Subject: ALL FLEET VESSELS/ DA-11, QITAPI-LP-13-2019(Engine-room Resource Management, A Loss Prevention Perspective)
Ref : DMA/AIFI/98/**C 1043**
Date: 15/08/2019

Dear Captain
Good Day,

Kindly find the attached informative document titled
" QITAPI-LP-14-2019(Engine-room Resource Management, A Loss Prevention Perspective) "
for your kind attention and necessary precaution measures.

You are requested to confirm receipt, discuss the contents in the next consolidated meeting on board & keep a copy in the file DA-11 .

Best Regards,
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(Note: This e-mail has been sent as BCC <blind carbon copy to : All R.O.D.-SMC Vessels, to eliminate the lengthy list that would result if this e-mail is printed)

QITA MUTUAL CLUB
موسسه کلوپ بین المللی بیمه متقابل اطمینان متحد قشم

Loss Prevention Circular QITAPI-LP-14-2019
(Engine-room Resource Management, A Loss Prevention Perspective)

►What is Safety:

Several types of research establishing safety have been conducted. However, in fact, what we should essentially consider are social considerations. So, it is necessary to consider safety from the point of view of preventative measures to ensure that the accident and trouble does not reoccur.

The English psychologist Professor James Reason defines safety as “having resistance to danger to which an organization is constantly exposed”.

For example, when we consider operation of a vessel, we could recognize many dangers such as the dangers of a collision, the dangers of a cargo accident, the dangers of damage to harbor facilities, and the dangers of an engine failure.

Therefore, since safety is only just sense of values or concept, we should focus on and consider "how to avoid these dangers" as being most significantly associated with safety.

►The Relationship amongst Science, Technology, and Engineers:

About the machinery and systems in the engine room, the crew as technical professionals should understand and deal with the following; the purpose of using technology developed by science, which is the basic rule and principle of nature, the method of operating it rationally, and that of daily management. It is important to fully establish the pyramid of science, technology (engineering), and technical professionals (engineers, marine officers) as shown in Figure on the next page.

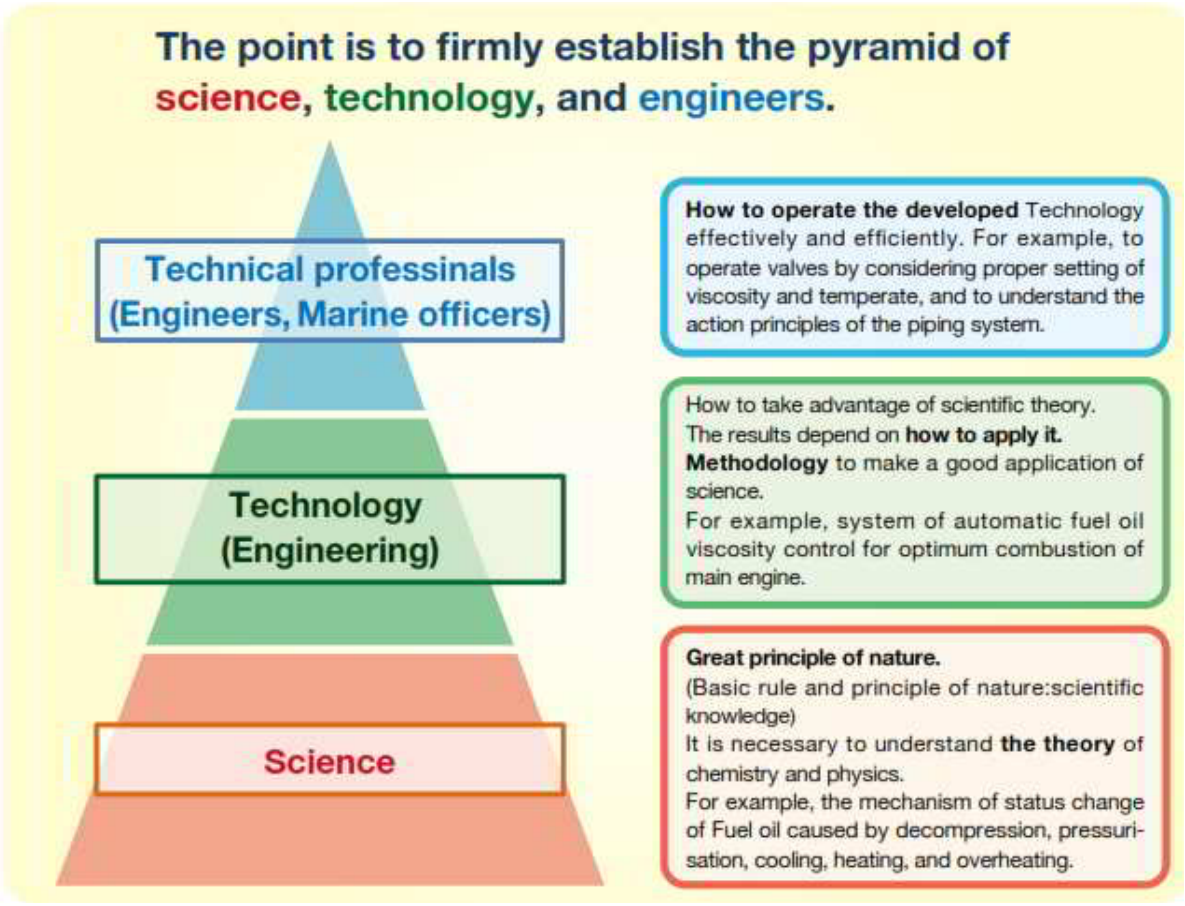
For example, in the scientific field which is the base, we should know the fuel oil how state change after pressurization or heating under the rule and principle of nature. Next, in the technology field, we develop how to control viscosity automatically, considering good use of the features of fuel oil. Moreover, marine officers as engineers and professionals consider and decide how to set viscosity or temperature based on the purpose of the pipe line system and appropriate viscosity.

Therefore, in dealing with equipment, do not forget that the crew are to breathe life into machinery and make the best performance of machinery.

We have the phrase used at work site, “A word to the wise is enough!”(To understand everything from only one part). This means that a one instruction or decision always has the principles of science or technology as grounds, which is the elements for making a decision, which is 10 times or 100 times the amount of instructions or decisions.

For example, about the instruction from a senior engineer to a junior engineer, the junior engineer should understand the background precisely of the instruction. If the junior makes a decision by himself, the process should be logical. Otherwise, his each action does not bring out the power (meaning) of grounds (intention and conscious). Moreover, the junior engineer cannot improve himself.

If the junior engineers study the principle of science and technology only for the exam, and they do not try to obtain any knowledge after the graduation, they would not be able to have a mutual understanding related to the operation management with the senior engineers including C/E. As the result, we are afraid that it may cause the risk that the engine room’s work cannot be operated systematically.



►Establishing Ideal Management:

In order to establish the ideal management system, we must think about something extra as follows:

1-It is important for the engineers to find the presage and indication of abnormality precisely before trouble or accidents occur by continuous machinery monitoring with acute power of observation.

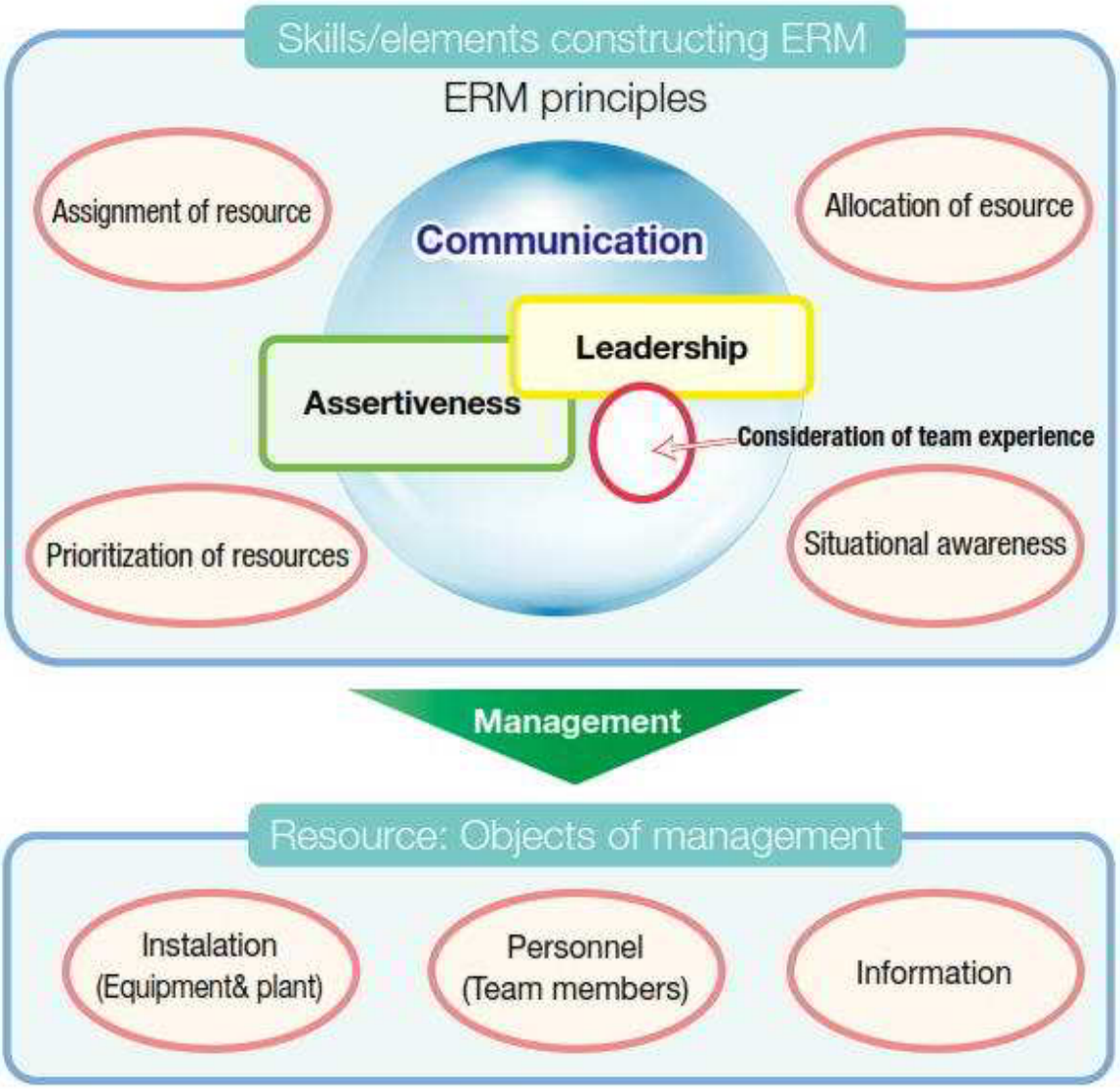
2- In order to achieve the normal operation of system and machinery based on the principle, it is necessary for crew to conduct the scheduled inspection & maintenance regularly and grasp the operation status appropriately.

3-If the education and training system appropriately are established, it may be able to deal effectively with an emergency trouble and avoid accidents.

We may also refer to ERM's ability requirements table in IMO:

- *Resource arrangement*
- *Effective communication*
- *The decision of duty and priority*
- *Definite indication of intention and leadership*
- *The ability to recognize situation*
- *Utilization of team members experience and understanding of ERM principle*

The correlation diagram for ERM based on IMO ability requirement table:



Summary of Resource Management:

►ERM functioning in case studies:

The direct effects of proper ERM in accident & loss prevention are defined as:

1-To handle the immediate response system to the standby maneuvering (engine operation) during the entering and departing at port.

2-To handle the immediate response system to emergencies such as a blackout, main engine's stop, oil leakage, a fire, and flooding.

3-To handle operation such as the bunkering of fuel or lubricating oil and discharge with sludge which may have the possibility of an oil pollution accident.

4-To handle watch-keeping at sea (cooperate with bridge maneuvering, engine operation)

5-To handle watch-keeping in port (cooperating with loading/discharge operation, maintenance operation)

6-To handle Maintenance operation (important information sharing , establish operational mutual cooperation, communication, support, and understanding the situation, normal operations, share the special status of the valves and equipment not to be operated, cooperation with other departments and so on.)

Then five cases of engine room related accidents are brought here in order to let the reader to compare & rethink about the requirements & check points:

	ERM ability requirement	Check point
Boiler water leak	Allocation of resources	Did the person in charge (hereinafter "PIC") of boiler have enough management knowlege & ability to maintain the boiler as designed?
	Effective communication	Did the chief engineer or the superior give precise advice?
	Assignment and prioritization of resources	Did the PIC of the boiler understand the importance of boiler water control?
	Assertiveness and leadership	Did the C/E or the other experienced senior engineers give the PIC the explanation about the importance of maintenance?
	Situational awareness	Did the engine member have enough knowledge?
	Consideration of team experience and knowledge of ERM principles	"Didn't the other engineers with experience of the boiler have doubts? Didn't they give PIC any advice?"

	ERM ability requirement	Check point
Main engine start failure	Allocation of resources	Were the C/E unable to assign the crew around the main engine in order to manage fuel temperature and viscosity change frequently, depending on the situation, so that they can avoid the abnormal situation?
	Effective communication	Was the communication among engine room, engine control room (ECR), and bridge enough?
	Assignment and prioritization of resources	Was the timing for the change of fuel temperature setting from the C/E appropriate?
	Assertiveness and leadership	Was the C/E's instruction appropriate?
	Situational awareness	Did the C/E understand the status change of fuel oil in pipe line in the case of no Main Engine fuel consumption?
	Consideration of team experience and knowledge of ERM principles	Didn't the other engineers have doubts about the C/E's order or the situation in the pipe line?

	ERM ability requirement	Check point
Blackout	Allocation of resources	"Was the assignment role for engine member appropriate ? So they can restart Generator engine after its emergency stop?"
	Effective communication	Did the senior engineers recognise the situation of starting air valve ?(Why closed?) (Didn't he check?)
	Assignment and prioritization of resources	Were the operating instructions for the inspection items of recovery work clear?
	Assertiveness and leadership	Did the C/E and the 2/E give all Engine member appropriate instruction?
	Situational awareness	Did engine member have the appropriate situational awareness for Blackout recovery?
	Consideration of team experience and knowledge of ERM principles	Why didn't engine member understand the importance of blackout recovery drill? Did any engine member experience the blackout recovery work?How many experienced menber were there?

	ERM ability requirement	Check point
Boiler black smoke	Allocation of resources	Did the PIC of boiler have enough management knowledge & ability to have boiler function as design?
	Effective communication	Regarding black smoke condition, why wasn't the information of exhaust gas condition shared between the engineer officer on watch and the deck officer on watch?
	Assignment and prioritization of resources	How was the priority schedule of burner maintenance?
	Assertiveness and leadership	Did the C/E explan and motivate PIC of boiler how importance the maintenance is?
	Situational awareness	When the black smoke was found, why did engine member fail to take effective measures such as suppressing or preventing it? Didn't the engineer officer on watch monitor the black smoke outside?
	Consideration of team experience and knowledge of ERM principles	"Didn't the other engineers with experience of the boiler have doubts? Didn't they give PIC any advice?"

	ERM ability requirement	Check point
Oil leakage in bunkering	Allocation of resources	Of course the each role of engine members must be assigned in advance,however didn't anyone double-check their colleague?
	Effective communication	Did any senior engineers instruct and explain their engine member the operation procedure how to change-over the valve beforehand?
	Assignment and prioritization of resources	Did the senior engineer infrom their engine member the bunkering plan precisely in advance?
	Assertiveness and leadership	Did the senior engineer conevey their engine member the bunkering plan, and remind them concern oil pollution in advance? Did the experienced engine member educate the poor skilled member?
	Situational awareness	Did engine member check the liquid level of the tank regularly (e.g., every 15 minutes)?
	Consideration of team experience and knowledge of ERM principles	"Did the experienced engineers give their engine member the appropriate advice each other? How many experienced engine menber were there?"