



Lloyd's Register Canada Limited

REPORT ON UNDERWATER INSPECTION OF M/V KATHRYN SPIRIT

PURCHASE ORDER NO. TTO-2016-12-02

PREPARED BY:

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**Michel Birs, President
DIVEX MARINE INC.**

Saint-Bruno, December 2016

1.0 MANDATE DESCRIPTION

Lloyd's Register Canada Limited and the Canadian Coast Guard have mandated Divex Marine Inc. to carry out an underwater inspection and determine the status of the M/V Kathryn Spirit.

On December 13, 2016, our team of divers, approved by Lloyd's Register Canada Limited (**MTL 1600437**), traveled by truck to the St-Pierre Construction Site in Beauharnois.

Our work unit included a truck fully equipped for this kind of operation, with the diving equipment and devices required according to WHSC and CSA standards.

Below, we have submitted our underwater inspection report in accordance with the provisions of the contract indicated in the title, which your organization awarded us.

David Corriveau of the Canadian Coast Guard was present for the inspection. The mandate includes, among others, the following items:

- Inspection of the hull;
- Extent of grounding;
- Status and condition of blanking plates;
- Type of seabed;
- Full report with video support.

2.0 TEAM ASSIGNED TO THE WORK

- | | |
|---------------|-----------------|
| • Team leader | Michel Birs |
| • Diver | Éric Villeneuve |
| • Diver | Mathieu Labelle |

3.0 ATMOSPHERIC AND HYDRAULIC CONDITIONS

- | | |
|-----------------------|-------------|
| • Weather conditions: | Overcast |
| • Temperature: | -5° Celsius |
| • Visibility: | 400 mm |
| • Current: | Nil |
| • Water temperature: | 4° Celsius |

4.0 DIVE DETAILS

• Time of departure from the surface:	9:40 a.m.	1:50 p.m.	4:10 p.m.
• Time of arrival at the surface:	12:15 p.m.	3:20 p.m.	4:35 p.m.
• Length of dive:	155 minutes	90 minutes	25 minutes
• Maximum depth:	8.0 metres	8.0 metres	8.0 metres

5.0 INSPECTION

We conducted a cursory inspection of the hull, starting with the stern and moving toward the bow.

5.1 AFTERPEAK

- We observed no significant damage to the side and bottom shell plating.
- The keel skeg was in bottom contact with the bedrock and was completely covered by sediment.
- The bottom of the rudder was buried in sediment, about 200 to 500 mm deep.
- The propeller blade, at the 6:00 position, was buried in 1000 mm of sediment.
- The empty space between the bottom of the sternpost tube and the seabed was 1600 mm.
- The side and bottom shell plating we inspected were 75% covered by silt and zebra mussels.
- On the starboard side, in line with frame 10 and at the 17-foot draft mark, we observed one blanking plate 150 mm wide by 140 mm high. The plate was held in place by two adjustable steel dogs. It was in good condition and appeared to be watertight.
- The bedrock was covered in a layer of sediment 1500 mm thick.

5.2 ENGINE ROOM

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 75% covered by silt and zebra mussels.
- The bottom plates on the port side were in contact with the bedrock, from frames 11 to 42.



- One outlet, 120 mm in diameter. The blanking plate that covered the outlet had failed.
- On the port side, in line with frame 25 and at the 12-foot draft mark, we observed one blanking plate, 320 mm wide by 320 mm high. The plate was kept in place by one adjustable steel dog, and the second dog had failed. The blanking plate did not seem to be watertight.
- On the port side, in line with frame 28 and at the 9-foot draft mark, we observed one blanking plate, 225 mm wide by 280 mm high. The plate was kept in place by two adjustable steel dogs. It was in good condition and appeared to be watertight.
- On the port side, in line with frame 40 and at the 8-foot draft mark, we observed one blanking plate, 1070 mm wide by 1080 mm high. The plate was kept in place by 9 adjustable steel dogs. It was in good condition and appeared to be watertight.
- On the port side, in line with frame 39 and at the 8-foot draft mark, we observed one outlet, 300 mm in diameter. The blanking plate that covered the outlet had failed.
- On the starboard side, in line with frame 39 and at the 17-foot draft mark, we observed one blanking plate 550 mm wide by 550 mm high. The plate was kept in place by 8 adjustable steel dogs. It was in good condition and appeared to be watertight.
- On the starboard side, in line with frame 40 and at the 17-foot draft mark, we observed one blanking plate 200 mm wide by 200 mm high. The plate was kept in place by three adjustable steel dogs, and the fourth dog had failed. It appeared to be watertight.
- On the starboard side, in line with frame 40 and at the 5-foot draft mark, we observed one blanking plate 910 mm wide by 740 mm high. The plate was kept in place by four adjustable steel dogs, and three dogs had failed. The blanking plate was not watertight.
- The diver could partially see two blanking plates on the bottom plates on the starboard side, in line with frame 37. The plates were kept in place by adjustable steel dogs.
- The bedrock was covered in a sediment layer 1000 to 1500 mm thick.

5.3 CARGO HOLD NO. 5

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 85% covered by silt and zebra mussels.
- The bilge plates on the port side were buried in sediment and seemed to be in contact with the bedrock from frame 42 to 68.

- On the port side, the bedrock was covered in a layer of sediment 1000 to 1500 mm thick.
- The space between the bilge plate and the sediment, in line with frame 50, starboard side, was 1000 mm.
- The space between the bilge keel and the sediment, in line with frame 68, starboard side, was 3200 mm.
- In several places under the vessel's starboard side, the bedrock was not covered with a layer of sediment.
- On the starboard side, in line with frame 46 and the bottom shell plating, we observed one blanking plate 330 mm long by 120 mm high. The plate was kept in place by welded flat irons. The blanking plate was not watertight.
- On the starboard side, in line with frame 44 and at the 5-foot draft mark, we observed one blanking plate, 70 mm wide by 80 mm high. The plate was kept in place by one adjustable steel dog. The blanking plate appeared to be watertight.
- We observed several depressions in the starboard bottom plating, between the frames, with a maximum depth of 40 mm.

5.4 CARGO HOLD NO. 4

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 85% covered by silt and zebra mussels.
- The bilge plates on the port side were buried in sediment and seemed to be in contact with the bedrock from frame 68 to 85. From frame 85 to 95, the bilge plate was partially visible.
- The port-side bilge keel was buried in sediment from frame 68 to 92; the bilge keel was partially visible from frame 92 to 85.
- On the port side, the bedrock was covered in a layer of sediment 1500 mm thick.
- On the starboard side, the bedrock was covered in a layer of sediment 800 mm thick.
- The space between the starboard bilge keel and the sediment, in line with frame 95, was 3370 mm.

5.5 CARGO HOLD NO. 3

- We observed no significant damage to the side and bottom shell plating.

- The side and bottom shell plating we inspected were 85% covered by silt and zebra mussels.
- We observed that the starboard side shell plates were supported on the barge from frame 100 to 117.
- The space between the port bilge keel and the sediment, in line with frame 115, was 150 mm.
- On the port side, the bedrock was covered in a layer of sediment 1000 mm thick.
- On the starboard side, the bedrock was covered in a layer of sediment 800 mm thick.

5.6 CARGO HOLD NO. 2

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 95% covered by silt and zebra mussels.
- The vessel was not grounded from frame 130.
- The space between the port bilge keel and the sediment, in line with frame 122, was 660 mm.
- The space between the port bilge keel and the sediment, in line with frame 135, was 1400 mm.
- On the port side, the bedrock was covered in a layer of sediment 1000 mm thick.
- On the starboard side, the bedrock was covered in a layer of sediment 500 mm thick.

5.7 CARGO HOLD NO. 1

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 95% covered by silt and zebra mussels.
- The space between the port bilge keel and the sediment, in line with frame 170, was 4000 mm..
- The space between the starboard bilge keel and the sediment, in line with frame 140, was 4100 mm..
- In line with frame 149, the bedrock was covered in a layer of sediment 500 mm thick.

5.8 FOREPEAK

- We observed no significant damage to the side and bottom shell plating.
- The side and bottom shell plating we inspected were 95% covered by silt and zebra mussels.
- Between the 12-foot and 13-foot draft marks, we observed one tie on the bow that was in good condition.
- The space between the bottom plating and the sediment, in line with frame 180, was 3700 mm.
- In line with frame 180, the bedrock was covered in a layer of sediment 1270 mm thick.

6.0 CONCLUSION

This inspection was conducted without any part of the structure being opened or removed, and no measurements of thickness were taken. The stability and integrity of the structure were not determined, and any opinions or recommendations are made with all due caution.

For any additional information on this inspection, please feel free to contact us.



Micher Birs, President,
Divex Marine Inc.