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Chilling of pelagic fish onboard Norwegian fishing vessels

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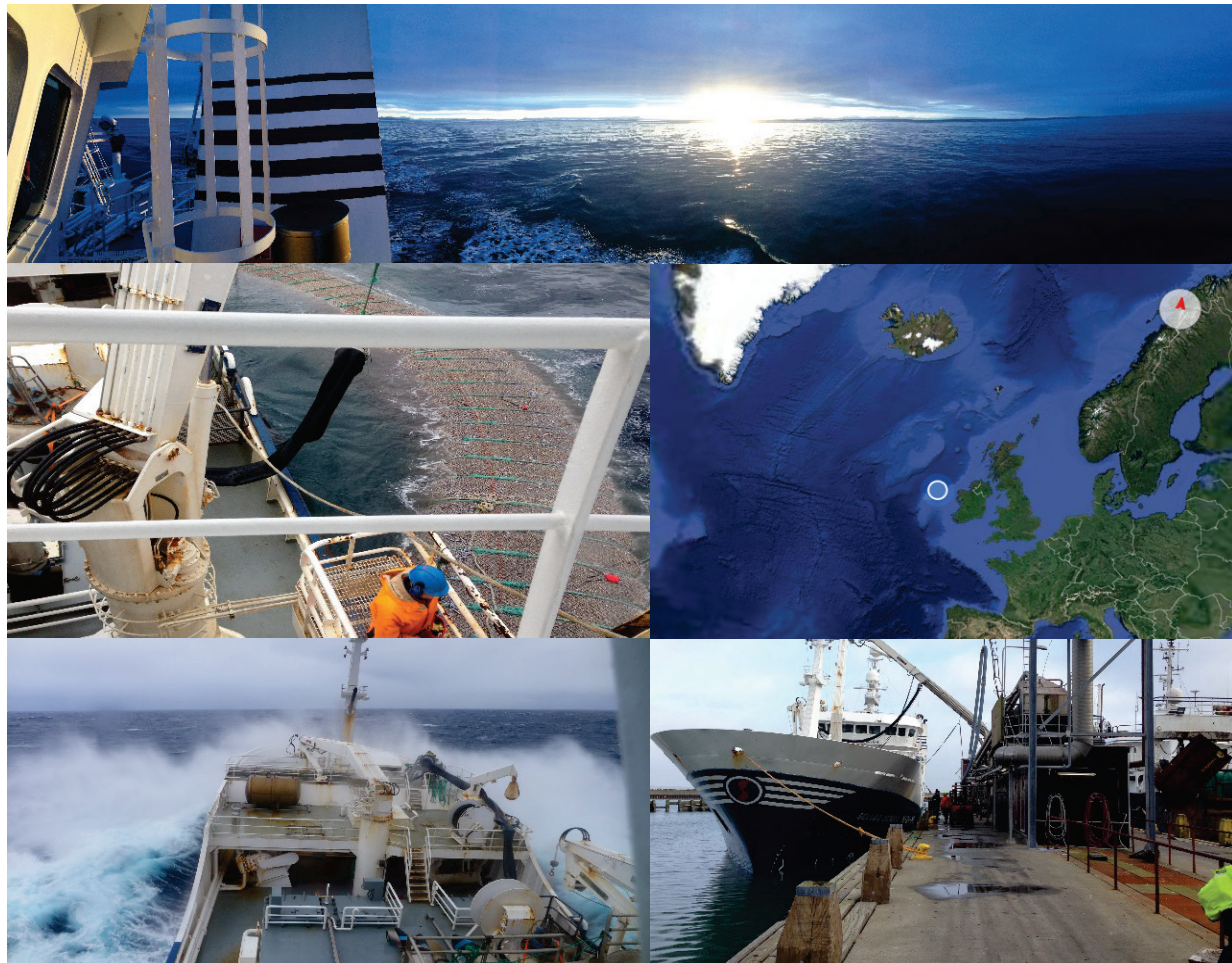


Objectiv

Ice was earlier used for chilling of fish, but because of large amounts of fish onboard, tanks with refrigerated sea water (RSW) has been used since the 1960s for chilling of pelagic fish. The water is chilled in a refrigeration system and circulated through the fish tanks. The efficiency of the chilling is dependent the ratio of water and fish, species and flow. The most common pelagic species caught are mackerel, herring and blue whiting. Each of them has different behaviour in water and ratio of fish and water.

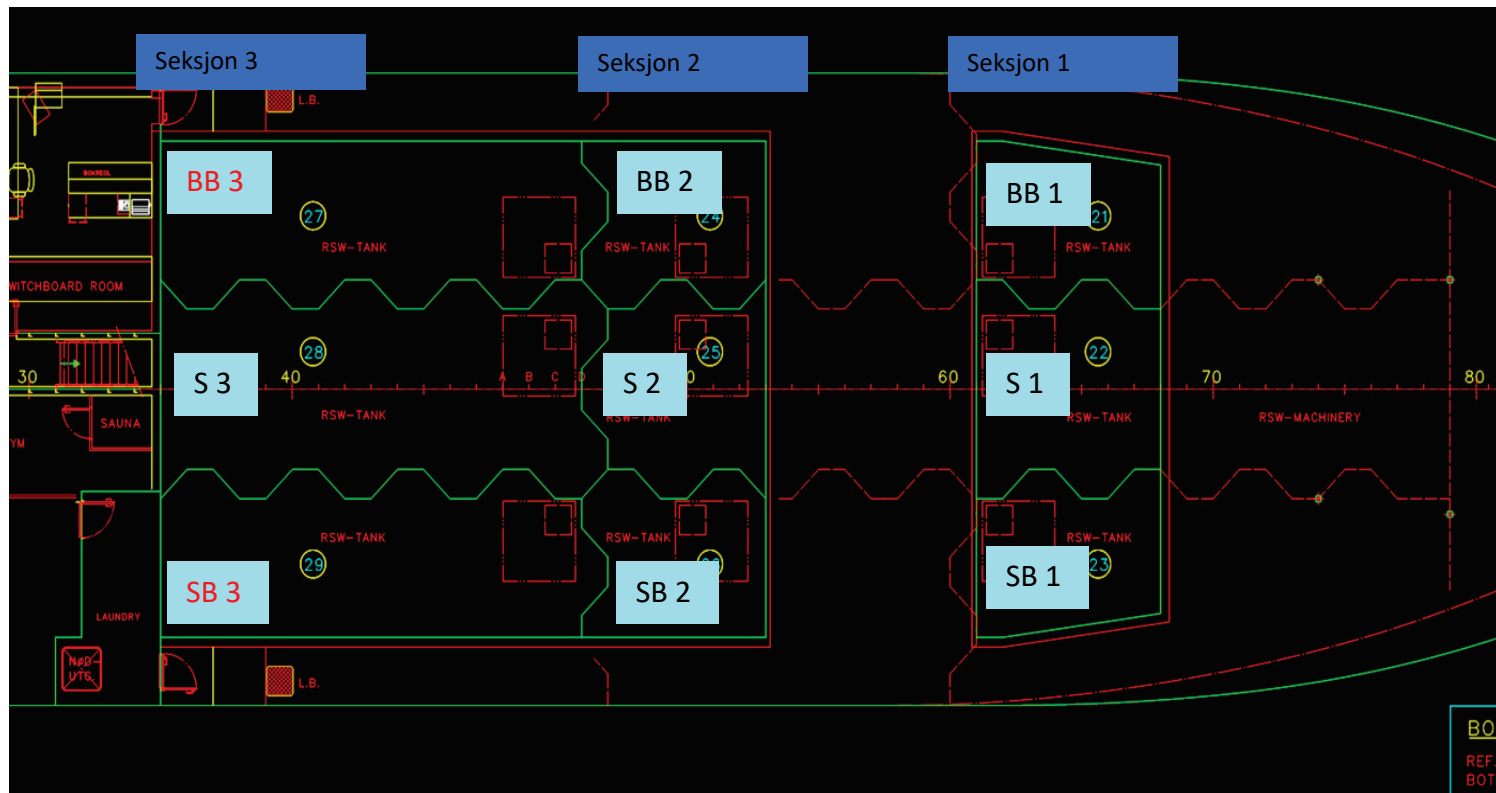
To investigate this a vessel has been equipped with temperature sensors in two equally tanks where one of them has possibility to change the flow pattern. Results from a research cruise where blue whiting was caught will be presented and discussed.





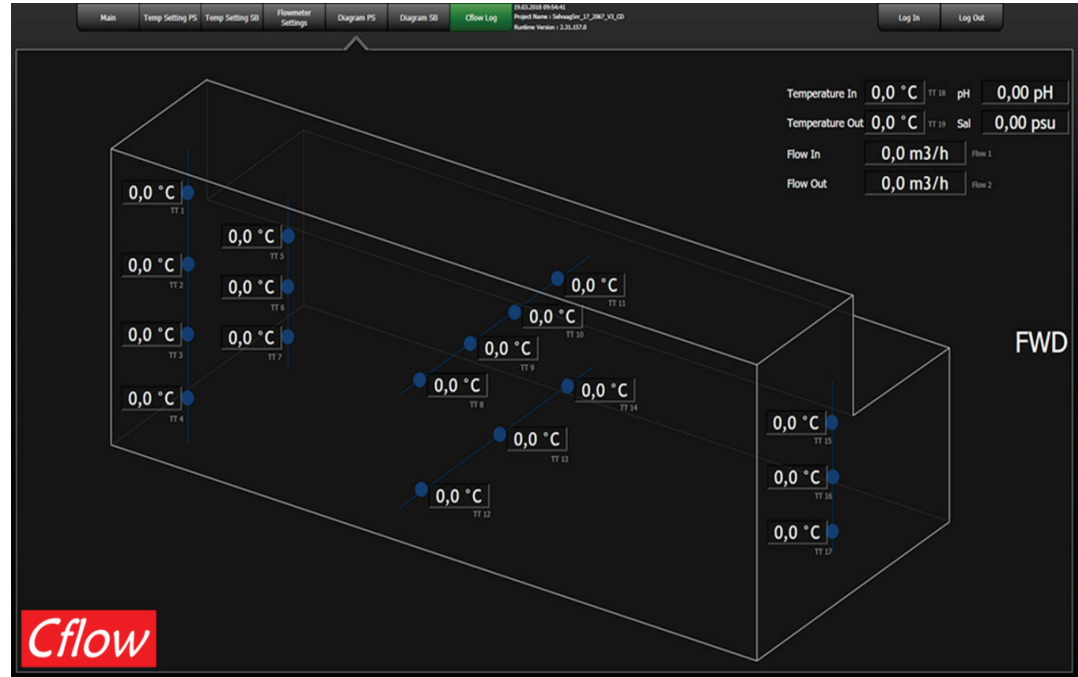
- Research cruise
- Blue Whiting
- Period Mars-April 2018
- West of Ireland
- Delivered in Denmark

RSW tank plan onboard



Instrumentation

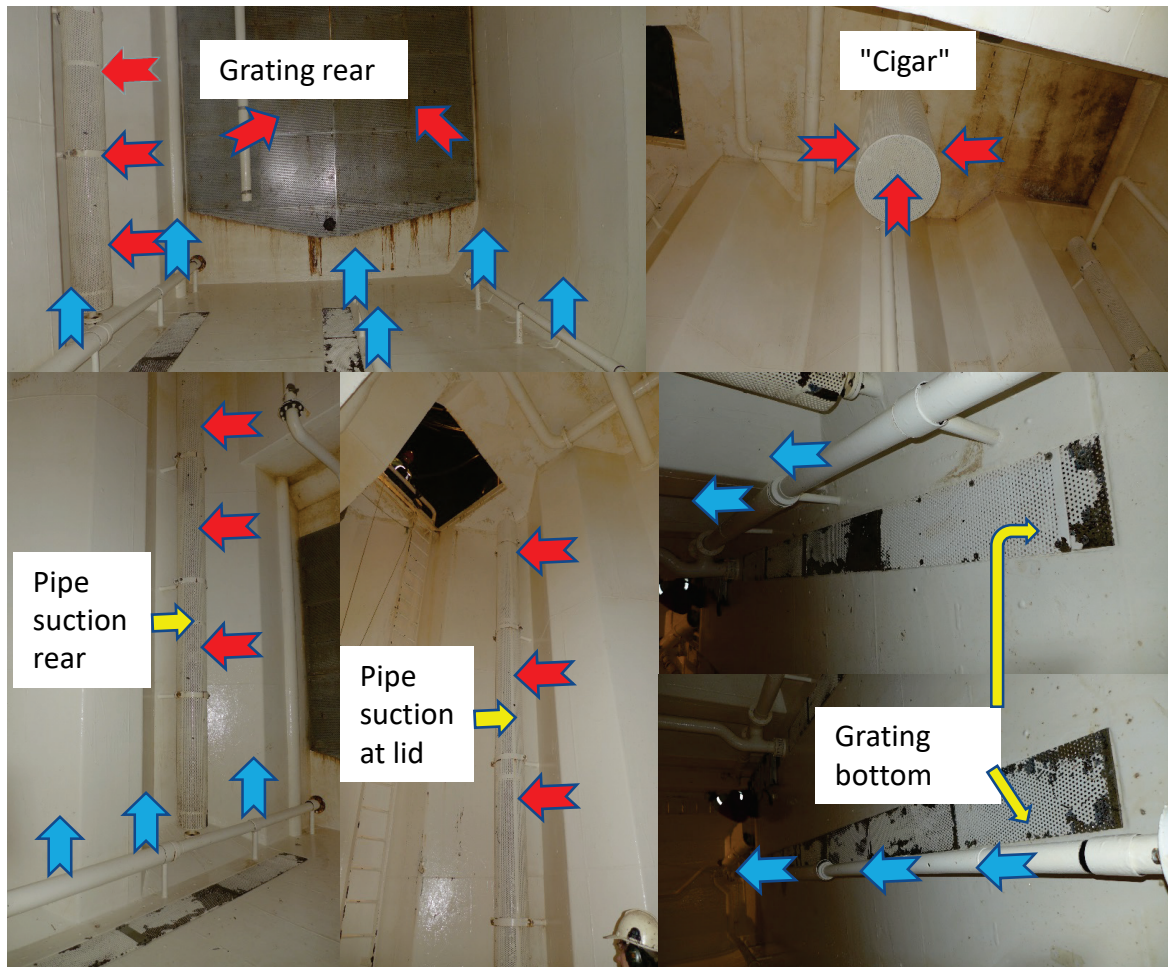
To get an overview of the flow pattern it is important to get the entire tank volume covered with temperature sensors. In addition, mass flow meter was installed in the input and output of both tanks. The chart shows where they were placed in the tank BB3 and SB3



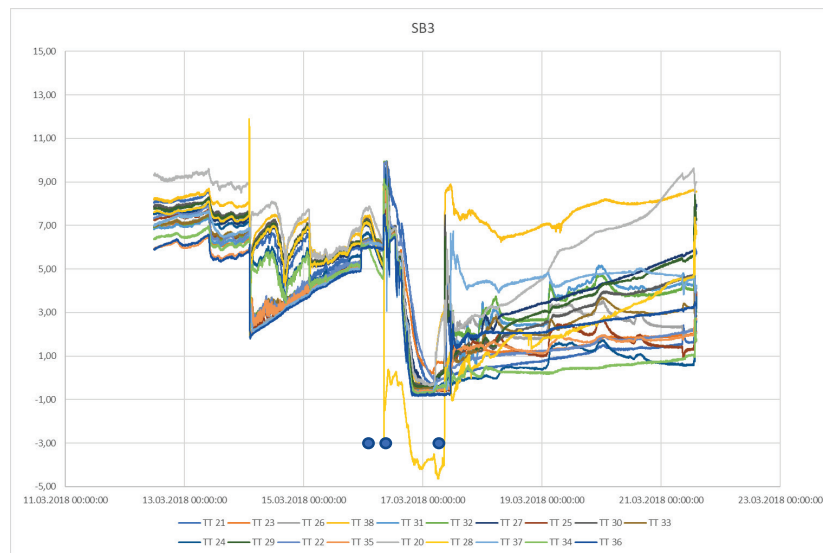
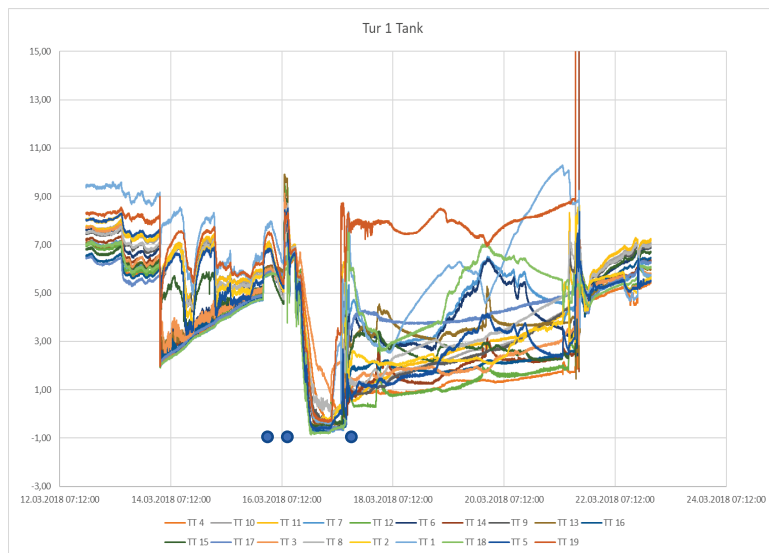
Measurement

- It was made changes to the suction side for tank SB3 so that it can be sucked from the grating on top or rear, or both.
- During the cruise 1 both tank 2 was operated identically (sucked from the top), while during the cruise 2 it was sucked from the rear grating from tank SB3 after the last catch.

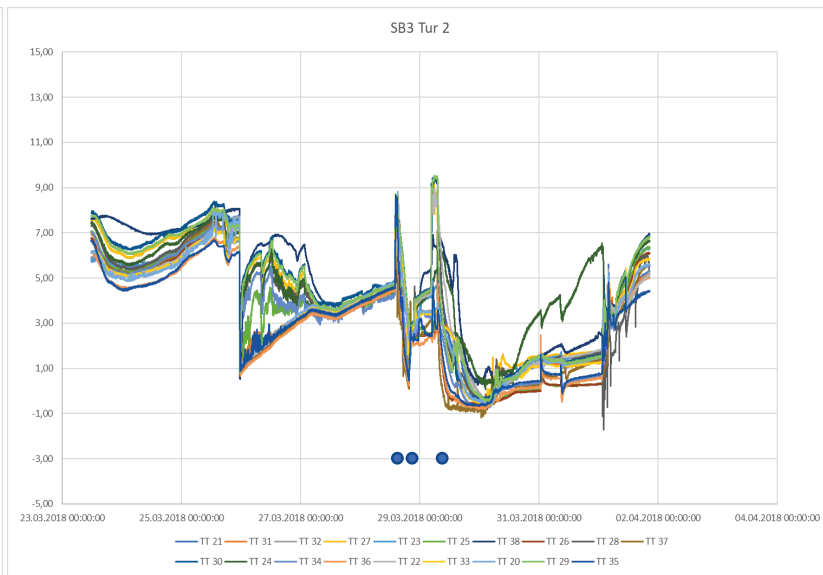
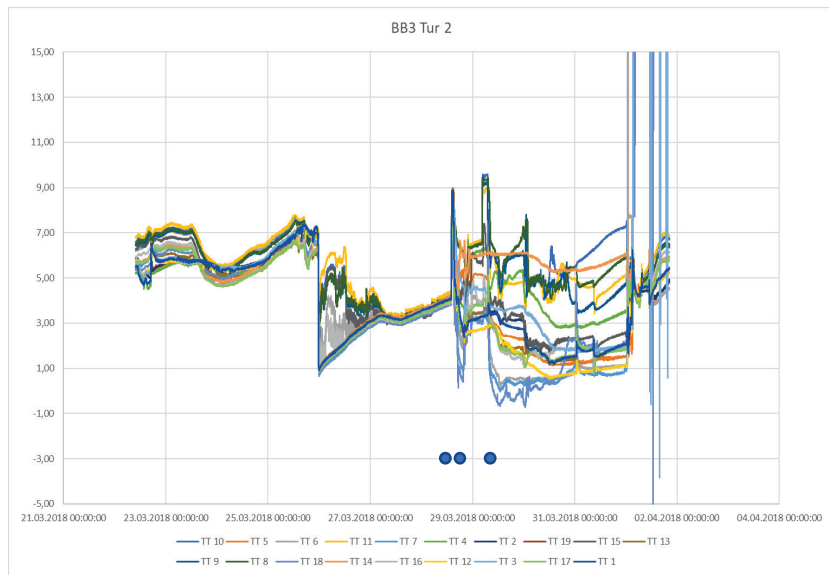




Cruise 1



Cruise 2



Results

Both tanks SB3 and BB3 were full at both cruises. Dots in the graphs show when fish were loaded on the tanks. For cruise 1 (both tanks) and cruise 2 in the BB3, the water temperature is at unloading between 1 and 6 °C, while those for cruise 2 SB3 are between 0 and 2 °C. The flow pattern was identical in both tanks during cruise 1, but unlike during the cruise 2. At cruise 2 we had the normal operation of the BB3, while SB3 had suction from top and rear gratings.

The average temperature for cruise 1 was 3.7 °C in tank SB3 and 4.1 °C in tank BB3. For the cruises, the numbers were 1.2 °C for tank SB3 and 2.9 °C for tank BB3. There is a distinct gain of altered operating patterns and this is to be tested further in the cruises in the future.

Organizing

- The project is led by CFLOW AS, with SINTEF Ocean as research partner. Sørheim Holding, Skipsteknisk AS and Øyangen AS are partners in the project.

Acknowledgment

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