

## 2. Statistics on accidents caused by dozing

### By accident type

By accident type, 35 (78%), or approximately 80%, were grounding, followed by 9 (20%) collisions between vessels and 1 (2%) contact with a breakwater. (See Figure 2)

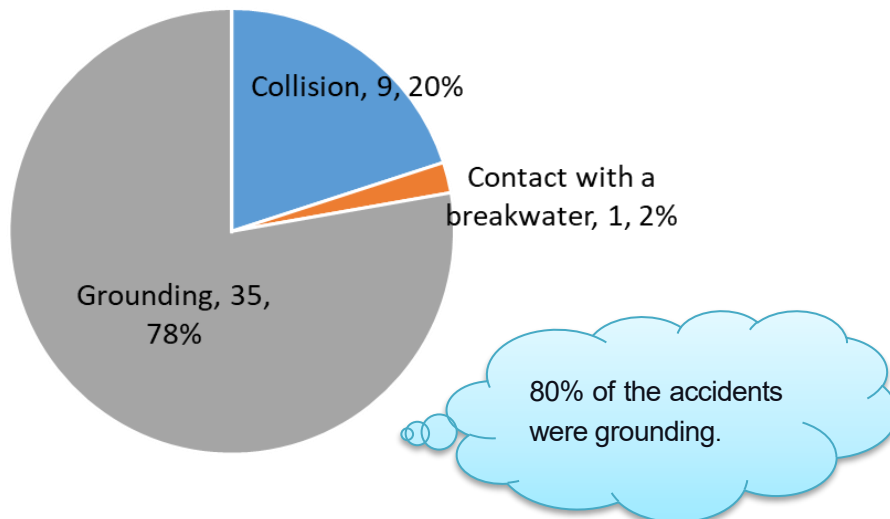


Figure 2. Occurrence by accident type

### By vessel type and the gross tonnage

By vessel type, 38 (84%), or more than 80%, were cargo ships. (See Figure 3)

By gross tonnage, 28 vessels (62%), or more than 60%, were between 200 and 500 tons, followed by 11 vessels (25%) between 100 and 200 tons and 6 vessels (14%) between 500 and 1600 tons. (See Figure 4)

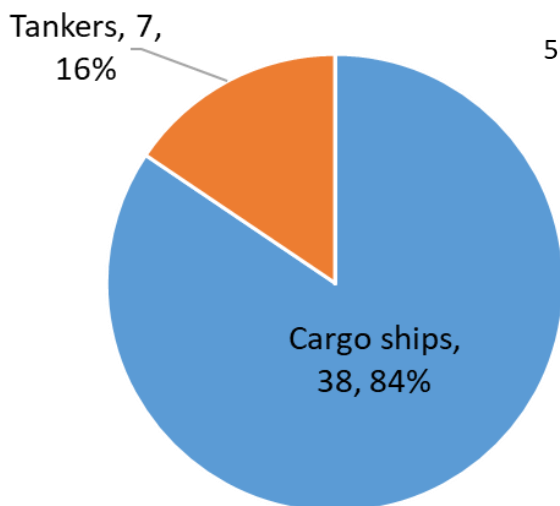


Figure 3. Occurrence by vessel type

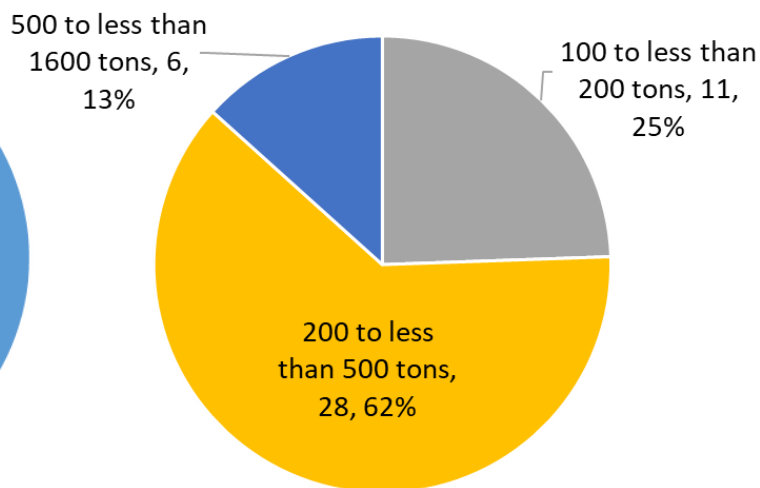


Figure 4. Occurrence by gross tonnage

The majority were of 200 to less than 500 gross tonnages.

## By area

By area, 25 (56%), or approximately 60%, were accidents in the Seto Inland Sea and around (Osaka Bay to the Kanmon Strait), followed by 6 (13%) in the central part of the south coast of Honshu (Tokyo Bay to the coast of Wakayama Prefecture) and 4 (9%) in the north and west coast of Kyushu (northern coast of Fukuoka Prefecture to western coast of Kagoshima Prefecture). (See Figure 5)

The "Japan-Marine Accident Risk and Safety Information System (J-MARISIS)" developed by JTSB in its Seto Inland Sea area shows four groundings near Kudako Island, Matsuyama City, indicating many groundings in the vicinity of the narrow waterway. (See Figure 6)

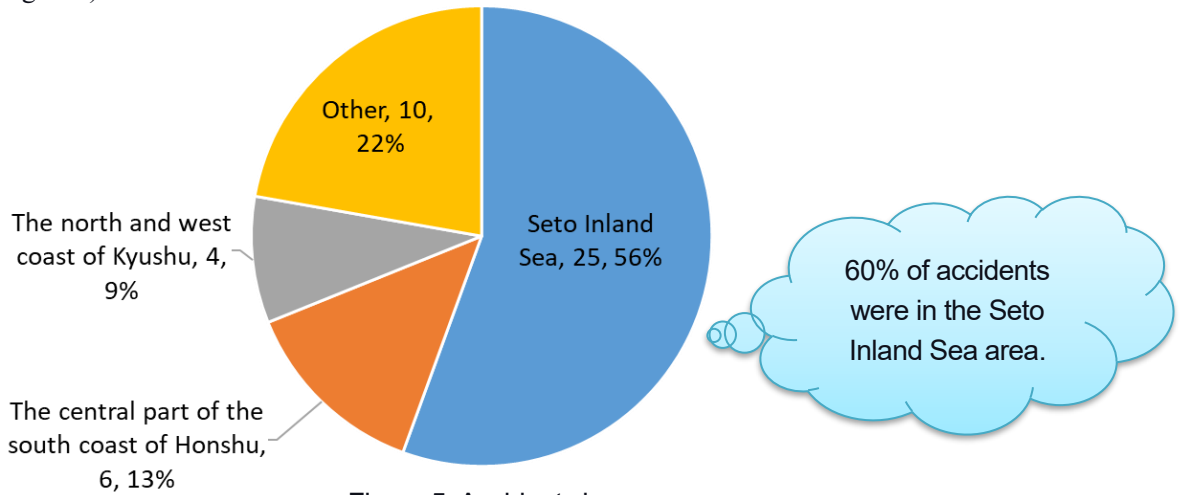


Figure 5. Accidents by area

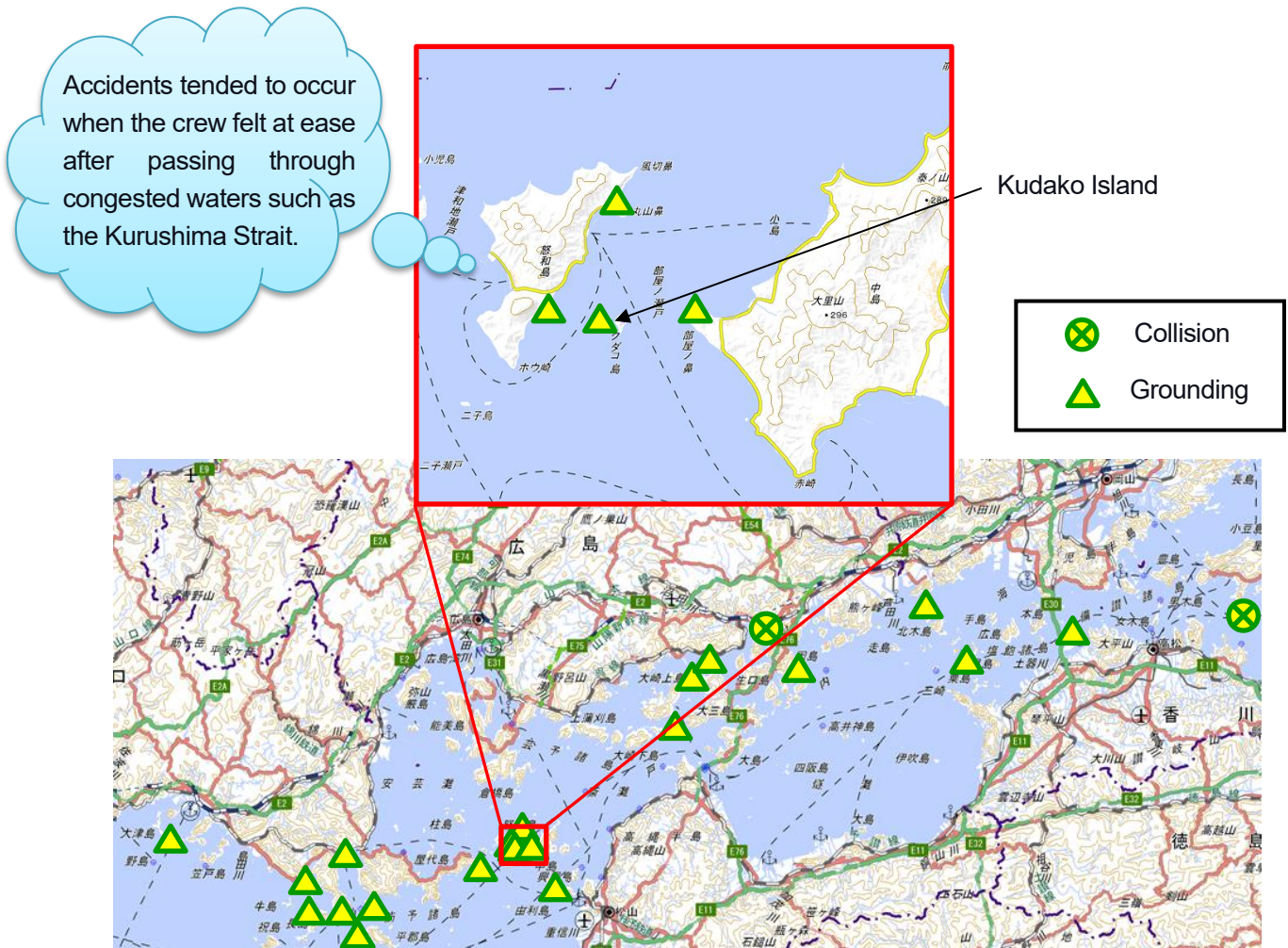


Figure 6. Accidents recorded in the J-MARISIS

## By time range

By time range of the day, the highest number of accidents is 7 (16%) between 2 and 3 a.m., followed by 6 (13%) between 9 and 10 p.m., and 39 (87%, approximately 90%) between 9 p.m. and 5 a.m. (See Figure 7)

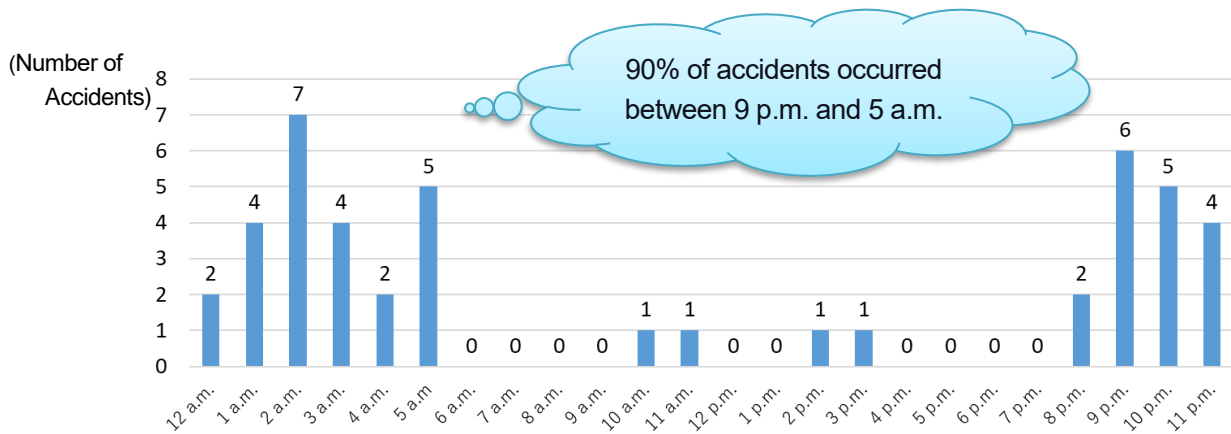


Figure 7. Accidents by time range of the day

## By the number of crew members and bridge watchkeepers

By the number of crew members, the highest occurrence was at 14 vessels (31%) with four crew members, followed by 11 vessels (24%) with five crew members, and 43 vessels (96%) with three to six crew members. (See Figure 8)

By the number of bridge watchkeepers, 43 vessels (96%) were with one watchkeeper, followed by two vessels (4%) with two watchkeepers.

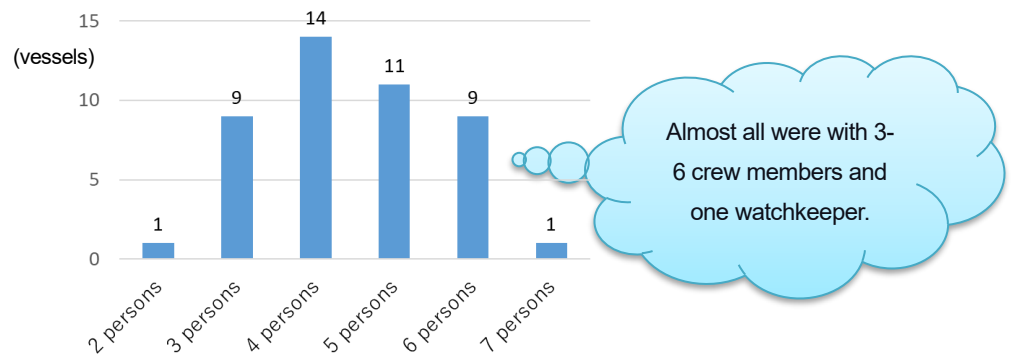


Figure 8. Vessels by number of crew members

## By watchkeeper posture and autopilot use

By bridge watchkeeper posture, 29 vessels (65%), or approximately 70%, were with the watchkeepers on their chair, followed by six vessels (13%) with their elbows on the steering gear, and five vessels (11%) leaning against a wall or similar. (See Figure 9)

As for the autopilot, 43 vessels (96%) deployed it.

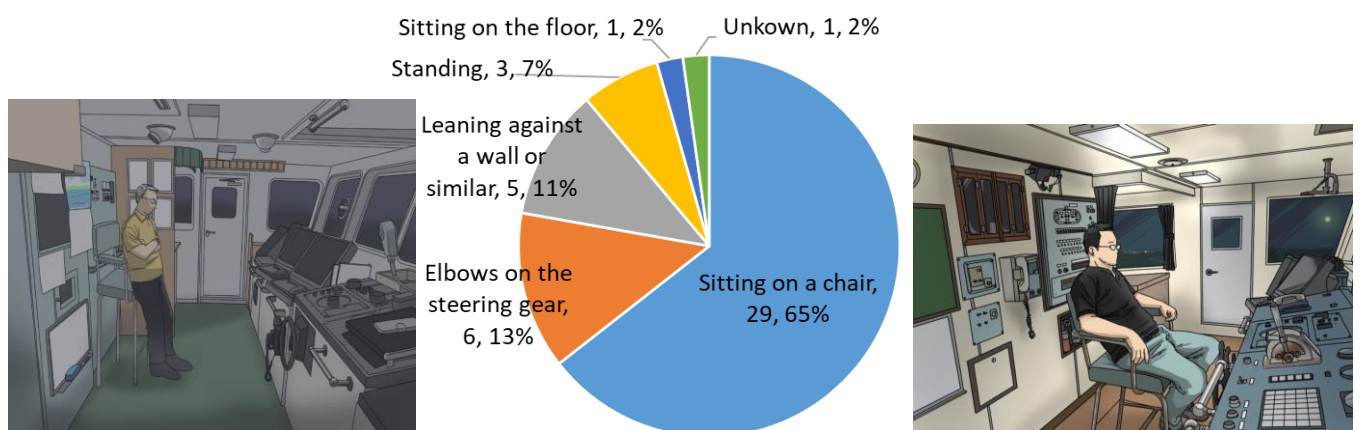


Figure 9. Vessels by bridge watchkeeper posture

## By use of the Bridge Navigational Watch Alarm System

40 of the 45 vessels were equipped with the Bridge Navigational Watch Alarm System (BNWAS) as of the accident. These 40 vessels, 34 (85%) had their BNWAS activated, and 6 (15%) did not, such as having turned them off. (See Figure 10)

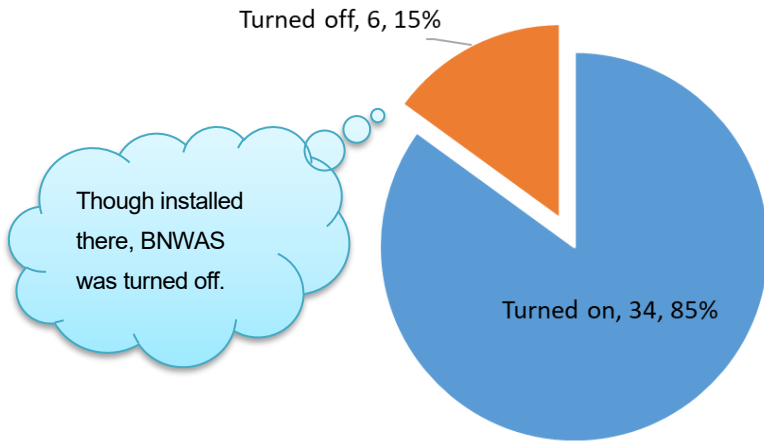


Figure 10. Vessels by BNWAS activation

BNWAS installation became mandatory in 2011 for vessels, including non-international coastal trading vessels of less than 500 gross tonnages.

(Details on the mandatory installation of BNWAS: article from the JTSB Newsletter, released in July 2011).

[https://www.mlit.go.jp/jtsb/bunseki-kankoubutu/jtsbnewsletter/jtsbnewsletter\\_N011/No11\\_pdf/jtsbnl-11\\_02.pdf](https://www.mlit.go.jp/jtsb/bunseki-kankoubutu/jtsbnewsletter/jtsbnewsletter_N011/No11_pdf/jtsbnl-11_02.pdf)

At 33 out of the 34 vessels that had activated their BNWAS, the alarm did not work.

As for possible reasons for the alarm not working, at the 16 vessels (48%), or almost half of the total, the sensors could have misinterpreted the operator's body movements as regular movement, even though dozing (e.g. the case study on page 6). On the other hand, the operator dozed at 9 vessels (27%), and the accident occurred in less than the set time (the alarm inactivation time) (e.g. the case on page 7). (See figure 11)

Of those that may not have passed the set time (the alarm inactivation time), 4 vessels had the time (the alarm inactivation time) set to be more than 10 minutes.

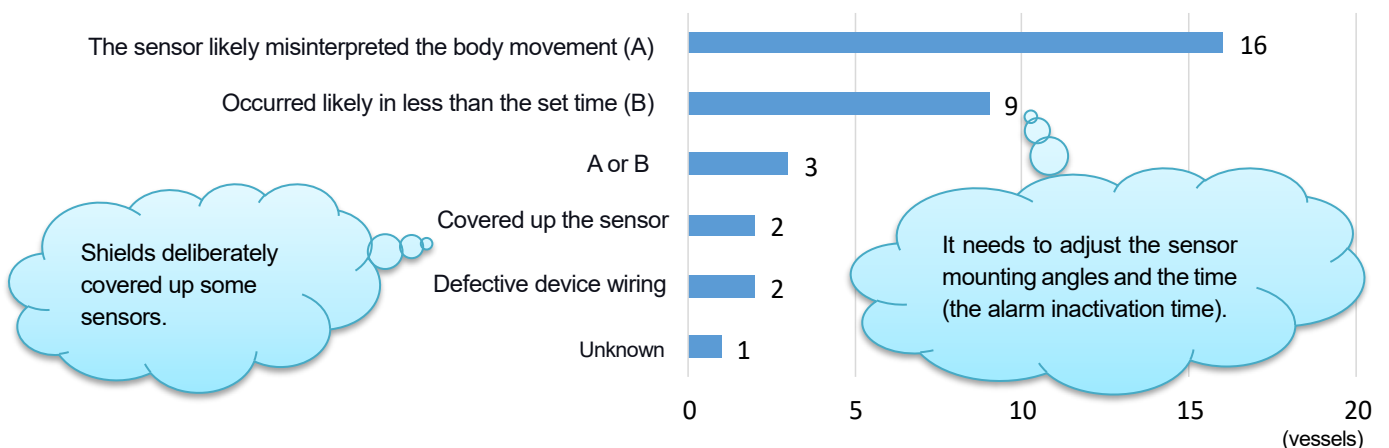


Figure 11. Reasons why the alarm did not work



There were some inappropriate recommendations to point the sensor upwards to avoid detecting a dozing operator.