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NEW PURSE SEINE CONSTRUCTION

By

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INTRODUCTION

With the objectives of reducing costs, increasing resistance to wear and tear, and improving catching efficiency, a novel design has been constructed and tested. The project, carried out in cooperation with purse seine fishermen and fishing gear manufacturers, was financed through a grant from the Norwegian National Federation of Fishermen's Efficiency Fund and by a direct contribution from the fishing vessel company which has agreed to purchase the seine.

SPECIFICATION OF THE PURSE SEINE

The design of the purse seine is given in Figure 1. To achieve high sinking speed the major part of the seine is made of polyester, having higher specific weight than polyamide (1,38 g/cm versus 1,14 g/cm), but lower strength and elasticity.

Polyester was used as webbing in some Norwegian purse seines in the early 1960's, but due to increasing price of polyester, twice as expensive as polyamide, the fishermen changed to polyamide. Today the price is approximately the same for both materials.

The salvage and the bunt are made of ordinary polyamide. Large meshed net (210 mm stretched mesh) of polyester is used in the last end of the seine to reduce bulk and costs, and new types of floats, purse rings and mounting methods, are being tested. To reduce the wear and tear of the net and the handling problems, a light weighted lead cable is used on the groundline. Another experimental feature to reduce the amount of lead on the groundline was to transfer more weight to the purse line.

RESULTS AND CONCLUSION

The seine was tested onboard M/V "Libas", a combined purse seiner/trawler of 1348 Brt., during commercial fishing for herring, mackerel, and horsemackerel, in the North Sea in September-December 1989.

Test results so far have been quite encouraging, both in regard to catching efficiency, as well as to operational and handling features. Catch was achieved in about 70 % of 40 sets with catch from 20-500 tons, which is higher than the average for the total Norwegian fleet during the same period.

The high sinking speed of the polyester net is especially noted (Fig. 2 and 3). Even with half the lead weight normally used in similar Norwegian seines, the sinking speed measured was 25 % higher. Preliminary trials with a heavy purse wire (7 kg/m against 2,4 kg/m in traditional purse wire) further increased the sinking speed of the polyesternet by 21 %. This indicates a great potential to reduce the lead weight on the groundline and transfer the weight to the purse line.

No observations were made of fish escaping through the big meshed panels in the last end of the net, neither by day nor during darkness at night. Due to our results from such experiments, a lot of fishermen in Norway have subsequently elongated their seines with

big meshed net panels. However, the big meshed webbing used in this seine was not strong enough, while the 35 mm polyesternets, both knotted and knottless, seemed to have sufficient strength.

All the different new methods tried for mounting the float- and groundline to the webbing were labour saving compared to the traditional method, but the tests to date are not sufficient to evaluate their durability.

The use of lead cable seems promising. The seine went noiseless from the netbeen during shooting, and there was no tear and wear in the webbing as when using ordinary lead. The stacking of the lead cable in the netbeen was also much easier and labour saving compared to heavy leadline.

The buoyancy of new floats of ethylenvinylacetate (EVA) proved to be inferior to traditional polyvinylclorid (PVC) floats. A new production type of PVC floats appeared to have improved wear resistancer. New purse rings with roller seemed promising, both with regard to gear operation and durability on rings and purse wire, but further improvments of these are required.

Several amendments and further trials are needed before the total concept of this novel purse seine can be recommended. Accordingly, the seine will be modified in the light of the experiences made, and subsequently tested again in commercial fishing.

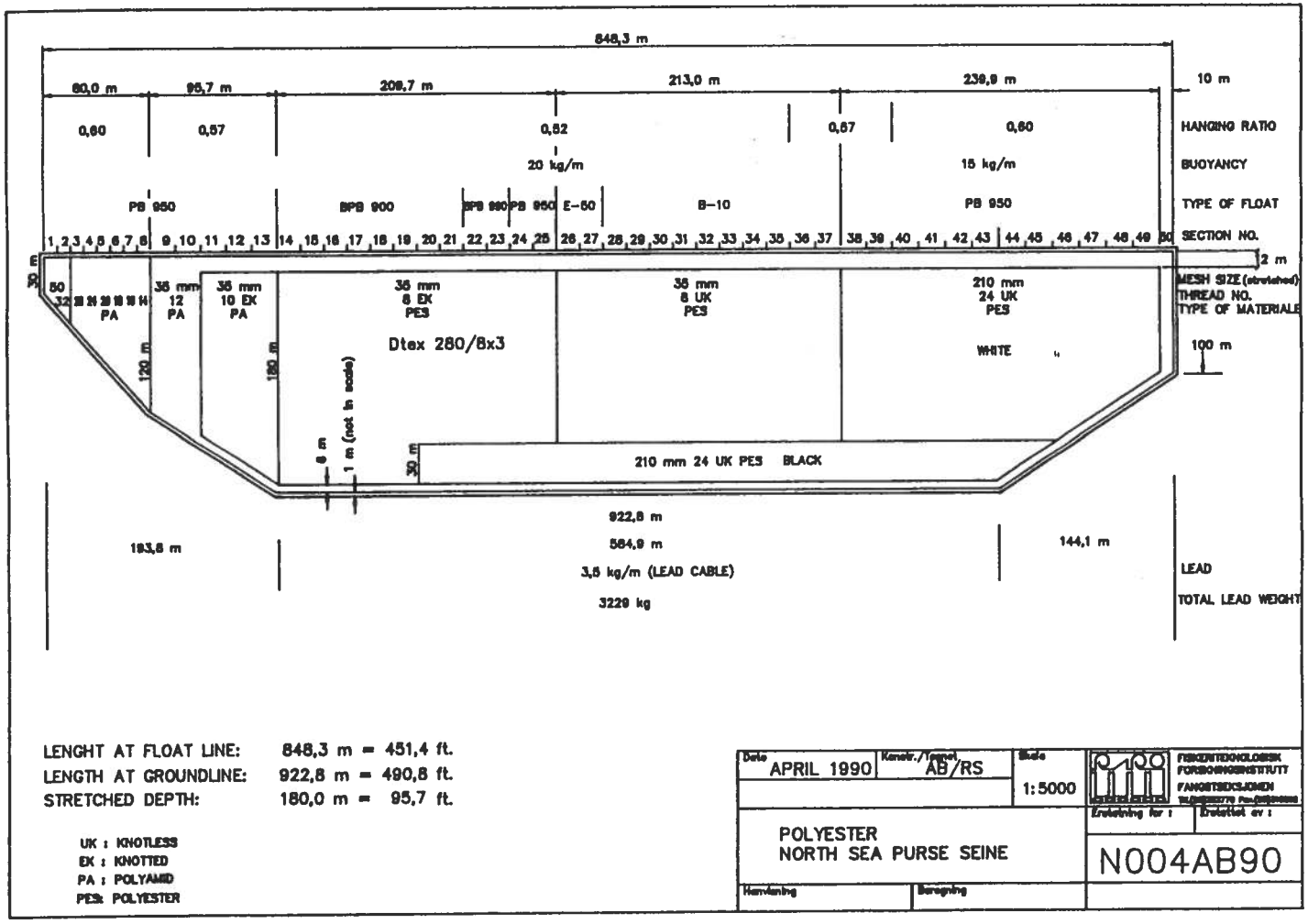

Figure 1. Design of the purse seine.

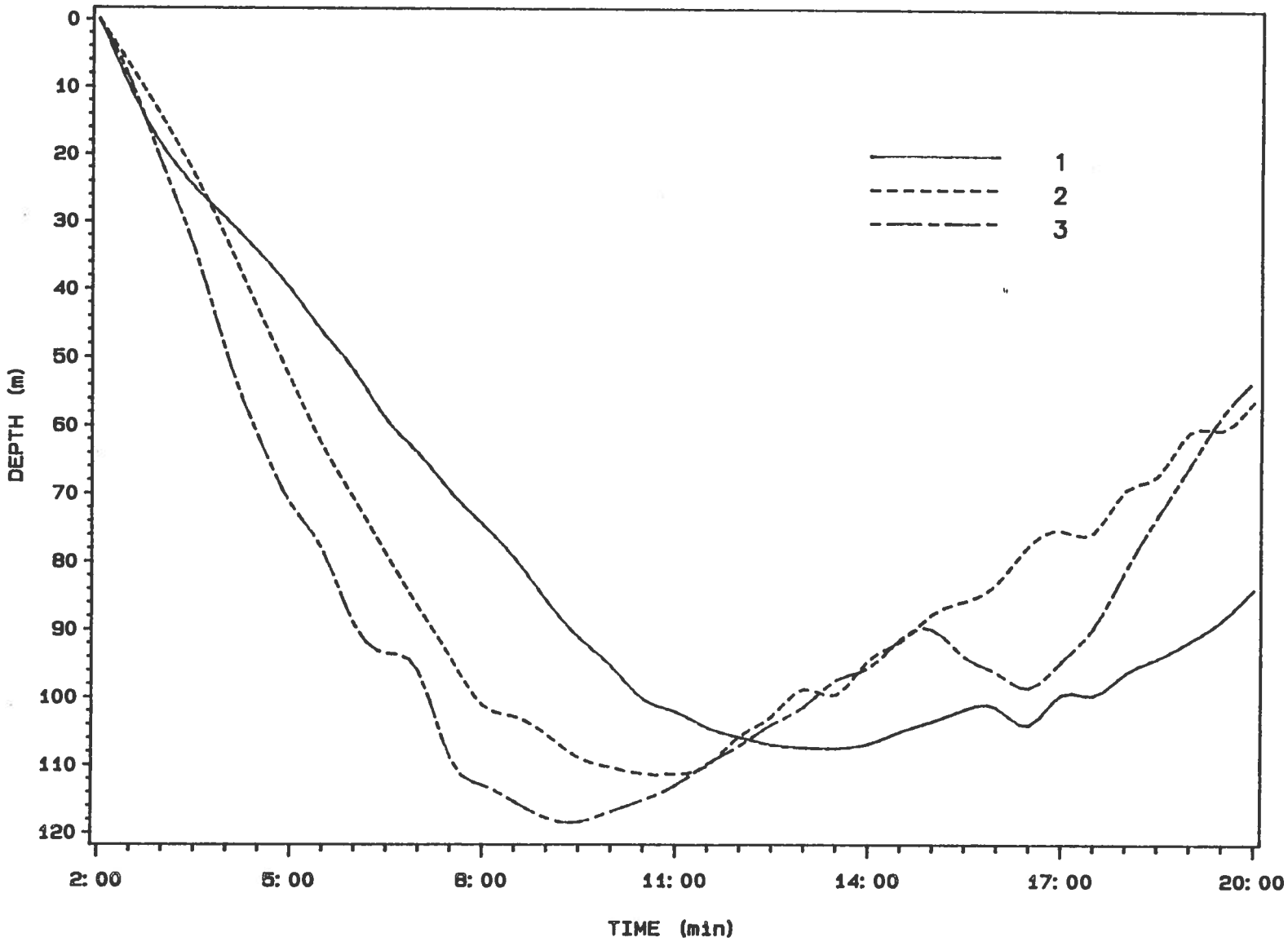

Figure 2. Depth profiles of:
1. Polyamid net with lead weight of 8 k/m and purse wire of 2.4 kg/m
2. Polyester net with lead weight of 3.5 kg/m and purse wire of 2.4 kg/m
3. Polyester net with lead weight of 3.5 kg/m and purse wire of 7 kg/m

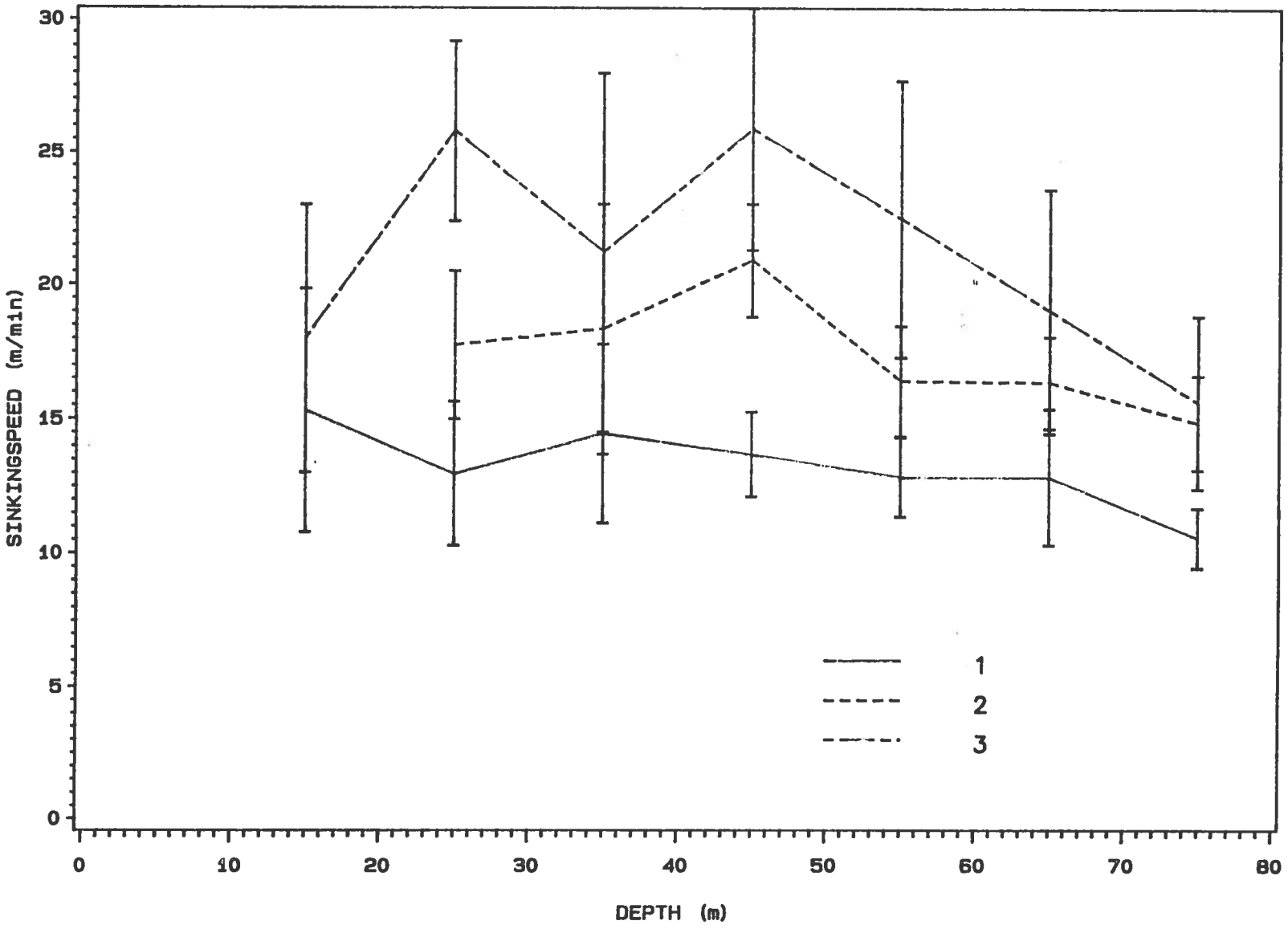

Figure 3. Average sinking speed for 10 m intervals from 10-80 m (standard errors are given).
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2. Polyester net with lead weight of 3.5 kg/m and purse wire og 2.4 kg/m
3. Polyester net with lead weight of 3.5 kg/m and purse wire of 7 kg/m