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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 02 03

Subj: CARRIAGE OF NAVIGATION EQUIPMENT BY SHIPS ON INTERNATIONAL VOYAGES

Ref: (a) Notice of Policy, 67 FR 53382, published August 15, 2002
(b) Navigation and Vessel Inspection Circular No. 8-01

1. PURPOSE. This Circular provides amplifying information for implementing the Coast Guard's policy announced in reference (a) for resolving conflicts between its regulations for the carriage of navigation equipment and those in the 2000 revision of Chapter V of the 1974 International Convention for the Safety of Life at Sea (SOLAS).

2. ACTION.

   a. Coast Guard Officers in Charge, Marine Inspection (OCMIs) should use this Circular when determining whether a vessel to which reference (a) applies is in compliance with applicable navigation equipment carriage requirements when there is a conflict between the requirements of SOLAS Chapter V that entered into force on 1 July 2002 and the requirements in Titles 33 and 46 Code of Federal Regulations (CFR). This Circular will be distributed by electronic means only and is available on the World Wide Web at http://www.uscg.mil/hq/g-m/nvic/.

   b. While the guidance contained in this document may assist the industry, public, Coast Guard, and other Federal and State regulators in applying statutory and regulatory requirements, the guidance is not a substitute for applicable legal requirements; nor is it a regulation itself. Thus, it is not intended to nor does it impose legally binding requirements on any party outside the Coast Guard.

3. DIRECTIVES AFFECTED. None.

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4. BACKGROUND.

a. The 2000 revision of SOLAS Chapter V significantly changed the carriage requirements for shipboard navigation equipment. This revision was adopted at the 73rd Session of the Maritime Safety Committee in December 2000 and entered into force on 1 July 2002. This revision includes changes to the existing tonnage thresholds as well as requirements for the carriage of voyage data recorders (VDR) and automatic identification systems (AIS), and the acceptance of electronic chart display and information systems (ECDIS). As discussed in reference (b), the 2000 Revision of SOLAS Chapter V also requires that navigation equipment be type approved. A summary of the changes to the tonnage thresholds as well as new equipment requirements is provided in enclosure (1).

b. Because of the extensive changes contained in the 2000 Revision of SOLAS Chapter V, it will be necessary to align the navigation equipment requirements that are in Titles 33 and 46 CFR. Notice of the Coast Guard's policy for resolving problems that may result due to differences between the requirements in SOLAS Chapter V and those in Titles 33 and 46 CFR was provided in reference (a). It is the Coast Guard's policy that when a requirement in the 2000 Revision of SOLAS Chapter V addresses the same navigation equipment as a requirement in either Title 33 or 46 CFR, the Coast Guard will accept the provision in SOLAS Chapter V as meeting the corresponding Coast Guard regulation. Reference (a) will remain in effect until Titles 33 and 46 CFR are aligned with SOLAS Chapter V, or until August 16, 2004, whichever is earlier.

c. Until the requirements in Titles 33 and 46 CFR are aligned with those in the 2000 Revision of SOLAS Chapter V, the policy outlined in reference (a) is applicable to the following ships:

(1) U.S.-flag ships of 150 or more gross tons that engage on international voyages;

(2) U.S.-flag ships certificated solely for service on the Great Lakes and the St. Lawrence River as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and, on the north side of Anticosti Island, the 63rd Meridian; and,

(3) Foreign-flag ships to which SOLAS Chapter V applies that are operating on the navigable waters of the United States.

d. As stated in reference (a), under SOLAS regulation I/12, the Coast Guard will not issue SOLAS certificates to U.S.-flag ships that are not in full compliance with the applicable requirements of the 2000 Revision of SOLAS Chapter V. Similarly the Coast Guard will continue to exercise port state control authority under SOLAS regulation I/19 for foreign-flag ships that are not in compliance with the applicable requirements of SOLAS Chapter V.

5. DISCUSSION.

a. Enclosure (2) provides a cross-reference between the navigation equipment requirements contained in the 2000 Revision of SOLAS Chapter V, the SOLAS Chapter V requirements that were in force prior to 1 July 2002, and those in Titles 33 and 46 CFR. This cross-reference

should be used to determine when a requirement in the 2000 Revision of SOLAS Chapter V corresponds with a requirement in Titles 33 and 46 CFR.

b. OCMIs are encouraged to bring this Circular to the attention of appropriate individuals in the marine industry within their zones.

PAUL J. PLUTA
ASSISTANT COMMANDANT FOR MARINE SAFETY,
SECURITY AND ENVIRONMENTAL PROTECTION

Encl: (1) Summary of Significant Changes Impacting the Carriage of Navigation Equipment in the 2000 Revision of SOLAS Chapter V
(2) Navigation Equipment Carriage Requirements Cross Reference

Non-Standard Distribution:

B:a G-MOC; G-MO-1; G-MSE; MSC

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Summary of Significant Changes Impacting the Carriage of Navigation Equipment in the 2000 Revision of SOLAS Chapter V

Overview

The 2000 revision of SOLAS Chapter V entered into force on 1 July 2002. This revision is a complete rewrite of Chapter V and includes significant changes related to the carriage of navigation equipment. They include changes to tonnage thresholds for some existing equipment requirements as well as carriage requirements for new systems.

Tonnage Thresholds

The 2000 revision of Chapter V changed the tonnage thresholds used to establish equipment carriage requirements. The most significant change was the addition of a tonnage threshold at 3,000 gross tons and replacing the threshold at 100,000 gross tons with one at 50,000 gross tons. The 2000 revision also eliminated the 1600 gross ton threshold. A comparison of the old and revised tonnage thresholds is show below.

Thresholds for SOLAS Chap. V in force prior to 1 July 2002	Thresholds for SOLAS Chap V. that entered into force 1 July 2002
All ships	All ships
150 gross tons	150 gross tons
300 gross tons	300 gross tons
500 gross tons	500 gross tons
1,600 gross tons	**3,000 gross tons**
10,000 gross tons	10,000 gross tons
100,000 gross tons	**50,000 gross tons**

Changes to Existing Equipment Requirements

The 2000 revision to Chapter V changed the requirements for the carriage of a second radar and rate of turn indicators.

Requirement	2000 Rev. to SOLAS Chap V (entered into force 1 July 2002)		SOLAS Chap. V (in force prior to 1 July 2002)	
	Reg.	Tonnage Threshold	Regulation	Tonnage Threshold
Second radar **Note:** The second radar must be 3 GHz unless the Administration determines a second 9 GHz radar is appropriate.	19.2.7.1	3,000 GT	12(h)	10,000 GT
Rate of turn indicator	19.2.9.1	50,000 GT	12(n)	100,000 GT

New Equipment Requirements

The most publicized changes included in the 2000 revision of Chapter V are the requirements for new systems. These include automatic identification systems (AIS) and voyage data recorders (VDR) as well as the acceptance of electronic chart display and information systems (ECDIS).

Automatic Identification System (AIS)

AIS is intended to reduce the likelihood of collisions by permitting the voiceless exchange of near real-time navigation information between vessels and shore-side vessel traffic centers. In accordance with regulation V/19.2.4, as amended by the Conference of Contracting Governments to SOLAS, the mandatory carriage of AIS by vessels engaged on international voyages will be phased in between 2002 and 2004.

Voyage Data Recorders (VDR)

In order to assist casualty investigations, a carriage requirement for VDRs was established (Reg. V/20). VDRs, which are the marine equivalent of an aircraft's flight data recorder, are required to record 12 hours of data from multiple sources. Data recorded includes:

- Ship's position, speed and heading
- Bridge audio captured with microphones positioned at or near: conning stations, radar displays, chart tables, etc.
- Communications audio – all VHF communications relating to ship operations
- Radar data – must be able to record all of the information that was actually being presented on the master display
- Echo-sounder
- Main alarms – record status of all mandatory alarms on the bridge
- Rudder order and response
- Engine order and response
- Status of hull openings as well as watertight and fire doors
- Wind speed and direction

IMO has issued guidelines (MSC/Circ.1024) addressing the ownership, custody, recovery, read-out and access to the VDR information.

Electronic Chart and Display and Information Systems (ECDIS)

ECDIS provides mariners a real-time, true-to-scale display of their ship's location and movement, as well as a look ahead to where the ship will be. These features contribute to improving situational awareness while also reducing the navigation workload as compared to using a paper chart. IMO Res. A.817(19) first accepted the use of ECDIS as an alternative to paper charts in 1995. The 2000 revision incorporates this acceptance into Chapter V (Reg. V/19.2.1.4). However, it should be remembered that carriage of ECDIS *is voluntary, not mandatory*. If ECDIS is used to either fulfill or partly fulfill the chart carriage requirement, back-up arrangements must be provided (Reg. V/19.2.1.5). Requirements for non-paper chart back-up systems are established in Appendix 6 of the IMO Res. A.817(19) as amended.

Navigation Equipment Carriage Requirements Cross Reference

Introduction

This cross-reference is intended to assist vessel owners and operators as well as Coast Guard marine inspectors, boarding officers, and investigating officers to determine whether a vessel is in compliance with the applicable equipment requirements in Regulations 19 and 20 of the 2000 revision of Chapter V of the 1974 International Convention for the Safety of Life at Sea (SOLAS), as amended.

Applicability

As stated in the Notice of Policy published in the Federal Register (67 FR 53382), the Coast Guard's policy for resolving discrepancies between the navigation equipment requirements in the 2000 Revision of SOLAS Chapter V and those in Titles 33 and 46 Code of Federal Regulations is applicable to the following ships:

a. U.S.-flag ships of 150 or more gross tons that engage on international voyages;
b. U.S.-flag ships certificated solely for service on the Great Lakes and the St. Lawrence River as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island, and, on the north side of Anticosti Island, the 63rd Meridian; and,
c. Foreign-flag ships to which SOLAS Chapter V applies that are operating on the navigable waters of the United States.

The applicability of the navigation equipment requirements in SOLAS Chapter V that entered into force on 1 July 2002 is as follows:

SOLAS Chap V Reg.	Requirement
19.1.1	Ships constructed on or after 1 July 2002 shall be fitted with navigational systems and equipment that fulfill the requirements prescribed in paragraphs 2.1 to 2.9.
19.1.2	Ships constructed before 1 July 2002 shall:
19.1.2.1	subject to the provisions of paragraphs 1.2.2 and 1.2.3, unless they comply fully with this regulation, continue to be fitted with equipment which fulfils the requirements prescribed in regulations V/11, V/12 and V/20 of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002;
19.1.2.2	be fitted with the equipment or systems required in paragraph 2.1.6 not later than the first survey after 1 July 2002 at which time the radio direction-finding apparatus referred to in V/12 (p) of the International Convention for the Safety of Life at Sea, 1974 in force prior to 1 July 2002 shall no longer be required; and
19.1.2.3	be fitted with the system required in paragraph 2.4 not later than the dates specified in paragraphs 2.4.2 and 2.4.3.

Type Approval

Regulation 18 requires that all systems and equipment, including back-up arrangements where applicable, that are installed on or after 1 July 2002 conform to performance standards that are not inferior to those adopted by the International Maritime Organization (IMO). The applicable IMO performance standard for required systems and equipment is listed in Enclosure (1) of NVIC 8-01.

Navigation Equipment Carriage Requirements

Regulation 19.2.1: All ships shall have:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.1.1	12(b)(i) and (ii), 12(c) 150 GT cut off for specific carriage requirement.	33 CFR 164.35(b) 46 CFR 32.15-35(a) 46 CFR 77.11-1(a) 46 CFR 96.25-1 46 CFR 108.715(a) 46 CFR 130.340 46 CFR 167.40-45(a) 46 CFR 169.709 46 CFR 195.19-1(a)	Properly adjusted magnetic compass
19.2.1.2	No corresponding requirement	No corresponding domestic regulations	Pelorus or compass bearing device
19.2.1.3	No corresponding requirement	No corresponding domestic regulations	Means of correcting heading or bearings to true at all times
19.2.1.4	20 IMO Resolution A.19(817) authorized the use of ECDIS to meet this requirement.	33 CFR 164.33 46 CFR 35.20-1 46 CFR 78.05-5 46 CFR 97.05-5 46 CFR 109.565 46 CFR 130.330 46 CFR 167.65-45 46 CFR 169.809 46 CFR 196.05-5	Nautical charts and nautical publications to plan and display the ship's route for the intended voyage and to plot and monitor positions throughout the voyage. ECDIS may be accepted to meet this requirement. **Note:** Per regulation V/27, all nautical charts and nautical publications necessary for the intended voyage shall be adequate and up to date, i.e., currently corrected.
19.2.1.5	IMO Resolution A.19(817)	No corresponding domestic regulations	Back-up arrangements if ECDIS is used to fill or partly fill the functional requirement of Reg. 19.2.4. Acceptable back-up arrangements include an appropriate folio of paper nautical charts, a second ECDIS or other means approved by the Administration.
19.2.1.6	No corresponding requirement	33 CFR 164.41	Receiver for a global navigation satellite system (e.g., GPS) or a terrestrial radionavigation system (e.g., LORAN-C). **Note:** The domestic regulation requires either LORAN or SATNAV receiver.
19.2.1.8	No corresponding requirement	No corresponding domestic regulations	When the ship's bridge is totally enclosed and unless the Administration determines otherwise, a sound reception system to enable the officer in charge of the navigational watch to hear sound signals and determine their direction.
19.2.1.9	12(f)	33 CFR 164.35(o) 46 CFR 113.30-5	A telephone, or other means, to communicate heading information to the emergency steering position, if provided.

Regulation 19.2.2: In addition to the above, all ships of 150 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.2.1	12(b)(iii)	No corresponding domestic regulations	A spare magnetic compass interchangeable with the magnetic compass required by 19.2.1.1.
19.2.2.2	11	46 CFR 111.75-18	A daylight-signaling lamp.

Regulation 19.2.3: In addition to the above, all ships of 300 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.3.1	12(k)	33 CFR 164.35(h) and (i) 46 CFR 32.15-10 46 CFR 77.27-1 46 CFR 96.27-1 46 CFR 108.701 46 CFR 167.40-20 46 CFR 195.27-1	An echo sounding device to measure and display the available depth of water. **Note:** 1. In accordance with the SOLAS performance standard, MSC.74(69), the echo sounder is required to have a means of recording on paper **or other means** the depth and associated time for 12 hours. It also requires that there be a means of retrieving this information. 2. SOLAS regulations in force prior to 1 Jul 2002 applicable to ships on international voyages 1600 GT or more built before 25 May 1980 and ships of 500 GT or more built on or after 25 May 1980.
19.2.3.2	12(g)	33 CFR 164.35(a) 46 CFR 32.15-30 46 CFR 77.09-1 46 CFR 96.25-1 46 CFR 108.717 46 CFR 130.310 46 CFR 167.40-40 46 CFR 195.17-1	A 9GHz radar **Note:** The domestic regulations do not specify frequency.
19.2.3.3	12(i)	33 CFR 164.35(j)	An electronic plotting aid **Note:** 1. Regulations in 46 CFR require that vessels required to carry a radar also have facilities for plotting radar information on the bridge. Plotting equipment required by domestic regulations does not have to be electronic. 2. SOLAS regulations in force before 1 Jul 2002 did not require that the plotting aid be electronic.
19.2.3.4	12(l)	33 CFR 164.40	A speed and distance measuring device to indicated speed and distance through the water. **Note:** The domestic regulation applies only if the vessel is required by 33 CFR 164.38 to be fitted with an ARPA.
19.2.3.5		No corresponding domestic regulations	A properly adjusted transmitting heading device to transmit heading information for input to the equipment referred to in 19.2.3.2, 19.2.3.3 and 19.2.3.4.

Regulation 19.2.4: In addition to the above, all ships of 300 or more gross tons on international voyages and all passengers ships irrespective of size shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.4	No corresponding requirement	Corresponding domestic regulations are pending	An automatic identification system (AIS) as follows -
19.2.4.1			Ships constructed on or after 1 July 2002
19.2.4.2			Ships engaged on international voyages constructed before 1 July 2002 -
19.2.4.2.1			In the case of passenger ships, not later than 1 July 2003,

Regulation 19.2.4: In addition to the above, all ships of 300 or more gross tons on international voyages and all passengers ships irrespective of size shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.4.2.2			In the case of tankers, not later than the first survey for safety equipment on or after 1 July 2003,
19.2.4.2.3			In the case of ships, other than passenger ships and tankers, of 50,000 or more gross tons, not later than 1 July 2004,
19.2.4.2.4			In the case of ships, other than passenger ships and tankers, of 300 or more gross tons but less than 50,000 gross tons, not later than the first safety equipment survey after 1 July 2004 or by 31 December 2004, whichever occurs earlier; and,
19.2.4.3			Ships not engaged on international voyages constructed before 1 July 2002, not later than 1 July 2008.
Note: The Conference of Contracting Governments to SOLAS held in December 2002 amended the carriage dates established by the 2000 Revision (SOLAS/CONF.5/32). The dates shown are the amended dates.			

Regulation 19.2.5: In addition to the above, with the exception of the equipment required by 19.2.3.3 and 19.2.3.5, all ships of 500 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.5.1	12(d) and (e)	33 CFR 164.35(d) 46 CFR 32.15-35(b) 46 CFR 77.11-1(b) 46 CFR 96.17-1(b) 46 CFR 108.715(b) 46 CFR 167.40-45(b) 46 CFR 195.19-1(b)	A gyro compass, or other means, to determine and display heading by shipborne non-magnetic means and to transmit heading information for input to the equipment required by 19.2.3.2, 19.2.4 and 19.2.5.5 **Note:** 1. Domestic regulations are applicable to vessels 1600 or more GT on ocean or coastwise routes. 2. SOLAS requirements in force prior to 1 Jul 2002 applicable to ships of 500 GT or more constructed on or after 1 Sep 1984 and ships 1600 GT or more constructed before 1 Sep 1984.
19.2.5.2		33 CFR 164.35(o)	A gyro compass heading repeater to supply heading information visually at the emergency steering position.
19.2.5.3	12(d)(ii) (applicable to ships 1600 GT or more)	No corresponding domestic regulation	A gyro compass bearing repeater to take bearings over an arc of the horizon of 360° using the gyro compass. Ships of less than 1,600 gross tons shall be fitted with such means as far as possible.
19.2.5.4	12(m)	33 CFR 164.35(f), (l), (m), and (n)	Rudder, propeller, thrust, pitch and operational mode indicators, all to be readable from the conning position.
19.2.5.5		No corresponding domestic regulation	An automatic tracking aid to plot automatically the range and bearing of other targets to determine collision risk.
Note: Per 19.2.5.6 on all ships of 500 or more gross tons, failure of one piece of equipment should not reduce the ship's ability to meet the requirements of 19.2.1.1, 19.2.1.2, and 19.2.1.4.			

Regulation 19.2.7: In addition to the above, all ships of 3,000 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.7.1	12(h)	33 CFR 164.37	A 3GHz radar, or where considered appropriate by the Administration a second 9 GHz radar, which is functionally independent of the one required by 19.2.3.2. **Note:** The domestic regulation is applicable to ships 10,000 or more GT and does not specify the frequency of the second radar.
19.2.7.2		No corresponding domestic regulation	A second automatic tracking aid to plot automatically the range and bearing of other targets to determine the risk of collision that is functionally independent of that required by 19.2.5.5.

Regulation 19.2.8: In addition to the above, with the exception of the equipment required by 19.2.7.2, all ships of 10,000 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.8.1	12(j)	33 CFR 164.38	An automatic radar plotting aid to plot automatically the range and bearing of at least 20 other targets, connected to a device to indicate speed and distance through the water, to determine if risk of collision exists, and to simulate trial maneuvers. **Note:** This is an ARPA unit.
19.2.8.2		No corresponding domestic regulation	A heading or track control system to automatically control and keep the ship to a heading and / or straight track.

Regulation 19.2.9: In addition to the above, all ships of 50,000 or more gross tons shall also be fitted with:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
19.2.9.1	12(n)	33 CFR 164.42	A rate of turn indicator to determine and display the rate of turn. **Note:** SOLAS regulations in force prior to 1 July 2002 and domestic regulation are applicable to vessels 100,000 GT or more constructed on or after 1 September 1984.
19.2.9.2		No corresponding domestic regulation	A speed and distance measuring device to indicate speed and distance over the ground in the forward and athwartships direction.

Regulation 20: Ships, when engaged on international voyages, shall be fitted with voyage data recorders as follows:			
SOLAS Chap V Reg. that entered into force 1 Jul 2002	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
20.1.1	No corresponding regulation	No corresponding domestic regulation	Passenger ships constructed on or after 1 July 2002;
20.1.2			Ro-ro passenger ships constructed before 1 July 2002 not later than the first survey on or after 1 July 200.
20.1.3			Passenger ships other than ro-ro passenger ships constructed before 1 July 2002 not later than 1 January 2004.
20.1.4			Ships, other than passenger ships, of 3,000 or more gross tons constructed on or after 1 July 2002.
Note: Administrations may exempt ships, other than ro-ro passenger ships, constructed before 1 July 2002 from being fitted with a VDR where it can be demonstrated that interfacing a VDR with the existing equipment on the ship is unreasonable and impracticable.			

The following ships, when engaged on international voyages, shall be fitted with a ship security system as follows:			
SOLAS Chap XI-2 Reg.	**SOLAS Chap. V Reg. in force before 1 Jul 2002**	**Corresponding U.S. Regulation**	**Description**
6.1.1	No corresponding regulation	No corresponding domestic regulation	Passenger ships, including high-speed passenger craft; cargo ships, including high-speed craft, of 500 GT or more, and mobile offshore drilling units constructed on or after 1 July 2004;
6.1.2			Passenger ships, including high-speed passenger craft, constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2004;
6.1.3			Oil tankers, chemical tankers, gas carriers, bulk carriers and cargo high speed craft, of 500 gross tonnage and upwards constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2004; and
6.1.4			Other cargo ships of 500 gross tonnage and upward and mobile offshore drilling units constructed before 1 July 2004, not later than the first survey of the radio installation after 1 July 2006.
Note: This requirement was established by the Conference of Contracting Governments to SOLAS, see SOLAS/CONF.5/32.			