Attachment 18

Maritime Accident Accident Cause (Unsafe Behaviour) Collision with Ōshima Bridge

Cause (Unsafe behaviour)		Man																								
		Human factor (The vessel, shipowner and ship management company)																								
		1 Psychological												2 Emotional					3 Organizational						
In ①, write down a direct cause which was investigated based on the facts After ②, write down the root cause using the Why Why Analysis. Then, circle each applicable cause. Regarding items other than Man (Human factors), enter the sub-item number of each item in the 4M Classification List.		① Impulsive action	② Forgetful	③ Habituation behaviour	④ Personal problems	⑤ Unconscious acts	⑥ Sense of urgency and sensitivity	⑦ Mental shortcuts	⑧ Cuts corners	⑨ Judgement based on speculation	⑩ Mistakes and perceptual illusion	⑪ Habituation abnormality	⑫ Personality	① Fatigue	② Lack of sleep	③ Alcohol, medicine or disease	④ Physical ability	⑤ Ageing	① Desire and willingness	② Leadership and teamwork	③ Communication	④ Commitment (responsible intervention)
2/O E and Ship management company E																										
1	2/O E created the Passage Plan between Onsan and Etajima without confirming the height of the Ōshima Bridge						○		○			○														
②	Why was the Passage Plan created using nautical chart ordering software?			○		○	○	○	○			○														
③	What was the data copied over to the ECDIS?			○		○	○	○	○			○														
④	Why was Draft and Air Draft data not input into the ECDIS?			○					○																	
⑤	Regarding the Passage Plan, why did the management company not intervene?																									
Master E and 2/O E																										
2	Why did the Master E believe that the previous Master had signed the Passage Plan?								○	○																
②	Why was the Master E unable to take over effectively from the previous Master?	○							○	○																
③	Why did the 2/O E create the Passage Plan between Onsan and Etajima without confirming the height of the Ōshima Bridge?							○	○	○																
Master E and 2/O E																										
4	Why did the Master E continue navigating even though he felt uneasy about the height of the bridge?	○					○			○	○															
②	Why did the 2/O E not re-confirm the height of the bridge beam?																									
Master E																										
6	Why did he continue navigating regardless?	○					○	○	○	○																
②	Why was an Abort Point not arranged?		○				○																			
Total number of circled items		3	1	3		2	6	4	8	5	1	3														

Example (1/3)

Cause (Unsafe behaviour)		Man														Machine					
														5 Management of health and working environment		Mechanical factors such as machinery not working properly or being out of order					
		4 Individual skills														Mainly on the vessel					
		4-1 Inadequate knowledge						4-2 Inadequate skills			4-3 Poor work ethic										
In ①, write down a direct cause which was investigated based on the facts After ②, write down the root cause using the Why Why Analysis. Then, circle each applicable cause. Regarding items other than Man (Human factors), enter the sub-item number of each item in the 4M Classification List.		① Inadequate or inappropriate knowledge about the work to be carried out	② Work content not understood or misunderstood	③ Lack of a sense of urgency and awareness	④ Mistakes regarding work procedure/ forgetfulness	⑤ Lacks basic knowledge of the work	⑥ Unaccustomed to work, inexperienced inadequate skills	② Not enough training	③ The belief that the work done is satisfactory, when objectively it is inadequate	① Not "ready" to work	② Intentionally dishonest regarding work and breaks the rules	③ Covers up or tolerates dishonest work	④ Protective wear not worn	① Health check not implemented prior to working	② Tool box meeting was not implemented	① Design flaw in the machinery	② Defective protection against hazards	③ Lack of fundamental safety (design and ergonomic arrangement)	④ Lack of consideration regarding ergonomic factors	⑤ Lack of standardization	⑥ Lack of machinery and facility maintenance, etc.
2/O E and Ship management company E																					
1	2/O E created the Passage Plan between Onsan and Etajima without confirming the height of the Ôshima Bridge	○	○	○	○	○	○			○	○										
②	Why was the Passage Plan created using nautical chart ordering software?	○	○	○	○	○	○			○	○										
③	What was the data copied over to the ECDIS?	○	○	○	○	○	○			○	○										
④	Why was Draft and Air Draft data not input into the ECDIS?	○	○	○	○	○	○			○	○										
⑤	Regarding the Passage Plan, why did the management company not intervene?																				
Master E and 2/O E																					
2	Why did the Master E believe that the previous Master had signed the Passage Plan?				○																
②	Why was the Master E unable to take over effectively from the previous Master?																				
③	Why did the 2/O E create the Passage Plan between Onsan and Etajima without confirming the height of the Ôshima Bridge?																				
Master E and 2/O E																					
4	Why did the Master E continue navigating even though he felt uneasy about the height of the bridge?																				
②	Why did the 2/O E not re-confirm the height of the bridge beam?	○	○	○	○	○	○			○	○										
Master E																					
6	Why did he continue navigating regardless?																				
②	Why was an Abort Point not arranged?	○	○	○	○	○	○			○	○										
Total number of circled items		6	6	6	7	6	6			6	6										

Example (2/3)

Cause (Unsafe behaviour)		Media					Management												Necessity of re-investigation
		Media connecting Man with Machinery					Management factors and organization												
		The vessel, shipowner and ship management company					On the vessel						Shipowner and Ship management company						
In ①, write down a direct cause which was investigated based on the facts After ②, write down the root cause using the Why Why Analysis. Then, circle each applicable cause. Regarding items other than Man (Human factors), enter the sub-item number of each item in the 4M Classification List.		① Lack of information regarding work to be carried out	② Work preparedness/inadequate working conditions	③ Inappropriate work method	④ Inadequate work space	⑤ Poor working environment conditions	① Inadequate management / organization	② Inadequate/incomplete regulations and procedure manual	③ Inadequate safety management planning	④ Lack of education and training	⑤ Inadequate layout arrangement	⑥ Inadequate supervision of his/her subordinates	① Inadequate management / organization	② Inadequate/incomplete regulations and procedure manual	③ Inadequate safety management planning	④ Lack of education and training	⑤ Inadequate layout arrangement	⑥ Inadequate supervision of his/her subordinates	
2/O E and Ship management company E																			
1	2/O E created the Passage Plan between Onsan and Etajima without confirming the height of the Ôshima Bridge			①				①	③	②		③		②	①	①			○
②	Why was the Passage Plan created using nautical chart ordering software?																		
③	What was the data copied over to the ECDIS?																		
④	Why was Draft and Air Draft data not input into the ECDIS?																		
⑤	Regarding the Passage Plan, why did the management company not intervene?													②	①	①			
Master E and 2/O E																			
2	Why did the Master E believe that the previous Master had signed the Passage Plan?																		
②	Why was the Master E unable to take over effectively from the previous Master?																		
③	Why did the 2/O E create the Passage Plan between Onsan and Etajima without confirming the height of the Ôshima Bridge?																		
Master E and 2/O E																			
4	Why did the Master E continue navigating even though he felt uneasy about the height of the bridge?																		
②	Why did the 2/O E not re-confirm the height of the bridge beam?																		
Master E																			
6	Why did he continue navigating regardless?																		
②	Why was an Abort Point not arranged?																		
Total number of circled items				1				1	1	1		1		2	2	2			1

The number in the circle applies to the number in Attachment 2-2 (Maritime Accidents 4M Classification List)

Attachment 19

Maritime Accident Analysis using 4M5E and Countermeasure List
(Unsafe behaviour) Collision with Ōshima Bridge

	Man	Machine	Media	Management	
	The vessel, shipowner and ship management company	Mainly on the vessel	The vessel, shipowner and ship management company	On the vessel	Shipowner and ship management company
Risk factors (Direct cause and indirect/root cause)	1. 2/O E created the Passage Plan between Onsan and Etajima without confirming the bridge beam height of the Hakata-Oshima Bridge (1- ③ and ⑤～⑪) 2. Regarding the Passage Plan between Onsan-Etajima, Master E did not receive details from the previous Master. (1- ①, ⑧ and ⑨) 6. Continued navigating while feeling uneasy about the height of the bridge, (1- ①, ⑥, ⑨ and ⑩) 1. Abort Point: Was there a clear plan if the Passage Plan got interrupted or if there were non-returnable points? (Re-examination necessary) (1- ①, ② and ⑥～⑨)		1. Vague setting method of ECDIS (inputting basic data) (1- ③, ⑤～⑧ and ⑪)	3. Vague procedure for confirming and approving the Passage Plan (1- ① and ⑦～⑨) 2. What the Master did receive from the previous Master was vague (1- ①, ⑧ and ⑨)	7. No intervention was taken into account whatsoever regarding the vessel's Passage Plan (Management 2- ②, 3- ① and 4- ①)
Education Education and training Knowledge, skills, consciousness, being given information, etc.	・Re-training for the personnel in charge of creating the Passage Plan (2/O E) ・Re-training regarding handling of Abort Point procedure ・Re-training on how to handle feeling uneasiness regarding navigation ・Re-training for Master E regarding Safety Management Code				・Formulation of continued training and education for Crew
Engineering Technology and engineering Technological countermeasures					

	Man	Machine	Media	Management	
	The vessel, shipowner and ship management company	Mainly on the vessel	The vessel, shipowner and ship management company	On the vessel	Shipowner and ship management company
Enforcement Thorough guidance and enforcement Standardization, proceduralization, alerting, reward and punishment KYT, campagnes etc.	• Re-training for taking over from previous Master • In particular, procedure manual compliance regarding the approval procedure of Passage Plans. • Formulation of handling method (procedure) regarding the route check function of ECDIS		• Creation of Passage Plans using ECDIS and a procedure manual on how to utilize the route function	• Thorough compliance with the revised procedure manual	• Review of SMS procedure manual regarding creation, confirmation and approval of Passage Plans. (To include basic setting method of ECDIS) • Guidance and completeness of revised procedure manual for all ships under management • Enforcement of internal auditing
Examples Case studies, countermeasures and rules Lead by example, experience of success, introduce model cases, “Hiyari-Hatto” (near misses), etc.					
Environment Working environment, office internal management, on-board organization, etc.					

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