

 $\boldsymbol{\chi}$

MARINE CONSULTANCY SERVICES

Chris Dyson – Marine Engineer 22nd May, 2024

© 2023 Exponent, Inc. | Privileged & Confidential

Introduction

 \mathcal{X}

Chris Dyson - Seagoing Marine Engineer with a Combined First Class Certificate of Competency.

26 years of surveying and consultancy experience.

Experience includes slow speed engines, medium speed diesel, and diesel electric propulsion, as well as steam turbines and all associated plant. Investigated machinery performance and failure, cranes (ship and shore), MARPOL, new building, ship repair, pre-purchase, fuel quality, major structural damage, flooding, grounding, fire and technical management.

Provided opinion and expert evidence in Courts and Arbitration around the world.

Member of CIMAC (The International Council on Combustion Engines).

Investigative Support within the Maritime Field

Exponent is a leading global, multi-disciplinary engineering and scientific consulting firm spanning 90 different technical disciplines to solve engineering, science, regulatory and business challenges facing our clients.

The Marine Team was established to build on Exponent's previous experience in many high profile marine cases over the years such as Exxon Valdez, Piper Alpha, Prestige and the Deepwater Horizon.

The team is based around marine engineering expertise, with a proven track record of excellence in delivering unbiased opinions, expert advice and evidence in courts and arbitrations in the UK and internationally.



Chris Dyson Principal +44 (0) 7403 740 670 cdyson@exponent.com



Duncan Tanner Senior Manager +44 (0) 7796 688 809 dtanner@exponent.com



Neil Cook Senior Engineer +44 (0) 7710 919 560 ncook@exponent.com

Topics

Multi Disciplinary Problems

Marine Engineering

Services

 \mathcal{X}

Types of Work

Clients

Case Study

Λ

Multi Disciplinary Problems



Marine Engineering

- Applied to all stages of the marine engineering lifecycle, for example as falling under the headings below:-
 - Design, materials of manufacture, type approval and factory acceptance
 - Manufacture, manufacturing processes, for example dimensional control issues
 - Installation aspects including: alignment, securing arrangements and vibration
 - Operation and operating parameters
 - Alarm monitoring and control, safety and shutdown systems
 - Interaction between machinery items, components and systems
 - Wear and tear
 - Condition assessment and deterioration



Marine Engineering

- Maintenance, for example incorrect and/or inadequate maintenance procedures, changes and revisions in maintenance procedures, required, recommended and necessary maintenance and suitability of spare parts
- Failure analysis: nature, cause and extent of damage; root cause analysis and FMEA
 - Predictive maintenance and assessment, mean time between failures
 - Failures as a result of maintenance, for example on dis-assembly or re-assembly, human elements
- Repair assessment: nature and scope of repairs, repair specification preparation and tender evaluation, repair cost analysis
- Lifecycle assessment and prediction, obsolescence, modifications and upgrade
- Compliance, suitability for use, statutory and classification compliance
- Influence of the marine environment and ambient conditions
- Scrappage and removal, redundancy





Services

- Casualty Investigation Groundings, Collisions, Total Loss
- Forensic Failure and Damage Investigation Machinery, Plant including electrical and electronic equipment, fuel and structure
- Fire and Explosion Investigation
- New Building/Conversion Disputes
- Environmental issues
- Operational and Management Disputes and Advice
- Repair Assessment and Cost
- Cargo issues and advice



Maritime Fuel Services

Exponent's multi-disciplinary, in-house, knowledge, experience, and expertise can add value at all levels of the supply chain and all stages of the marine fuel lifecycle.

Working closely with the marine engineering team, our team of petroleum chemists can provide timely knowledge-based, scientifically supported, pragmatic advice and can comment with authority on all relevant fuel aspects, proactive and reactive, including advanced testing and assessment techniques, relevant to IMO 2020 fuel issues such as stability, compatibility, use of additives, regulatory compliance, and physical problems that may be encountered.



Exponent has fuel chemists in the USA, Europe and the Far East, who are able to witness laboratory testing and provide timely advice on interpreting the results.

Exponent have our own laboratories for advanced testing including GC-MS, in the US and Far East.





Dr Sarah Parker Managing Scientist +1 (508) 652 8510 sparker@exponent.com



Dr Malcolm Driffield Managing Scientist +44 (0) 7971 353126 mdriffield@exponent.com



Dr Su Cheun Oh Managing Scientist +852 3998 5427 soh@exponent.com

Exponent

Maritime Perishable Cargoes Services

Exponent's multi-disciplinary, in-house, knowledge, experience, and expertise can add value at all levels of the supply chain of perishable cargoes.

Exponent has a team of highly experienced regulatory compliance and risk management professionals, safety scientists and analytical chemists who can provide timely scientifically robust, pragmatic advice and who can comment with authority proactively and reactively on the suitability status perishable cargoes including food, feed, cosmetics, and pharmaceuticals, and on expected handling and transportation conditions to ensure suitability for declared intended uses.

Exponent has regulatory, safety and analytical chemistry expertise in the USA, Europe and the Far East, who are able to offer timely advice on perishable cargoes regulatory status, safety status and appropriate sampling and analysis, as well as witnessed sampling and laboratory testing to ensure robust evidence generation. Dr. Rachel Ward Managing Scientist +44 (0) 7879 646358 rward@exponent.com



Dr Malcolm Driffield Managing Scientist +44 (0) 7971 353126 mdriffield@exponent.com



Types of Work

- Survey Attendance
- Opinion and Expert Witness
- Pro-active Advice



Clients

- Ship Owners and their Insurers
- P & I Clubs
- Underwriters, Hull and Machinery
- Re-insurers
- Instructed Solicitors
- Charterers, Cargo Interests
- Other Stakeholders shipyards, designers, equipment and machinery manufacturers, port and terminal operators



Case Study – Ship's Crane Turret Collapse: Slew Ring Failure



- Welded flange on pedestal fractured in way of welding
- Note fracture termination at previous repair weld and original construction weld

- Slew ring removed
- Lifted working a normal load



Slew Ring Failure

- View from above
- Slew ring removed
- Welded flange on pedestal damaged



Any Questions?



Thank you for listening

Chris Dyson Marine Engineer +44 (0)7403 740670 cdyson@exponent.com