BACK TO BASICS!

In the Shiretoko passenger ship sinking accident, the master lacked sufficient understanding, knowledge, and experience regarding the weather and sea conditions of the area, leading to an inadequate ability to assess navigation safety. Lessons from this and similar accidents highlight the following fundamental actions.

【Weather and Sea Condition Assessment】

- Do you understand the weather and sea conditions of the operating area based on accumulated information and experience?
- Can the master and operations manager assess departure feasibility using weather charts and meteorological data?
- Do the master and operations manager accurately understand the wind speed and wave height limits set in the operating standards?
- Are weather observation methods based on natural phenomena and animal behavior used to predict local weather patterns?
- Is the latest weather information from the Japan Meteorological Agency or private providers checked before departure?
- Is the Maritime Safety Agency's "Marine Conditions Display System" used to supplement weather and sea condition information?
- Are real-time weather and sea condition monitoring apps utilized during operations?
- Is communication between the master and operation manager ensured regarding weather conditions and navigation decisions?

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【Operational Decision-Making】

- Do you understand your company's operational standards and prioritize safety when making departure decisions?
- Do you ever decide to depart without clearly determining an alternative course when worsening weather and sea conditions are expected?
- Have you established a system to designate and utilize port of refuge in case rough weather makes navigation difficult?
- Is there a cooperative framework with local operators for sharing weather and sea condition information and making operational decisions?
- Is a safety culture in place that respects the master's decisions to suspend operations, turn back, seek shelter, or make an unscheduled stop?

（Column 1） Operational standards

Passenger ship operators are required by the Maritime Transport Act to establish "Safety management regulations" and develop "Operational standards" to implement them effectively.

In the Shiretoko passenger ship sinking accident, the operator had set the following wind speed and wave height limits in the "Operational standards" for deciding whether to operate. If any of these conditions were likely to be met, the vessel was required to suspend departure, turn back, seek shelter, or make an unscheduled stop.

1） **Departure decision (based on port observations): Wind speed: 8 m/s or higher, or wave height: 0.5 m or higher**
2） **Departure decision (based on expected conditions during navigation): Wind speed: 8 m/s or higher, or wave height: 1.0 m or higher**
3） **Operational navigation decision (for stopping, turning back, etc.): Wind speed: 8 m/s or higher, or wave height: 1.0 m or higher**

Despite the likelihood of reaching condition **(2)** during navigation, the vessel was still allowed to depart.

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How can wind speed and wave height be accurately assessed on-site before departure?
One useful reference is the "**Beaufort scale of wind force**," described below.

For example, the "Operational standards" in the Shiretoko passenger ship sinking accident set a threshold of **8 m/s wind speed**. Let's see how this is classified in the Beaufort scale. (Note: The scale ranges from 1 to 12, but only a portion is shown in the table below.)

Beaufort Scale	Explanations	Equivalent wind speed		Reference wind speed (meter)
		knot	meter/second	
0	Mirror-like Sea surface	< 1	0~0.2	-
1	Small ripples appear like fish scales, but no foam on the wave crests.	1~3	0.3~1.5	0.1(0.1)
2	Small waves begin to foam, still short but distinct. The wave crests appear smooth and unbroken.	4~6	1.6~3.3	0.2(0.3)
3	Larger small waves. The wave crests start to break, and foam appears glassy, with occasional whitecaps.	7~10	3.4~5.4	0.6(1)
4	Small but longer waves. Whitecaps became quite frequent.	11~16	5.5~7.9	1(1.5)
5	Medium-sized waves, becoming more distinct and longer. Many whitecaps appear, sometimes accompanied by spray.	17~21	8.0~10.7	2(2.5)
6	Larger waves foam, with foamy crests expanding in various places and frequent spray.	22~27	10.8~13.8	3(4)
7	Waves grow larger, and the white foam created by breaking wave crests begins to streak and drift downwind.	28~33	13.9~17.1	4(5.5)
8	Somewhat smaller but longer large waves. The streaks of breaking wave crests start turning into sea spray, and the foam forms distinct streaks that are blown downwind.	34~40	17.2~20.7	5.5(7.5)

Figure 11- Source: Japan Meteorological Agency, Beaufort scale (excerpt)

Figure 11 shows that 8 m/s corresponds to **Beaufort Scale 5** (red box).

Reference wave heights for offshore areas indicate waves reaching approximately 2.0 m, with a maximum of around 2.5 m.

The sea surface condition at this level generally appears as shown in Figure 12 (photo).

Figure 12- Source: Japan Meteorological Agency, Beaufort wind scale (modified)

Therefore, if "8 m/s wind speed or 1.0 m wave height" is set as the threshold in Operational Standards 2) and 3), once wind speed reaches 8 m/s, wave height is also likely to exceed 1.0 m.

The Beaufort scale classifies 1.0 m wave height within Scale 3 (around 5 m/s) to Scale 4 (see purple box). The corresponding sea surface conditions generally appear as shown in Figure 13 (photo).

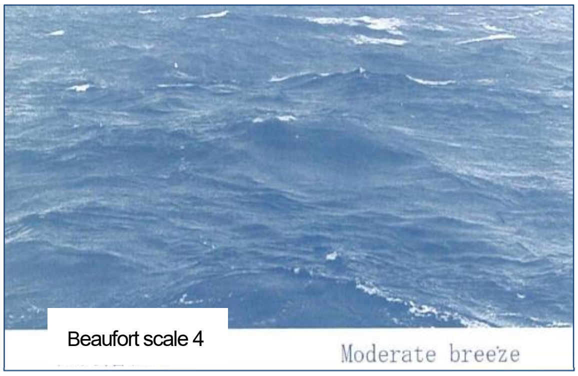

Figure 13- Source: Japan Meteorological Agency, Beaufort wind scale (modified)

Thus, if 0.5 m wave height or around 5.5 m/s wind speed is observed in the port, **offshore waves may already be reaching 1.0 m**. Regardless of the 8 m/s threshold, prioritizing safety and making flexible operational decisions (such as canceling operations) in advance is crucial.

→ Have you established appropriate operational standards for your company while prioritizing passenger safety? Do you consider flexible operations, such as canceling departures even if conditions are below the threshold based on weather and sea forecasts?