



NORWEGIAN CRUISE LINE

Interoffice M E M O

File:

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Distribution:

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From: Per O. Sopp

Location: Ship Operations

Date: March 16, 1998

Subject: **S/S NORWAY - BOILERS RETUBING**

Since the S/S Norway started the itinerary to St. Maarten, St. John, St. Thomas, Great Stirrup Cay, the ship has been sailing on 2-3 boilers. This operation is causing a lot of stress to the boilers, because we are forced to shut them down frequently. After a few years of operating in this condition, and being the boilers shut down for more than 100 times, and lights off every year, we can see that the steel is getting brittle and the reoccurrence of tube failures. If we want to continue the safe operation of the vessel with no mechanical interruptions, the retubing of all 4 boilers should be done soonest.

During the last few years, we experienced numerous boiler tube failures, which caused shutting down the boilers for repairs. We must realize that we have reached a point, where the operation of the vessel is not safe. Also we should take in consideration that the interior of the boilers are worn out due to the sulfur-dioxide corrosion.

Attached you will find copies from the log book extracts, stating the failures, which generated the shut down.

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E-0143

2/3

ALL OF THESE INCIDENTS CAUSED SHUT DOWN OF THE BOILER

BOILER # 21

- WEEK # 7 1995 Start work with registers and manholes on superheaters
 - 8 Welded in new tube in Penhoet economiser
 - 16 Changed packing on man hole lower drum
 - 17 Renewed cover for sootcase
 - 18 Welded in four new lead plates above the superheaters
 - 19 Renewed corroded plates and insulation back wall s/b
 - 20 Changed packing on eight handcovers superheater
 - 27 Removed corroded air preheater elements permanently
- WEEK # 7 1996 Changed packing on eight handholes primary superheater, grinded off cuts
 - Plugged and welded 3 riser tubes furnace area
 - Welded an additional plug that was leaking
 - Boxed up with Blu-ram furnace area and sootcase
 - 20 Welded in a sheet metal insert between economisers
 - Start boiler cleaning 3000 hours
 - Repair of broken down refractory, furnace area
 - 23 Repair of cracked windbox
 - Changed packing on two handholes primary superheater
 - ← 27 Plugged 12 tubes on primary superheater
 - ← 28 Changed leak pilot valve for superheater safety valve
 - Plugged 7 tubes on superheater
 - 31 Changed ibex ring on flange superheater pilot valve ← Plugged 5
 - Welded broken drain tube from superheater
 - 43 Boxed up with Blu-ram furnace area and between superheaters
 - 49 Welded in new drain line from desuperheater
- WEEK # 3 1997 Overhauled spraywater valve for superheater temperature regulating
 - 4 Overhauled broken down flaps for boiler fan
 - 15 Start boiler cleaning 3000 hours
 - Repaired refractory furnace area
 - 20 Plugged 1 riser tube and welded
 - Changed packing on 4 handholes superheater
 - 22 Plugged 2 riser tubes
 - 27 Welded leak tube on Penhoet economiser
 - 29 By passed one tube on lower basket Penhoet economiser
 - 47 Boiler cleaning started 3000 hours
 - Changed packing on 2 handholes secondary superheater
 - Boxed up with Blu-ram furnace area
- WEEK # 1 1998 Changed rubber balls for coupling, upper boiler forced draft fan
 - 9 Repair of boiler shut off valve
 - 10 Changed ibex ring on flange for Cockburn valve A-41

NTSB

#21

27 tubes?
see E-0229
(July 7, 1996)

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ALL OF THESE INCIDENTS CAUSED SHUT DOWN OF THE BOILER

BOILER # 22

- WEEK # 6 1995 Overhauled superheater drain valves
- Overhauled sprayvalves for temp. regulation
- 10 Renewed refractory boiler furnace
- Welded in 3 new tubes in Penhoet economizer
- 11 Welded in new anchors (104 pcs) for new refractory furnace front
- 12 Welded in 6 new lead plates for primary superheater
- 14 Changed packing on six handcover for primary superheater
- 23 Balanced upper and lower forced draft boiler fans
- 34 Welded cracked windbox, insert
- 36 Welded boiler inner casing to stop air leaks
- 41 Changed ibex ring on steam drum manhole
- 47 Boiler cleaning started 3000 hours
- WEEK# 10 1996 Changed ibex ring man cover steam drum
- 29 Boiler cleaning start
- Plugged 1 tube on primary superheater
- Plugged 5 riser tubes furnace area
- 30 Welded 2 leak tubes on Penhoet economizer ←
- 31 Repair of refractory above primary superheater
- 34 Changed packing on manhole steam drum
- 36 Welded 2 tubes on Penhoet economizer
- Plugged 1 tube on primary superheater
- 39 Boxed up refractory in furnace area with Blu-ram
- Repaired and welded lead plates above economizer
- 43 Repair of cracked windbox
- 45 Repair of economizer tubes
- 46 Plugged 4 tubes on primary superheater
- Changed packing on 1 handhole, superheater
- WEEK# 5 1997 Overhaul of broken forced draft boiler fan flaps
- 10 Start renewing insulation at bottom side, weld in new plates
- 11 Plugged 2 tubes on secondary superheater
- 12 Welded in new lead plates above secondary superheater
- 34 Plugged 1 tube primary superheater
- Partly bypassed 1 tube on Pehoet economizer
- 41 Welded leak tubes on Penhoet economizer
- Plugged 3 tubes on secondary superheater
- Changed ibex ring on 2 handholes
- Overhauled 2 sootblower valves
- 44 Plugged 2 tubes on primary superheater
- WEEK# 3 1998 Changed packing on handhole Pehoet economizer
- Boiler cleaning started 3000 hours
- 4 Repair of refractory furnace area
- Changed ibex ring on man cover steam drum
- 6 Repair of steam cut on steam drum man hole
- 7 Changed packing on 3 hand holes superheater
- 8 Changed rubber balls on coupling lower forced draft boiler fan
- 9 Changed and overhauled 2 stop valves for the bottom blowing line

E-0279

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23.7



- WEEK# 02 1995 Repaired exhaust canal between economizer, and repaired broken plates inside
- Repair of broken down refractory in boiler furnace area
- Changed burnt out lead plates between primary and secondary superheater
- 3 Removed last part of corroded away air preheaters. Blanked off permanently.
- 4 Welded in new piece on drinline from primary superheater
- Repair on cracked air duct
- Fabricated new boiler casing starboard side
- 5 Continued sheet metal work on boiler casing
- 30 Boiler cleaning 3000 hours started
- 31 Welded up new lead plates for superheaters
- 33 Plugged 2 tubes on primary superheater
- 40 Welded inserts on several air leaks
- 43 Changed ibex ring on flange, Cockburn valve

- WEEK#11 1996 Boiler cleaning started
- Furnace refractory torn down
- 12 Welded in 115 pieces anchors boiler front furnace area, and started boxing up
- 15 Finished plastic cement work inside, boiler furnace
- Repair of signal line to D/P cell air controller
- 17 Plugged 1 tube on primary and 1 tube on secondary superheater
- 24 Changed two worn out bottom blow valves
- 31 Changed rubber balls on coupling for upper forced draft fan
- 32 Changed actuator for upper boiler fan
- 43 Plugged 1 riser tube
- 44 Plugged 6 tubes on primary superheater
- 46 Boiler cleaning started
- 48 Changed flaps on forced draft boiler fan

- WEEK#6 1997 Plugged 2 riser tubes furnace area
- 7 Changed packing on 3 handholes second superheater
- Welded leak drain pipe from secondary superheater
- 21 Bypassed 1 tube on Green economizer
- 31 Boiler cleaning started 3000 + hours
- 36 Plugged 1 riser tube furnace area
- 42 Plugged 3 tubes on secondary and primary superheater
- 43 Bypassed 1 leak tube on Green economizer
- 50 Repair of soot leak in exhaust gas duct

- WEEK#9 1998 Repair of refractory in furnace area

welded
 Plugged tube
 July 23, 1996
 E-0229

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~~REPAIR AND MAINTENANCE LOG DURING SHUTDOWN OF THE BOILER~~

- WEEK#21 1995 Repair of refractory furnace area
22 Pressure testing of boiler ok
23 Repair of sheet metal and insulation, boiler casing, ongoing
23 Balancing of lower forced draft fan

- WEEK# 4 1996 Boiler cleaning start
Welded in new lead plates between superheaters
Repair of refractory furnace area
16 Changed packing on handhole Penhoet economizer
30 Changed packing on handhole Penhoet economizer
Plugged 5 tubes on internal desuperheater
32 Changed broken handhole cover Penhoet economizer
35 Boiler cleaning started 3000 hours
39 Welded cracks in windbox
40 Boxed up furnace area with Blu-ram
49 Overhauled boiler fan flaps, new leather
50 New observation hatches installed

E-0779

- WEEK # 8 1997 Plugged 1 riser tube furnace area
Changed packings on 3 handholes primary superheater
9 Renewed 10 flaps on lower boiler forced draft fan
10 Overhauled, changed bearings on upper boiler fan
28 Welded blown out bottom blow pipe lower drum
Overhauled skimming valve steam drum
32 Boiler cleaning started
Welded in new steel plates port side inner casing
33 Boxed up with Blu-ram front wall furnace area

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