

THE INSTITUTE OF MARINE ENGINEERS

Founded 1889. Incorporated by Royal Charter 1933

Patron: Her Majesty The Queen

TRANSACTIONS

Vol. 89

1977



TECHNICAL MEETINGS

CONFERENCES

General Information

Volume 89 contains Reports as follows:

Technical Meetings
(keyed TM)

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(keyed C)
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TRANSACTIONS

Vol. 89

SUPPLEMENT

1977



INDEX

TRANSACTIONS OF
TECHNICAL MEETINGS
AND CONFERENCES
1976—1977 SESSION

THE INSTITUTE OF MARINE ENGINEERS

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INTRODUCTION

This Index covers volume 89 of the Transactions, and the Proceedings of Conferences held in the 1976-77 session, including IMAS'76. Conference Proceedings are not issued with the annual volume of Transactions, but are available for sale or loan from the Institute. The three sections of the Index and instructions for use are described below.

SECTION 1. LIST OF PAPERS

This is a complete list of papers presented during the year at the Institute's Evening Meetings and Conferences. The Conferences do not form part of the annual volume of Transactions but can be obtained from the Institute as separate publications. The entry for each paper consists of a full bibliographical description and a code number.

The code numbers are used in both the Author and subject Indexes. Papers presented at the Evening Meetings have been given code numbers which indicate the volume number, the series, the part number, and the number of the paper within the part:

VOLUME OF TRANSACTIONS	SERIES	PART	PAPER
V89	/A	-2	(1)

Conferences, which are collectively known as "Series B", have been assigned their initial letters as a code. The number following these initials indicates the paper number with the Conference. Some Conferences have appeared in two parts, and in such cases the paper number is preceded by a part number:

CONFERENCE	PART	PAPER
IMAS '76	/2	(1)

SECTION 2. AUTHOR INDEX

The authors of the papers are listed alphabetically; the codes which follow the names refer to the List of Paper Numbers.

To find papers written by a particular author:

- (1) Turn to the Author Index.
- (2) Note the code numbers adjacent to the names.
- (3) Look for the code numbers in the List of Papers; this will provide full bibliographical descriptions and the locations.

SECTION 3. SUBJECT INDEX

The contents of each paper have been summarized as a series of keywords. These have been arranged in chains of logically associated concepts. The terms included within the chains might describe a concept which require greater explanation than a single keyword can offer, or alternatively they might show that several aspects of a concept are discussed in the paper. Chains are punctuated by the symbol "\$": keywords are separated by the symbol "...".

For example, an entry for the paper "Modern Condenser Design" by H. Gotoda and S. Izumi reads.

"CONDENSERS : Axial : Underslung \$ Steam Plant : Corrosion \$ Design : Water flow.
V89/A-5 (1)

This would indicate that the paper describes the design of both axial and underslung condensers in relation to the corrosion of steam plant with special reference to water flow.

To find papers on a given subject:

- (1) Turn to the Subject Index.
- (2) Think of the terms which best describe your subjects; as a general rule it is better to work from the broadest to the most specific.
- (3) Note the code numbers.
- (4) Look for the code numbers in the List of Papers; this will provide full bibliographical descriptions and the locations.

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- V89/A-1 (1) THOMPSON, R. V. and CONSTANTINE, A. B.**
Oily water separators and oil content monitors—review of current equipment.
Volume 89, Series A. Part 1, Paper 1. Pages 1–19.
University of Newcastle upon Tyne and Marine Industries Centre, Newcastle upon Tyne.
- V89/A-1 (2) CORMACK, O., PARKER, H. and WALSH, T.**
Oil-water separation and the IMCO performance test specification for separators.
Volume 89, Series A. Part 1, Paper 2. Pages 20–35.
Warren Spring Laboratory.
- V89/A-2 (1) MCKENZIE, P. and KING, R. A.**
Microbial degradation of marine lubricating oil.
Volume 89, Series A. Part 2, Paper 1. Pages 37–45.
Corrosion and Protection Centre Industrial Services, UMIST.
- V89/A-2 (2) CROMBIE, G.**
Stern bearings—in service measurements of tailshaft attitude, bearing clearance, and other parameters.
Volume 89, Series A. Part 2, Paper 2. Pages 46–59.
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- V89/A-3 (1) HENNESEY, G., MCIVER, J., MARTIN, B. and RUTHERFORD, J.**
Commissioning and operational experience of 3.3kV electrical systems on ESSO petroleum products tankers.
Volume 89, Series A. Part 3, Paper 1. Pages 61–77.
Cammell Laird Shipbuilders Ltd., and ESSO Petroleum Company Ltd.
- V89/A-3 (2) REIN, H.**
A case study of the effect of reduced ship speed and off design operation of the power plant on the net earning rate of a steam turbine powered VLCC.
Volume 89, Series A. Part 3, Paper 2. Pages 78–96.
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- V89/A-4 (1) STANDEN, G. and GILBERT, D. E.**
Recent developments in the design and production of marine piping systems.
Volume 89, Series A. Part 4, Paper 1. Pages 97–121.
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- V89/A-4 (2) BUCHANAN, G. I.**
Marine auxiliary gas turbines.
Volume 89, Series A. Part 4, Paper 2. Pages 122–144.
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- V89/A-5 (1) CLELAND, J. P., KEELING, M. R., DAVIDSON, P. G. and LINES, N. P.**
Shore trials of a marine propulsion system—computer controlled manoeuvring trials.
Volume 89, Series A. Part 5, Paper 1, Pages 145–162.
Y-ARD LTD., MOD (PE) and Rolls-Royce (1971) Ltd.
- V89/A-5 (2) LANGENBERG, H. and ANDERSSON, G. O.**
Design of a high speed single-screw containership.
Volume 89, Series A. Part 5, Paper 2. Pages 163–199.
Blohm and Voss A.G.
- V89/A-6 (1) BAKER, H.**
Gas detectors and gas monitoring techniques for marine applications.
Volume 89, Series A. Part 6, Paper 1. Pages 201–219.
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The versatile console concept.
Volume 89, Series A. Part 6, Paper 2. Pages 220–252.
Ministry of Defence, Aish & Co. Ltd. and Vosper Thornycroft Ltd.
- V89/A-7 (1) GOTODA, H. and IZUMI, S.**
Modern condenser design.
Volume 89, Series A. Part 7, Paper 1. Pages 253–273.
Kawasaki Heavy Industries Ltd.
- V89/A-7 (2) HOPKINS, G.**
Engineering aspects of offshore supply vessel operations.
Volume 89, Series A. Part 7, Paper 2. Pages 274–279.
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- V89/A-7 (3) BROWN, R. J.**
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Newgate Shipping Company Ltd.
- V89/A-8 (2) BROWN, W. S.**
The reduction of electrical cabling costs—introducing the data highway.
Volume 89, Series A. Part 8, Paper 2. Pages 296–312.
Hawker Siddeley Dynamics Engineering Ltd.
- The following papers which were presented at Conferences, can be obtained from the Institute as separate publications.
- Proceedings of the Hatch Covers, Design, Installation, Operation and Maintenance Conference, The Institute of Marine Engineers, London, 1977.
- HC/1 BOYLAN, F. W.**
Opening of Conference.
Hatch Covers Conference, Paper 1. Page 2.
- HC/2 LOCKHART, R. G.**
Hatch Cover design and related experience.
Hatch Covers Conference, Paper 2. Pages 3–25.
Lloyd's Register of Shipping.
- HC/3 TURNBULL, D. E.**
Maintenance, overhaul, and repairs to hatch covers.
Hatch Covers Conference, Paper 3. Pages 26–40.
MacGregor Centrex Ltd.
- HC/4 GOLDIE, C. W. H.**
The views of a P and I Club manager.
Hatch Covers Conference, Paper 4. Pages 41–48.
Thos. R. Miller and Son.
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Some typical hatch cover defects in a mixed fleet.
Hatch Covers Conference, Paper 5. Pages 49–56.
Cayzer Irvine and Company Ltd.
- HC/6 PITT, C. T.**
Some practical experience with steel hatch covers.
Hatch Covers Conference, Paper 6. Pages 57–61.
Bowring Steamship Co. Ltd.
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Proceedings of the Health Monitoring Of Ships' Machinery Conference.
The Institute of Marine Engineers, London, 1977.

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Sea experience with a condition monitoring system.
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HM/3 GARDNER, G. E. HARRISON, F.R. and WALKER, J. F.
Gas turbine condition monitoring.
Health Monitoring Conference, Paper 3. Pages 14–20.
Central Electricity Generating Board.

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Condition monitoring and maintenance—four years' fleet experience.
Health Monitoring Conference, Paper 4. Pages 21–37.
B. P. Tanker Co. Ltd.

HM/5 BENNETT, R. M.
Engine health and performance monitoring of marinated aircraft-type gas turbines for warships.
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Three Quays Marine Services Ltd.

HM/7 LEACH, R. M.
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Lloyd's Register of Shipping.

Proceedings of the Reduction of Pollution from Shipping Conference.
The Institute of Marine Engineers, London, 1978.

RP/1 VICTORY, G.
Introduction to conference.
Reduction of Pollution Conference, Paper 1. Page 1.

RP/2 VICTORY, G.
The avoidance of marine pollution.
Reduction of Pollution Conference, Paper 2. Pages 2–11.

RP/3 BEAUDIN, L.
The U.S. Coast Guard's views on pollution from ships.
Reduction of Pollution Conference, Paper 3. Pages 12–21.
U.S. Coast Guard.

RP/4 PITT, G. D. and DOOLEY, A. M. E.
Oil content monitoring.
Reduction of Pollution Conference, Paper 4. Pages 24–46.
STL Ltd.

RP/5 THOMPSON, W. J.
Treatment of onboard waste.
Reduction of Pollution Conference, Paper 5. Pages 47–59.
Hamworthy Engineering Ltd.

RP/6 DAVIES, D. R. and PULLEN, H. G.
Shore based facilities and services for the reception and disposal of chemical wastes in the United Kingdom.
Reduction of Pollution Conference, Paper 6. Pages 60–71.
Redland Purle Ltd.

RP/7 THOMAS, K. G.
How significant is marine pollution?
Reduction of Pollution Conference, Paper 7. Pages 72–89.
Y-ARD Ltd.

Proceedings of the International Marine and Shipping Conference 1976 (IMAS '76)
The Institute of Marine Engineers, London, 1976.

IMAS '76/1 (1) HORTON, R. B.
Fuel sources, supply and transportation—the overall problem.
IMAS '76 Part 1. Paper 1. Pages 1/1–1/6.
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Future fuel supplies—the naval problem.
IMAS '76 Part 1. Paper 2, Pages 1/7–1/13.
Admiralty.

IMAS '76/1 (3) HODGKIN, A. F. and GRAMS, R. A.
Alternative fuels for sea power.
IMAS '76 Part 1. Paper 3, Pages 1/14–1/24.
Babcock and Wilcox (Operations) Ltd.

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Some economic aspects of ship-routeing.
IMAS '76 Part 1. Paper 4, Pages 1/25–1/30.
Meteorological Office Bracknell.

IMAS '76/1 (5) KOMOTO, M. and YABUKI, S.
The effect of higher fuel prices on the design of ships.
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Department of Plant Biology. University of Newcastle upon Tyne.

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Efficiency of waste heat recovery systems in motorships.
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Rotary regenerative air pre-heaters for marine boilers.
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IMAS '76/1 (9) CROWDY, E. P., BEAVERS, C. and MAY, E. R.
Waste heat recovery—purpose designed, fully integrated, automatically controlled packaged generating plant.
IMAS '76 Part 1. Paper 9, Pages 1/63–1/75.
Hawthorn Leslie (Engineers) Ltd.
Stone Manganese Marine Ltd.

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Increasing efficiency without decreasing reliability.
IMAS '76 Part 2. Paper 1, Pages 2/1–2/11.
G.E.C. Turbine Generators Ltd.

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Marine reheat plant development and its future.
IMAS '76 Part 2. Paper 2, Pages 2/12–2/18.
Kawasaki Heavy Industries Ltd.

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Marine boiler design for the 1970's—efficiency and reheat considerations.
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Combustion Engineering Inc.,

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Advanced steam cycles for maximum efficiency.
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New and evolutionary developments with crosshead and medium-speed engines from the point of view of economy.
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COMPUTERS : Shore Trials : Simulation \$ Propulsion
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V89/A-5 (1)

CONDENSERS : Axial : Underslung \$ Steam Plant : Corro-
sion \$ Design : Water Flow. **V89/A-7 (1)**

CONDITION MONITORING : Automation : Economics \$
Power Stations : Turbines : Gas Turbines \$ Hastings Power
Station : Generators : Turbo-Alternators. **HM/3**

CONDITION MONITORING : Data Chief Systems : Date
Trend Systems \$ Economics : Trends : Operational Experi-
ence \$ Engine Performance : Thermal Loads. **HM/2**

CONDITION MONITORING \$ Maintenance : Planned
Maintenance \$ Fleets : Operational Experience : Economics.
HM/4

CONDITION MONITORING : Performance Monitoring :
Health Monitoring \$ Machinery & Equipment. **HM/1**

CONDITION MONITORING : Vibration Monitoring :
Lubricating Oil Debris Monitoring \$ Maintenance \$ Penin-
sular \$ Orient Steam Navigation Company. **HM/6**

CONSOLES : Warships : Bridges \$ Design : Ergonomics \$
Controls : Versatile Console Systems. **V89/A-6 (2)**

CONSTRUCTION : Corrosion : Economics \$ Waste Heat
Recovery : Air Pre-Heaters : Rotary Regenerative Air
Pre-Heaters \$ Boilers : Combustion : Uptake Gases.
IMAS '76/1 (8)

CONTAINER MONITORING : Valve Control : Trends \$
Automation : Computers : Data Transmission \$ Cables :
Data Highway System : Economics. **V89/A-8 (2)**

CONTAINERS SHIPS : High Speed : Single Screw \$ Design :
Tank Tests \$ Vibration : Propeller Induced : Problems.
V89/A-5 (2)

CONTROL OF POLLUTION ACT : Inter-Governmental
Maritime Consultative Chemical Wastes : Disposal \$ United
Kingdom : Shore Based : Reception. **RP/6**

CONTROLS : Versatile Console System \$ Warships :
Bridges : Consoles \$ Design : Ergonomics. **V89/A-6 (2)**

CORROSION : Economics : Construction \$ Waste Heat
Recovery : Air Pre-Heaters : Rotary Regenerative Air
Pre-Heaters \$ Boilers : Combustion : Uptake Gases.
IMAS '76/1 (8)

CORROSION : Leakage \$ Operational Experience : Main-
tenance : Tests \$ Hatch Covers : Defects. **HC/6**

CORROSION : Microbial Degradation : Microbial Organ-
isms \$ Propulsion Systems : Bearings : Lubricants & Opera-
tional Experience. **V89/A-2 (1)**

CORROSION : Steam Plant \$ Design : Waterflow \$ Con-
densers : Axial : Underslung. **V89/A-7 (1)**

CORROSION : Wear : Scuffing \$ Diesel Engines : Low
Speed : Cylinders \$ Fuels : Sulphur Content : Alkaline
Cylinder Oils. **IMAS '76/2 (6)**

CROSSHEAD : Diesel Engines : Medium Speed \$ Turbo-
charging : Lubrication \$ Economics : Fuels. **IMAS '76/2 (5)**

CROSS-JOINT MAINTENANCE \$ Hatch Covers : Design
: Sealing \$ Maintenance : Sea-Going. **HC/3**

CROSS-JOINTS : Leakage \$ Maintenance \$ Hatch Covers :
Materials : Comparisons. **HC/8**

CYLINDERS : Diesel Engines : Low Speed \$ Fuels : Sulphur
Content : Alkaline Cylinder Oils \$ Corrosion : Wear :
Scuffing. **IMAS '76/2 (6)**

DATA CHIEF SYSTEMS : Data Trend Systems : Condition Monitoring \$ Economics : Trends : Operational Experience \$ Engine Performance: Thermal Loads. **HM/2**

DATA HIGHWAY SYSTEM : Economics : Cables \$ Container Monitoring : Valve Control : Trends \$ Automation : Computers : Data Transmission. **V89/A-8 (2)**

DATA LOGGERS : Trends Plots : Operational Parameters \$ Performance Monitoring : Tests \$ Warships : Turbines : Gas Turbines. **HM/5**

DATA TRANSMISSION : Automation : Computers \$ Cables : Data Highway Systems : Economics \$ Container Monitoring : Valve Controls : Trends. **V89/A-8 (2)**

DATA TREND SYSTEMS : Condition Monitoring : Data Chief Systems \$ Economics: Trends : Operational Experience \$ Engine Performance : Thermal Loads. **HM/2**

DEEP WATER : Offshore : North Sea \$ Design : Modelling \$ Pipe Laying : Barges : Lay Barges. **V89/A-7 (3)**

DEFECTS : Hatch Covers \$ Inspection : Testing. **HC/7**

DEFECTS : Hatch Covers \$ Refrigerated Fruit Carriers : Bulk Carriers \$ Operational Experience. **HC/5**

DEFECTS : Hatch Covers \$ Leakage : Corrosion \$ Operational Experience : Maintenance : Tests. **HC/6**

DEFINITION \$ Pollution. **RP/1**

DEMAND : Trends : Supply \$ Fuels : Economics \$ Transportation : Shipping. **IMAS '76/1 (1)**

DEPOSIT OF POISONOUS WASTE ACT : Control of Pollution Act : Inter-Governmental Maritime Consultative Organisation \$ Pollution : Chemical Wastes : Disposal \$ United Kingdom : Shore Based : Reception. **RP/6**

DESIGN : Boilers \$ Reheat Systems : Waste Heat Recovery : Fluid Regenerative Air Heaters \$ Fuels : Economics. **IMAS '76/2 (3)**

DESIGN : Ergonomics \$ Controls : Versatile Console System \$ Warships : Bridges : Consoles. **V89/A-6 (2)**

DESIGN : Hulls \$ Steam : Diesel : Comparisons \$ Fuels : Oil : Economics. **IMAS '76/1 (5)**

DESIGN : Modelling \$ Pipe Laying : Barges : Lay Barges \$ Offshore : North Sea : Deep Water. **V89/A-7 (3)**

DESIGN : Performance Data \$ Turbines : Gas Turbines : Trends \$ Merchant Ships : Auxiliary Machinery. **V89/A-4 (2)**

DESIGN : Problems : Hatch Covers \$ Classification Societies : Surveys \$ Inter-Governmental Maritime Consultative Organisation : International Conference on Load Lines 1966 : Regulations. **HC/2**

DESIGN : Production : Piping Systems \$ Machinery Spaces \$ Computer Models : Codem System. **V89/A-4 (1)**

DESIGN : Reliability \$ Fuels : Economics : Efficiency \$ Propulsion Systems : Turbines : Turbovisory Systems. **IMAS '76/2 (1)**

DESIGN : Sealing : Hatch Covers \$ Maintenance : Sea-Going \$ Cross-Joint Maintenance. **HC/3**

DESIGN : Tank Tests \$ Vibration : Propeller Induced : Problems \$ Container Ships : High Speed : Single Screw. **V89/A-5 (2)**

DESIGN : Waterflow \$ Condensers : Axial : Underslung \$ Steam Plant : Corrosion. **V89/A-7 (1)**

DIESEL : Comparisons : Steam \$ Fuels : Oil : Economics \$ Hulls : Design. **IMAS '76/1 (5)**

DIESEL ENGINES : Exhaust Gases : Waste Heat Recovery \$ Fuels : Economics \$ Boilers : Generators : Turbo-Generators. **IMAS '76/1 (7)**

DIESEL ENGINES : Low Speed : Cylinders \$ Fuels : Sulphur Content : Alkaline Cylinder Oils \$ Corrosion : Wear : Scuffing. **IMAS '76/2 (6)**

DIESEL ENGINES : Medium Speed : Crosshead \$ Turbo-charging : Lubrication \$ Economics : Fuels. **IMAS '76/2 (5)**

DIESEL ENGINES : Slow Speed : Long Stroke \$ Propulsion Systems : Propellers : Large Diameter Propellers \$ Hulls : Slender Hulls : Hull Resistance. **IMAS '76/2 (7)**

DISPOSAL : Pollution : Chemical Wastes \$ United Kingdom : Shore Based : Reception \$ Inter-Governmental Maritime Consultative Organisation : Deposit of Poisonous Waste Act : Control of Pollution Act. **RP/6**

DISPOSAL : Treatment : Equipment \$ Inter-Governmental Maritime Consultative Organisation : United States of America : Regulations \$ Pollution : Sewage : Garbage. **RP/5**

DISTRIBUTION : Generation \$ Electrical Systems : Three Thousand Three Hundred Volts \$ Products Tankers : Petroleum. **V89/A-3 (1)**

DYNAMIC LOADING : Manoeuvring \$ Simulation : Computers : Shore Trials \$ Propulsion Systems : Power Injection. **V89/A-5 (1)**

ECONOMICS : Cables : Data Highway System \$ Container Monitoring : Valve Control : Trends \$ Automation : Computers : Data Transmission. **V89/A-8 (2)**

ECONOMICS : Condition Monitoring : Automation \$ Power Stations : Turbines : Gas Turbines \$ Hastings Power Station : Generators : Turbo-Alternators. **HM/3**

ECONOMICS : Construction : Corrosion \$ Waste Heat Recovery : Air Pre-Heaters : Rotary Regenerative Air Pre-Heaters \$ Boilers : Combustion : Uptake Gases. **IMAS '76/1 (8)**

ECONOMICS : Fleets : Operational Experience \$ Condition Monitoring \$ Maintenance : Planned Maintenance. **HM/4**

ECONOMICS : Fuels \$ Boilers : Design : Trends \$ Reheat Systems : Waste Heat Recovery : Fluid Regenerative Air Heaters. **IMAS '76/2 (3)**

ECONOMICS : Fuels \$ Boilers : Generators : Turbo-Generators \$ Waste Heat Recovery : Diesel Engines : Exhaust Gases. **IMAS '76/1 (7)**

ECONOMICS : Fuels \$ Boilers : Turbines \$ Reheat Systems : Maintenance : Reliability. **IMAS '76/2 (2)**

ECONOMICS : Fuels \$ Diesel Engines : Medium Speed : Crosshead \$ Turbocharging : Lubrication. **IMAS '76/2 (5)**

ECONOMICS : Fuels : Efficiency \$ Propulsion Systems : Turbines Turbovisory Systems \$ Design : Reliability. **IMAS '76/2 (1)**

ECONOMICS : Fuels : Oil. **IMAS '76/2 (10)**

ECONOMICS : Fuels : Oil \$ Hulls : Design \$ Steam : Diesel : Comparisons. **IMAS '76/1 (5)**

ECONOMICS : Fuels : Operations \$ Meteorology : Climatology : Weather \$ Ship-Routeing : Weather-Routeing : Automation. **IMAS '76/1 (4)**

ECONOMICS : Fuels \$ Transportation : Shipping \$ Supply : Demand : Trends. **IMAS '76/1 (1)**

ECONOMICS : Fuels : Trends \$ Fluidized Bed Combustion : Fuel Quality \$ Residual Fuels \$ Coal : Liquid Natural Gas : Liquid/Solid Blends. **IMAS '76/1 (3)**

ECONOMICS : Fuels \$ Turbines : Steam Cycles : Reheat Systems \$ Fluidized Bed Combustion : Waste Heat Recovery. **IMAS '76/2 (4)**

ECONOMICS : Fuels \$ Very Large Crude Carriers : Steam Turbines : Speed \$ Charter Rates. **V89/A-3 (2)**

ECONOMICS : Seajoule \$ Waste Heat Recovery : Exhaust Gases : Heat Exchange \$ Boilers : Generators : Turbo-Alternators. **IMAS '76/1 (9)**

ECONOMICS : Trends : Operational Experience \$ Engine Performance : Thermal Loads \$ Condition Monitoring : Data Chief Systems : Data Trend Systems. **HM/2**

EFFECTIVENESS : Scrubbing : Underwater \$ Fouling : Hulls : Algae \$ Coatings : Paints : Quality. **IMAS '76/1 (6)**

EFFICIENCY : Fuels : Economics \$ Propulsion Systems : Turbines : Turbovisory Systems \$ Design : Reliability. **IMAS '76/2 (1)**

ELECTRICAL SYSTEMS : Three Thousand Three Hundred Volts \$ Products Tankers : Petroleum \$ Generation : Distribution. **V89/A-3 (1)**

ENGINE PERFORMANCE : Thermal Loads \$ Condition Monitoring : Data Chief Systems : Data Trend Systems \$ Economics : Trends : Operational Experience. **HM/2**

EQUIPMENT : Disposal : Treatment \$ Inter-Governmental Maritime Consultative Organisation : United States of America : Regulations \$ Pollution : Sewage : Garbage. **RP/5**

EQUIPMENT \$ Health Monitoring : Condition Monitoring : Performance Monitoring \$ Machinery. **HM/1**

EQUIPMENT : Oily Water Separators etc : Pollution \$ Very Large Crude Carriers : Products Carriers : Oily Water Ballast \$ Inter-Governmental Maritime Consultative Organisation : International Conferences on Prevention of Pollution of the Sea : Regulations. **PR/2**

EQUIPMENT : Review : Pollution Control \$ Oily Water Separators : Gravity : Coalescing \$ Oil Content Monitors. **V89/A-1 (1)**

EQUIPMENT : Safety : Gas Detection \$ Very Large Crude Carriers : Liquid Natural Gas Carriers : Offshore Structures \$ Instruments : Testing : Monitoring. **V89/A-6 (1)**

ERGONOMICS : Design \$ Controls : Versatile Console System \$ Warships : Bridges : Consoles. **V89/A-6 (2)**

EXHAUST GASES : Heat Exchanger : Waste Heat Recovery \$ Boilers : Generators : Turbo-Alternators \$ Seajoule : Economics. **IMAS '76/1 (9)**

EXHAUST GASES : Waste Heat Recovery : Diesel Engines \$ Fuels : Economics \$ Boilers : Generators : Turbo-Generators. **IMAS '76/1 (7)**

FEDERAL WATER POLLUTION CONTROL ACT 1972 : Regulations Code of Federal Regulations \$ Pollution : Safety : Policy \$ United States Coast Guard. **RP/3**

FLEETS : Operational Experience : Economics \$ Condition Monitoring \$ Maintenance : Planned Maintenance. **HM/4**

FLUID REGENERATIVE AIR HEATERS : Reheat Systems : Waste Heat Recovery \$ Fuels : Economics \$ Boilers : Design : Trends. **IMAS '76/2 (3)**

FLUIDIZED BED COMBUSTION : Fuel Quality : Residual Fuels \$ Coal : Liquid Natural Gas : Liquid/Solid Blends \$ Fuels : Economics : Trends. **IMAS '76/1 (3)**

FLUIDIZED BED COMBUSTION : Waste Heat Recovery \$ Fuels : Economics \$ Turbines : Steam Cycles : Reheat Systems. **IMAS '76/2 (4)**

FOULING : Hulls : Algae \$ Costings : Paints : Quality \$ Scrubbing : Underwater : Effectiveness. **IMAS '76/1 (6)**

FUEL QUALITY : Residual Fuels : Fluidized Bed Combustion \$ Coal : Liquid Natural Gas : Liquid/Solid Blends \$ Fuels : Economics : Trends. **IMAS '76/1 (3)**

FUELS : Economics \$ Boilers : Design : Trends \$ Reheat Systems : Waste Heat Recovery : Fluid Regenerative Air Heaters. **IMAS '76/2 (3)**

- FUELS** : Economics \$ Boilers : Generators : Turbo-Generators \$ Waste Heat Recovery : Diesel Engines : Exhaust Gases. **IMAS '76/1 (7)**
- FUELS** : Economics \$ Boilers : Turbines \$ Reheat Systems : Maintenance : Reliability. **IMAS '76/2 (2)**
- FUELS** : Economics \$ Diesel Engines : Medium Speed : Crosshead \$ Turbocharging : Lubrication. **IMAS '76/2 (5)**
- FUELS** : Economics : Efficiency \$ Propulsion Systems : Turbines : Turbovisory Systems \$ Design : Reliability. **IMAS '76/2 (1)**
- FUELS** : Economics : Operations \$ Meteorology : Climatology : Weather \$ Ship-Routeing : Weather-Routeing : Automation. **IMAS '76/1 (4)**
- FUELS** : Economics \$ Transportation : Shipping \$ Supply : Demand : Trends. **IMAS '76/1 (1)**
- FUELS** : Economics : Trends \$ Fluidized Bed Combustion : Fuel Quality : Residual Fuels \$ Coal : Liquid Natural Gas : Liquid/Solid Blends. **IMAS '76/1 (3)**
- FUELS** : Economics \$ Turbines : Steam Cycles : Reheat Systems \$ Fluidized Bed Combustion : Waste Heat Recovery. **IMAS '76/2 (4)**
- FUELS** : Oils : Economics. **IMAS '76/1 (10)**
- FUELS** : Oil : Economics \$ Hulls : Design \$ Steam : Diesel : Comparisons. **IMAS '76/1 (5)**
- FUELS** : Sulphur Content : Alkaline Cylinder Oils \$ Corrosion : Wear : Scuffing \$ Diesel Engines : Low Speed : Cylinders. **IMAS '76/2 (6)**
- FUELS** : Supply : Trends \$ Navies : Warships : Propulsion Systems \$ Oil : Nuclear : Hydrogen. **IMAS '76/1 (2)**
- FUELS** : Economics \$ Very Large Crude Carriers : Steam Turbines : Speed \$ Charter Rates. **V89/A-3 (2)**
- GARBAGE** : Pollution : Sewage \$ Disposal : Treatment : Equipment \$ Inter-Governmental Maritime Consultative Organisation : United States of America : Regulations. **RP/5**
- GAS DETECTION** : Equipment : Safety \$ Very Large Crude Carriers : Liquid Natural Gas Carriers : Offshore Structures \$ Instruments : Testing : Monitoring. **V89/A-6 (1)**
- GAS INDUSTRY** : Offshore : Oil Industry \$ Trends \$ Supply Vessels : Propulsion Systems : Auxiliary Machinery. **V89/A-7 (2)**
- GAS TURBINES** : Power Stations : Turbines \$ Hastings Power Station : Generators : Turbo-Alternators \$ Condition Monitoring : Automation : Economics. **HM/3**
- GAS TURBINES** : Trends : Turbines \$ Merchant Ships : Auxiliary Machinery \$ Design : Performance Data. **V89/A-4 (2)**
- GAS TURBINES** : Warships : Turbines \$ Operating Parameters : Data Loggers : Trend Plots \$ Performance Monitoring : Tests. **HM/5**
- GENERATION** : Distribution \$ Electrical Systems : Three Thousand Three Hundred Volts \$ Products Tankers : Petroleum. **V89/A-3 (1)**
- GENERATORS** : Turbo-Alternators : Boilers \$ Seajoule : Economics \$ Waste Heat Recovery : Exhaust Gases : Heat Exchanger. **IMAS '76/1 (9)**
- GENERATORS** : Turbo-Alternators : Hastings Power Station \$ Condition Monitoring : Automation : Economics \$ Power Stations : Turbines : Gas Turbines. **HM/3**
- GENERATORS** : Turbo-Generators : Boilers \$ Waste Heat Recovery : Diesel Engines : Exhaust Gases \$ Fuels : Economics. **IMAS '76/1 (7)**
- GRAVITY** : Coalescing : Oily Water Separators \$ Oil Content Monitors \$ Pollution Control : Equipment : Review. **V89/A-1 (1)**
- GRAVITY** : Coalescing : Oily Water Separators \$ Pollution Control \$ Inter-Governmental Maritime Consultative Organisation : International Convention on the Prevention of Pollution by Ships 1973 : Requirements. **V89/A-1 (2)**
- HASTINGS POWER STATION** : Generators : Turbo-Alternators \$ Condition Monitoring : Automation : Economics \$ Power Station : Turbines : Gas Turbines. **HM/3**
- HATCH COVER SIZE** : Tonnage : Jumboization : Inter-Governmental Maritime Consultative Organisation : International Conference on Load Lines 1966 \$ Hatch Covers : Watertightness : Weathertightness. **HC/1**
- HATCH COVERS** : Cargo Damage : Cargo Underwriters \$ Maintenance : Claims : Arbitration \$ Insurance : Liability Underwriters : P & I Clubs. **HC/4**
- HATCH COVERS** : Defects \$ Inspection : Testing. **HC/7**
- HATCH COVERS** : Defects \$ Refrigerated Fruit Carriers : Bulk Carriers \$ Operational Experience. **HC/5**
- HATCH COVER** : Defects \$ Leakage : Corrosion \$ Operational Experience : Maintenance : Tests. **HC/6**
- HATCH COVERS** : Design : Problems \$ Classification Societies : Surveys \$ Inter-Governmental Consultative Organisation : International Conference on Load Lines 1966 : Regulations. **HC/2**
- HATCH COVERS** : Design : Sealing \$ Maintenance : Sea-Going \$ Cross-Joint Maintenance. **HC/3**
- HATCH COVERS** : Materials : Comparisons \$ Leakage : Cross-Joints \$ Maintenance. **HC/8**
- HATCH COVERS** : Watertightness : Weathertightness \$ Tonnage : Jumboization : Hatch Cover Size \$ Inter-Governmental Maritime Consultative Organisation : International Conference on Load Lines 1966. **HC/1**

HEALTH MONITORING : Condition Monitoring : Performance Monitoring § Machinery § Equipment. **HM/1**

HEALTH MONITORING : Visual Inspection : Comparisons § Classification Societies : Surveys. **HM/7**

HEAT EXCHANGER : Waste Heat Recovery : Exhaust Gases § Boilers : Generators : Turbo-Alternators § Seajoule : Seajoule : Economics. **IMAS '76/1 (9)**

HIGH SPEED : Single Screw : Container Ships § Design : Tank Tests § Vibration : Propellers Induced : Problems. **V89/A-5 (2)**

HISTORY : Shipping : South African Mail Service § United Kingdom : Republic of South Africa § Union Steamship Company : Castle Mail Packets Company : Union Castle Mail Steam Ship Company. **V89/A-8 (1)**

HULL RESISTANCE : Hulls : Slender § Diesel Engines : Slow Speed Long Stroke § Propulsion Systems : Propellers : Diameter Propellers. **IMAS '76/2 (4)**

HULLS : Algae : Fouling § Coatings : Paints : Quality § Scrubbing : Underwater : Effectiveness. **IMAS '76/1 (6)**

HULLS : Design § Steam : Diesel : Comparisons § Fuels : Oil : Economics. **IMAS '76/1 (5)**

HULLS : Slender Hulls : Hull Resistance § Diesel Engines : Slow Speed : Long Stroke § Propulsion Systems : Propellers : Large Diameter Propellers. **IMAS '76/2 (7)**

HYDROGEN : Oil : Nuclear § Fuels : Supply : Trends § Navies : Warships : Propulsion Systems. **IMAS '76/1 (2)**

IN SERVICE : Measurements § Propulsion Systems : Operations : Parameters § Stern Bearing Clearance : Propeller Tailshaft Attitudes : Axial Shaft Movements. **V89/A-2 (2)**

INSPECTION : Testing § Hatch Covers : Defects. **HC/7**

INSTRUMENTS : Testing : Monitoring § Safety Gas Detection : Equipment § Very Large Crude Carriers : Liquid Natural Gas Carriers : Offshore Structures. **V89/A-6 (1)**

INSURANCE : Liability Underwriters : P & I Clubs § Hatch Covers : Cargo Damage : Cargo Underwriters § Maintenance : Claims : Arbitration. **HC/4**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : Deposit of Poisonous Waste Act : Control of Pollution Act § Pollution : Chemical Wastes : Disposal § United Kingdom : Shore Based : Reception. **RP/6**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : International Convention on the Prevention of Pollution by ships 1973 : Requirements § Oily Water Separators : Gravity : Coalescing § Pollution. **V89/A-1 (2)**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : International Conference on Load Lines 1966 § Hatch Covers : Watertightness : Weather-tightness § Tonnage : Jumboization : Hatch Cover Size. **HC/1**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : International Conference on Load Lines 1966 : Regulations § Hatch Covers : Design : Problems § Classification Societies : Surveys. **HC/2**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : International Conferences on Prevention of Pollution of the Sea : Regulations § Pollution : Equipment : Oily Water Separators etc § Very Large Crude Carriers : Product Carriers : Oily Water Ballast. **RP/2**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : Regulations § Pollution : Oil Content Monitors : Light Scatter § Bilge Water : Ballast Water. **RP/4**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : International Convention on the Prevention of Pollution by Ships 1973 : Requirements § Oily Water separators : Gravity : Coalescing § Pollution. **V89/A-1 (2)**

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANISATION : United States of America : Regulations § Pollution : Sewage : Garbage § Disposal : Treatment : Equipment. **RP/5**

INTERNATIONAL CONFERENCE ON LOAD LINES 1966 : Inter-Governmental Maritime Consultative Organisation § Hatch Covers : Watertightness : Weather-tightness § Tonnage § Jumboization : Hatch Cover Size. **HC/1**

INTERNATIONAL CONFERENCE ON LOAD LINES 1966 : Regulations : Inter-Governmental Maritime Consultative Organisation § Hatch Covers : Design : Problems § Classification Societies : Surveys. **HC/2**

INTERNATIONAL CONFERENCES ON PREVENTION OF POLLUTION OF THE SEA : Regulations : Inter-Governmental Maritime Consultative Organisation § Pollution : Equipment : Oily Water Separators etc § Very Large Crude Carriers : Product Carriers : Oily Water Ballast. **RP/2**

INTERNATIONAL CONVENTION ON THE PREVENTION OF POLLUTION BY SHIPS 1973 : Requirements : Inter-Governmental Maritime Consultative Organisation § Oily Water Separators : Gravity : Coalescing § Pollution Control. **V89/A-1 (2)**

JUMBOIZATION : Hatch Cover Size : Tonnage § Inter-Governmental Maritime Consultative Organisation : International Conference on Load Lines 1966 § Hatch Covers : Watertightness : Weather-tightness. **HC/1**

LARGE DIAMETER PROPELLERS : Propulsion Systems : Propellers § Hulls : Slender Hulls : Hull Resistance § Diesel Engines : Slow Speed : Long Stroke. **IMAS '76/2 (7)**

LAY BARGES : Pipe Laying : Barges § Offshore : North Sea : Deep Water § Design : Modelling. **V89/A-7 (3)**

- LEAKAGE** : Cross-Joints \$ Maintenance \$ Hatch Covers :
Materials : Comparisons. **HC/8**
- LIABILITY UNDERWRITERS** : P & I Clubs : Insurance \$
Hatch Covers : Cargo Damage : Cargo Underwriters \$
Maintenance : Claims : Arbitration. **HC/4**
- LIGHT SCATTER** : Pollution : Oil Content Monitors \$
Bilge Water : Ballast Water \$ Inter-Governmental Maritime
Consultative Organisation : Regulations. **RP/4**
- LIQUID NATURAL GAS** : Liquid/Solid Blends : Coal \$
Fuels : Economics : Trends \$ Fluidized Bed Combustion :
Fuel Quality : Residual Fuels. **IMAS '76/1 (3)**
- LIQUID NATURAL GAS CARRIERS** : Offshore Structures
: Very Large Crude Carriers \$ Instruments : Testing : Monitoring
\$ Safety : Gas Detection : Equipment. **V89/A-6 (1)**
- LIQUID/SOLID BLENDS** : Coal : Liquid Natural Gas \$
Fuels : Economics : Trends \$ Fluidized Bed Combustion :
Fuel Quality : Residual Fuels. **IMAS '76/1 (3)**
- LONG STROKE** : Diesel Engines : Slow Speed \$ Propulsion
Systems : Propellers : Large Diameter Propellers \$ Hulls :
Slender Hulls : Hull Resistance. **IMAS '76/2 (7)**
- LOW SPEED** : Cylinders : Diesel Engines \$ Fuels : Sulphur
Content : Alkaline Cylinder Oils \$ Corrosion : Wear :
Scuffing. **IMAS '76/2 (6)**
- LUBRICANTS** : Propulsion Systems : Bearings \$ Operational
Experience \$ Corrosion : Microbial Degradation : Micro-
organisms. **V89/A-2 (1)**
- LUBRICATING OIL DEBRIS MONITORING** : Condition
Monitoring : Vibration Monitoring \$ Maintenance \$ Penin-
sular & Orient Steam Navigation Company. **HM/6**
- LUBRICATION** : Turbocharging \$ Economics : Fuels \$
Diesel Engines : Medium Speed : Crosshead. **IMAS '76/2 (5)**
- MACHINERY** \$ Equipment \$ Health Monitoring : Condition
Monitoring : Performance Monitoring. **HM/1**
- MACHINERY SPACES** \$ Computer Models : Codem
System \$ Piping Systems : Design : Production. **V89/A-4 (1)**
- MAINTENANCE** : Claims : Arbitration \$ Insurance :
Liability Underwriters : P & I Clubs \$ Hatch Covers : Cargo
Damage : Cargo Underwriters. **HC/4**
- MAINTENANCE** \$ Hatch Covers : Materials : Comparisons
\$ Leakage : Cross-Joints. **HC/8**
- MAINTENANCE** \$ Peninsular & Orient Steam Navigation
Company \$ Condition Monitoring : Vibration Monitoring :
Lubricating Oil Debris Monitoring \$ Maintenance. **HM/6**
- MAINTENANCE** : Planned Maintenance \$ Fleets : Opera-
tional Experience : Economics \$ Condition Monitoring.
HM/4
- MAINTENANCE** : Reliability : Reheat Systems \$ Fuels :
Economics \$ Boilers : Turbines. **IMAS '76/2 (2)**
- MAINTENANCE** : Sea-Going \$ Cross-Joint Maintenance \$
Hatch Covers : Design : Sealing. **HC/3**
- MAINTENANCE** : Tests : Operational Experience \$ Hatch
Covers : Defects \$ Leakage : Corrosion. **HC/6**
- MANOEUVRING** : Dynamic Loading \$ Simulation : Com-
puters : Shore Trials \$ Propulsion Systems : Power Injection.
V89/A-5 (1)
- MANUFACTURE** : Operation : Safety \$ Nuclear Power \$
Merchant Ships : Propulsion Systems. **IMAS '76/2 (8)**
- MERCHANT REPORT** : Regulations \$ Nuclear Power \$
Merchant Ships : Ports : Safety. **IMAS '76/2 (9)**
- MATERIALS** : Comparisons : Hatch Covers \$ Leakage :
Cross-Joints \$ Maintenance. **HC/8**
- MEASUREMENTS** : In Service \$ Propulsion Systems :
Operations : Parameters \$ Stern Bearing Clearances : Pro-
pellers Tailshaft Attitudes : Axial Shaft Movements.
V89/A-2 (2)
- MEDIUM SPEED** : Crosshead : Diesel Engines \$ Turbo-
charging : Lubrication \$ Economics : Fuels. **IMAS '76/2 (5)**
- MERCHANT SHIPS** : Auxiliary Machinery \$ Design :
Performance Data \$ Turbines : Gas Turbines : Trends.
V89/A-4 (2)
- MERCHANT SHIPS** : Ports : Safety \$ Merchant Report :
Regulations \$ Nuclear Power. **IMAS '76/2 (9)**
- MERCHANT SHIPS** : Propulsion Systems \$ Safety : Manu-
facture : Operation \$ Nuclear Power. **IMAS '76/2 (8)**
- METEOROLOGY** : Climatology : Weather \$ Ship-Routeing
: Weather-Routeing : Automation \$ Economics : Operations :
Fuels. **IMAS '76/1 (4)**
- MICROBIAL DEGRADATION** : Micro-organisms : Cor-
rosion \$ Propulsion Systems : Bearings : Lubricants \$
Operational Experience. **V89/A-2 (1)**
- MICRO-ORGANISMS** : Corrosion : Microbial Degradation
\$ Propulsion Systems : Beatings : Lubricants \$ Operational
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REVIEW OF CURRENT EQUIPMENT**
2. **OIL-WATER SEPARATION AND THE IMCO PERFORMANCE TEST
SPECIFICATION FOR SEPARATORS**

