

## RECOMMENDATION 218-2

**PREVENTION OF INTERFERENCE TO RADIO RECEPTION ON BOARD SHIPS**

(1951-1956-1974-1990)

The CCIR,

## CONSIDERING

- (a) that the Maritime Regional Radio Conference, Copenhagen, 1948, recommended that the CCIR study the question of interference to radio reception caused by electrical installations on board ship;
- (b) that the International Convention for the Safety of Life at Sea, 1974, as amended in 1988, requires that every radio installation shall be so located that no harmful interference of mechanical, electrical or other origin affects its proper use;
- (c) that electrical interference is generally caused by the unwanted excitation of the radio receiving equipment, including the antenna, by fluctuating electromagnetic fields set up by other electrical installations;
- (d) that the fluctuation of electromagnetic fields, which gives rise to interference, is caused by abrupt changes in current in the source of interference, and by abrupt changes in the resistance of conductors situated in electromagnetic fields;
- (e) that electrical interference may be transmitted by direct radiation and induction from the source of interference itself, and also by radiation, re-radiation and induction from conductors which carry interfering currents,

## UNANIMOUSLY RECOMMENDS

1. that the design, construction and installation of electrical equipment on ships should be such that interference is minimized at its source (see No. 3600, 4100, 5131 of the Radio Regulations);
2. that electrical equipment installed in ships should be properly maintained to prevent any increase in the level of interference which it causes;
3. that antennas used for transmission or reception should be erected as far above and as far away as possible from electrical machinery and from parts of the ship's structure such as funnels, stays and shrouds;
4. that the feeders of antennas which are used exclusively for reception should be screened; that the screen should extend continuously from the receiver to a point which is as high as practicable above the ship's structure, and that the screen should be effectively earthed;
5. that the frame or loop antennas used for direction-finding, should be effectively screened against electrostatic interference;
6. that radio receiving equipment should be sited in a room specifically provided for the purpose. This room should be effectively screened and situated as high as practicable in the ship;
7. that where a room cannot be provided specifically for radio equipment then the space provided should be as far away as possible from all sources of interference and situated as high as practicable in the ship;
8. that the radio receiving equipment should be designed so that it is effectively screened and protected against conducted interference;
9. that suppressor filters, intended to reduce to an acceptable level the interference which is propagated, should be fitted at the sources of interference, preferably being built into equipment producing the interference, and that in particular:
  - 9.1 the electrical ignition systems of internal combustion engines, including those which may be installed in life-boats, should be fitted with suppressors;
  - 9.2 the navigational instruments and other electronic equipment, should, if necessary, be fitted with suppressors, be screened, and the screen effectively earthed;
  - 9.3 the necessary degree of suppression should be determined taking into account:
    - the susceptibility to interference of the receiver, and
    - the coupling between the ship's electrical installation and the receiving antennas;

10. that cables in the vicinity of the receiving antennas or the radio receiving room, and cables within the radio room, should be screened by enclosing them in metal conduits, unless the cables themselves are effectively screened;
  11. that "lead" and "return" conductors should be in the same cable to avoid the formation of current loops. The metal structure of the ship should not be used for carrying current;
  12. that suppressors should be fitted to cables at their point of entry into the radio receiving room;
  13. that cables, ducts and pipes which do not terminate in the radio receiving room, should preferably not be routed through the radio receiving room; if it is essential for them to pass through the radio receiving room, the ducts and pipes and the screening of the cables should be effectively earthed;
  14. that all radio, electrical and electronic apparatus in the radio receiving room should be effectively connected to the metal structure of the ship in the shortest possible way, and that the screens of all cables in the ship should be properly earthed;
  15. that rigging should be either deliberately insulated from or bonded to the ship's structure (stays that are subject to considerable tension can more conveniently be bonded);
  16. that for smaller vessels, vessels without specific radio receiving rooms, and those constructed of non-conducting materials, the principles recommended should be applied as far as is practicable;
  17. that particular care should be taken to minimize interference on the frequency bands used for distress, safety and radionavigation in the maritime service;
  18. that administrations should bring the above recommendations to the attention of naval architects, shipbuilders, those responsible for the construction, installation and maintenance of electrical, electronic and radio equipment and those organizations responsible for the formulation of standards.
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