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Ship accidents of last 30 years at maritime ferry Baltic Sea operating area

Keywords

Baltic Sea, maritime ferry operating area, sea accident, climate-weather conditions

Abstract

The paper deals with the sea accidents that have occurred at the domain of a passenger Ro-Ro ship operating at the Baltic Sea between Gdynia and Karlskrona ports during last three decades. The accidents are grouped into two sets, that happened at the open waters and those at the port waters. Next, for each accident, the climate-weather change process conditions are identified to examine the weather hazards influence on the considered accidents.

1. Introduction

The considered maritime ferry is a passenger Ro-Ro ship operating at the Baltic Sea between Gdynia and Karlskrona ports on regular everyday line. Its route is illustrated with interrupted line in *Figure 1*. The domain of the maritime ferry operating area and its coordinates are also illustrated in *Figure 1*.

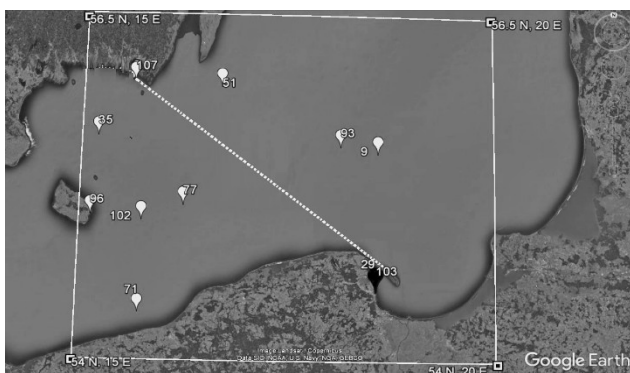


Figure 1. Ship accidents at the domain of maritime ferry operating area (the number on the map is corresponding to the accident number in *Table 1* in [Bogalecka et al., 2017].

More details about the maritime ferry, its assets and interconnections between them are given in [EU-CIRCLE Report D6.4, 2018a].

Despite the lack of exhausting, detailed and completed documents on ship accidents at the Baltic Sea, we collected more than 100 sea accidents that have happened at the Baltic Sea area for last three decades [Bogalecka et al., 2017]. We have detailed data on 11 accidents that happened last 30 years at the domain of the maritime ferry operating area (*Figure 1*). Five of them happened because of the bad weather condition (accident number: 9, 71, 77, 93, 107). Moreover, 3 of them happened directly on the maritime ferry route (accident number: 29, 103, 107).

2. Weather condition during ship accidents at the Baltic Sea domain of maritime ferry operating area

The accidents at the Baltic Sea domain of maritime ferry operating area occurred at open waters (accident number: 9, 35, 51, 71, 77, 93, 96, 102, 107)

as well as at port waters (accident number: 29, 103). To examine the influence of weather condition on these sea accidents, we established the kind of state of the climate-weather change process during particular sea accidents. The climate-weather states at the Baltic Sea open waters are based on $a = 2$ parameters that mainly describe the climate-weather states in this area: w_1 – the wave height measured in meters and w_2 – the wind speed measured in meters per second. On the other hand the climate-weather states at the Baltic Sea ports are based on $a = 2$ parameters that describe the climate-weather states in this area: w_1 – the wind speed measured in meters per second and w_2 – the wind direction measured in angle degrees. Next, taking into account expert opinions on the climate-weather change processes for both the ship operating areas at the Baltic Sea (open waters and port waters), $w = 6$ climate-weather states c_1, c_2, \dots, c_6 are distinguished [EU-CIRCLE Report D6.4, 2018a]. The state c_1 means the slight weather hazard state, whereas the c_6 means the extreme weather hazard state.

2.1. Ship accidents at open waters of the Baltic Sea domain of maritime ferry operating area

The accidents happened at open waters of the Baltic Sea domain of maritime ferry operating area are marked with white pin on the map (Figure 1).

2.1.1. Dan Trimmer accident

The general cargo vessel *Dan Trimmer* (Figure 1, #9 on the map) was carrying 750 tons of metal sheets to Klaipeda, Lithuania. On 13th March 2004, at 18.30 hours LT, when the ship was approaching Klaipeda and was 70 nautical miles from port, the vessel called to Klaipeda Port Co-ordination Centre for assistance, as an ingress of water was noted in the forepeak part of the vessel. There was already about 60 m³ of water in the forepeak which was close to the critical limit. The Lithuanian tug vessel assisted the vessel by shielding it on its way to Klaipeda port. On its way to the port, the crew on board *Dan Trimmer* were pumping out the water from the vessel. The vessel reached the port safely. The occurrence of the water in the forepeak was caused by a defect in the non-return-valves in the ventilation duct, and because of rough weather, water had emerged [GISIS, 2017].

The *Dan Trimmer* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . The Baltic Sea

was influenced by a periphery of the extended area of high pressure which was centred over Russia. The trough of low pressure with the indistinct occluded weather front was approaching very slowly from the west. At night on 13/14 March 2004 the Baltic Sea was already influenced by the trough of low pressure, while its southern part was influenced by a warm part of the cyclone (Figure 2).

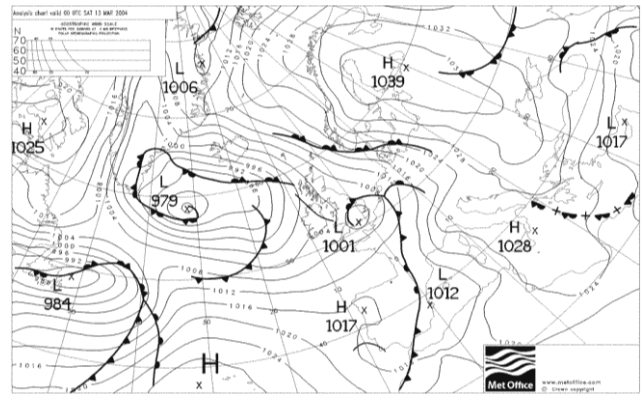


Figure 2. Synoptic map for Europe on March 13, 2004.

2.1.2. Egon W accident

The vessel *Egon W* (Figure 1, #35 on the map) reported a fire in the engine room on 2nd January 2006. Danish and Swedish SAR was executed. Following that, the fire was under control and loss of engine power was reported and, that the vessel itself had arranged for towing assistance, SAR was cancelled [GISIS, 2017].

The *Egon W* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . Over the eastern Europe the area of high pressure was stagnating (Figure 3).

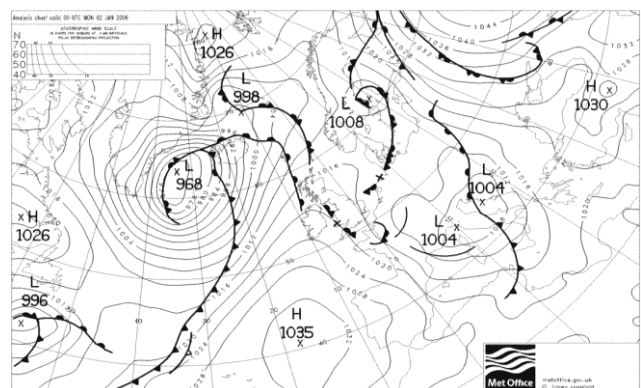


Figure 3. Synoptic map for Europe on January 2, 2006.

The Baltic Sea was influenced by the shallow, widely extended trough of low pressure. The line of waving atmospheric fronts was stretched from the Gulf of Bothnia, over the Gotland down to Denmark. The weather condition had the irrelevant influence on the accident.

2.1.3. Breant accident

The ro-ro / cargo vessel *Breant* (Figure 1, #51 on the map) was on passage on 10th June 2007 when the fire alarm and the main engine failure occurred simultaneously. Thick smoke was discovered in the engine room and access doors and fire flaps were secured. Crew were mustered on the bridge and two teams of firefighters were formed. One team entered the engine room through the normal access and the second came from forward through a pipe tunnel access. Firefighters wearing breathing apparatus were able to put out the fire using portable dry powder extinguishers. Fixed systems were available, but were not used. Subsequent investigation determined that a low pressure fuel inlet pipe situated between the two banks of the main "V" engine had broken allowing fuel oil, pre-heated at 110 to 120°C to spill onto hot engine components. Fractured low pressure fuel pipe was made from steel and approximately 30 mm in diameter. Pipe was supported locally by brackets but a section about 100 mm long had detached and was missing. Fire was extinguished rapidly, but area in a 6 m radius was heavily damaged, particularly engine controls, governor, cabling and deckhead fittings. Company reported that they were very pleased with crew response to the emergency [GISIS, 2017].

The *Breant* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . The Baltic Sea was influenced by an extended area of low pressure characterized by weak pressure gradient (Figure 4).

2.1.4. Rozgwiazda accident

On 17th October 2008, the dredger *Rozgwiazda* was about eight miles off the coast in the South Baltic Sea (Figure 1, #71 on the map), when she sank at approximately 06.55 in heavy weather, with 25 m tons of marine diesel oil in her tanks. Five crew members were lost at sea [GISIS, 2017].

The *Rozgwiazda* accident was classified as a very serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety

Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . The Baltic Sea was influenced by the extended area of low pressure centred over the northern Sweden with the central value of 984 hPa. The cyclone was gradually dissipating. Within extension of the low pressure area, secondary weather fronts appeared. A polar maritime air mass approached from the west. After midday, the shallow ridge of high pressure advanced from the east (Figure 5).

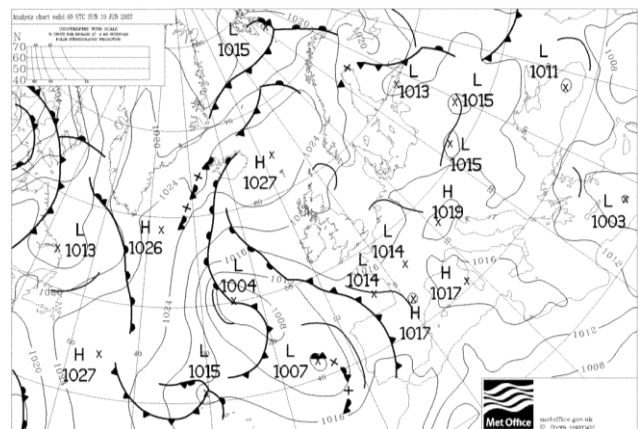


Figure 4. Synoptic map for Europe on June 10, 2007.

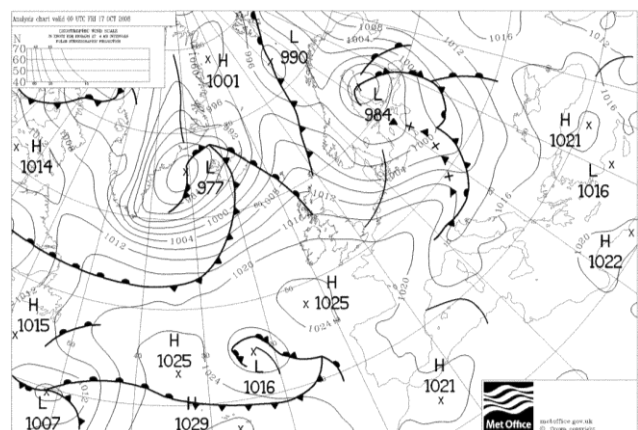


Figure 5. Synoptic map for Europe on October 17, 2008.

2.1.5. Unora accident

The fishing vessel *Unora* (Figure 1, #77 on the map) on 17th February 2009 was employed in the South Baltic sea in fish trawling, when suddenly the vessel listed to starboard, capsized and sank very quickly. 4 crew members were rescued by SAR helicopter and 2 crew members were missing [GISIS, 2017]. Loss of *Unora* was caused by offence of ship's stability information in connection with the exceeded weight of the cargo of fish in the vessel's hold and on deck, and possible shift of fish cargo in cargo hold after a

vessel's list to starboard. During investigation it was established that overweight of cargo in fishing vessels is a common offence. Sometimes the weight of cargo of fish in a fishing vessels 3 times exceeds the allowed weight which is noted in a ship's stability criteria [DIMA of MAL, 2009].

The *Unora* accident was classified as a very serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_6 . On February 17th 2009 the Baltic Sea was influenced by a periphery of a strengthening anticyclone centred over northern Scandinavia, and a depression centred over eastern Russia. The arctic air mass advanced from the north over the Baltic Sea (Figure 6).

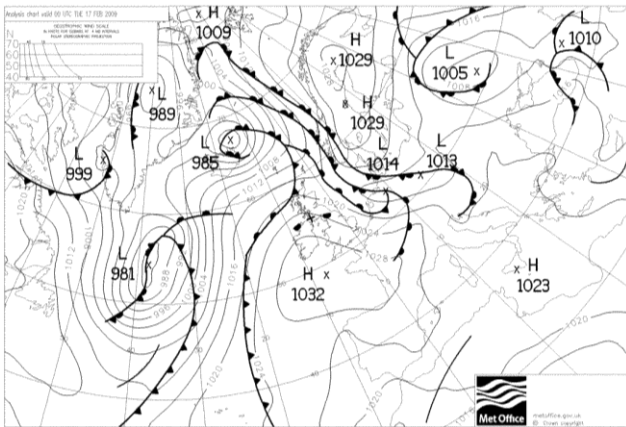


Figure 6. Synoptic map for Europe on February 17, 2009.

2.1.6. DC Merwestone accident

On 28th January 2010, the Dutch ship *DC Merwestone* (Figure 1, #93 on the map) left Klaipeda (Lithuania) for Bilbao (Spain) carrying a cargo of scrap iron. At sea that evening the bilge alarm sounded and water was observed to be flowing into the engine room. Despite efforts made to empty the bilges the engine room filled completely and several of the adjacent spaces were partially filled. The vessel managed to seek refuge at the port of Gdynia, Poland [GISIS, 2017].

The *DC Merwestone* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . On 28th January 2010 a very active and deepening area of low pressure rapidly moved over the Baltic Sea. The

cyclone was centred off the south coast of Sweden with central value of 981 hPa. At 12 UTC the central value already reached 976 hPa and was located over the coast of Lithuania. An occluded weather front was moving along with the low over the Baltic Sea (Figure 7).

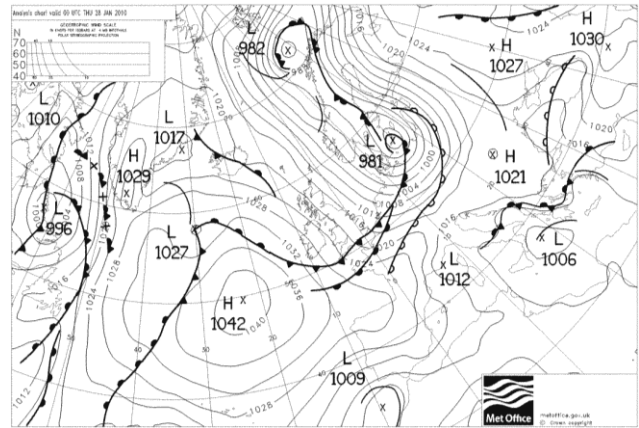


Figure 7. Synoptic map for Europe on January 28, 2010.

2.1.7. Rytas accident

On 28th April 2010, during approach to Nexø, Bornholm, the fishing vessel *Rytas* (Figure 1, #96 on the map) missed the harbour entrance and grounded just north of the northern break water [GISIS, 2017].

The *Rytas* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . The southern Baltic Sea was influenced by a weak area of high pressure (Figure 8).

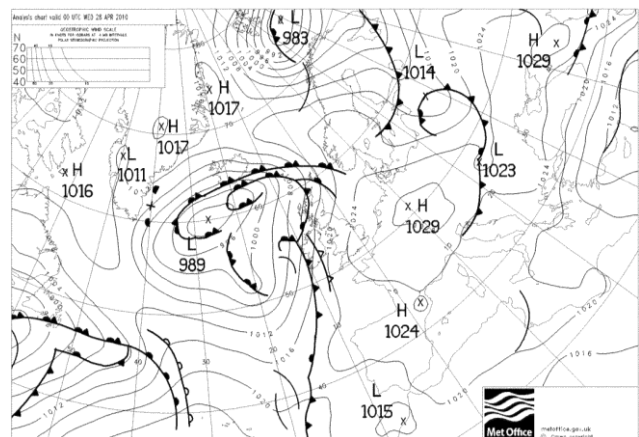


Figure 8. Synoptic map for Europe on April 28, 2010.

At 00 UTC the high was centred over the southern Germany, with central value of 1029 hPa. The high pressure center was gradually developing to the east. A trough of low pressure, originated over a central part of the Baltic Sea and the Gulf of Finland, was traveling to the east along with a cold front. In the evening a second trough of low pressure approached along with a warm front.

2.1.8. Victoria Seaways accident

Self-ignition of a vehicle on a cargo deck of *Victoria Seaways* happened on 23rd April 2012 (Figure 1, #102 on the map). The fire was observed on the ship's main deck at 00:52, when the ship was about 22 nautical miles from Nexø on Bornholm. The ship's extinguishing system was activated and the crew gained control of the fire relatively quickly. At the same time the passengers gathered at the ship's muster stations from where evacuation can be carried out quickly. After a hour the crew had the situation under control, and the ship could proceed to Klaipeda where it is expected to arrive at 12:30 CET the same day. On the board were 301 passengers, 37 crew members and 160 freight units in the form of trailers, containers, trucks, etc. In addition, there were 48 cars and two buses on board. The extent of the damage to goods and vehicles on the car deck, where the fire broke out, cannot be assessed until the ship was in Klaipeda port. No other area on the ship other than the main deck, which is a closed vehicle deck, was affected by the fire. The cause of fire is unknown [GISIS, 2017, World Maritime News, 2017].

The *Victoria Seaways* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_1 . The Baltic Sea was influenced by a very extended but shallow through of low pressure in the zone of occluded atmospheric fronts. A polar maritime air mass was approaching (Figure 9). The weather condition had the irrelevant influence on the accident.

2.1.9. Stena Alegra accident

The RoPax ferry *Stena Alegra* (Figure 1, #107 on the map) on 28th October 2013 grounded after dragging its anchor in Knot winds off Karlskrona, Sweden. The ship's bottom plating and frames were damaged, and one ballast tank and one void space were flooded. Two tugs towed the ship off the rocks after the weather had moderated the next day. Following

an underwater inspection the ship proceeded to Gdynia, Poland, for repair [GISIS, 2017].

The *Stena Alegra* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_6 . On October 28th 2013, the Baltic Sea was influenced by an extended area of low pressure with its centers over the Faroe Islands and Norway. At 00 UTC a small area of low pressure with a central pressure value of 981 hPa, originated over the Atlantic approached to the western Great Britain coast. The low was deepening fast and moving northeast. The center deepest value was reached at 12 UTC while approaching to Denmark coast. A slowly occluding weather fronts system was moving along with the low center. During a day the Baltic Sea was temporary influenced by a warm arctic maritime air mass. After a midday the Baltic Sea was influenced by cold arctic maritime air mass from the east (Figure 10). The weather condition had the irrelevant influence on the accident.

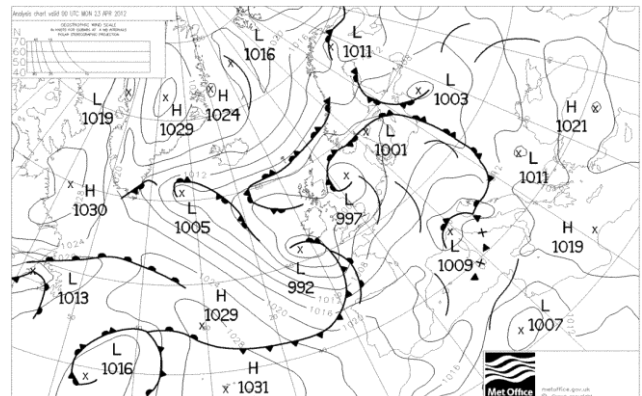


Figure 9. Synoptic map for Europe on April 23, 2012.

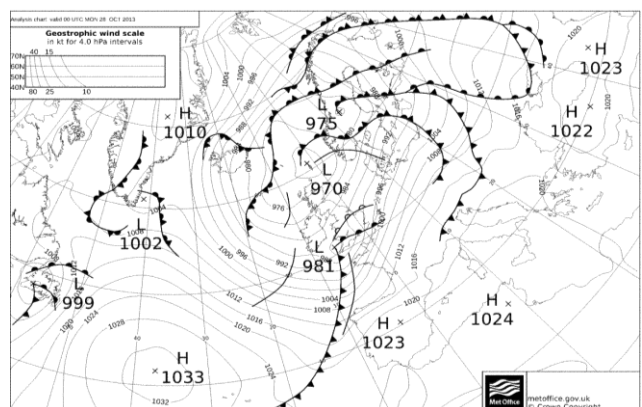


Figure 10. Synoptic map for Europe on October 28, 2013.

2.2. Ship accidents at port waters of the Baltic Sea domain of maritime ferry operating area

The accidents happened at port waters of the Baltic Sea domain of maritime ferry operating area are marked with black pin on the map (Figure 1).

2.2.1. Stena Baltica accident

The ferry *Stena Baltica* (Figure 1, #29 on the map) exceeded allowed speed on the fairway and hit into the pier on 30th July 2005 [Portal Morski, 2017a].

The *Stena Baltica* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_4 . The Baltic Sea and northern Poland were influenced by a surface low pressure area originated over Denmark with a fronts system traveling east and northeast. Warm part of the low pressure area stagnating at night over Poland contained a warm, moist and unbalanced air mass (Figure 11).

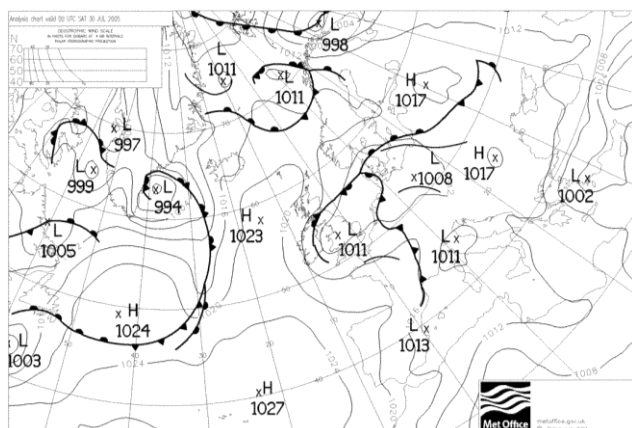


Figure 11. Synoptic map for Europe on July 30, 2005.

2.2.2. Stena Spirit accident

On 17th May 2012, the *Stena Spirit* was departing from Gdynia Ferry Terminal en route to Karlskrona, Sweden when she became involved in an accident at the Baltic Container Terminal (Figure 1, #103 on the map). The bow (ship) of the cruise ferry struck one of the Gantry cranes causing it to catastrophically collapse onto the quay below as she was manoeuvring. Three employees of the container terminal were injured, all requiring hospital treatment. Two of the Three staff members are said to be in a serious condition. None of the passengers or crew on board the *Stena Spirit* were injured [Portal Morski, 2017b].

The *Stena Spirit* accident was classified as a serious casualty according to the Circular MSC-MEPC.3/Circ.3 of the IMO Maritime Safety Committee and Marine Environment protection Committee [IMO, 2008].

The accident happened when the climate-weather change process was at the state c_5 . The trough of low pressure area was deepening and moving north along with the fronts system from southern Scandinavia and the North Baltic Sea. An area of high pressure was moving eastwards. A polar maritime air mass was approaching from the North Sea (Figure 12).

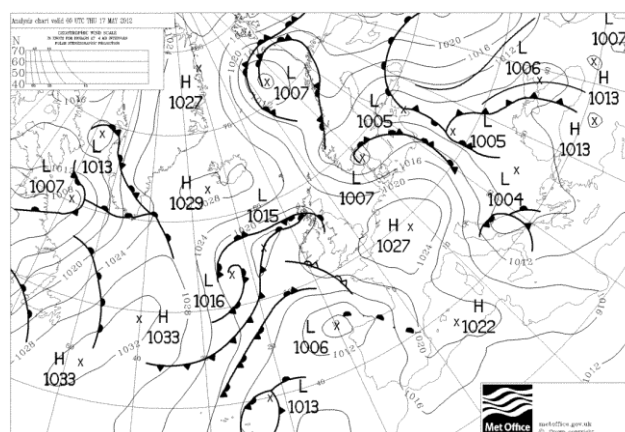


Figure 12. Synoptic map for Europe on May 17, 2012.

3. Conclusion

The description of the ship accidents occurred at the domain of a passenger Ro-Ro ship operating at the Baltic Sea between Gdynia and Karlskrona ports was done in this paper. Moreover, the weather conditions during these accidents were described. The presented data will be used in the EU-CIRCLE Case Study 2, Sea Surge and Extreme Winds at the Baltic Sea Area [EU-CIRCLE Report D6.4, 2018b].

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