Ship collisions with Danish lighthouses

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Collisions de navires avec des phares danois

Schiffskollisionen mit dänischen Leuchttürmen

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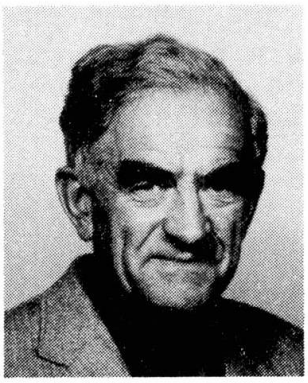

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SUMMARY
Since 1972, fourteen small lighthouses have been built in the Great Belt at water depths ranging between 8 and 17 m. Many of them have since then been exposed to ship collisions. Two of them, situated closely to the planned site of the Great Belt Bridge, have for instance been run into three and four times, respectively. The conclusion of the collision cases must be said to be negligence.

RÉSUMÉ
Depuis 1972, quatorze petits phares ont été construits dans le Grand Belt à des profondeurs d'eau de 8 à 17 m. Nombre d'entre eux ont été entretemps exposés à des collisions de navires. Ainsi, deux de ces phares, implantés à proximité du site prévu pour le pont du Grand Belt, ont fait l'objet de trois resp. quatre collisions. Il a été conclu que ces accidents étaient le résultat de négligences.

ZUSAMMENFASSUNG
Seit 1972 sind im Großen Belt in Wassertiefen von 8 bis 17 m 14 kleine Leuchttürme gebaut worden. Viele von ihnen sind seither in Schiffskollisionen verwickelt gewesen. Zwei von ihnen, die nahe der geplanten Linienführung der Großen-Belt-Brücke liegen, unterlagen 3 bzw. 4 Zusammenstößen. Diese Kollisionen sind offensichtlich auf Fahrlässigkeit zurückzuführen.

0. INTRODUCTION

Danish lighthouses, lightships and buoys have before been the object of collisions, and one of them, with the 'Drogden Lighthouse' on 2/12-1946, was described in 'Ingeniørens Ugeblad' (Engineers' Weekly) No. 6 of 6 February 1965.

In the period between 1972 and 1977, fourteen small lighthouses were built along the so-called 'deep water route' of the Great Belt, more or less to replace lightbuoys.

With these lighthouses there have - so far - been ten collisions, of wich seven comprised the two lighthouses nearest the planned position of the Great Belt Bridge.

1. LOCATION OF LIGHTHOUSES (FIG. 1)

On account of the growing traffic with larger and more powerful vessels which without much difficulty have been able to force there way through the ice occurring in Danish waters, it has become increasingly desirable to have the floating buoyage, which had to be withdrawn during winter, replaced by light houses made fast on the sea bed.

The placing of the lighthouses became a compromise between the best position for navigation purposes and the most advantageous technical solution. The lighthouses are placed as close to the deep fairway as possible, and preferably where there are bends or turns of the route.

In the placing of the two lighthouses, Halskov Rev and Sprogø N. Ø., it was taken into consideration - following consultation with the Great Belt Commission at that time - that the lighthouses were to assist navigation when vessels had to pass under the Great Belt Bridge, if this should become a reality.

2. LIGHTHOUSE CONSTRUCTION AND EQUIPMENT (FIG. 2)

On account of the rather heavy drifting of ice in Danish waters, the lighthouses have been made as slender as possible in the area near the waterline. At a water depth of between 5 and 7 m, the steel lighthouse structure has been anchored in a round concrete caisson placed on a level layer of gravel on the sea bed.

At a height of approx. lo m above sea level, a glasfiber reinforced plastic lantern house has been placed containing the lighthouse equipment which is based on gas and a battery-operated racon.

With these sources of energy it has not been possible to establish flood light on the lighthouse. This would either require an independent power plant for each lighthouse or a land-connected submarine cable.

Either of these solutions would have multiplied the construction costs, but it must be admitted that a good flood light of the facade would undoubtedly have reduced the number of collisions.

The lighthouses have been designed in such a way that if they are run into, damages to the ship should be as insignificant as possible, as this would be less costly, less dangerous to the crew, and reduce the risk of oil pollution.

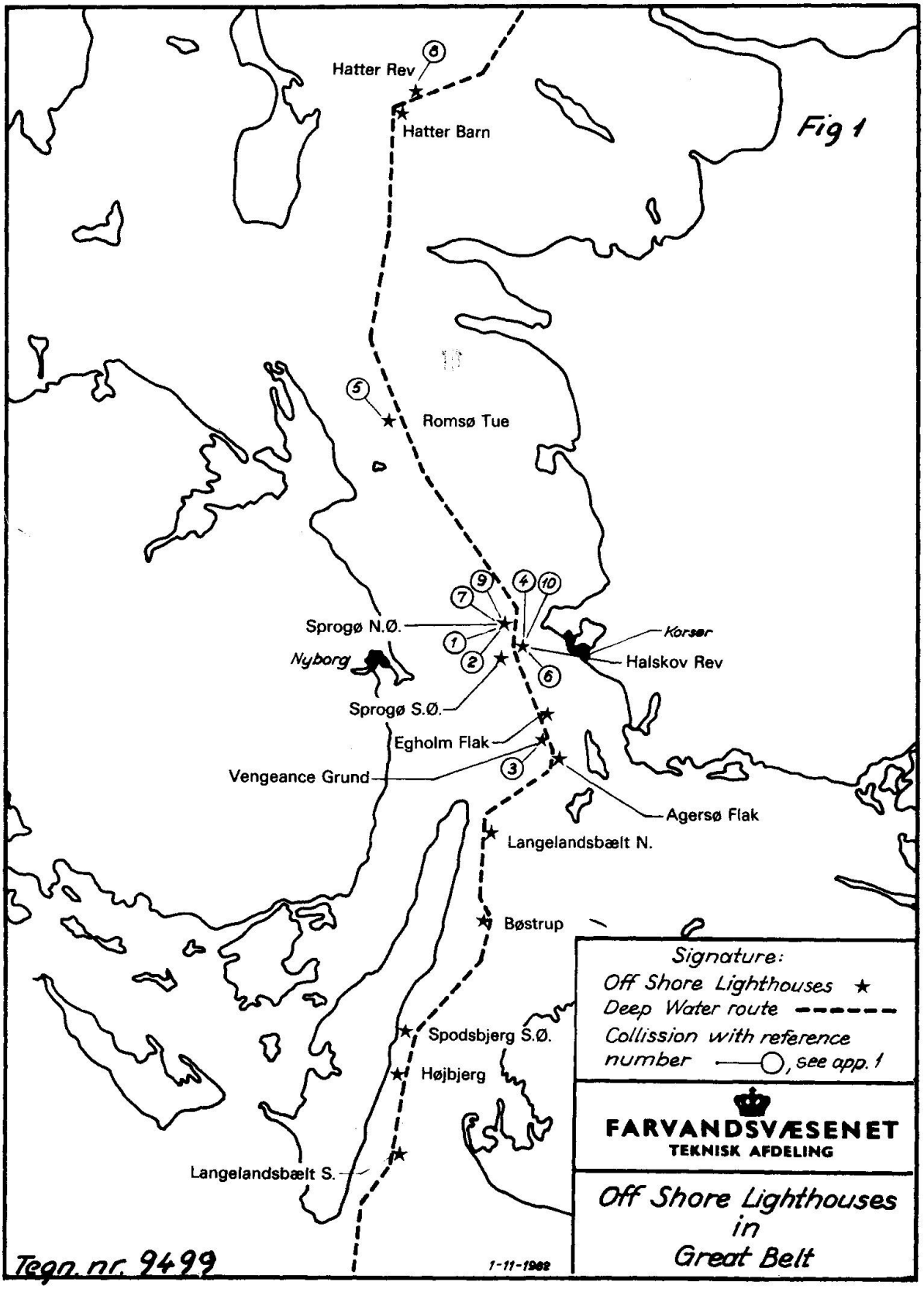

Fig. 1 Location of lighthouses in Great Belt

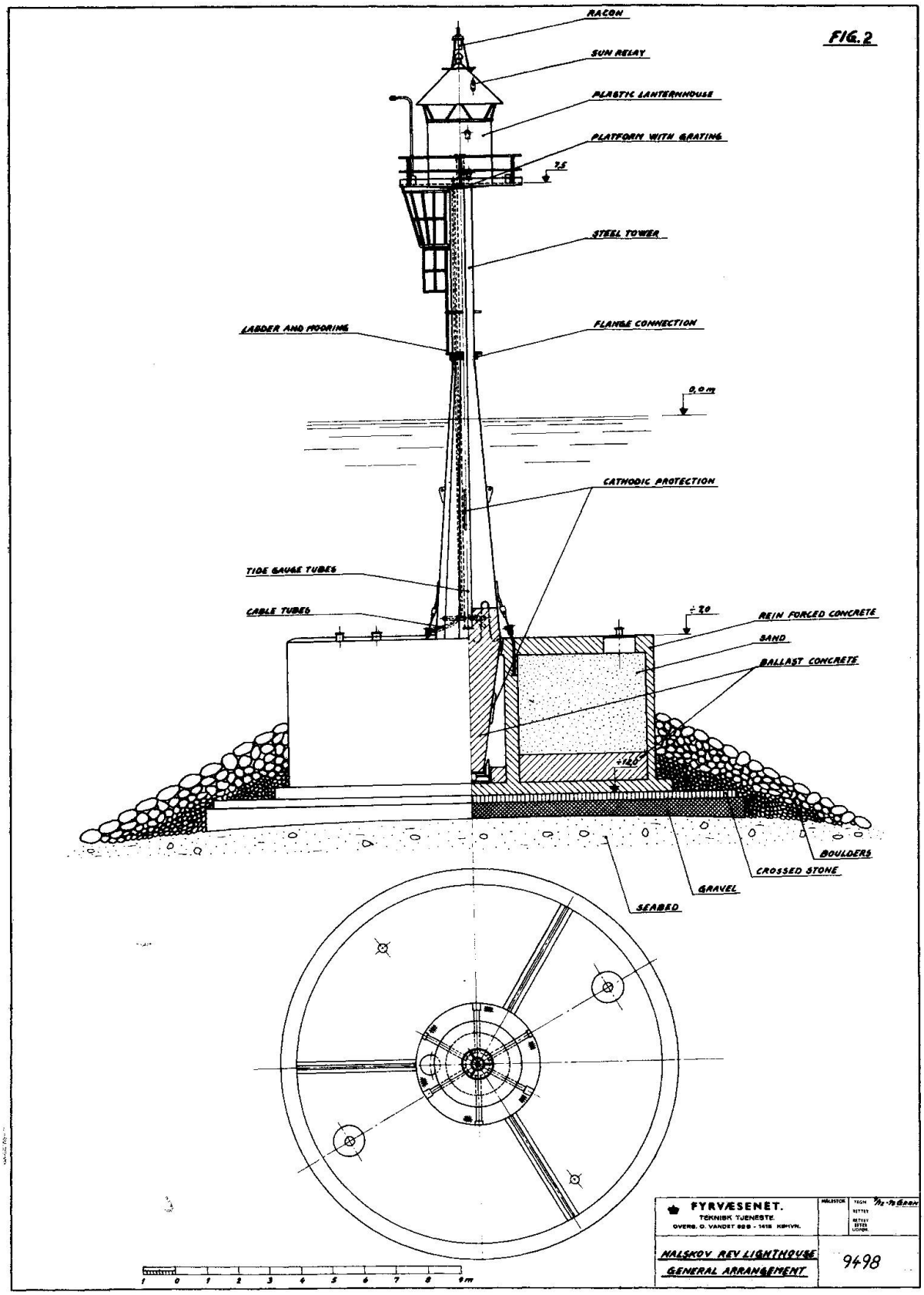

Fig. 2 Lighthouse. General arrangement

In return, it has been necessary to carry a stock of various spare parts for the lighthouses, in order that following a collision they can be promptly re-established.

3. SUMMARY OF REGISTERED COLLISIONS WITH THE LIGHTHOUSES

In appendix 1 a schematic presentation has been made of the ten known collisions with the Great Belt lighthouses.

In seven cases information as to the name of ship involved in collision and the time of it are available, but unfortunately not all the required information has been received which would enable us to make a detailed analysis of the causes, but the following information can be given:

Ref. 1. The ship was heading north. Unexpected strong current was stated as the cause of the collision. The ship hit the lighthouse abaft the beam, and the lighthouse broke and crashed into the sea.

2. The ship merely grazed the lighthouse, and no great damage was done.

3. The lighthouse had only been in service for four months when it was hit by an unknown ship, the draught for which must have been smaller than 5.3 m.

4. Reason given for the collision was that the distance had been misjudged. The ship was badly damaged, and had to go straight to a shipyard, The upper part of the lighthouse broke off, and the whole lighthouse was displaced about 1 m.

5. The upper part of the lighthouse was hit and thrown into the sea by the stem of the vessel which sustained minor damages, the ship had to put in for repairs.

6. An unknown ship has grazed the lighthouse.

7. Central collision with the lighthouse, the superstructure broke and the lighthouse was displaced.

   The stem of the ship was badly damaged.

   The captain, who was standing on the bridge when the collision happened, states that he was dazzled by the strong lights of a temporary drilling rig which was examining the sea bed in connection with the projected bridge siting. The lighthouse was only noticed at the moment the collision took place.

8. The unknown vessel has scraped its way heavily over the concrete caisson found at a depth of 6.2 m and compleatly destroyed the steel-structure.

9. The southbound Russian vessel 'General Shkodunovice' made a sweeping turn to avoid colliding with the northbound Russian ship which was allegedly sailing in the wrong side of the fairway. The two vessels collided nevertheless, and when 'General Shkodunovice' subsequently tried to back away, it was led towards the Sprogø N.Ø. lighthouse by the current.

   On the part of the pilot it was stated that it was realized that a collision with the lighthouse would

take place, but that it was considered that the material damage would be smaller through this manoeuvre.

This collision, incidentally, resulted in the most extensive damage found so far, as the concrete caisson at a depth of 7.8 m was also damaged and displaced.

lo. It is stated that in order to save an alternation of course the ship intended to sail along the inside of the lighthouse, but the current drew the ship against it.

The steel structure of the lighthouse was spoilt completely, and the caisson was shifted 2 m.

The ship sprang a leak and was grounded, causing oil pollution.

4. COLLISION CAUSES

No failures of the steering gear have been ascertained in the registered collisions.

In one single case it has been mentioned, but it could not be proved. In another case a member of the crew stated that no one was on the bridge at the time of the collision, but this has not been officially confirmed, either.

It is possible that some of the involved ships have had charts wich were not up to date.

It is remarkable that all the registered collisions took place in the dark. A good flood lighting would have improved the possibility of judging the distance correctly.

Only in the collision, ref. 9, was there a pilot on board the vessel, and in this case the whole blame for the accident was placed on the ship approaching in the opposite direction.

All in all, it would appear that the causes of the collisions must be said to be human errors, such as negligence, misjudgements and ignorance of the special conditions in the Great Belt.

Ref. No.	Name of Lighthouse	Collision date	hour	Ship's name	Tonnage	Damage to Lighthouse	Comments
1.	Sprogø N.Ø.	27/2-74	19.35	M/V Mulde	c.300	Broken flange	Strong current
2.	Sprogø N.Ø.	11/3-75	04.15	Dorothea	c.300	Minor damage to ladder	
3.	Vengeancegrund	4/11-77				Broken flange	
4.	Halskov Rev	5/11-77	03.25	M/V Windblow	c.400	Broken flange. Displaced.	Misjudged distance
5.	Romsøe Tue	24/1-78	05.15	M/S Anda	578	Broken flange	
6.	Halskov Rev	1/2-78				Minor damage to ladder	
7.	Sprogø N.Ø.	16/5-78	23.55	M/S Eva Bress	394	Broken flange. Displaced.	Dazzled by lights from temporary drilling rig
8.	Hatter Rev	30/9-78	Evening	- large ship		Steel structure completely destroyed	
9.	Sprogø N.Ø.	31/10-79	06.00	General Shkodunovice	12,000	idem. - and concrete caisson damaged	
10.	Halskov Rev	12/12-79	Night	M/T Tine	c.600	idem.	

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