

## WORK REPORTSHEET

<b>Site:</b>	Carnival Liberty	<b>Proj. ref:</b>	30.646	<b>Date :</b>	September 13 <sup>th</sup> -15
<b>Customer :</b>	Carnival Cruise Line				
<b>Address :</b>	St. Thomas US Virgin Islands –San Juan Puerto Rico				
<b>Tel. :</b>					
<b>Service X</b> Commissioning <input type="checkbox"/> Training <input type="checkbox"/> Warranty <input type="checkbox"/> Other <input type="checkbox"/>					

<b>Type of Fault or Work To Be Done Described by The Customer:</b>
-HI-FOG system inspection and restoration after September 7 <sup>th</sup> DG4 fire.

<b>Description of Work Carried Out:</b>
<p>HI-FOG pump units 4pcs serviced and function tested. 3pcs of unloading valves are replaced on unit number 2 (motors 1,2 and3) and 1 pcs on unit number 1 (motor 5). Stand-by pump is replaced with old spare pump and at the moment pump is not working properly (hysteresis is too high and causing false flow starts) Recommended replace pump with new one ASAP. HP Pump oils are being changed on unit 1 and 2 due to quality. Tanks and filters are washed. AFT units feed water lines is also flushed until water was clear again. Water sample is being taken from AFT units lines. System was drained complete to get all nitrogen gas out of piping.</p> <p>44 pcs of water cylinders re-filled, 35 pcs of nitrogen cylinders re-installed after re-filling. One original cylinder is now missing and it's now replaced with UNITOR cylinder. UNITOR cylinders have only 165bar and this causing low pressure alarm. Cylinder need to be replaced ASAP. Low pressure alarm is now by-passed (on pressure switch).</p> <p>DG's 1,2,3, and 4 spray heads are being removed and inspected. All sections flushed without spray heads. Same procedure is carried out with AFT and FWD boilers. It's recommend to carry out flushing for all remaining section which is included AFT or FWD total flooding areas. Several spray heads was replaced due to strainer condition.</p> <p>3pcs of gas valves are rebuilt because of internal leak. 2 pcs of pressure switches are replaced due to leak.</p> <p>DG 4 and AFT &amp; FWD boilers automatic release is tested after FDS loops restoration.</p> <p>Machinery system signals are being tested and verified. Accommodation valve signals are tested randomly.</p>

<b>Engineer's Comments / Recommendations / Notes:</b>
<p>Pump units 1 and 2 drive chains are recommended to replace in near future. Ships have in stock parts for one unit. Parts for second unit should be ordered.</p> <p>Piping on top of DG 4 and boilers is needed to replace. At the moment area is in use. Several pipe supports are being melted. Plastic clamps were used on some areas. All spray heads are being replaced on above DG4 and above of boilers.</p> <p>Water quality (technical water) on aft units is not suitable for use on HI-FOG system. "Sludge" is causing lot of problems with system valves and nozzles. Example fresh water valve on unit 2 stuck open several times duo to particles on water.</p> <p>DELTA-B valve from aft NAU10 unit is being replaced with new one and old valve will be sent for inspection to Marioff quality department.</p> <p>Recommended to order replacement parts on ship stock. Unloaders, stand-by ETC.</p>

Materials Used, Description:	Qty :	Code :	Site Time Info				
			Date :	Hours :		Travelling	
				Norm:	Overtime:	Hours :	MI:
Gas valve repair kit	6	G40226.A	September 9 <sup>th</sup> -15	2x5		2x12	60
Clutch coupling green	3	E040152	September 10 <sup>th</sup> -15	2x17			
DELTA-B valve	1	D21090	September 11 <sup>th</sup> -15	14,6,4		7,10	
Spray head	115	C31120	September 12 <sup>th</sup> -15	2x13			
Pressure switch	2	M23200	September 13 <sup>th</sup> -15	2x14			
			September 14 <sup>th</sup> -15			8,10*	60

\* estimated

 Engineers  
 Signature:



 Chief Engineer  
 Carnival Liberty
