Shipset

Ship Owner: Ministry of Defence

Ship yard: Sembcorp Marine Integrated Yard, Singapore

Ship type: Navy Vessel (ABS Approved)

JCI M&O SG
Supplied Item

1. Addressable Fire Detection System
2. FM200 Gas Release Panel



Project: 5 Years Maintenance Contract For Petrol Boat 10 shipset

Ship Owner: Ministry of Home Affairs / Singapore Police Coast Guard

Ship yard: Singapore Coast Guard

Ship type: Petrol Ship (ABS Approved)

JCI M&O SG
Supplied Item

1. Addressable Fire Detection System



Project: P-71 Aircraft Carrier

Ship Owner: Indian Navy

Ship yard: COCHIN Shipyard Ltd

Ship type: Aircraft Carrier (DNV Approved)

JCI M&O SG
Supplied Item

1. Wet Chemical Fire Fighting System
2. Galley System



Project: Royal Thai Navy HTMS Trang

Ship Owner: Royal Thai Navy

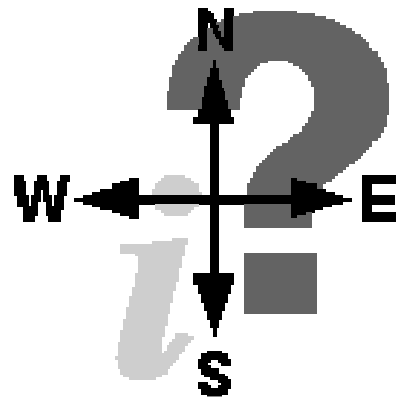
Ship yard: Bangkok Dock

Ship type: Navy Ship

JCI M&O SG
Supplied Item

1. Addressable Fire Detection System
2. Helideck Foam System
3. Rapid Response Spray System (RRSS)





THANKS!