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**INFORMATION ON THE CONSTRUCTION OF A FIXED TRAFFIC LINK ACROSS THE
CENTRAL PART OF THE SOUND BETWEEN DENMARK AND SWEDEN**

1 At the request of the Governments of Denmark and Sweden, the attached information on the construction of a fixed traffic link across the central part of the Sound between Denmark and Sweden is brought to the attention of Member Governments.

2 Member Governments are requested to bring the attached information to the attention of all concerned.

ANNEX

CONSTRUCTION OF A FIXED TRAFFIC LINK ACROSS THE SOUND

1 INTRODUCTION

1 Denmark and Sweden submitted information to the forty-first session of the Sub-Committee on Safety of Navigation (NAV 41/INF.8) about the construction of a fixed traffic link across the central part of the Sound between Denmark and Sweden (see annex 1). The document further informed about the detailed planning and safety precautions which would be undertaken by the two Governments to ensure the safety of navigation during the construction work in the Sound.

1.1 The Sound is divided into two main traffic routes by Saltholm Island, the Drogden Channel on the Danish side and the Flinte Channel on the Swedish side. The offshore construction work is well underway and will continue on a larger scale until 2000, when the traffic link is expected to be inaugurated.

2 DESCRIPTION OF THE FIXED TRAFFIC LINK

2.1 The Fixed Link across the Sound will consist of a four-lane motorway and a 16 kilometres, dual-track, electrified, high-speed rail line between Kastrup south of Copenhagen and Lernacken on the Swedish coast, south of Malmö. The key components - from Denmark towards Sweden - will be:

- an artificial peninsula (already established) extending 430 metres from the Danish coast at Kastrup;
- 3.5 kilometres immersed tunnel, constructed from prefabricated concrete elements, from the artificial peninsula and under the Drogden navigational channel to the artificial island in the Sound;
- a 4 kilometres long artificial island southwest of Saltholm island (already established);
- a western approach bridge 3 kilometres long;
- a 1.1 kilometres cable-stayed high bridge in two levels across the Flinte navigation channel. The bridge will have a free span of 490 metres and a maximum clearance of 55 metres; and
- an eastern approach bridge 3.7 kilometres long from the high bridge to the Swedish coast at Lernacken.

3 THE IMMERSED TUNNEL CROSSING THE DROGDEN CHANNEL

3.1 The Drogden Channel is a dredged channel between the islands of Saltholm and Amager and it is used by the international maritime traffic. Its length is 5.5 nautical miles and the minimum width is 290 metres. The channel has a guaranteed minimum water depth of 7.7 metres at MWL.

3.2 A tunnel trench has been dredged across the Drogden Channel and the immersion of the tunnel elements commences in June 1997 and is expected to be finalized in December 1998. The tunnel site consists of a working area 500 metres wide on each side of the tunnel line. The area will be marked with yellow buoys. A navigation route marked with red and green light buoys (IALA, Region A) and with a width of at least 300 metres will be maintained through the working area (see annex 2).

3.3 The immersed part of the tunnel will consist of 20 elements, each approximately 176 metres long, weight 55,000 tons and draught of 9 metres. The elements will be prefabricated in the northern part of Copenhagen Harbour.

3.4 Tow-out and immersion of tunnel elements

3.4.1 The transportation distance to the tunnel site is 11 nautical miles, and the route followed is based upon ensuring a 1.0 metre under keel clearance for the element. The towing operation is carried out with two leading and two assisting tug boats, i.e. one at each corner of the element. The towing operation will be immediately followed by the immersion process, and as soon as the element is towed into position inside the working area mooring lines are connected to anchors laid out in the vicinity of the trench.

3.4.2 The immersion operation commences with water ballasting of the elements to a negative buoyancy. The element is lowered in small steps, the control of movements increasing with each step. Once the position of the element is surveyed within tolerance in the trench, the element is ballasted to a safe minimum dead weight, and the immersion is completed.

3.4.3 The immersion operation, which will take place approximately once every month, necessitates that navigation through the Drogden Channel has to be suspended for a maximum period of 2 daylight hours. All efforts will be concentrated on keeping these periods to an absolute minimum in order to avoid unnecessary delays for the through traffic.

3.5 Precautionary measures

3.5.1 As the tow-out and immersion operations take place in very narrow waters with current and a high traffic density, guard vessels in co-operation with Drogden VTS will assist shipping in the area during these operations in order to prevent dangerous navigational situations from occurring.

3.5.2 The guard vessels will be positioned North and South of the Drogden VTS Area well in advance of and during the suspension period. The guard vessels will assist approaching vessels and guide them to appropriate anchorages in the vicinity of the navigation route.

3.5.3 Information about the exact time for and the duration of the suspension periods, the names and call signs of the guard vessels and available communication channels will be duly announced through Notices to Mariners and Navigational Warnings.

3.6 VTS-system

3.6.1 The VTS-system, "DROGDEN VTS", covers the VTS Area Hollaenderdybet, Kongedybet and the Drogden Channel in the Sound (annex 3). Drogden VTS can be called on VHF, channel 71 or 16. During the suspension period the VTS Center will be able to give up-to-date information about the immersion operation and the expected duration of the delay.

3.6.2 For safety reasons approaching vessels are requested to identify themselves to "DROGDEN VTS" at an early stage, preferably before entering the VTS-area (see annex 4).

3.7 Navigation in the Drogden Channel

3.7.1 Navigation in the vicinity of the working areas as well as through the navigation route shall be carried out with caution and with reduced speed sufficient for the safe navigation and manoeuvring of the ship.

3.7.2 All ships employed in the construction work which need to cross the navigation route and channel shall endeavour to navigate in such a way that risk of collision with ships using the navigation route and channel does not arise. If, however, risk of collision does arise, the Steering and Sailing rules (Part B) of the International Regulations for Preventing Collisions at Sea, 1972, must be applied.

3.7.3 Information to shipping about specific situations concerning safety of navigation and changes in the working areas will be issued in the Danish Notices to Mariners and will be transmitted as navigational warnings via the Danish coastal radio stations.

3.7.4 Unauthorized ships are not allowed to pass through the working areas outside the navigation route or channel or to engage in fishing within the working areas.

3.7.5 Attention is drawn to the fact that aircraft operating from Copenhagen Airport, Kastrup, on the Island of Amager, can be expected to cross the dredged Drogden Channel in the Sound at an altitude down to 35 metres above the sea. The altitude of the aircraft will, however, normally be considerably higher. All ships - including ships with a tow - with an air draft exceeding 35 m shall report to Drogden VTS or to the control tower at Copenhagen Airport (phone 32 50 21 01, ext. 8283) via the Danish coastal radio station Lyngby Radio 2 hours before passing the dredged channel at Drogden. The transmission is free of charge.

4 THE ELEVATED BRIDGE ACROSS THE FLINTE CHANNEL

4.1 The existing Flinte Channel is a shipping route for international maritime traffic. It is approximately 4 nautical miles long and has a width of 200 - 250 metres with a maximum permissible draught of 7.0 metres at MWL. During the period of construction a navigation route of this size and standard will be maintained through the working areas. Furthermore, a buoyed channel for smaller vessels has been established east of the Flinte Channel with a minimum water depth of 4.0 metres.

4.2 Construction work for the bridge started in April 1997 and will continue until the year 2000. The bridge will link the Swedish mainland at Lernacken with the artificial island south of Saltholm, and the elevated bridge across the New Flinte Channel will have a span of 490 metres and a navigable overhead clearance of 55 metres.

4.3 A working area has been established, following the projected bridge line from Lernacken and projecting northwards along the eastern border of the Flinte Channel. A second working area will be established at a later stage, starting at the western border of the Flinte Channel, following the projected bridge line. This second working area will be connected to the working area around the artificial island in the Danish waters.

4.4 Transport of piers and bridge segments

4.4.1 All piers and bridge segments will be transported from the factory in Malmoe to the bridge by the selfpropelled cranebarge "Svanen". There will be 1-3 transports per week during the next two years, starting in July 1997. The route followed will be parallel to, and approximately 1 nautical mile southeast of, the Flinte Channel. Positioning of the barge inside the working area will be done with the help of prepositioned anchors.

4.5 VTS-system

4.5.1 Flint VTS covers the area around the Flinte Channel, and will supply vessels with necessary information during the construction period in order to ensure safe navigation and avoid dangerous situations in the vicinity of the working areas. Flint VTS maintains listening watch on VHF channels 74 and 16.

4.6 Navigation in the Flint Channel

4.6.1 Navigation in the vicinity of the working areas as well as through the navigation route and channel should be carried out with caution and with reduced speed sufficient for the safe navigation and manoeuvring of the ship.

4.6.2 All ships employed in the construction work which need to cross the navigation route and the channel should endeavour to navigate in such a way that risk of collision with ships using the navigation route and channel does not arise. If, however, risk of collision does arise, the Steering and Sailing rules (Part B) of the International Regulations for Preventing Collisions at Sea, 1972, must be applied.

4.6.3 Information to shipping about specific situations concerning safety of navigation and changes in the working areas will be promulgated in the Swedish Notices to Mariners and will be transmitted as navigational warnings via Swedish coastal radio stations.

4.6.4 Unauthorized ships are not allowed in the working areas outside the navigation route or channel or to be engaged in fishing within the working areas.

4.6.5 Attention is drawn to the fact that High Speed Craft are in regular traffic across the Sound in this region, and will use the navigation route in the Flinte Channel partly, when passing between the working areas.

5 GENERAL PROVISIONS

5.1 Pilotage

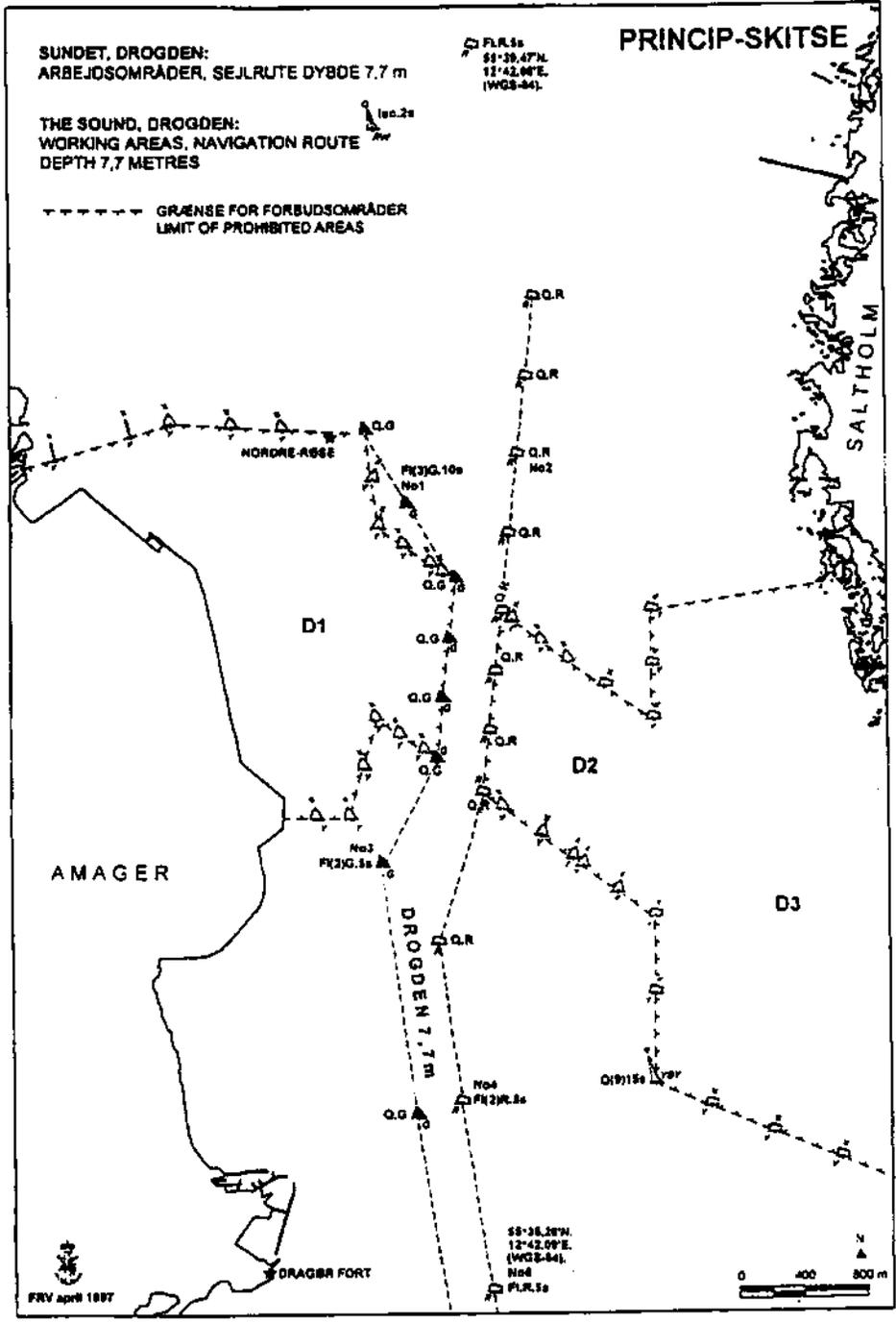
5.1.1 Ships which do not have updated navigational information about the working areas in Drogden and Flinte Channel and recent changes hereto are recommended to take a pilot before entering the areas.

5.1.2 Attention is called to IMO resolution A. 579(14) "Use of Pilotage Services in the Sound". The Resolution recommends the use of pilotage services for loaded oil tankers with a draught of 7 metres or more, loaded chemical tankers and gas carriers irrespective of size, and ships carrying a shipment of class 7 radioactive materials as specified in the International Maritime Dangerous Goods (IMDG) Code.

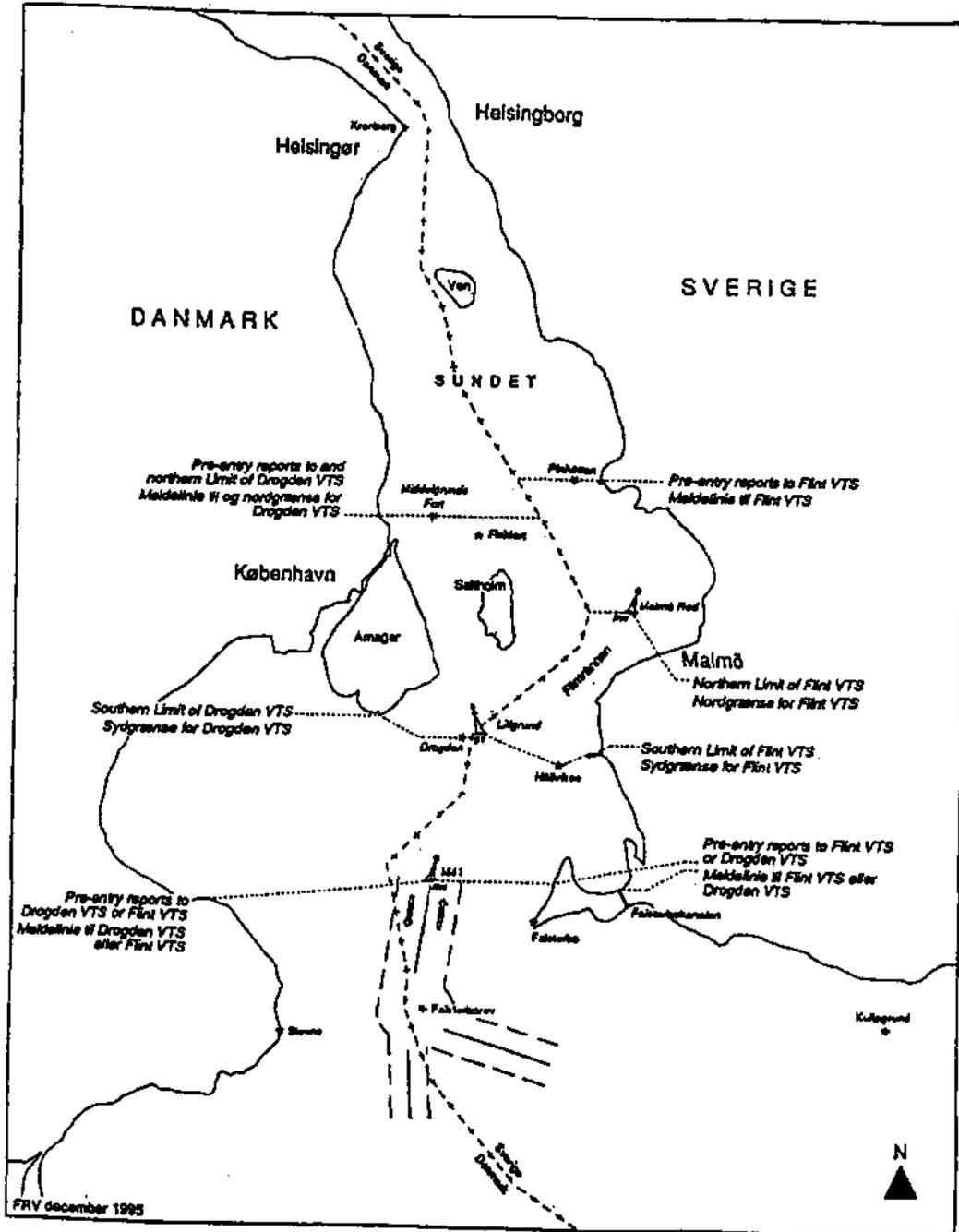
5.2 Notices to Mariners

5.2.1 Government Orders for the construction sites in Drogden and Flinte Channel will be issued by the National Maritime Administrations of Denmark and Sweden. The Orders will contain provisions on restrictions in navigation, information about construction areas, commencement and termination of the different tasks or phases of the construction works, aids to navigation, VTS-systems, etc. The Orders will be translated into English and will be promulgated by the National Notices to Mariners.

Annex 2



Annex 3



Annex 4

**DRAFTING OF REPORTS
TO
VTS-AREA DROGDEN OR FLINTRÄNNAN
(Drogden VTS or Flint VTS)**

Designator	Function	Information required
System Identifier		Drogden VTS or Flint VTS
A	Ship	Name and call sign
B	Time (UTC)	Only if report has been transmitted via coastal radio station
C	Position	Geographical position by two 4 digit groups, or
D	Position	True bearing and distance given in nautical miles from an identifiable point (state name)
E	Course	N or S bound
F	Speed	In knots (2 digit group)
J	Pilot	State whether a pilot is on board (e.g. PILOT EMBARKED)
O	Draught	2 digit group giving metres and decimetres
Q	Deficiencies	Brief details of defects, deficiencies or restrictions of manoeuvrability
U	Air draft	State ship's air draft if exceeding 35 metres