

ALL-SEA

UNDERWATER SOLUTIONS



All-Sea Enterprises Ltd.

1458 Rupert Street
North Vancouver, B.C., Canada V7J 1E9
T: +1 (604) 980-9613
F: +1 (604) 980-9223
www.all-sea.com
office@all-sea.com

UNDERWATER SERVICE REPORT BRIGADIER MG "ZALINSKI" OIL REMOVAL OPERATION

March 26 – April 6, 2015

Ref# 35058

BACKGROUND

Over the time period of March 26th to April 6th, 2015, All-Sea Underwater Solutions diving team in conjunction with the Canadian Coast Guard underwent the removal of the bunker oil from the vessel's tanks. Also in attendance as observers, were representatives from the First Nations to witness and contribute the pumping operations to confirm and witness the oil removal and quantities.

Back in December 2013 an oil removal operation removed approx 363.3 cu.m of oily water from starboard DB tanks 1, 2, and 3, Port DB tanks 1 and 2, the port coal bunker tank, the starboard bilge of the engine room and the starboard bilge of No. 1 hold for a sum of 319.4 oily water waste and a total of 43.9 cu.m of oil. Hot tap valves were installed at the time and capped for future suction line connections.

Over time it was believed that residual oil would migrate to the upper parts of the DB tanks and it was confirmed during a small scale dive operation in July 2014.

OPERATIONS PERSONNEL

- Dive Supervisor/Project Manager
- 5 Divers
- Crane Operator
- Canadian Coast Guard Emergency Oil Spill Response Team
- CCG Operations Manager
- First Nations on site Representatives
- Barge deck hands and Tug Operators
- Accommodations Vessel's crew

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DIVING CONDITIONS

The diving operations was performed during the high and low water tides at slack water to provide the opportunity to install valves and carry out pumping operations with minimal risk of oil loss to the surface and the ability to work without unnecessary current restrictions.

On average, during the low water slack, two dives could be performed providing about 80 minutes of bottom time at 22 meters. At high water slack, one dive could be completed for a bottom time of 30 minutes at a depth of 26 meters. At times three separate slack water opportunities were available during daylight hours which allowed three diving operations to be performed. All diving was restricted to the daylight hours to enable the emergency response oil spill crew to visually sight and oil that may have surfaced.

OIL RELEASE MANAGEMENT

Care was taken during the pumping operations to not risk the ability for the diver to make the connection or disconnection of the oil suction hose during an unmanageable amount of bottom current. At any time that the current became too strong for the diver to manage the suction hose and not re secure to the retrieval basket, the dive task was either changed to the task of valve install or transfer or the dive was aborted.

Cam lock nipple flanges were fabricated that incorporated a 25mm ball valve fitted into the neck of the flanges to allow the suction hose 3" valve to be flushed with clean water prior to the disconnection from the cam lock nipple.

Any release of oil was immediately wiped with oil absorbent pads and contained in a plastic bag. Oil droplets that could not be recovered were announced to the top side control and relayed to the CCG oil spill recovery team which responded immediately to address the situation.

All oil released during the diving operations was minimal and could be cleaned by the CCG oil spill recovery team quickly.

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EQUIPEMENT

DIVING OPERATIONS

- Surface supplied diving system with topside to diver communications.
- HP Nitrox breathing system.
- Continuous diver to top side video feed with audio/video recording capability.
- Topside control diver light system.
- Man basket diver deployment and recovery by use of a 20 ton crane.
- Recompression chamber for emergency use.

PUMPING OPERATIONS

- 8 – 3" quarter turn ball valves with cam lock connections
- 8 – 3" cam lock nipple flange with flush valves.
- 6 – 50 foot 3" cam lock connection ribbed transparent suction hose.
- 3 – 3" Wilden double diaphragm air driven pumps.
- 200' of ¾" air line
- 150psi commercial air compressor.
- 2 – 19,612 gallons (74,239L) capacity Baker tanks

SUPPORT EQUIPMENT

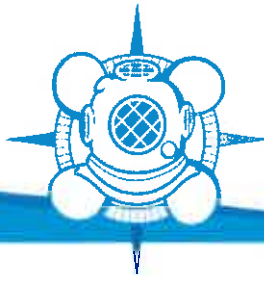
- 200' Barge with tugs and deck hands
- Dive control container
- 40KW diesel generator
- 20T crane with man basket
- Accommodation vessel
- Crew transfer skiff

CANADIAN COAST GUARD

- Oil Recovery Response Team
- 200' CCG emergency response equipment barge
- CCG response vessels
- Oil booms and spill recovery equipment

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PUMPING OPERATIONS

The following tanks were pumped at the specific valves in the following order:
During the first round of pumping operations, each valve was pumped multiple times with time in between to allow the oil to migrate.

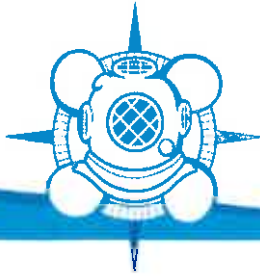
1. **DB Tank 2 port valve #1:** Tank was pumped 3 times with time intervals between to allow the oil to migrate. Oil was recovered until the discharge became mostly oil water.
2. **DB Tank 2 port valve #2:** Tank was pumped until oily water was constant.
3. **DB Tank 1 stbd valve #3:** Tank was pumped until mostly water with small quantities of oil water was observed.
4. **DB Tank 1 stbd valve #1:** Tank was pumped until mostly water with small quantities of oily water was observed.
5. **DB Tank 1 Stbd valve #2:** Tank was pumped until oily water was observed.
6. **DB Tank 2 Stbd valve #1:** Good quantity of oil observed, pumping until consistent oily water.
7. **DB Tank 2 Stbd valve #2:** Good quantity of oil observed, pumping until consistent oily water.
8. **DB Tank 3 Stbd valve #1:** Good quantity of oil observed, pumping until consistent oily water.
9. **DB Tank 3 Stbd valve #2:** Good quantity of oil observed, pumping until consistent oily water.
10. **DB Tank 3 Stbd valve #4:** Small globules but primarily oil water present.
11. **DB Tank 3 Stbd valve #3:** Small globules but primarily oily water present.
12. **DB Tank 3 Port valve #2:** Quantity of oil observed, pumping until consistent oily water.
13. **DB Tank 3 Port valve #1:** Quantity of oil observed, pumping until consistent oily water.
14. **DB Tank 2 Stbd valve #4:** Pumped until consistent oily water to mostly clear water.
15. **DB Tank 2 Stbd valve #3:** Pumped until consistent oily water to mostly clear water.

Second round of pumping allowed each valve to pump until clear and/or light oil water was observed for a minimum of 5 minutes.

Upon completion of pumping operations each valve operated was capped and fastened with a gasket and bolts.

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RECOVERED QUANTITIES

During the pumping operations periodic de-canting of the below oil level oily water waste was performed to separate to allow a more accurate reading of amounts.

Baker Tank #1: Total product: **9,566 gallons (36,211L)** Est.: **Heavy oil: 855 gallons (3,237L)**.

Baker Tank #2: Total product: **7,512 gallons (28,436L)** oily water.

Summary: **855 gallons (3,237L)** of heavy oil and **16,223 gallons (61,410L)** of oily water

ADDITIONAL WORK PERFORMED

A survey of the vessels bottom was carried out to determine the condition of the shell plate and to locate any perforations that may have developed.

The following was observed:

- Bottom plating was covered in soft and hard marine growth with no signs of large holes from corrosion.
- Plating was still relatively solid as no hole developed while working throughout the pumping process with a series of tap tests performed periodically by diver.
- One small 5mm hole was observed approx 1 meter aft of Stbd tank 1: valve 3. This hole was covered with a two part epoxy.
- All other epoxy patches previously applied that were sighted remained intact.

Photos are included with this report.

A hull drawing with valve placement is included with the report.

For any additional information please contact the writer at the numbers provided.

Report Submitted By:
ALL-SEA ENTERPRISES LTD.

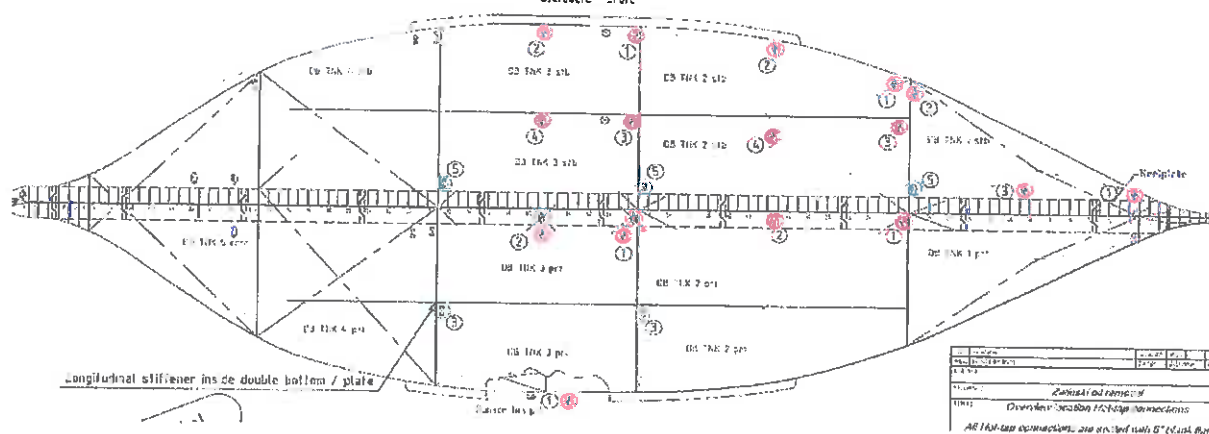
Lance Hiney



HULL VALVE PLACEMENT DRAWING

All hot-tap connection sealed with 6" blank flange!

Slartcord - shore



Valves presently missing handles:

- Port tank 3: Valve 1
- Stbd tank 1: Valve 1
- Stbd tank 1: Valve 3



Bottom plate



Bottom plate





Nipple cam lock flange fitted

Suction hose valve fitted while pumping



Flange fitted with a blanking valve

Pumping hose connected





Previous applied epoxy remains intact



Newly applied epoxy to a small hole
Tank valve caps re installed





Intact valve with handle



Valve with missing handle