INTERNATIONAL MARITIME ORGANIZATION

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PREVENTION OF AIR POLLUTION FROM SHIPS

Standardization of on-shore power supply

Submitted by the Institute of Marine Engineering, Science and Technology (IMarEST)

SUMMARY

Executive summary:	Having reviewed the Secretariat paper (MEPC 55/4/6) on liaison with international and intergovernmental organizations regarding proposals for the standardization of on-shore power supply for ships in port, IMarEST makes general comments and identifies further considerations which should be taken into account
Action to be taken:	Paragraph 11
Related documents:	MEPC 54/4/3 and MEPC 55/4/6

1 This document is submitted in accordance with paragraph 4.10.5 of the Committee's Guidelines and in connection with document MEPC 55/4/6 by the Secretariat which follows up proposals on the standardization of on-shore power supply (cold ironing) submitted by Germany and Sweden in document MEPC 54/4/3. The Institute of Marine Engineering Science and Technology (IMarEST) has reviewed the proposals by means of a group drawn from various maritime interests. It supports the proposals and agrees that a standardization process for on-shore power supply is important for the operation of ships. However, it believes that some technical issues have not been fully understood or addressed in the work done to date and it would wish to be involved in any further work towards a standardization process for on-shore power supply to ships.

Background

2 The proposal in document MEPC 54/4/3 refers to work by Entec for the European Commission Directorate General Environment under the Service Contract on Ship Emissions: Assignment, Abatement and Market-based Instruments for which a specific task (2a) looked at shore-side electricity in August 2005. The paper provides excellent information and argues logically with regard to the advantages, and disadvantages, for ships using shore power. The main advantage, in terms of emissions is the expectation that the electrical energy needed by the ship is more efficiently and more cleanly produced in bulk as part of the port's national infrastructure. The point is made by Entec, and echoed in the proposal by Germany and Sweden,

that this balance of advantage relies on many issues which may not be fixed over time and in certain circumstances the provision of shore power to a ship may not be the optimum arrangement.

Comments by IMarEST

3 The work by Entec notes some difficulties in transferring to shore power and anticipates dead bus transfers entailing temporary loss of power supply. This is unnecessary, shore supply is commonly used by warships of all navies and procedures avoid any interruption of power supply during connection to shore power. Similarly cruise liners have recently started using shore power and again procedures specifically avoid any loss of supply.

4 The work by Entec envisages shore supplied power being provided in the range of 6 to 20 kV. Such a range is unacceptable for standardisation and needs closer definition. In addition voltages of this level (by shore definition Medium Voltage and by marine definition High Voltage) will be entirely unsuitable for ships with only Low Voltage Systems (below 1,000 V AC). The additional equipment installation requirements, segregation, access control and crew training arising from the presence of MV Voltage in the ship would be unacceptable.

5 A "one size fits all" solution for all ships is not technically or economically practicable or justifiable. A major comment by the IMarEST on the proposal is that plurality must be stressed: there is certainly the need for the standardization of systems but not for the development of a standard system. There will need to be standards for medium voltage connections, standards for low voltage connections and standards covering a range of power levels. (All with seamless transfer of power).

6 Some Ports associated with Cruise Ships already have a number of 6 and 11 kV, 14 MW, shore connection points and increasing numbers of these ships have the necessary shipboard equipment. Any standard adopted should not make this equipment subject to any major change as this would ignore the positive experience gained to date and put an unnecessary and unfair burden on the pioneers in this field.

7 Plug connector systems have become standardised worldwide, yet distinct, to prevent cross connection between differing voltages, for example:

60Hz 440V 3 phase systems,
50Hz 400V 3 phase systems,
60Hz 110V 1 phase systems,
50Hz 230V 1 phase systems.

All or any of which systems may be fitted to different types/nationality of ships. Any standard developed for the supply of shore power to ships should take account of these existing connectors and their uses.

Subjects for further consideration

8 Considering ports, harbours and terminals, it is recommended that compulsory use of "cold-ironing" is avoided. Many UK ports (London included) have disparate and very small terminals many of which are miles from a decent electrical supply. Compulsion for "cold ironing", without any kind of lower limit to size of ship and power demand, would effectively close these very useful terminals down as their only option would be to arrange shore generators.

9 The way in which ports and harbours to cope with the different frequency and voltage requirements of the various ships that might visit will need very careful consideration. The technical issues associated with interconnection of two separate (and differing) electrical power systems are complex and extensive these have been largely overlooked in the work conducted to date. As well as the issues already noted with regard to voltage and transfer procedures the following will need consideration in any further work:

Earthing arrangements,
Personnel safety systems,
Stability,
Harmonic Distortion,
Protection,
Voltage Transient duration and recovery,
Frequency transient duration and recovery.

Conclusion

10 IMarEST is supportive of Germany and Sweden's proposal to initiate a standardization process for on-shore power supply (cold ironing). However some technical issues have not been fully understood or addressed in the work done to date; this needs rectification early in any subsequent process. The IMarEST would like to be involved in any further work towards a standardization process for on-shore power supply (cold ironing).

Action requested of the Committee

11 The Committee is invited to consider the above information and take action as appropriate.

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