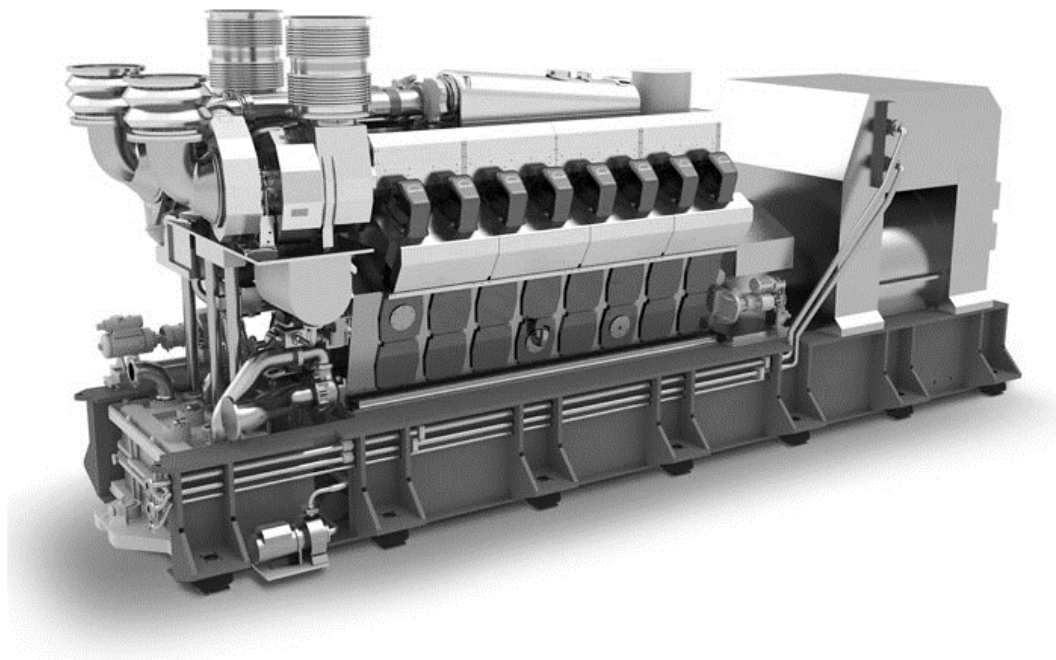


Internal Combustion – Diesel, Petrol, Pump, Propulsion and Operation of Marine 4 and 2 Stroke Engines in the Marine & Offshore Industry

2nd – 4th November 2016 | **Kuala Lumpur, Malaysia**

Factual case studies 4
and 2 Stroke failures
exceeding
\$125 - \$150 Million
USD.



Internal Combustion – Diesel, Petrol, Pump, Propulsion and Operation of Marine 4 and 2 Stroke Engines

This course is designed to introduce and enhance the knowledge of internal combustion engines and the complexities of both 2 and 4 stroke engines. The operation, maintenance and repair of these engines and components depends on many factors – including wear down, poor repairs and diagnostic faults, poor maintenance, fuels and lubrication. Results of analysis of casualties and accidents show that in one third of all, that human error is involved, and the same amount of damages is attributed to the poor education and specific training standards.

This course covers these aspects from both basic and intermediate levels of experience. This course provides technical instructions regarding mechanical wear down, piston and bearing failures, exhaust and valves, engine checklists, engine vulnerabilities and the internal mechanics of combustion engines and its components in a marine environment. Delegates are also trained in the technical operation, construction, configuration and operation of propulsion systems, stern tubes and shafting arrangements.

The trainer uses factual case studies and exercises along the way to cement participants' newly acquired skills and help them apply them to real situations. **Factual - Real Case Studies are broken down and exposed in relation to 4 and 2 stroke engine failures with individual case studies each exceeding \$125 - \$150 Million USD in the offshore industry.**

MASTER the necessary knowledge and complexities of:

- 4 and 2 stroke marine engines.
- How to determine failures and diagnose faults.
- Successfully operate and manage engines in a marine environment.
- EQUIP and Lead individuals and response teams with techniques, procedures and resources to manage technical Main Engine and Aux services and repair in a maritime environment.
- Marine Engine Components and seals.
- EDUCATE your team in pumps, failures and maintenance best practices.
- Diesel Fuel and Petrol driven mechanical operations and mechanics.
- The correct use of Lubrication and Oils, purification.
- Mechanical and wear down of 4 and 2 stroke engines and analysis.
- Piston and Bearing - lacquering and wearing of 2 and 4 stroke engine components.
- Fuel and oil line head pressure.
- OEM, Turbo servicing and failures.
- Exhaust, inlet and valves in 4 and 2 stroke general arrangements.
- Engine Checklists and vulnerabilities.

DURING THE 3 DAY SEMINAR THERE WILL BE FIVE FACTUAL CASE STUDIES— 4 AND 2 STROKE FAILURES EXCEEDING \$125 Million USD.

- **ATTENDEES LEARN** about factual case studies concerning failures to propulsion, C.P.P, stern tube and shafts including shaft and design failures in excess of \$125 Million USD
- Factual Case studies in how to prevent and identify Hazards regarding 4 and 2 stroke engines and fatal explosions aboard vessels
- Factual Case studies in how to prevent multimillion \$USD failures to 4 and 2 stroke engines due to poor maintenance practises and condition monitoring procedures.
- Groups will each conduct technical diagnostic analysis of factual case study failures (in teams). They are instructed to participate in individual and combined group knowledge sharing; based upon exploring several case studies after each group has conducted their own technical diagnostic analysis and their findings are then conveyed to all delegates.

This program is intended

This course will benefit basic level; project managers, marine engineers and marine response teams with techniques, procedures and resources to manage and understand the aspects of marine mechanics in a maritime environment.

Directors, Managers, Superintendents, Operators, and Engineers for

- Technical
- Machinery
- Marine Engineering Surveyors
- Fleet
- Salvage and Installation manager
- Offshore project manager.
- Maritime Safety
- Underwriters
- Maritime Law Specialists
- Professional Marine Investigators
- OSV Operator and Anchor Handlers, Ship/all commercial vessel Crew, Insurers underwriters, Ship Superintendents, Ship/barges/tug Owners, On Board Chief Engineers and Captains/Pilots, Maritime Safety Government Agencies, Cargo underwriters, OIM and Crew, Break Bulk Cargo/and Bulk Carrier firms, Port Authorities, Maritime Law Specialists and firms. Freight Forwarders Cargo – Marine, All Cargo and Insurance Brokers, Marine Claims managers, Containerised freight and logistics providers, Professional Marine Investigators

Internal Combustion – Diesel, Petrol, Pump, Propulsion and Operation of Marine 4 and 2 Stroke Engines

DAY 1

What are the major components of an internal combustion 2 and 4 stroke engine - How do they work?

- Diesel Engines
- Petrol Engine
- What happens internally
- How is power produced
- The effectiveness of 2 and 4 stroke engines and why
- The efficiency of 2 and 4 stroke engines and why
- What are the differences
- Crank shafts
- Strokes and forces
- Spark and glow plugs
- New developments

How do the internal mechanics of an internal combustion 2 and 4 stroke engine work?

- Engine arrangements
- Compression within bores
- Ignition and timing
- Chains and belt driven mechanisms
- The 2 and 4 stages of pistons and cylinders
- Exhaust and compression operations
- Timing failures
- Hoses and clamps
- Power head arrangements for 2 and 4 strokes
- EFI and fuel delivery
- Valves and springs for exhaust and air entry
- Effect of compression and ignition

The 2 and 4 stroke engines

The General Arrangements of 2 and 4 stroke engines

- Manifolds and gaskets
- ECU on 4 and 2 stroke engines
- Exhaust and cylinder arrangement - In line, V6 and V8, V12 engines
- 4 and 2 stroke engine seals and failures
- Pistons
- Rod assembly
- Bearings and rings

2 and 4 stroke Engines – Cooling systems and pumps how do they work in two and four stroke assemblies?

- Fuel flow
- The 'Slow steam' principles and effects on Main and Aux engines
- Pump installations on board and how they work
- Pump arrangements and maintenance
- Stop cooling water and reducing flow rates aboard

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DAY 2

The 2 and 4 stroke engines

Factual Case studies in how to prevent and identify Hazards regarding 4 and 2 stroke engines and fatal explosions aboard vessels

**How do the internal mechanics of a Propulsion and Drive systems work
How do 2 and 4 stroke motor and Propulsion systems combine?**

- Shafts
- Stern tubes and bearings
- Propulsion
- Propellers fixed and non-fixed CCP
- Gear box tooth failure
- Ship/Vessel steering and thrust

Crankshaft design and function with 2 and 4 stroke engines

- Corrosion and fatigue HFO
- M.E Turbo and Super chargers how do they work.

The 2 and 4 stroke engines

How can internal failures and wear down occur in two and four stroke engine?

- Damage from unusual sources
- What can you learn from the external appearance of failures
- Coolants and Gas safety Monitoring equipment
- Effects of internal temperatures to 2 and 4 stroke engines
- High temp alarms and failures

Oil and Electrical systems in 2 and 4 stroke engines

- Basic knowledge in vessel electrical layout
- Basic knowledge in vessel equipment
- Ship/vessel electrical systems
- The Main Engine and Aux

Discussion and analysis of Factual Case studies in how to prevent multimillion \$USD failures to 4 and 2 stroke engines due to poor maintenance practices and condition monitoring procedures

Fire, seizure in 2 and 4 strokes and causes – involving 2 and 4 stroke engines

- Accidental causes a fire with petrol engines
- Classification of fire causes.
- Chemical sources, material subject to spontaneous ignition
- Faulty electric circuits and equipment, replacement parts.

DAY 3

The 2 and 4 stroke engines

What are the role of Fuel and Oil in 2 and 4 stroke engines - how does it work?

- Fuels and fuel
- The combustion chamber and lubrication
- Lubrication oils
- Marine Engineering Failures
- Effects of poor lubrication
- Oil Types what's the difference

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Electrical energy and the effects of heat in 2 and 4 stroke engines

- Faulty electric circuits and equipment, replacement parts.
- Fuses, exposed lights by the type.
- Fixtures, motors and engine rooms leaks in fuel Systems.
- Welding in burning operations and other energy sources.
- Mechanical energy.
- Liquids and gases.
- Electrical wiring malfunctions.

The 2 and 4 stroke engines

The effects of corrosion within 2 and 4 stroke engines

- Corrosion
- The effect of exhaust and scavenging
- Air flow and bores

2 and 4 stroke Machinery and how to prevent failures.

- Discuss planned maintenance systems
- Discuss Trend analysis
- Analysis of Condition monitoring technical CME
- OEM Main Engine component failures relevant to engine performance

2 and 4 stroke engine performance and how it affects propulsion.

- Introduction to Ship Naval architecture
- Forces
- Centre of gravity
- Movement and stability
- Hydrodynamics
- Ship motion and vibrations
- Intact stability
- Damage and stability
- Degrees of freedom
- Systems and monitoring
- Example of diagrams of forces and degrees of freedom



PETRO1 provides Oil & Gas Trainings & Consultancy services ranging from Petroleum Engineering, Exploration & Production, Subsurface and business related activities in the oil & gas industry. We had successfully made impact to petroleum professional mainly the Top 50 Oil & gas players in the Asia Pacific Region.

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Programme Facilitator – Mr. James Gardiner



James's 25 years experiences expertise in the offshore engineering industry as a C.Engineer, Tech Supt and Senior Marine Surveyor (G.L and Lloyds) includes diesel - diagnostic, condition monitoring and preventative maintenance practices on some of the world's largest and most technically advanced 2 and 4 stroke diesel engines in the industrial and maritime sectors. From Iron Ore/LNG and 'slow steam' Bulk Carriers to smaller OSV engine installations.

James has exposure to engine brand such as **Wartsilla, B & W, MAN, CATERPILLAR, MITSUBISHI, CUMMINS.**

From a Marine Engineering and Surveying perspective, he has worked aboard a variety of vessel classes including; Multi-Purpose Self loaders, Roll On/Roll Off, Cruise liner Class, Offshore Supply Vessels [OSV] – Oil and Gas, Panamax, Containership and Combo -Heavy lift Ships. His previous experience also includes Technical Engineering inspection of existing ship as per class, statutory and international codes. Compliance of class, standards and flag state survey includes: Dry cargo, self-loader Ro – Ro, heavy-lift, container, cruise ship class, bulk carrier and multi-purpose vessel. His experience also includes Forensic engineering material and component surveying, Technical inspection of ship maintenance period and preparation of vessel for periodical surveys.

James is also engaged as an advisor to various Federal, and State Government Departments and Multinationals within Australia and South East Asia, in the Gas and Oil Installation and OSV Sectors.

James now advises class societies, PMA (s), multinational underwriters and insurers on the key issues and differing aspects of engine design and the common failures within the industry. His experience, skills and knowledge is at the fore front of the maritime industry. Several of his case studies explore diesel engine and Latent design engineering failures and off hire costs in **excess of \$ 100 million USD**. They include the following:

- ✓ **Vessel: M.V Moon Globe – Globus Maritime Management. (Iron Ore Bulk Carrier Class)**
BHP Billiton Pty. Ltd Port Hedland - Iron Ore Shipping Loading Facility
Responsibilities; Multimillion USD Off Hire and On Hire costing and estimating of engineering losses; including all costs associated with offshore removal and reinstallation of Main Engine Turbo Charger by air (Heli) and sea assets. Advising on design and refit of Ships Main Engine Turbo Charger due to terminal and catastrophic engineering failure in International Offshore waters 200 Nm + North/East of Port Hedland Western Australia [Indian Ocean and South Pacific].
- ✓ **Vessel: Royal New Zealand Navy - RNZS Combat Supply and Multi Role War Ship Her Majesty's New Zealand Ship - HMNZS War Ship 'Canterbury'.**
Responsibilities; Multimillion USD costing and estimating of losses; including all costs associated with ship engineering construction deficiencies during and after build and commissioning. Advise on design and refit of main engine propulsion systems, and main engine deployment deficiencies
- ✓ **Vessel: M.V - SPIRIT OF SINGAPORE (Containership Class)**
Responsibilities; Multimillion USD Off Hire and On Hire investigating, costing and estimating losses (including performing Gap Analysis) - Rickmers Ship Fleet Management, Singapore.
- ✓ **Vessel: NOR AUSTRALIS (Gas and Oil Exploration - Offshore Support Vessel Class) – Woodside Pty Ltd. North West Shelf, Australia.**
Responsibilities; Multimillion USD Off Hire and On Hire investigating cause, costing and estimating of losses; including all costs associated with offshore removal and reinstallation of main engine. Advising on design and refit of Ships Main Engine, and Transverse Bow Thruster terminal failure Singapore and North West Shelf – Australia [Indian Ocean]

James has exposure to engine brand such as **Wartsilla, B & W, MAN, CATERPILLAR, MITSUBISHI, CUMMINS**

Companies which have benefited from his expertise include:

Australian Maritime Safety Authority, BHP Australia Pty Ltd, Woodside Pty Ltd, Solstad Shipping, Rickmers Shipping, Patricks Stevedores, Forensic Engineers Society Australia and USA, Offshore Marine Service Alliance, Gorgon Gas and Oil, Chevron Oil and Gas, Petronas, Maersk Shipping, China Shipping Lines (CSL), Brambles Shipping , Icon offshore Malaysia, Sembmarine International, KSDC Brokers Singapore and many more.

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Registration Form

Internal Combustion – Diesel, petrol, Pump, Propulsion and operation of marine 4 and 2 stroke engine	Early Bird Price	Standard Price
Early Bird Price	SGD\$ 2437 ()	SGD\$ 2967 ()
3 or more	SGD\$ 2119	
Register in-house to save costs ()		
<ul style="list-style-type: none"> - Please note that all registrations must be made at the same time to qualify. - Early Bird Promotion Deadline – 3rd October 2016 - The above price is inclusive of GST 6%. 		

Delegate Details

1. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

2. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

3. Name: _____ Mr Mrs Ms Dr

Job Title: _____

Email : _____

Contact No: _____

Department: _____

Invoice Details

Invoice Attention to: _____

Company: _____

Industry: _____

Address: _____

Postcode: _____ Country: _____

Telephone: _____ Fax: _____

Email: _____

Authorized Signature : _____

Venue: Kuala Lumpur, Malaysia
Date: 2nd – 4th November 2016

REGISTER NOW
CONTACT: kelvin
MAIN: +603 7727 3952
FAX: +603 7727 5278
Email: registration@petro1.com.my

Credit card Payment

Please Debit my credit card:

VISA MASTERCARD

Card Number: _____ - _____ - _____ - _____

Security Code: Expiry Date:

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Signature: _____

Payment Method

By Direct Transfer: Please quote invoice numbers on remittance advice.

GST input Tax claim

Organization who have register under GST is allow to claim on any GST Incurred (Known as input tax) on their purchase to the business.

ACCOUNT NAME : PETRO1 SDN BHD
BANK : United Overseas Bank (Malaysia) BHD
ACCOUNT NO : 202 - 900 - 319 -1 (SGD)
SWIFT CODE : UOVBYMYKL

All bank charges to be borne by payers. Please ensure that PETRO1 SDN BHD received the full invoice amount.

*** Credit card payment will include a charges 2.8%**

Payment Policy: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Payment is required with registration and must be received prior to the event to guarantee the seat. Payment has to be received 7 working days prior to the event date to confirm registration.

Venue: All of our training courses are held in 4 - 5 star venues. The course fee does not include accommodation or travel cost. It's recommended to book the hotel room early as there are only limited room available at the discounted corporate rate.

DATA PROTECTION

The information you provide will be safeguarded by Petro1 that may be used to keep you informed of relevant products and services. We take it seriously when it come s to protection of our client data.

Cancellation & Substitutions: Upon receipt of a completed registration form, it confirms that the organization is registering for the seat(s) of the participant(s) to attend the conference or training workshop. Should you be unable to attend, substitutes are always welcome at no additional cost. Please inform us as early as possible. Payment is non-refundable if cancellation occurs 7 working days prior to event commencement. However a substitute is welcome at no additional charges. If cancellation occurs 5 working days prior to the registration date and there is no substitute, the organizer reserves the right to charge 50% of the total investment from your organization.

PETRO1 SDN BHD is not responsible for any loss or damage as a result of a substitution, alteration or cancellation/postponement of an event. PETRO1 SDN BHD shall assume no liability whatsoever in the event this training course is cancelled, rescheduled or postponed due to a fortuitous event, Act of God, war, fire, labor strike, extreme weather or other emergency.

Walk in Registration: Walk-in participants with payment will only be admitted on the basis of seat availability at the event and with immediate full payment.

Program Change policy: The organizer reserves the right to make any amendments and/or changes to the workshop, venue, facilitator replacements and/or modules if warranted by circumstances beyond its control.

