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The Japan Ship Owners Mutual Protection & Indemnity Association Loss Prevention and Ship Inspection Department

Coastal vessels Prevention of damage to harbour facilities and related cases

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§1

Introduction

In November 2013, a Loss & Prevention Seminar under the theme of “Prevention of damage to harbour facilities” was held at the following five areas: Tokyo, Kobe, Imabari, Fukuoka and Saeki. Following these, Loss Prevention Bulletins Vol. 31 and 32 covering these themes were issued.

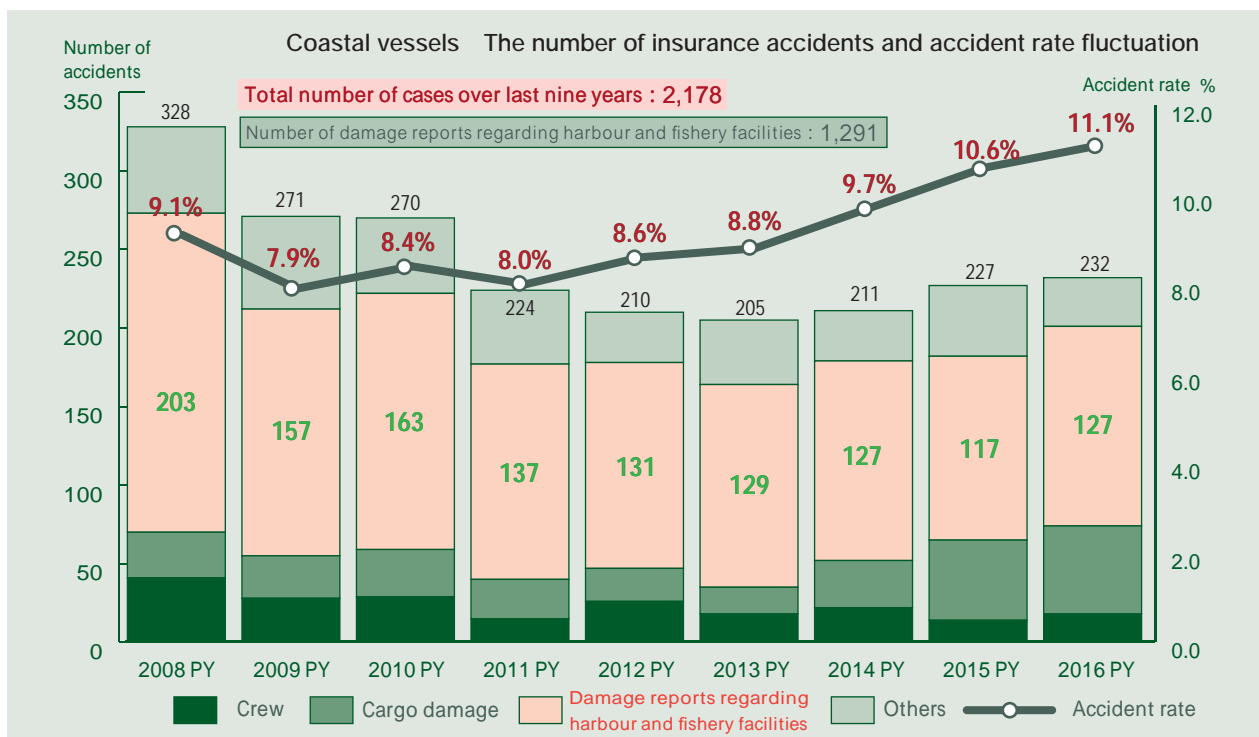
This time, the outline of the Loss & Prevention Seminar “Prevention of damage to harbour facilities caused by coastal vessels and related cases”, which was held from September to December in 2017, will be included.

§2

P&I Insurance accident statistics: Claims in 2008PY to 2016PY Statistics

Note : Policy Year (PY) : the insurance period shall be one year from 20th February to the following 20th February

§ 2 - 1 Fluctuation of the number of accidents



Graph 1 Coastal vessels The number of insurance accidents and accident rate fluctuation

By accident type	2008PY	2009PY	2010PY	2011PY	2012PY	2013PY	2014PY	2015PY	2016PY	Total	%	
Crew	41	28	29	15	26	18	22	14	18	211	10%	
Cargo damage	29	27	30	25	21	17	30	51	56	286	13%	
Damage reports regarding harbour and fishery facilities	203	157	163	137	131	129	127	117	127	1,291	59%	
Others	Other people except crew	1	1	2	2	0	1	3	2	1	13	1%
	Collision	11	12	13	7	7	4	8	10	2	74	3%
	Oil spilt	14	22	10	12	11	9	8	9	9	104	5%
	Groundings, sinkings and fire	2	5	3	5	1	2	4	3	3	28	1%
	Others	27	19	20	21	13	25	9	21	16	171	8%
Other - Subtotal	55	59	48	47	32	41	32	45	31	390	18%	
Total	328	271	270	224	210	205	211	227	232	2,178	100%	
Number of entered vessels at the beginning of the policy year	3,609	3,428	3,225	2,799	2,436	2,319	2,176	2,134	2,098	24,224		
Accident rate (Number of accidents divided by Number of entered vessels)	9.1	7.9	8.4	8.0	8.6	8.8	9.7	10.6	11.1	9.0		

Table 2

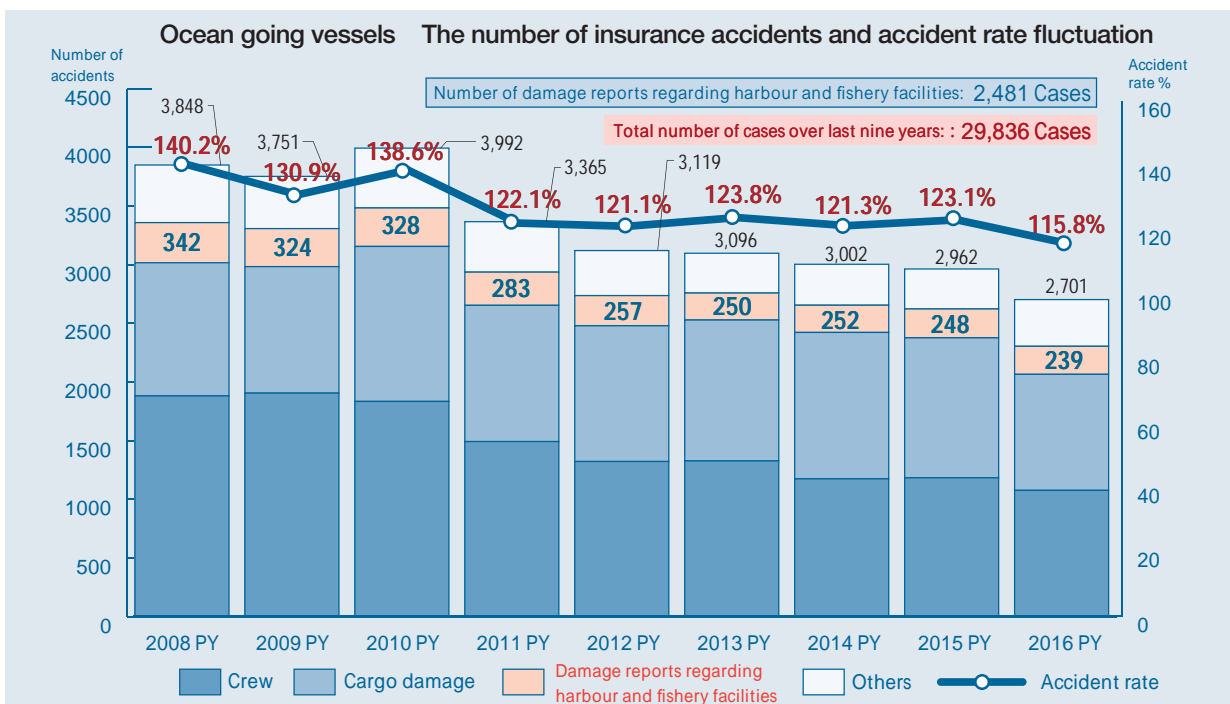
The total number of P&I insurance accidents concerning coastal vessels reported between 2008PY to 2016PY was 2,178. Of this figure, the number of damage accidents to harbour facilities and fishery facilities were 1,291, which occupied 59% of the total. Along with this, cargo damage accidents and crew injury / death related accidents account for approximately 80% of the total.

The number of accidents showed a tendency of decreasing at a peak of 328 cases in 2008PY, however, this number has slightly increased following 2014PY.

Although this trend shows a decrease in the number of accidents, it is influenced by a decrease in the number of entered ships. Thus, we compared this with an accident rate using a calculation that divides the number of accidents by the number of entered vessels at the beginning of the policy year.

Although the accident rate was 8% in 2011PY, it has increased very slightly since then.

In 2016PY, the accident rate was 11.1%, which, on close examination, tells us that 11 out of 100 ships caused some P&I accidents. We believe that urgent action should be taken to stop this increasing trend in order to decrease the call rate.



Graph 3 Ocean going vessels Number of accidents and accident rate fluctuation

By accident type		2008PY	2009PY	2010PY	2011PY	2012PY	2013PY	2014PY	2015PY	2016PY	Total	%
Crew		1,880	1,904	1,833	1,491	1,321	1,326	1,173	1,182	1,075	13,185	44%
Cargo damage		1,135	1,078	1,321	1,161	1,157	1,201	1,248	1,193	989	10,483	35%
Damage reports regarding harbour and fishery facilities		342	324	328	283	257	230	232	246	239	2,481	8%
Others	Other people except crew	93	95	99	106	73	76	67	67	74	750	3%
	Collision	72	60	64	45	32	32	42	32	42	421	1%
	Oil spill	55	34	34	47	35	40	26	30	34	335	1%
	Groundings, sinking and fire	18	9	12	19	7	11	10	11	11	108	1%
	Others	253	247	301	213	237	180	204	201	237	2,073	7%
Other - Subtotal		491	445	510	430	384	339	349	341	398	3,687	12%
Total		3,848	3,751	3,992	3,365	3,119	3,096	3,002	2,962	2,701	29,836	100%
Number of entered vessels at the beginning of the policy year		2,745	2,866	2,880	2,757	2,576	2,500	2,475	2,406	2,333	23,538	
Accident rate (Number of accidents divided by Number of entered vessels × 100%)		140.2	130.9	138.6	122.1	121.1	123.8	121.3	123.1	115.8	126.8	

Table 4 Ocean going vessels Number of accidents and accident rate fluctuation

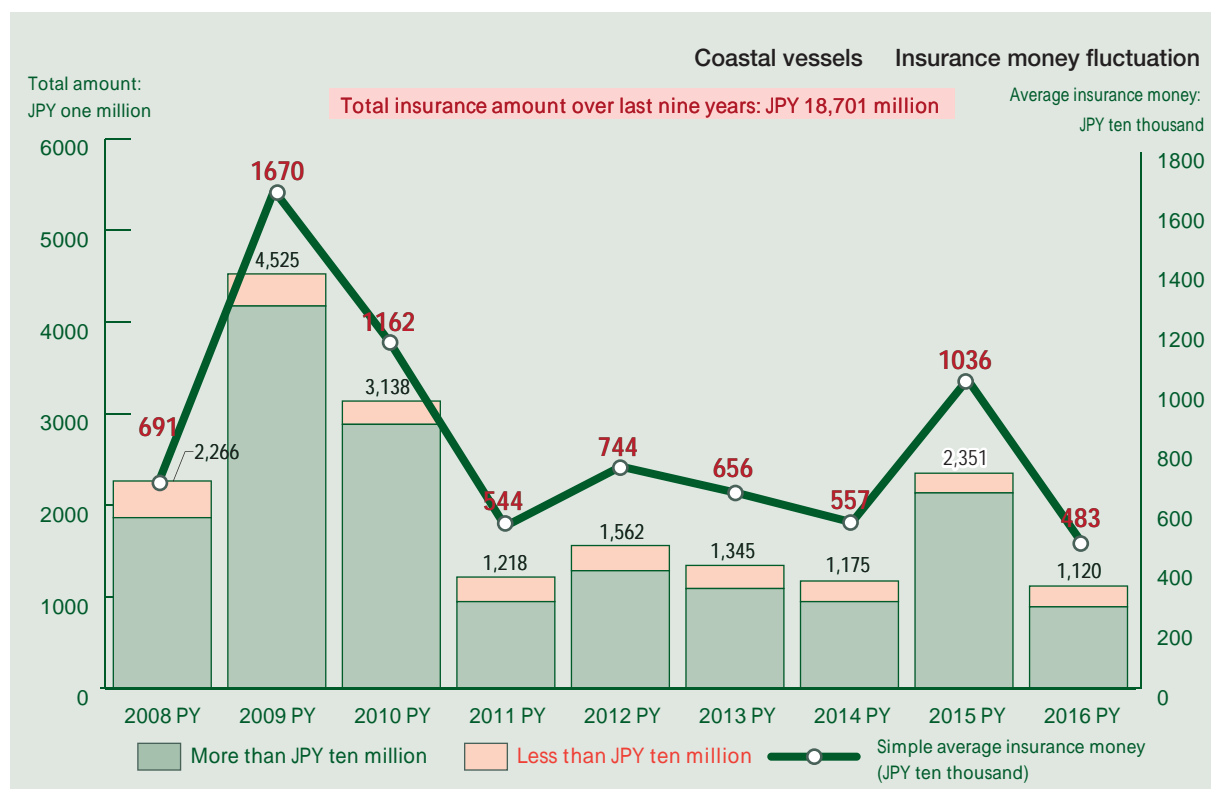
On the other hand, the total number of P&I accidents concerning ocean going vessels, which were reported between 2008PY to 2016PY, was 29,836. Of this figure, the number of damage accidents to harbour facilities and fishery facilities were 2,481, which occupied 8% of the total. The largest P&I accidents concerning ocean going vessels are crew injury / death related accidents, which occupy 44% of the total (13,185 cases). Cargo damage accidents came second place occupying 35% (10,483 cases) and in third place, damage accidents regarding harbour and fishery facilities occupying 8% of the total.

The differences between accident trends regarding coastal and ocean going vessels will vary depending on the contents of the insurance contract. The cost of medical treatment etc. for crew injury related accidents on board coastal vessels is covered by the seaman's insurance. If you contracted with P&I insurance which covers a seaman's accident compensation, you will be liable for any costs not covered by the seaman's insurance. Also, regarding coastal vessels, because shipowner as a business practice was not compensated for loss as a result of cargo damage accidents in the past, cargo related accidents concerning coastal vessels were not subject P&I insurance either. However, in recent years, cargo owners or cargo insurance companies that have been claiming for cargo accidents due to mistakes made by shipowners and crew have been increasing. In order to address this, there has been an increase in shipowners of coastal vessels also taking supplementary cargo related cover (Cargo Indemnity). In proportion to this, the number of cargo damage accidents for coastal vessels reported to P&I has shown a tendency to increase.

For coastal vessels also, we considered the accident rate using a calculation that divides the number of accidents of ocean going vessels by the number of entered vessels at the beginning of the policy year. Although there was a difference in the contents of insurance contract as described above, the accident rate was between 115.8% to 140.2%, which, on close examination, tells us that there were between 116 to 140 cases per 100 ships.

It is not appropriate to simply make a comparison, as there is a difference concerning insurance contracts. In addition, for ocean going vessels, crew injury / death related accidents occupy nearly half of the total number of accidents. However, comparing accident rates shows that the number of coastal vessel cases is only one tenth of that of ocean going vessels.

§ 2 - 2 Insurance money Fluctuation



Graph 5 Coastal vessels Insurance money fluctuation

Unit of insurance money: JPY one million

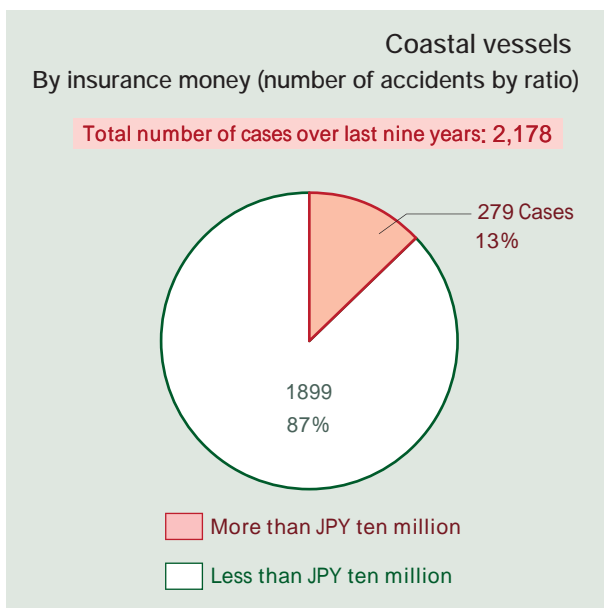
	2008PY		2009PY		2010PY		2011PY		2012PY		2013PY		2014PY		2015PY		2016PY		Total		%		
	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	
More than JPY one billion	0	0	1	2,605	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2,605	0%	14%
More than JPY 100 million but less than JPY one billion	5	784	3	623	5	1,573	2	244	5	758	2	532	1	101	2	1,276	2	468	27	6,359	1%	34%	
More than JPY 50 million but less than JPY 100 million	2	118	2	138	9	662	4	265	2	148	3	243	3	236	4	316	0	0	29	2,127	1%	11%	
More than JPY ten million but less than JPY 50 million	42	964	33	808	28	649	19	442	17	381	15	317	27	613	22	544	19	425	222	5,142	10%	27%	
More than JPY five million but less than JPY ten million	20	145	19	133	8	54	15	108	16	106	11	75	11	80	8	56	13	91	121	849	6%	5%	
More than JPY one million but less than JPY five million	80	191	65	167	60	144	49	108	54	131	59	139	50	114	54	122	48	103	519	1,218	24%	7%	
Less than JPY one million	179	64	148	50	160	56	135	52	116	38	115	39	119	31	137	37	150	33	1,259	399	58%	2%	
TOTAL	328	2,266	271	4,525	270	3,138	224	1,218	210	1,562	205	1,345	211	1,175	227	2,351	232	1,120	2,178	18,701	100%	100%	

Table 6 Coastal vessels Insurance money fluctuation

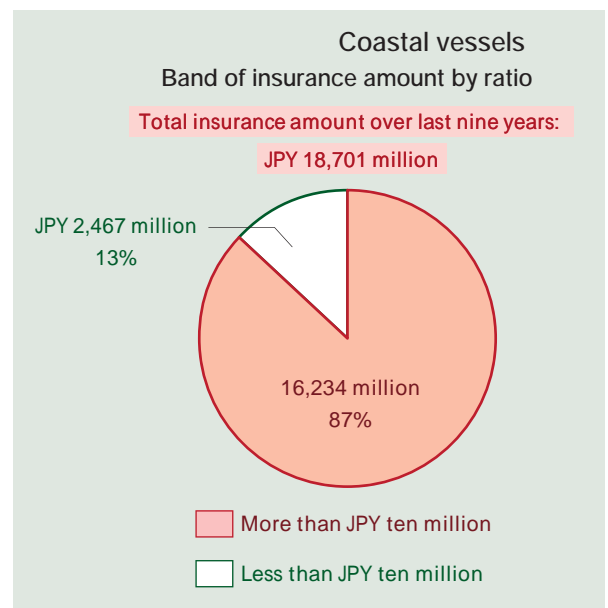
Regarding insurance money for coastal vessels, the insurance money has largely fluctuated every Policy Year. Compared to the number of accidents, it is conspicuous that there has been great change, recently. The total amount of insurance money over the last nine years is JPY 18,701 million. Although the largest amount was recorded in 2009PY (JPY 4,525 million), 2016PY came to only a quarter of the 2009PY (JPY 1,120 million).

The reason as to why there is a significant difference according to each individual Policy Year is because insurance money was greater for the PY when large P&I insurance accidents occurred, and, on the contrary, when there were no large P&I insurance accidents, the insurance money was small by comparison. Particularly, in 2009PY, only one accident occurred but the insurance amount was JPY 2,605 million, which was 57% of the total insurance money of the Policy Year (JPY 4,525 million). This came to 14% of the total insurance amount over the last nine years. It is conspicuous that the ratio of insurance accident money comes to more than JPY ten million, which is significant, no matter which policy year it is.

The following two pie charts compare the total number of accidents and insurance money over the last nine years.

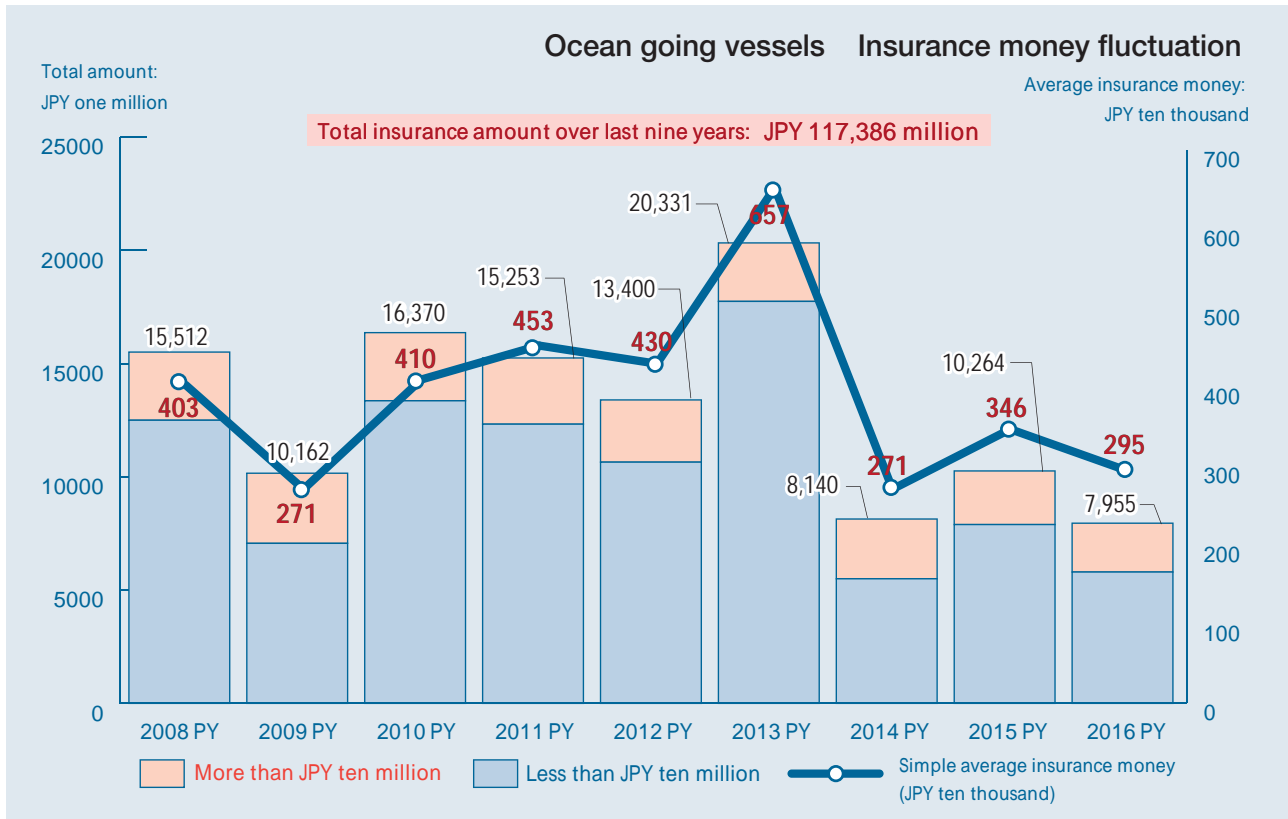


Graph 7
Coastal vessels By insurance money (number of accidents by ratio)



Graph 8
Coastal vessels Band of insurance amount by ratio

When it comes to the number of accidents, the insurance amount that was less than JPY ten million equated to 87% of the total. However, as for insurance money that was less than JPY ten million, it only equated to 13%. Whereas, the number of accidents that came to more than JPY ten million were 13%, however, as for the insurance money, it accounts for 87%. Thus, we learn that large accidents greatly influence the total loss record.



Graph 9 Ocean going vessels Insurance money fluctuation

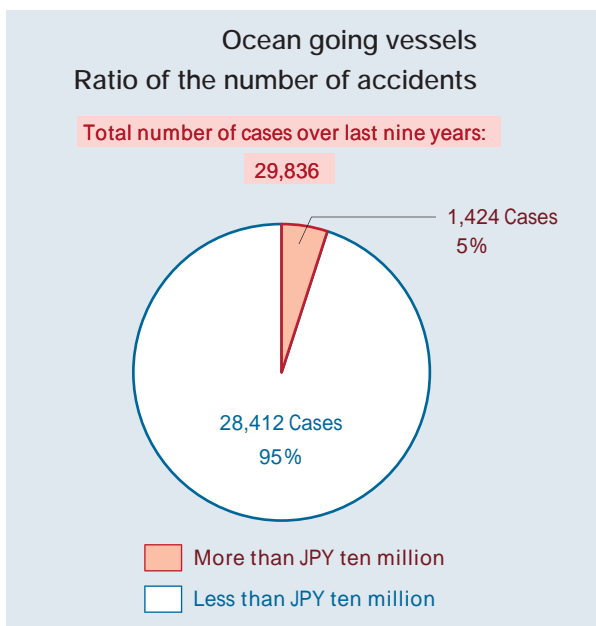
Unit of insurance money: JPY one million

	2008 PY		2009 PY		2010 PY		2011 PY		2012 PY		2013 PY		2014 PY		2015 PY		2016 PY		Total		%	
	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money	Number of accidents	Insurance money
More than JPY one billion	3	5,108	1	1,096	4	6,401	2	2,413	1	4,366	3	11,695	0	0	1	2,282	1	1,108	16	34,468	0%	29%
More than JPY 100 million but less than JPY one billion	14	3,472	9	2,787	10	3,302	20	6,687	9	3,158	12	2,687	7	1,645	4	2,109	7	2,288	92	28,136	0%	24%
More than JPY 50 million but less than JPY 100 million	16	1,131	10	750	16	1,165	8	596	11	763	12	803	14	990	13	906	10	682	110	7,787	1%	7%
More than JPY ten million but less than JPY 50 million	147	2,791	134	2,433	136	2,494	134	2,633	131	2,366	139	2,564	152	2,865	144	2,599	89	1,721	1,206	22,468	4%	19%
More than JPY five million but less than JPY ten million	147	1,043	177	1,239	147	1,036	172	1,249	146	1,090	130	930	135	973	98	721	98	674	1,250	8,953	4%	8%
More than JPY one million but less than JPY five million	543	1,161	490	1,100	517	1,182	466	1,044	460	1,032	447	1,039	467	1,045	467	1,028	411	880	4,268	9,512	14%	8%
Less than JPY one million	2,978	805	2,930	757	3,162	791	2,563	631	2,361	625	2,353	613	2,227	622	2,235	619	2,085	601	22,894	6,062	77%	5%
Total	3,848	15,512	3,751	10,162	3,992	16,370	3,365	15,253	3,119	13,400	3,096	20,331	3,002	8,140	2,962	10,264	2,701	7,954	29,836	117,386	100%	100%

Table 10 Ocean going vessels Insurance money fluctuation

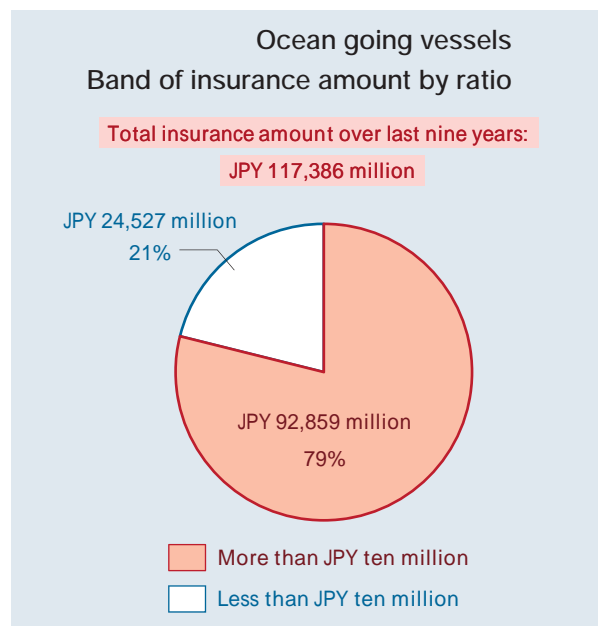
Although not as steep as coastal vessels, the insurance money for ocean going vessels also fluctuates every PY. The amount JPY 20,332 million in 2013PY is prominent. However, of these three cases the insurance money of more than JPY one billion in accidents among them was JPY 11,695 million, which occupied 57% of the total amount of insurance money in 2013 PY.

As shown in the following charts which compare the number of accidents over the last nine years and the total of insurance money, similar to coastal vessels, the number of accidents of more than JPY ten million came to 1,424 (5% of the total), however, as for the insurance money, it came to 79% of the total.



Graph 11

Ocean going vessels Ratio of the number of accidents

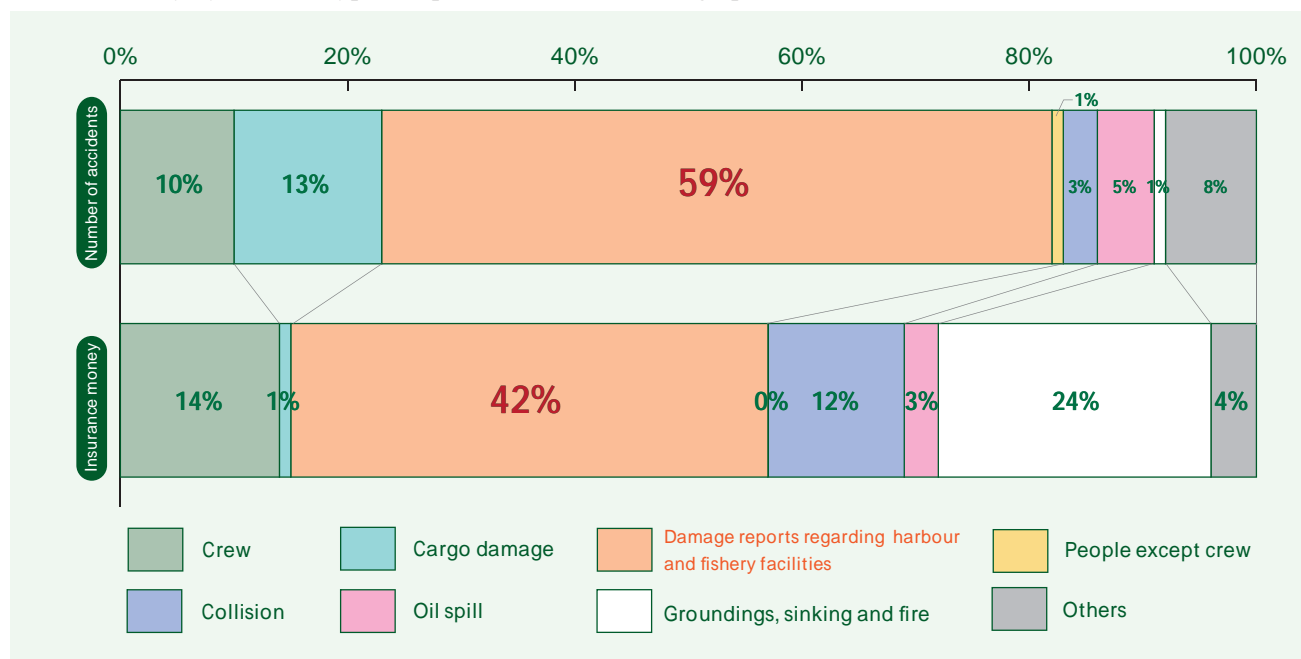


Graph 12

Ocean going vessels Band of insurance amount by ratio

§ 2 - 3 P&I Insurance accident statistics: Statistics of claims between 2008 PY and 2016 PY

We evaluated the insurance accident statistics which were described above, by comparing the number of accidents and insurance money by accident type and present them in the bar graph below.

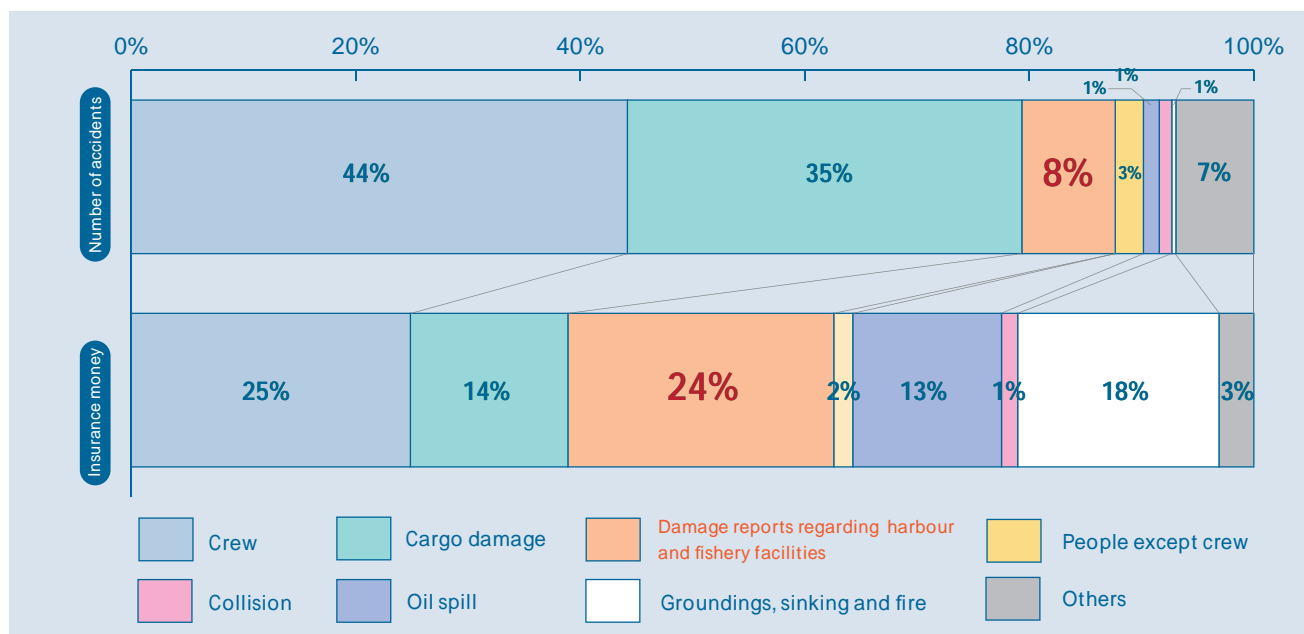


Graph 13 Coastal vessels The number of accidents and insurance money evaluation

Accident classification	Number of accidents	Insurance (JPY one million)	Average insurance money per case (JPY)	Evaluation	
				Number of accidents	Insurance money
Crew	211	2,541	12,043,589	Medium	Large
Cargo damage	286	217	759,784	Fewer	Fewer
Damage reports regarding harbour and fishery facilities	1,291	7,784	6,029,316	Greater	Large
Other people except crew	13	70	5,403,762	Fewer	Medium
Collision	74	2,307	31,173,935	Fewer	Large
Oil spill	104	500	4,812,400	Medium	Medium
Groundings, sinking and fire	28	4,579	163,538,058	Fewer	Large
Others	171	702	4,103,671	Fewer	Small
Total	2,178	18,701	8,586,201		

Table 14 Coastal vessels The number of accidents and insurance money evaluation

Regarding coastal vessels, loss records will be greatly improved if damage to harbour and fishery facilities can be prevented. Of course, it is important to reduce the number of large accidents such as collisions, groundings, sinkings and fire. Regarding crew accidents, the insurance money per case by simple average is significant. This is the reason as to why most take out supplementary insurance to cover "seamen's accident compensation" to cover in part compensation of death accidents and residual disability that were not covered by the seamen's insurance.



Graph 15 Ocean going vessels The number of accidents and insurance money evaluation

Classification by accident	Number of accidents	Insurance (JPY one million)	Average insurance money per case (JPY)	Evaluation	
				Number of accidents	Insurance money
Crew	13,185	29,178	2,212,945	Greater	Fewer
Cargo damage	10,483	16,473	1,571,383	Greater	Fewer
Damage reports regarding harbour and fishery facilities	2,481	27,805	11,207,095	Greater	Large
Other people except crew	750	1,982	2,642,474	Fewer	Small
Collision	421	15,553	36,942,304	Fewer	Large
Oil spill	335	1,693	5,055,088	Fewer	Medium
Groundings, sinking and fire	108	21,049	194,896,468	Fewer	Large
Others	2,073	3,654	1,762,564	Fewer	Small
Total	29,836	117,386	3,934,372		

Table 16 Ocean going vessels The number of accidents and insurance money evaluation

Because the insurance and supplementary content for ocean going vessels is different from those of coastal vessels, we compared the number of accidents and the insurance money in a bar graph, similar to those of coastal vessels, and evaluated it as follows.

It is a necessary to reduce them, because the number of crew accidents is significant. However, the simple average of insurance money for one case is approximately one sixth of that of a coastal vessel.

The simple average insurance money per damaged accident regarding harbour and fishery facilities is large only after huge accidents such as collision, groundings, sinkings and fire. It is necessary to reduce this.

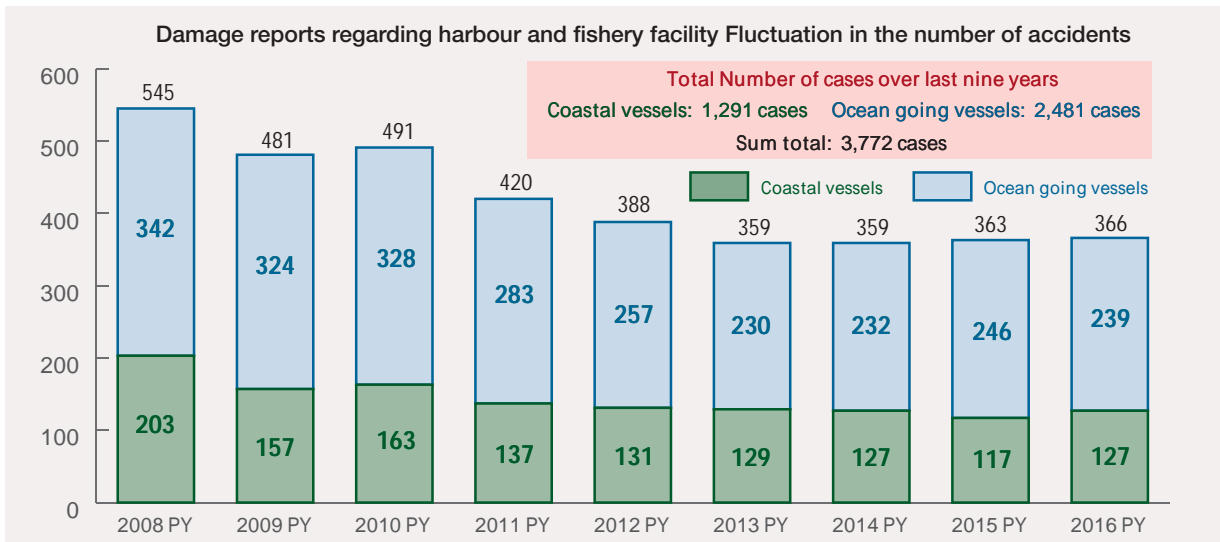
Naturally, the goal is for an accident never to occur, however, it is becoming evident that loss records will be greatly improved if the number of accidents regarding harbour and fishery facilities are reduced for both coastal and ocean going vessels.

§3

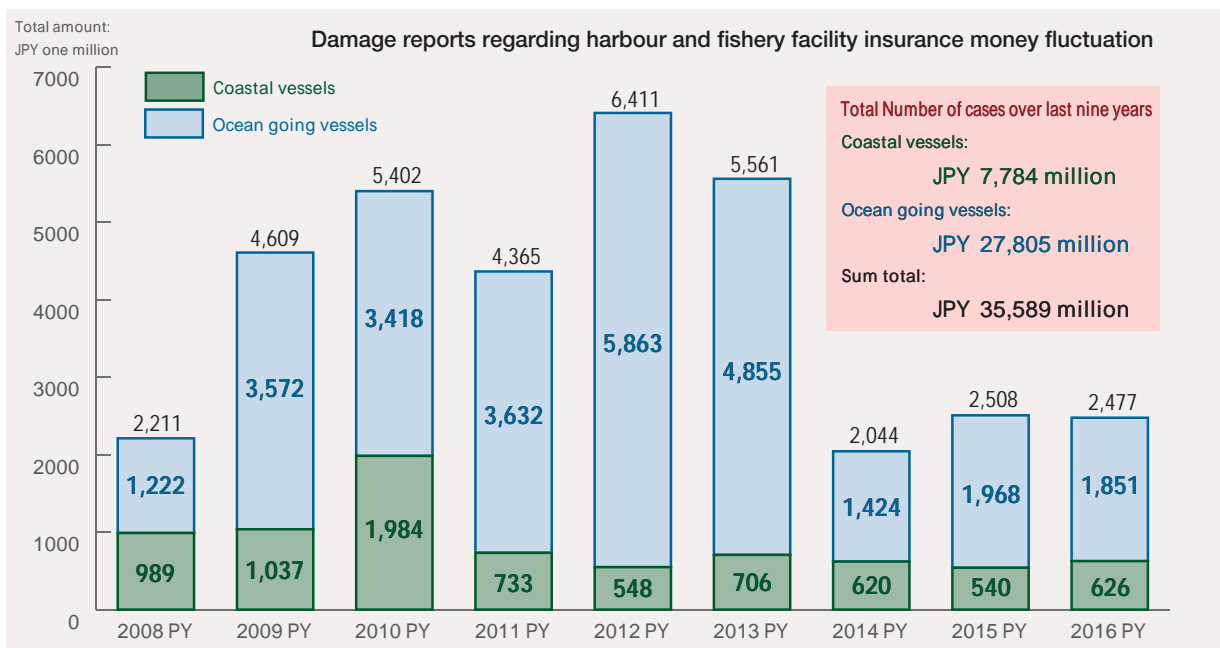
Damage statistics regarding harbour and fishery facilities

§ 3 - 1 Trends concerning damage to harbour and fishery facilities caused by coastal and ocean going vessels

Trends concerning all accidents in our Club were referred to in the previous chapter. Here, damage sustained by harbour and fishery facilities will be analysed.



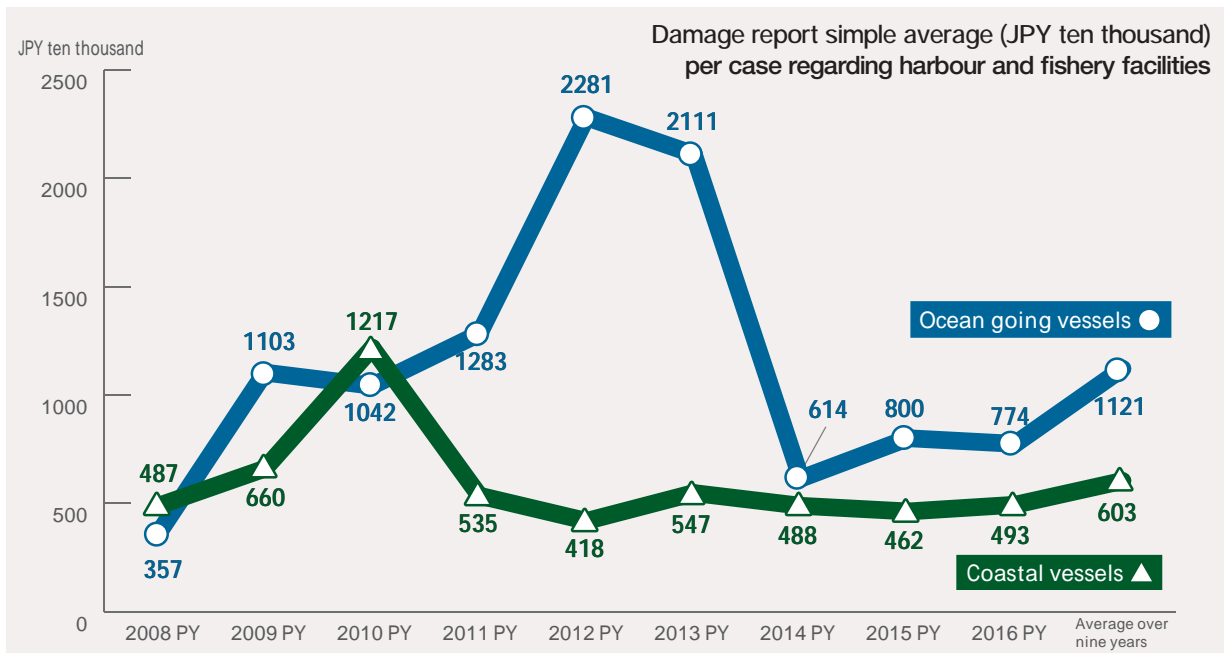
Graph 17 Damage reports regarding harbour and fishery facility Fluctuation in the number of accidents



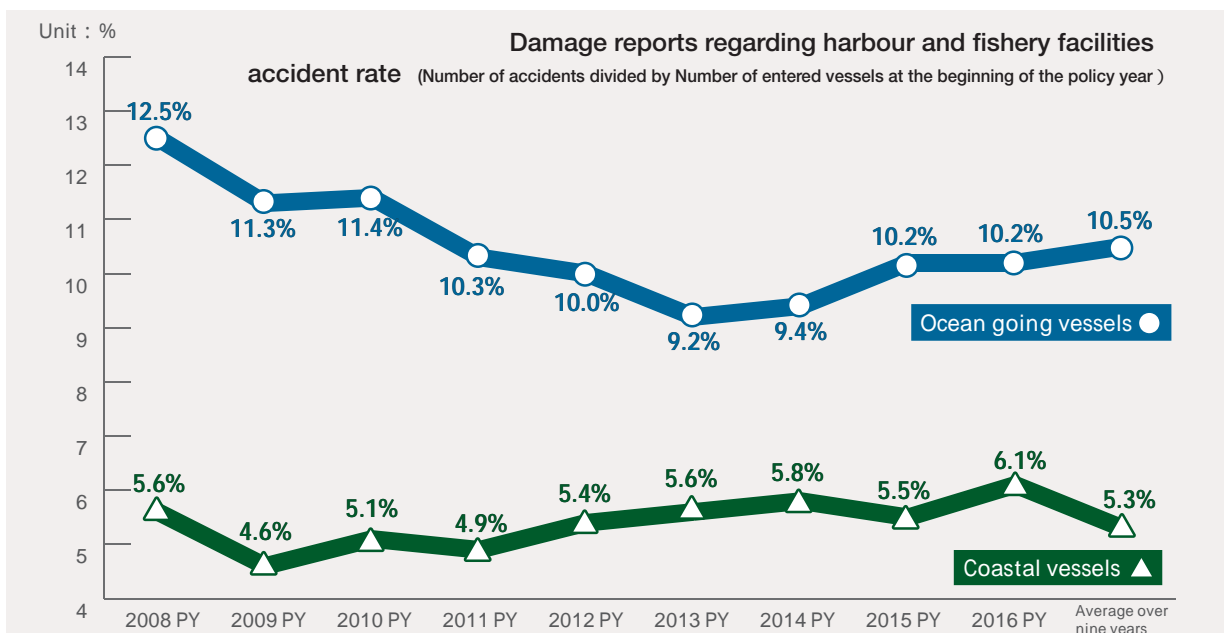
Graph 18 Damage reports regarding harbour and fishery facility insurance money fluctuation

The total number of accidents over nine years concerning coastal and ocean going vessels was 3,772 cases: the number of accidents for ocean going vessels accounts for 2,481 cases, which is approximately double that of coastal vessels. In addition, the total number of accidents for both coastal and ocean going vessels came to approximately 360 cases. This figure has remained constant since 2013PY.

On the other hand, insurance money greatly fluctuates depending on the scale of the accident. Further, accidents that occurred on ocean going vessels accounted for approximately 3.6 times that of accidents that occurred on coastal vessels. 67 cases regarding large accidents of more than JPY 50 million occurred between 2009 PY to 2013 PY (coastal vessels: 22 cases and ocean going vessels: 45 cases, average 13.4 cases per year). Meanwhile, the number of large accidents after 2014 PY increased up to 20 cases (coastal vessels: 5 cases and ocean going vessels: 15 cases, average 6.7 cases per year). This is also shown in the simple average insurance amount per case.



Graph 19 Damage report simple average (JPY ten thousand) per case regarding harbour and fishery facilities

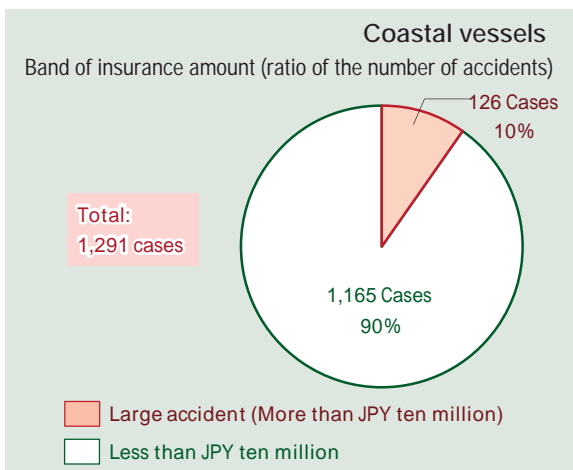


Graph 20 Damage reports regarding harbour and fishery facilities accident rate (Number of accidents divided by Number of entered vessels at the beginning of the policy year)

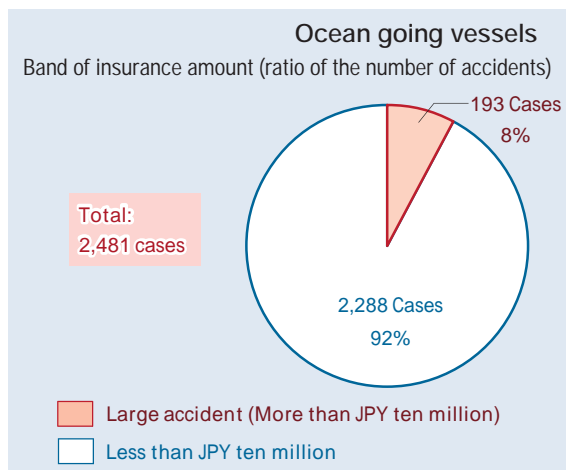
Unit of insurance money: JPY one million

Amount band (insurance)	Ocean going vessels				Coastal vessels				Total			
	Number of accidents		Insurance money		Number of accidents		Insurance money		Number of accidents		Insurance money	
	Number of accidents	%	Insurance money	%	Number of accidents	%	Insurance money	%	Number of accidents	%	Insurance money	%
More than JPY one billion	5	0.2%	11,739	42.2%	0	0.0%	0	0.0%	5	0.1%	11,739	32.9%
More than JPY 100 million but less than JPY one billion	27	1.1%	9,022	32.4%	13	1.0%	2,882	37.0%	40	1.1%	11,905	33.5%
More than JPY 50 million but less than JPY 100 million	28	1.1%	1,992	7.2%	17	1.3%	1,275	16.4%	45	1.2%	3,267	9.2%
More than JPY ten million but less than JPY 50 million	133	5.4%	2,727	9.8%	96	7.4%	1,961	25.2%	229	6.1%	4,688	13.2%
Large accident (More than JPY ten million) subtotal	193	7.8%	25,481	91.6%	126	9.8%	6,118	78.6%	319	8.5%	31,598	88.8%
More than JPY five million but less than JPY ten million	121	4.8%	851	3.1%	82	6.4%	580	7.4%	203	5.4%	1,431	4.0%
More than JPY one million but less than JPY five million	431	17.4%	1,005	3.6%	354	27.4%	825	10.6%	785	20.8%	1,830	5.1%
Less than JPY one million	1,736	70.0%	468	1.7%	729	56.5%	261	3.4%	2,465	65.3%	730	2.1%
Less than JPY ten million subtotal	2,288	92.2%	2,324	8.4%	1,165	90.2%	1,666	21.4%	3,453	91.5%	3,990	11.2%
Total	2,481	100.0%	27,805	100.0%	1,291	100.0%	7,784	100.0%	3,772	100.0%	35,589	100.0%

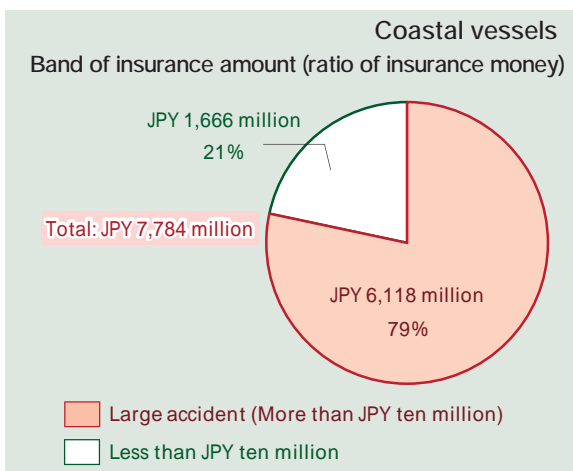
Table 21 Coastal vessels Harbour and fishery facilities by insurance amount Number of accidents and ratio



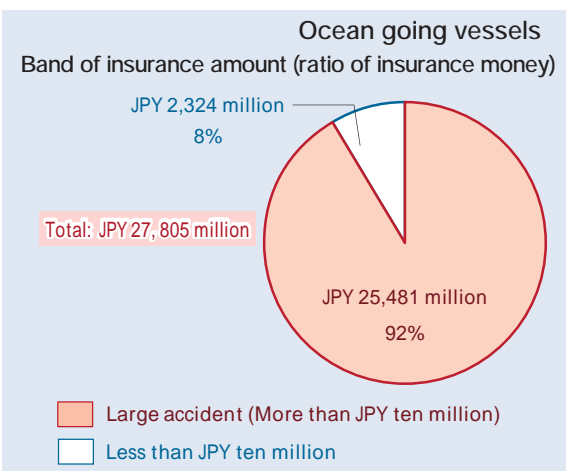
Graph 22



Graph 23



Graph 24



Graph 25

In addition, large accident claims accounted for more than JPY 10 million: 10% for coastal vessels and 8% for ocean going vessels, however, when it comes to insurance money, it is 79% for coastal vessels and 92% for ocean going vessels respectively, which means that large accidents make for worse loss records.

Meanwhile, looking at the accident rate which was divided by the number of accidents by the number of entered vessels at the beginning of the policy year, it is possible to see that ocean going vessels is approximately double that of coastal vessels.

Also, compared to the year when accident rates were at their lowest (coastal vessels: 2009PY(4.6%) and ocean going vessels: 2013PY (9.2%)), it is notable that the accident rates for both coastal and ocean going vessels have been increasing slightly since then.

Looking closely at the total number of accidents and insurance money over the past nine years by band of insurance amount, the sum total number of accidents for coastal and ocean vessels was 319 cases, which occupied 8.5% of the total. The insurance money was JPY 31,598 million (88.8% in total). Also, the number of accidents that came to more than JPY one million were 45 cases, which occupied only 1.2% of the total, however, as for insurance money, it accounts for JPY 23,644 million, which is 66.5% of the total.

Cases that claimed more than JPY 500 million will be introduced in the following.

In addition to damaging the quay, accidents involving damage to the on shore cargo work facilities and leakage of oil will significantly increase the magnitude of the accident.

Cases that claimed more than JPY 500 million

Ocean-going container vessel

1

In April 2009, at the time of ship departure from a quay of Port Said in Egypt, when turning round with the assistance of two tug boats, she closed to the quay on her port side stern due to drifting caused by wind pressure. As she made contact with a gantry crane which was consequently damaged, the repair fee and loss of time insurance for the gantry crane was claimed for. This was caused by the pilot's miss-maneuvering.

Ocean-going container vessel

2

In December, 2009, at the time of departure on ballast condition from Osaka Nanko, she was blown under during strong wind in the sea route after having left the wharf while using two tug boats, and came into contact with a breakwater causing damage to it. Also, a broken hole was made in the shell plating of the hull and approximately 0.8KL of fuel oil was spilt. Because spilt oil appeared inside the tetrapod, it took two years to remove it. The cause was the pilot's miss-maneuvering.

Coastal tanker

3

In October 2010, during a berthing operation using two tug boats at the petroleum station in Okinawa, ship posture control was lost and she made contact with the mooring dolphin on her port side stern. A broken hole was made in the fuel tank and approximately 46KL of fuel oil was spilt. A huge expense was incurred on the dolphin's repair cost, fuel oil washing operation and fishery compensation. The cause was down to the Master's miss-maneuvering.

Ocean-going container vessel

4

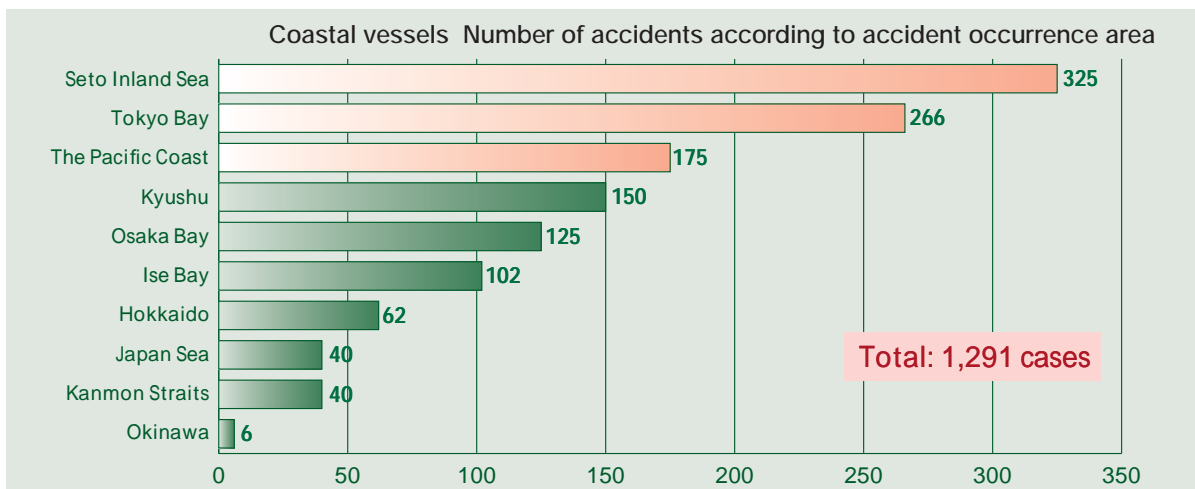
In January, 2010, during the berthing operation at Tokyo Oi Container Terminal using one tug boat, it made contact with a gantry crane due to excessive speed. Crane repair and inactivity incurred a huge cost. This was caused by the pilot's miss-maneuvering.

Most damage to harbour facilities is caused by miss-maneuvering by the ship commander such as the Master or pilot. Particularly, the risk increases in the event of sudden weather change at the time of leaving the wharf and during berthing operation. It will be difficult to ensure that the number of damaged accidents be zero, however, through BTM, it will be possible to reduce the amount of damage caused to harbour facilities. For example, after a pilot comes on board at both the time of entering and departing port, to not rely solely on his maneuvering, but to have a briefing regarding the ship maneuvering procedure with the Master and exchange necessary information with each other. Further, when it comes to coastal vessels where the pilot is not required to board, it should be seen to it that sole maneuvering is not carried out by the Master, but that his intentions of ship maneuvering are shared with the other crew on the bridge, fore/after stations and the Chief engineer.

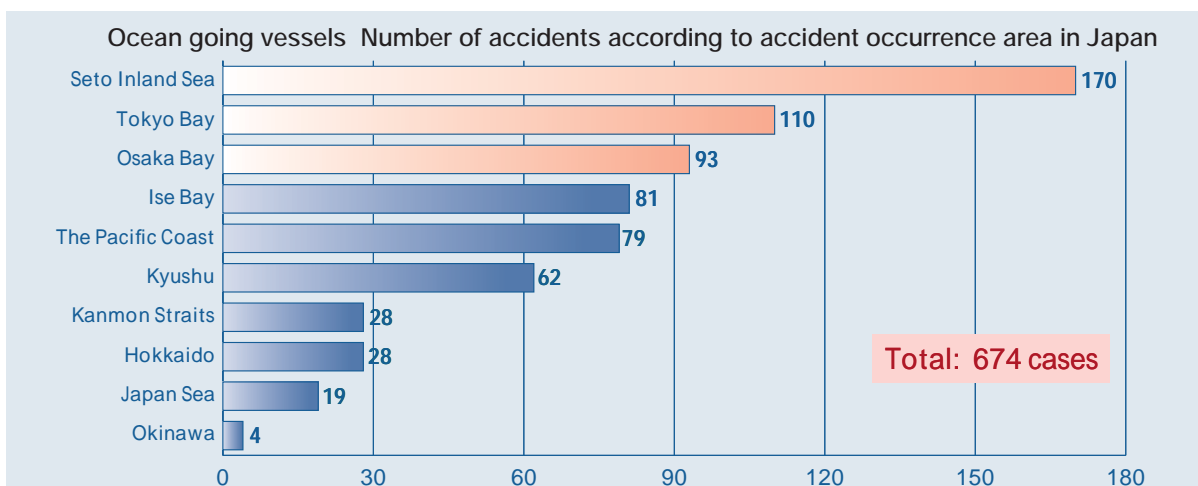
In addition, ship bottom contact accidents have occurred frequently because of a lack of investigation concerning harbour facilities in advance. Needless to say, it is important to regularly check harbour facilities in advance, even if the vessel has been navigating the line frequently.

§ 3 - 2 Statistics on the number of accidents by accident occurrence area in Japan

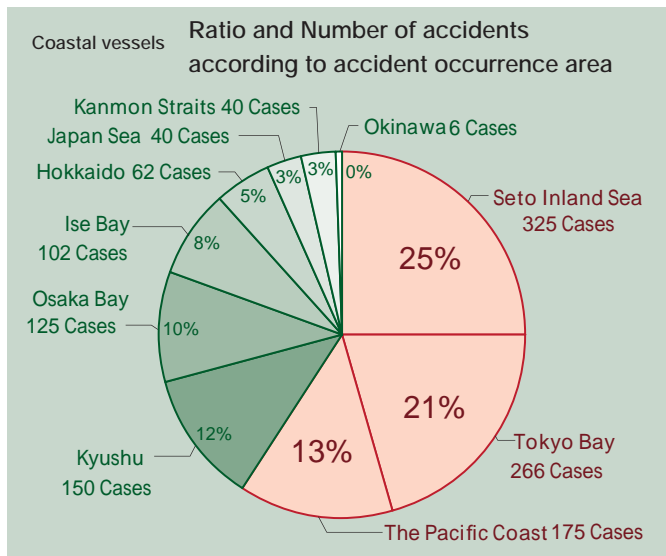
Accidents regarding harbour and fishery facilities in Japan were compiled by accident occurrence area.



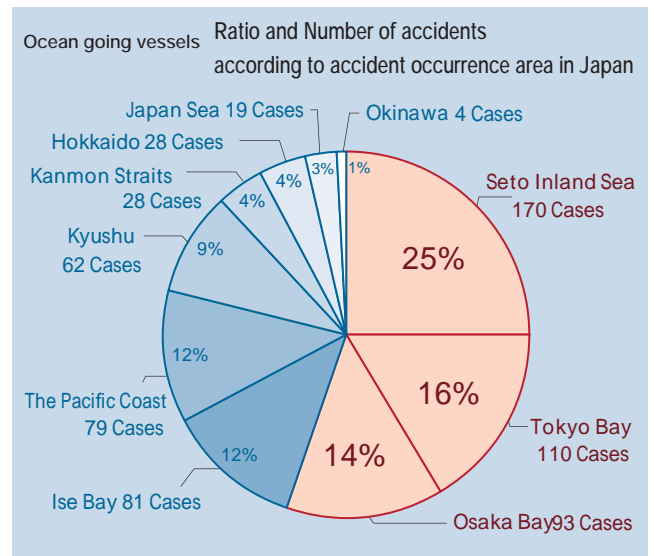
Graph 26 Coastal vessels (number of accidents according to accident occurrence area)



Graph 27 Ocean going vessels (number of accidents according to accident occurrence area in Japan)



Graph 28

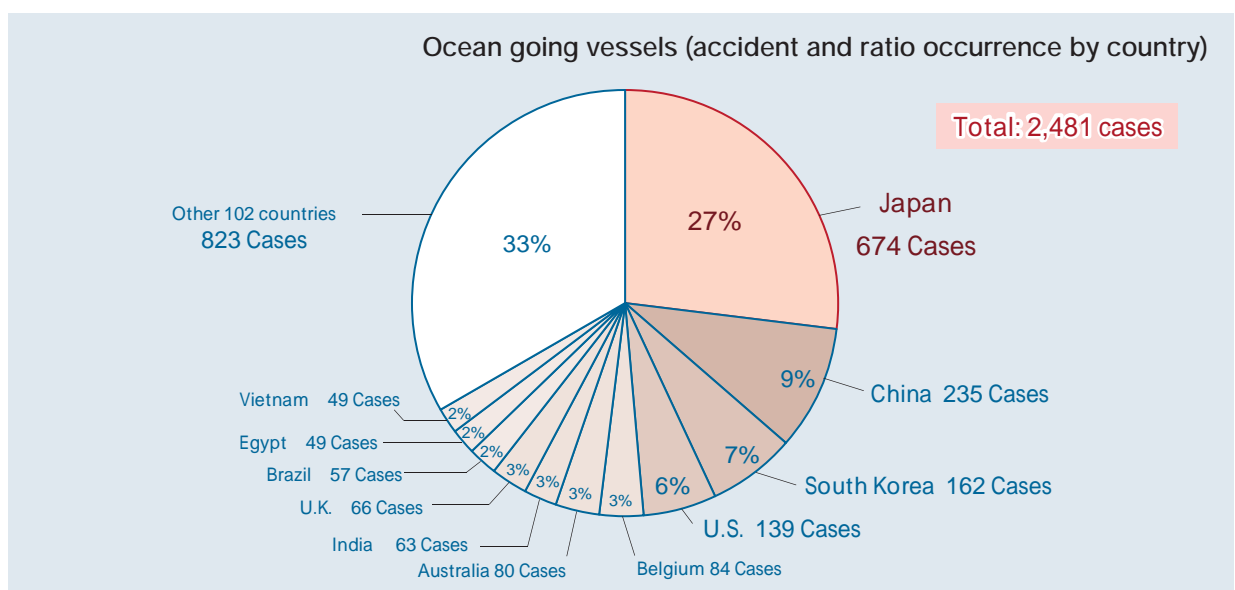


Graph 29

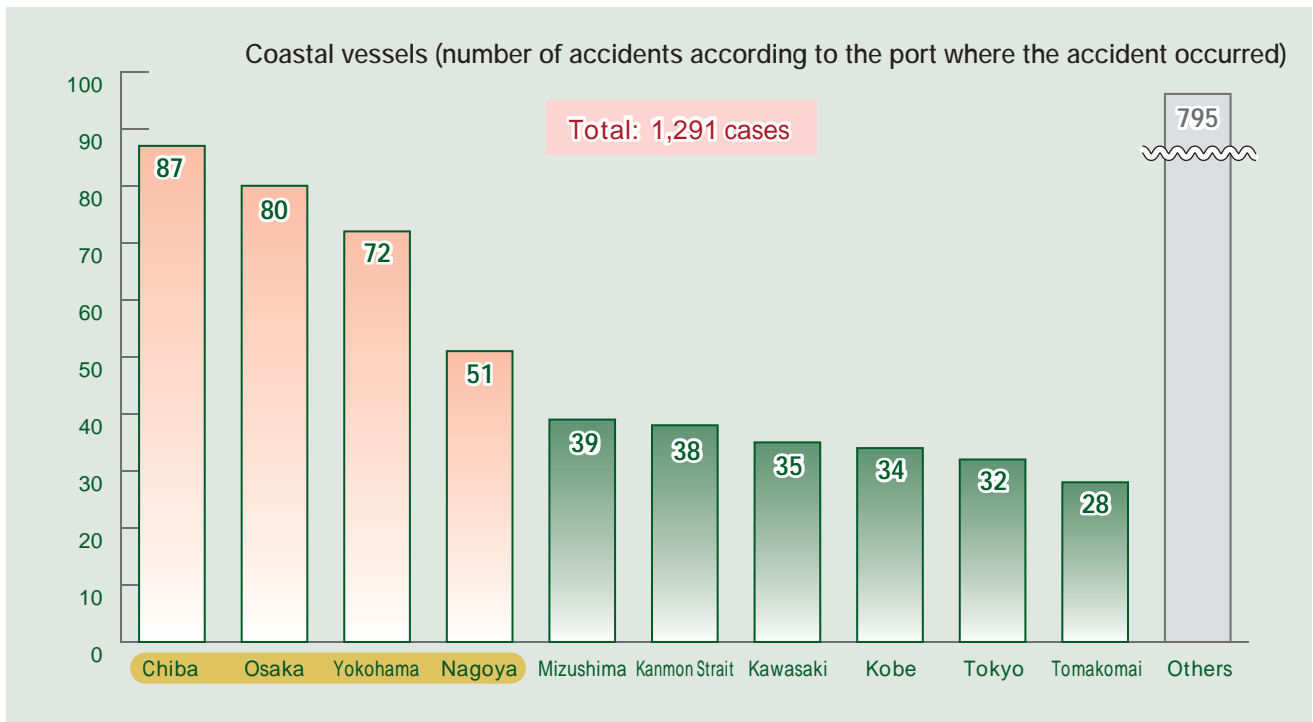
For a more accurate analysis, it was necessary to compare the number of entered and departed ports of our Club's members' ships by area over the past nine years, using the number of entered and departed ports by region, and comparing this with the accident occurrence rate as a denominator. However, unfortunately, because data of such numbers of entered and departed ports was not available, we only compared this with the number of accidents.

It should only be natural to imagine that a large number of accidents occur at Tokyo Bay, Ise Bay and Osaka Bay where main ports are concentrated, and Inland sea where both coastal and ocean going vessels frequent. Coastal and ocean going vessels account for about 70% of accidents in these top four areas. However, both coastal and ocean going vessels that continue to use these major ports, continue to experience accidents at Pacific Ocean coastal ports, also. (Coastal vessels occupy third place and ocean going vessels occupy fifth place)

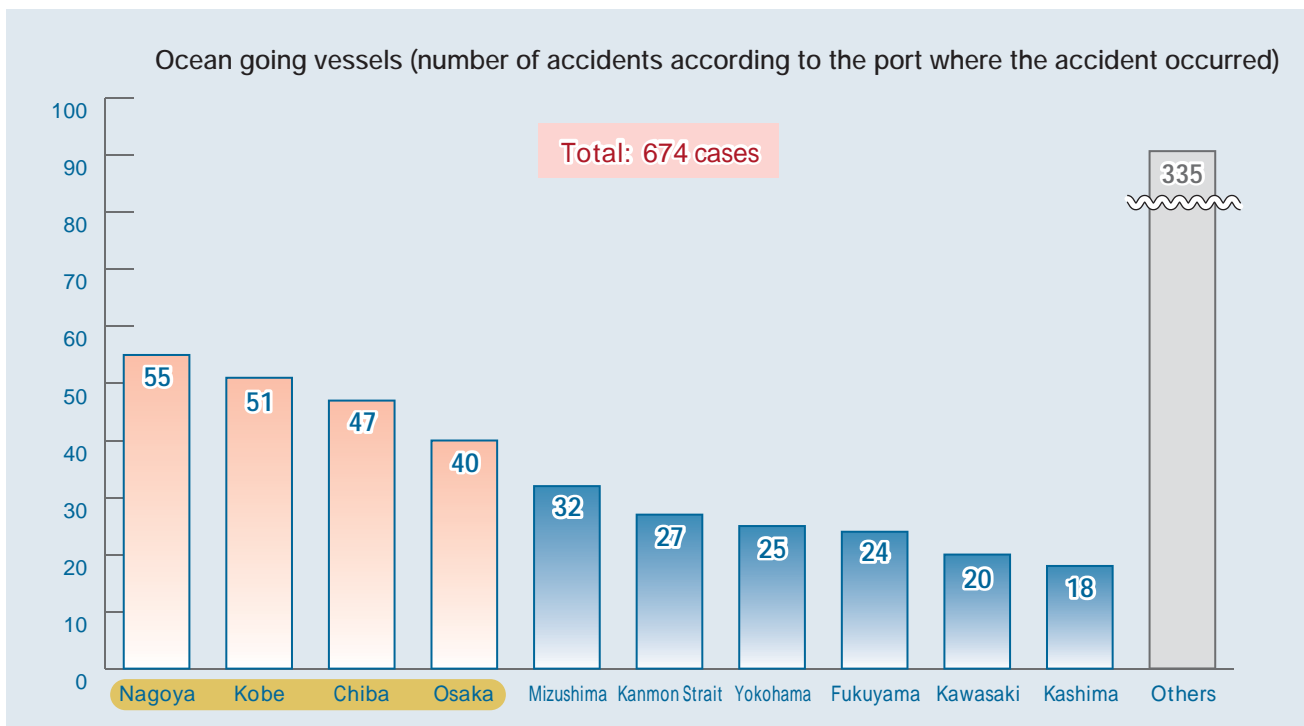
As a matter of fact, the number of accidents by country for ocean going vessels is shown in the pie chart below. The number of accidents that occurred in Japan occupied 27% of the total number of accidents.



Graph 30 Ocean going vessels (accident and ratio occurrence by country)



Graph 31 Coastal vessels (number of accidents according to the port where the accident occurred)



Graph 32 Ocean going vessels (number of accidents according to the port where the accident occurred)

Moreover, we summarised the number of accidents by port.

A large number of accidents occurred at main ports for both types of vessels. One of the causes among the main ports of Nagoya, Osaka and Kobe and Chiba appears to be down to their similar quay structure.



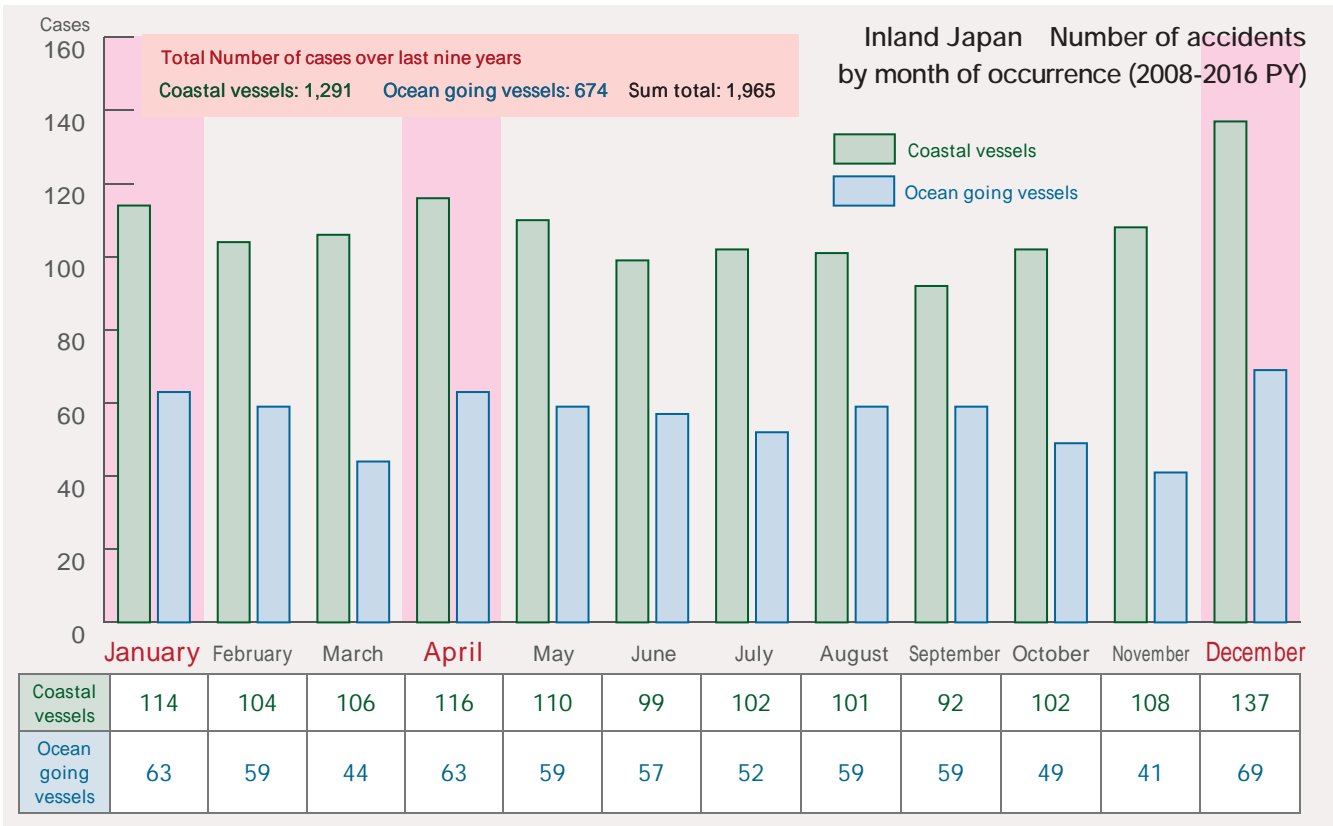
Fig. 33 Picture of Slits

Regarding the way that these ports are configured, there are a large number of slit type quays where larger vessels are also to dock, which presumably could be causing the accidents. At the port of Nagoya, there are a large number of Pure Car Carriers (PCC) entering the port and the accident rate for this type of ship, which will be mentioned below, is high. Moreover, the frequency of docking on this slit type quay adds to increase the risk of accidents occurring.

§ 3 - 3 Statistics on the number of accidents by accident occurrence month in Japan

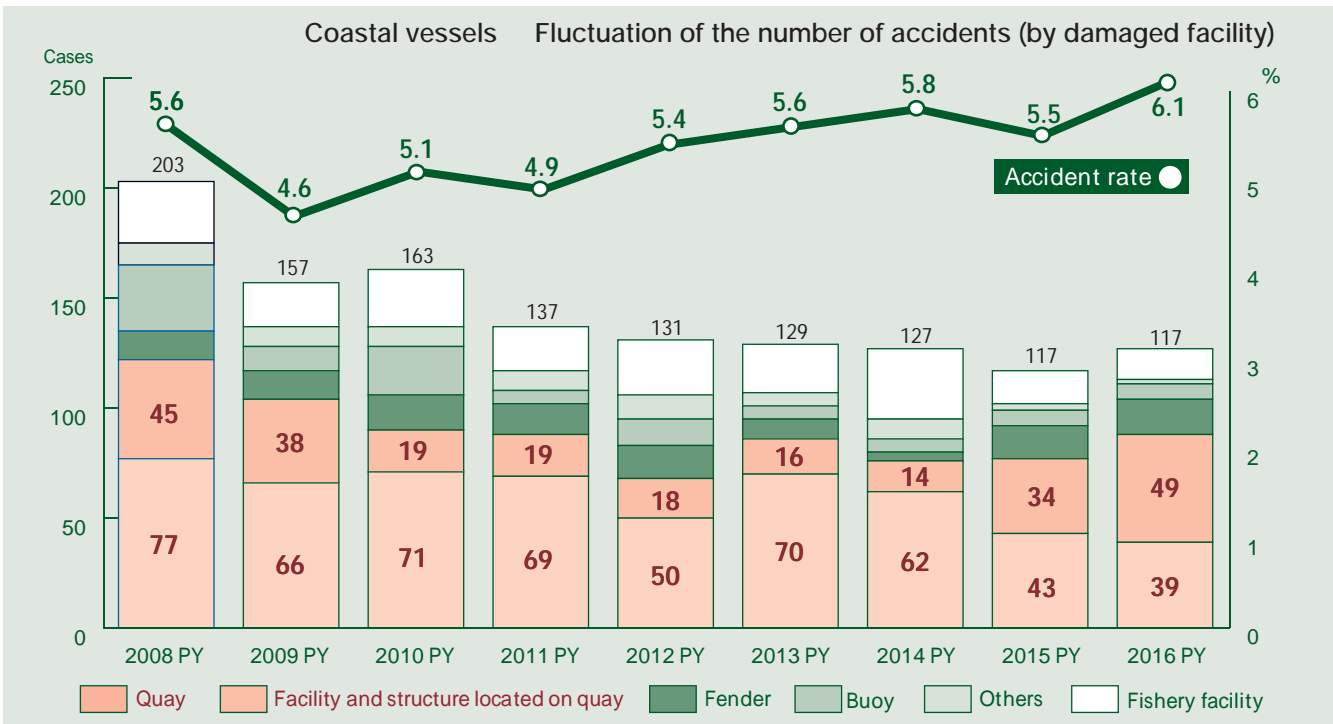
There is the tendency that the number of accidents at the end of the year, beginning of the new year and at the beginning of the Japanese fiscal year (April) is larger for coastal and ocean going vessels, compared with other months throughout a year. Regarding ocean going vessels, there were no trends like this in other countries but Japan. Thus, this is characteristic of harbour and fishery facility accidents in Japan.

So as to eliminate such accidents, it will be necessary to remind vessels of these time periods.



Graph 34 Inland Japan Number of accidents by month of occurrence (2008-2016 PY)

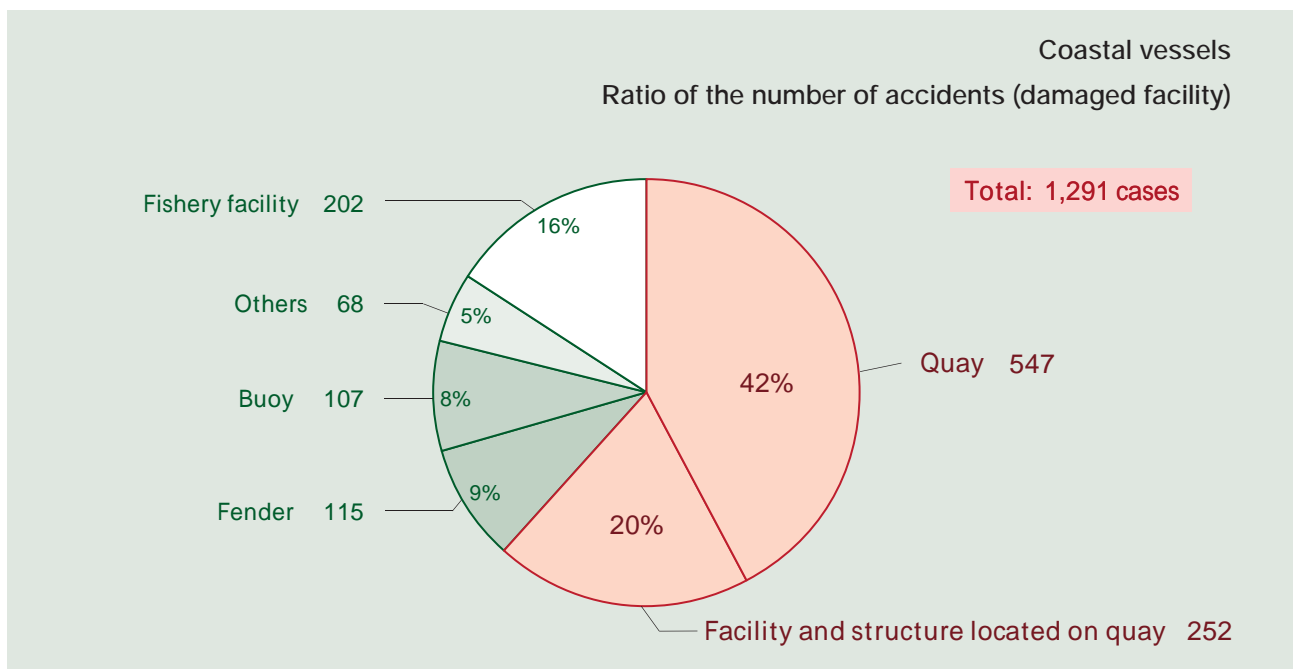
§ 3 - 4 Statistics on the number of accidents by damaged facility



Graph 35 Coastal vessels Harbour and fishery facilities Fluctuation of the number of accidents (by damaged facility)

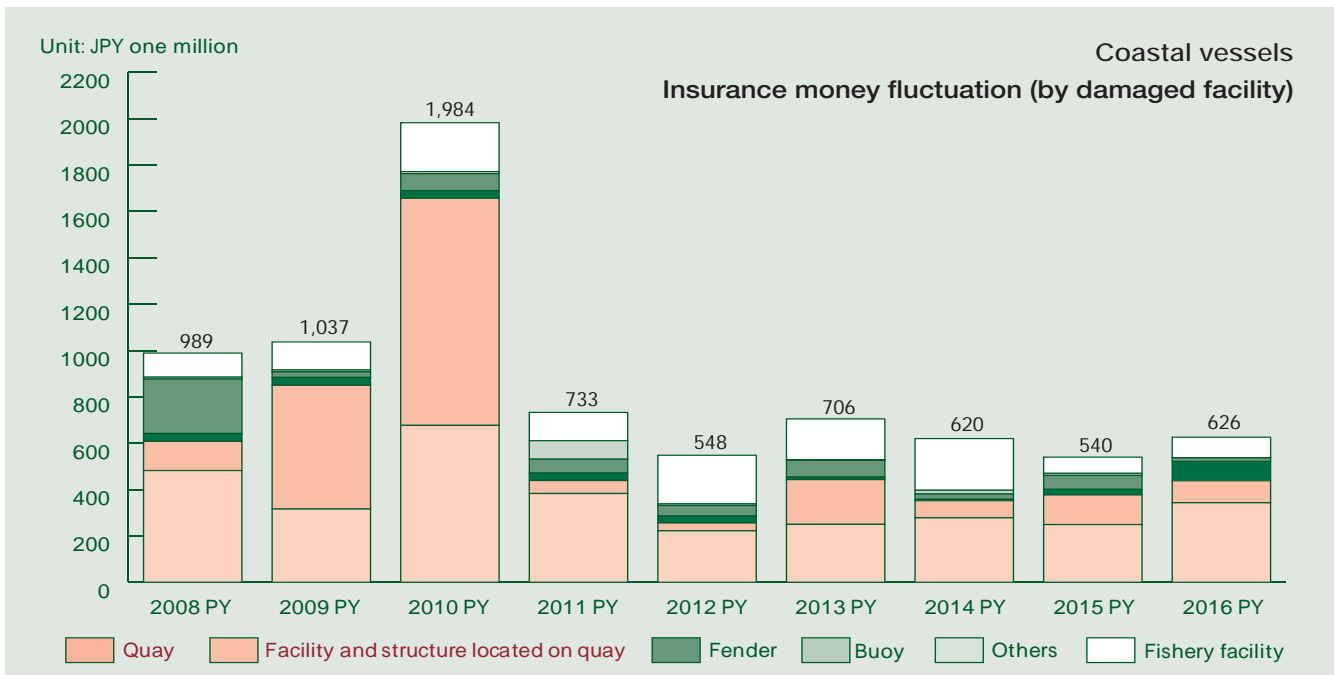
	2008 PY	2009 PY	2010 PY	2011 PY	2012 PY	2013 PY	2014 PY	2015 PY	2016 PY	Total	%
Quay	77	66	71	69	50	70	62	43	39	547	42%
Facility and structure located on quay	45	38	19	19	18	16	14	34	49	252	20%
Fender	13	13	16	14	15	9	4	15	16	115	9%
Buoy	30	11	22	6	12	6	6	7	7	107	8%
Others	10	9	9	9	11	6	9	3	2	68	5%
Fishery facility	28	20	26	20	25	22	32	15	14	202	16%
Total	203	157	163	137	131	129	127	117	127	1,291	100%
Number of entered vessels at the beginning of the policy year	3,609	3,428	3,225	2,799	2,436	2,319	2,176	2,134	2,091	24,217	
Accident rate (Number of accidents divided by Number of entered vessels ×100%)	5.6	4.6	5.1	4.9	5.4	5.6	5.8	5.5	6.1	5.3	

Table 36 Coastal vessels Fluctuation of the number of accidents (by damaged facility)



Graph 37 Coastal vessels Ratio of the number of accidents (damaged facility)

Examining the number of accidents of coastal vessels by damaged facility, the sum total of quay damage accidents (42%) and structure damage accidents including quay facilities (20%) occupy more than half of the total number of accidents.

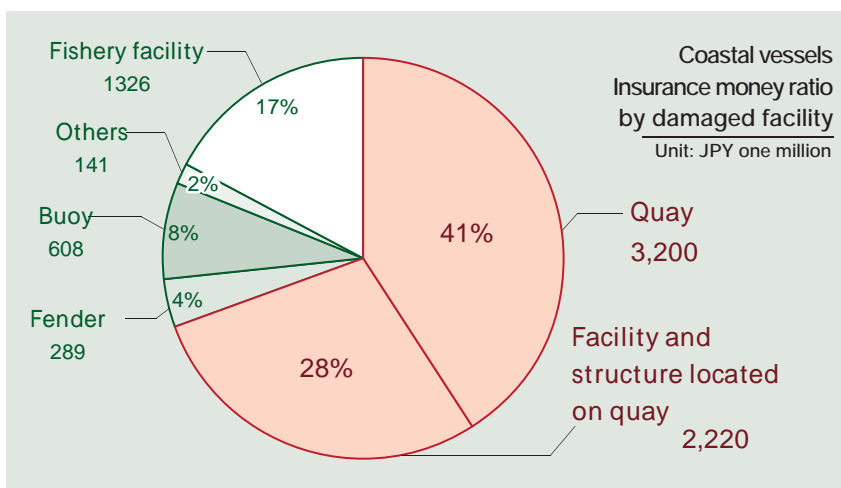


Graph 38 Coastal vessels Insurance money fluctuation (by damaged facility)

Unit of insurance money: JPY one million

	2008 PY	2009 PY	2010 PY	2011 PY	2012 PY	2013 PY	2014 PY	2015 PY	2016 PY	Total	%
Quay	482	316	677	383	222	250	278	249	343	3,200	41%
Facility and structure located on quay	126	534	980	56	34	193	74	128	95	2,220	28%
Fender	34	34	33	32	30	11	6	24	83	289	4%
Buoy	235	24	73	60	45	72	23	60	16	608	8%
Others	8	8	9	80	7	3	16	9	0	141	2%
Fishery facility	104	121	211	122	210	176	223	70	89	1,326	17%
Total	989	1,037	1,984	733	548	706	620	540	626	7,784	100%
Accident rate	13%	13%	26%	9%	7%	9%	8%	7%	8%	100%	

Table 39 Coastal vessels Insurance money fluctuation (by damaged facility)



Graph 40 Coastal vessels Insurance money ratio (by damaged facility)

On the other hand, regarding insurance money, 2010 PY is prominent compared to other insurance years due to one large accident (929 million yen: 47% of 2010 PY overall) that occurred. Also, regarding damaged facilities, insurance money regarding quay damage, quay facilities and structure damage occupy 70% of the total.