

Society of International Gas Tanker & Terminal Operators

*Impact of EU Directive
2005/33/EC on Steam Propelled
LNG Carriers*

SIGTTO

EMSA, Lisbon

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London

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Presentation Overview

- Brief introduction to SIGTTO
- “Anders Maersk”
- Overview of dual fuel marine boilers
- Key issues

Closing remarks

Purpose of SIGTTO

“SIGTTO was established in 1978 and incorporated in Bermuda in 1979 to encourage safe and responsible operation of liquefied gas tankers and marine terminals handling liquefied gas, to develop advice and guidance for best industry practice among its members and to promote criteria for best practice to all who either have responsibilities for, or an interest in, the continuing safety of gas tankers and terminals.”

Introduction to SIGTTO

SIGTTO is a “not-for-profit” organisation registered in Bermuda.

- Membership >175 from across the LNG/LPG industry representing:
 - > 90 % of LNG tonnage and terminals
 - About 60 % of LPG tonnage and terminals

SIGTTO Structure

- Board – 20 Directors
- General Purposes Committee (GPC) – 33 members
- Ad hoc working groups
- London-based secretariat with 5 full-time staff

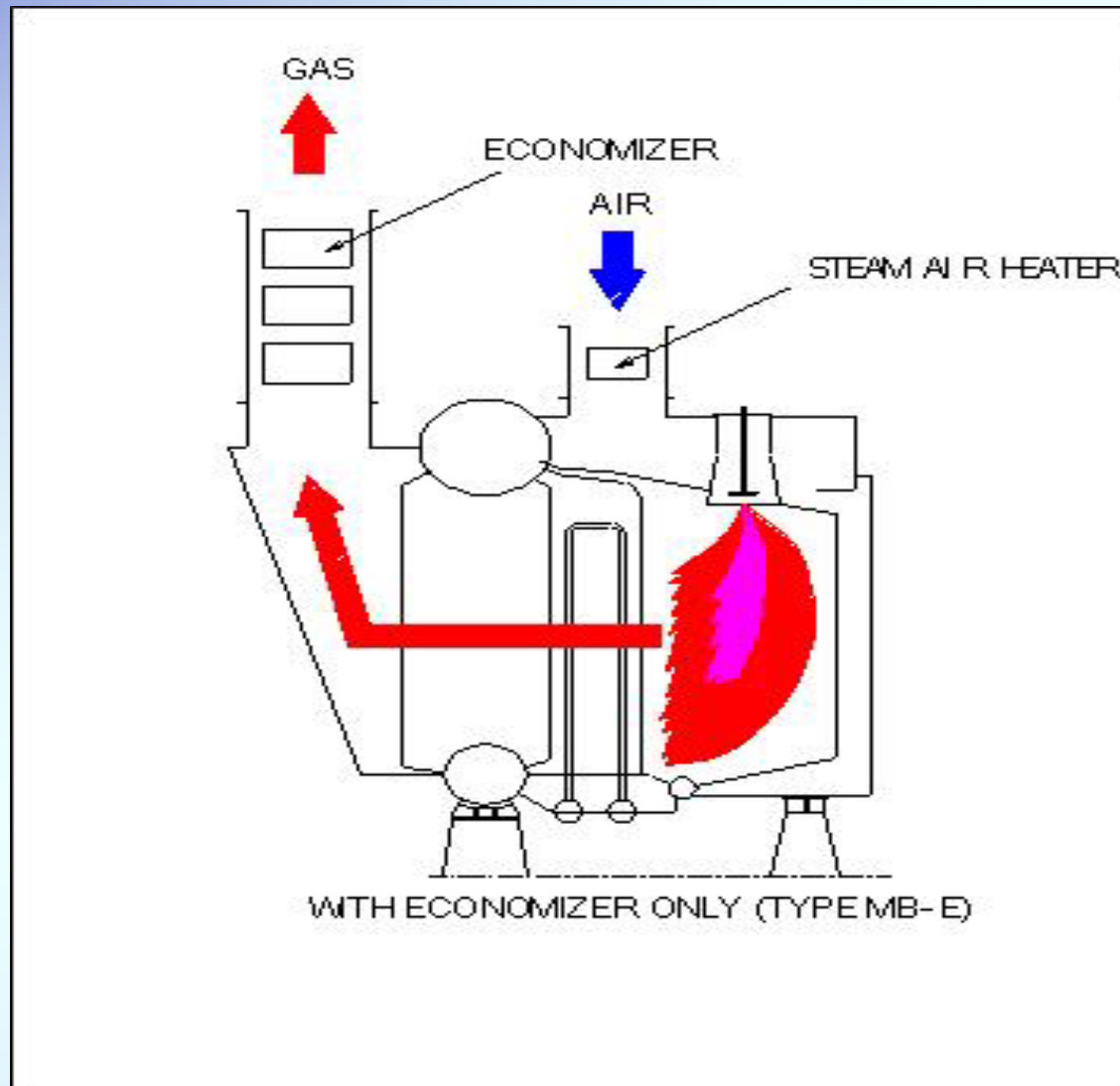
“Anders Maersk”

- Steam propelled container ship (1924 teu)
- January 1976 – in shipyard in Germany
- Incident whilst testing superheater relief valves – boilers being fired on distillate diesel fuel.
- 27 fatalities.

LOW SULPHUR DIRECTIVE IMPLEMENTATION TANKERS BOILERS VS LNG BOILERS

	TANKERS AUXILIARY BOILERS	LNG MAIN BOILERS
STEAM PRESSURE	15 bar	60 bar
STEAM TEMPERATURE	200 °C	515 °C
AIR PREHEATING	NO	YES (160 °C)
FURNACE VOLUME	LIMITED	BIG
FURNACE TEMPERATURE	LIMITED	HIGH
TYPICAL FIRING	SIDE/TOP	TOP
REQUIRED FOR PROPULSION	NO	YES
DUAL FIRING	NO	YES
ATOMISING	ROTARY CUP/STEAM	STEAM

Boiler Schematic



Typical Main Boiler

Typical Figures:

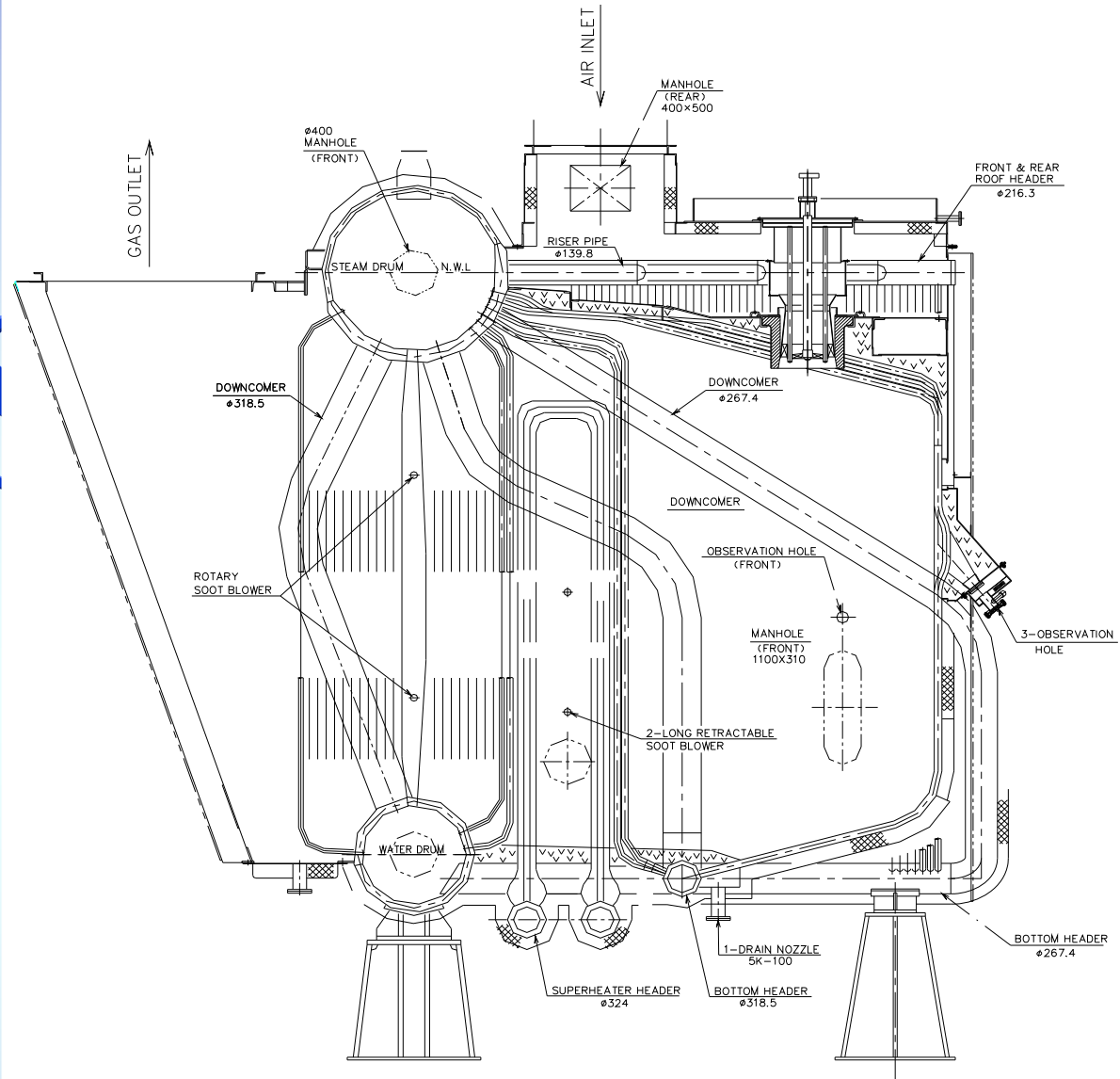
60 bar

510°C

30 t/h

F.O Cons.:

80 t/d/boiler



Typical Dual Fuel Burner



Key Issues

1. Distillate option

Boilers need modification of hardware and control systems. (Lead time on fuel pumps currently about 14 weeks.)

2. “Equivalency” options

- a) Burn 100 % gas – raises some technical and safety issues
- b) Burn gas with pilot fuel of LSHFO – minimum modification.

Key Issues

3. Scrubbing technology – not considered achievable in current timescale, but could have role to play in the longer term.
4. But don't forget the older LNG vessels

LNG Ship Delivery Record



Closing Remarks

1. Keep options open for “equivalent” solutions – burning gas must be acceptable and represent best environmental solution.
2. Burning gas in port requires renegotiation of sales contracts (SPAs) involving 3 parties:- Seller, Buyer and Fiscal Authorities.
3. LNG ship operators wish to be compliant but are very concerned that legitimate safety concerns are properly addressed.

Any Questions?



- Thank you

