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AN IMPROVED IBTS DIAGRAM

The attached diagram is an interpretation of the IBTS Flow Diagram (Figure 2) shown in MEPC 54/10/6.

The MEPC diagram shows an Integrated Bilge Water Treatment System (IBTS), but the diagram contains various inconsistencies and does not reflect the most up to date approaches for bilge water treatment.

The attached diagram is a composite of various best practices that have been identified in the last few years and is an attempt at providing more specific guidance beyond the guidance provided in the IMO diagram. It should be noted that this diagram is still no more than guidance since at this stage it appears there is no "one system fits all" approach.

The following comments apply to this diagram:

1. From left to right the diagram is divided into three liquid categories; "Clean" Drains, Oil Residues and Bilge water treatment. These three categories cannot be sharply divided, and in reality intersect.
2. Clean drains are drains that probably do not require OWS treatment prior to discharge overboard. At this time it is not clear from a statutory point of view if drains such as M/E air coolers can be drained directly overboard. In this diagram these drains have been routed through a "Clean drain observation tank", where these discharges can be evaluated before they are pumped overboard.
3. Some engine room drains such as soot blowing drains are not shown in the MEPC diagram, and, as such, it is unclear where these drains should be routed. Particularly soot and hand washing drains can create havoc with OWS systems and need to be routed such that they do not cause failures in the OWS system. In this diagram they are routed to the clean drain observation tank.
4. The clean drain overboard valve is shown above the waterline to allow crews and the public to clearly identify this drain as a possible source of oil contamination.
5. The clean drain discharge pump can also discharge to the bilges. In case of a significant contamination, a hose can be fitted to route this discharge to the treatment or holding tanks, or to a shore facility (not shown in the diagram). In such cases clear notations should be made in the ORB and ME log.
6. The diagram has been laid out to show the effects of the vertical arrangement of the system. This means that the OWS drains readily to the sludge tank, settling tanks are tall, and where advantageous, tanks can gravity drain.
7. The OWS is shown high in the diagram to indicate the desirability of taking the unit out of the darkest and lowest portions of the engine room.
8. Contrary to present common practice, all treatment tanks should have bottom drains and horizontal cleaning access.

9. The sludge tank and the bilge primary treatment tank are shown with very large bottom drains. These drains should have sufficient clearance to be able to accept a 55 gallon drum underneath the bottom drain.
10. The bottom drains should be large to prevent easy fitting of transfer hoses.
11. The bilge primary treatment tank is shown in outline only. At present there are various approaches for this tank. Some are very vertical and others contain weir style dividers that enable oil skimming. Many tanks have drains at multiple levels. In the diagram this tank is shown with an adjustable suction pipe. Regardless of detail design, in most systems that have been shown to be reasonably functional this treatment tank has been found to be the key ingredient.
12. There are two approaches for bilge water treatment, both of which can be facilitated in the diagram shown. One approach is for crews to drain all bilge liquids to the bilge water holding tank, allow settlement in this tank and carefully pump to the primary treatment tank. This method allows significant pretreatment, but will require regular cleaning of the bilge holding tank. The alternative approach is to pump to the primary treatment tank first and to attempt to keep the bilge water holding clean by only allowing water treated by the OWS to be stored there.
13. Some crews have successfully used flocculents to enhance treatment in the primary treatment tanks. Proper methods for flocculent dosing and removal then need to be fitted to this tank
14. Depending on vessel condition, and the occurrence of equipment failures, crews can elect to switch between the two above approaches.
15. This diagram shows a connection that allows pumping of liquids from the sludge tank through the sludge pump into the primary treatment tank. It is not clear if this connection is allowed from a regulatory point of view. However, any oil residue tank will collect varying amounts of water. (OWS malfunction, purifier malfunction, compressed air drains, settling tanks) In certain cases this water might need to be treated. If this connection does not exist, the crew will need to manually drain the sludge tank to the bilges, which could cause house keeping problems.
16. All tanks, but especially the primary treatment tank, the sludge tank and the incinerator tank need copious heating arrangements. The OWS also should be fitted with a heating system.
17. It is recommended that the sludge tank capacity never be smaller than as required for a system <u>without</u> an incinerator. This will allow a vessel that is fitted with an incinerator to operate without restriction when the incinerator is not operational.
18. The bilge and sludge pump need to be sized to allow complete discharge of the sludge and bilge water holding tank through the deck fitting in less than three hours.
19. All lines that can carry oil need to be insulated and some of these lines might need to be heated to prevent line clogging.
20. The system is shown with a bilge water polisher. This can be interpreted as an MEPC 107 (49) post treatment device, or as a standalone filter. As an MEPC

107 (49) device it generally will not allow optional selection of the filter (emulsion treatment) loop. From an operational point of view, the optional selection provides additional flexibility and analysis. An operator can first run the OWS without the polisher, if his OCM alarms he can then decide to use the polisher or not. With an MEPC 107 (49) device the operator will not know he had a gravity separation problem until his secondary treatment unit has also failed, at which stage a complete overhaul of the OWS will be required.

21. The OWS overboard line is fitted with an OWS test line that leads back to the bilge holding tank. This line is placed downstream from the three way valve. This will allow full operation of the OWS and the IBTS in port for testing or evaluation without requiring overboard discharge.
22. It is imperative to note that, at present, there is no indication that IBTS can be fully automated. As such, training, active management of the system by the crew and open communications are absolutely imperative for successful IBTS operation.
23. This system does not and cannot prevent foul play in operation, and depends on honest and rational ITBS operation. Owners can add various verification and control systems as required, but they will not enhance the inherent capability of the system.
24. Further comments are invited.
25. For further technical discussion of OWS systems see http://www.sname.org/committees/tech_ops/oilywater/INDEX.html

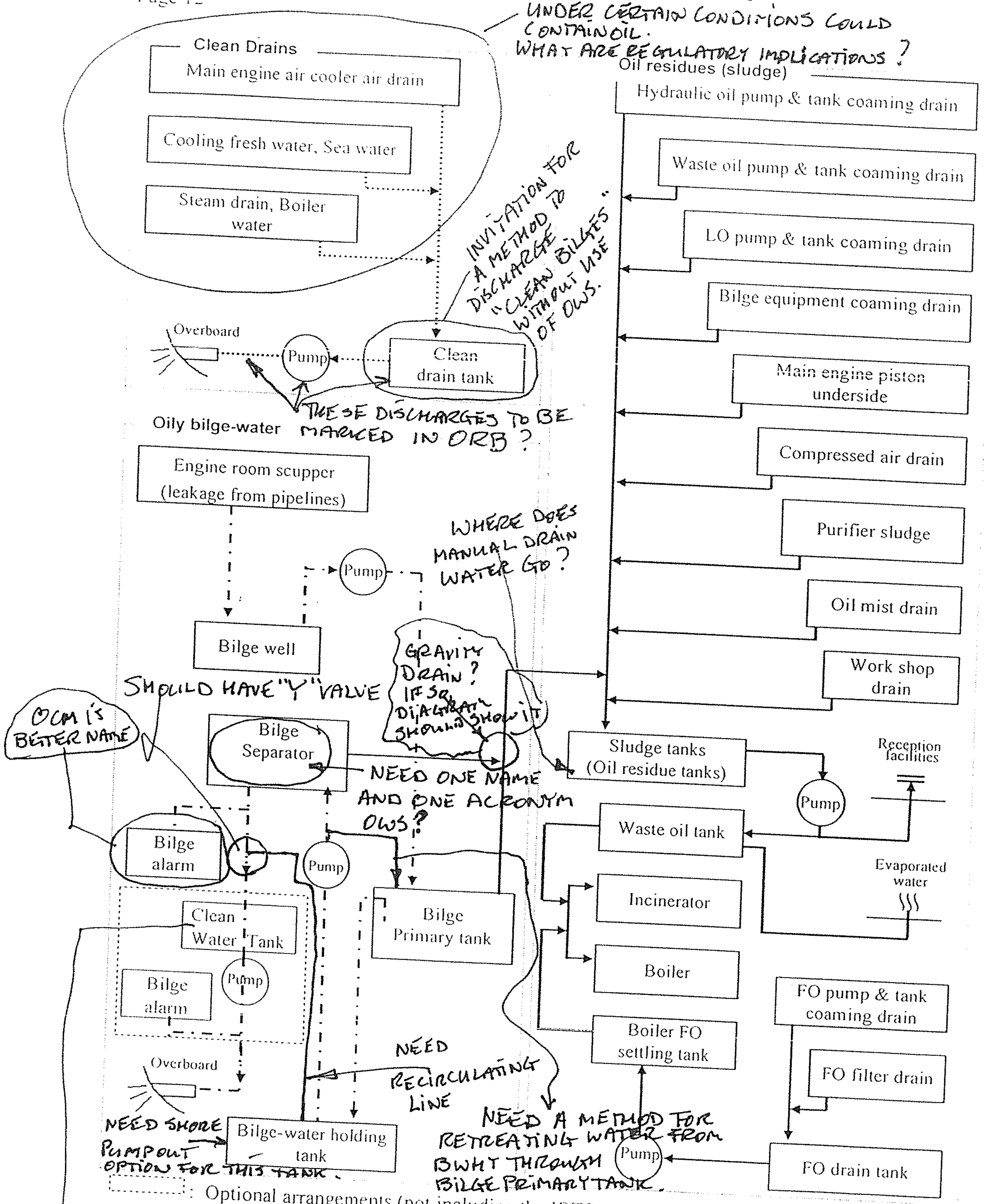

Figure 2 – Flow Diagram of Integrated Bilge Water Treatment System (IBTS)

WITH PRESENT TECHNOLOGY THIS TANK WILL NOT STAY CLEAN, AND AS SUCH WILL SIMPLY ADD AN ADDITIONAL MAINTENANCE BURDEN.

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