SUMMARY

Executive summary: The Safety of Life at Sea (SOLAS) convention and Member States require vessel carriage of pyrotechnic distress signal devices. (Some aircraft carry pyrotechnic devices.) Pyrotechnic flares create safety and environmental challenges in storage, use, and disposal. United States Coast Guard (USCG) SAR response to reported pyrotechnic flare sightings yields only a 4% resolution of actual distress incidents. The USCG developed a unique, conspicuous, two-color visual light signal as a potential alternative to pyrotechnic distress signals.

Action to be taken: Paragraph 3.1.

1 INTRODUCTION

1.1 The Life-Saving Appliance Code, International Regulations for Preventing Collisions at Sea or Member State regulations require carriage of or otherwise identify pyrotechnic signals to indicate distress. US requirements apply to a large number of non-SOLAS, non-commercial craft operating on internal or coastal waters.
1.2 Pyrotechnic flares create safety and environmental issues in their storage, use and disposal. Perchlorate mixtures in pyrotechnics are hazardous to human health, particularly when entering groundwater through the waste stream. Due to infrequent use, approximately one-third of pyrotechnic flares in the US are disposed of annually.

1.3. In-depth analysis has shown that pyrotechnic flares are not that effective as a distress signal device. In-depth analysis of USCG data showed that for response incidents based on reports of a pyrotechnic flare sighting, only 4% result in successful resolution of an actual distress incident.

2 DISCUSSION

2.1 The USCG conducted more than 4 years of research that included extensive literature review, study of human vision, investigation of signal characteristics, and testing human subjects in laboratory and field environment, and developed a signal. The following two reports have been published on these research efforts:

Suitability of Potential Alternatives to Pyrotechnic Distress Signals

Alternatives to Pyrotechnic Distress Signals; Laboratory and Field Studies

2.2 The signal characteristic, a group alternating (cyan and red-orange), 4Hz, signal with 50 candela effective intensity, is unique to the maritime background lighting environment, has no aids to navigation or COLREGS significance, and was conspicuous and identifiable in field testing at 6NM with 10 NM visibility.

2.3 The signal includes a near-infrared component to allow detection using night vision imaging systems, with “minus-blue” cockpit lighting filters.

2.4 The US intends to develop specifications for a device to meet domestic distress-signal carriage requirements. If adopted, even for US domestic craft, signal acceptance will require a significant amount of training, familiarization and outreach, to both domestic and international mariners.

2.5 The US is considering development of other signals and would welcome views and inputs from other countries before formally presenting the concept to IMO.

3 ACTION REQUESTED OF THE JWG

3.1 The JWG is invited to:

3.1.1 review the linked reports on alternatives to pyrotechnic distress signals;
3.1.2 discuss the concepts involved and the potential application to SOLAS requirements; and

3.1.3 provide advice as to the suitability of the signal characteristic requirements (e.g. effective intensity), and as-yet-finalized device performance requirements (e.g. longevity of signal).