ORIGINAL: ENGLISH

SOUTH PACIFIC COMMISSION

TWENTY-FOURTH REGIONAL TECHNICAL MEETING ON FISHERIES
(Noumea, New Caledonia, 3-7 August 1992)

REGIONAL TRIALS WITH A NEW FAD RAFT TYPE

(Paper prepared by the Secretariat and A. Desurmont of New Caledonia's Service des Affaires Maritimes et de la Marine Marchande)

INTRODUCTION

1. During the FAD Workshop held at the 22nd RTMF the representative for France gave an account of an innovative FAD raft type in use in the Indian Ocean. This raft, first deployed in Mauritius and later in the Comores and Reunion, is made up of a string of pressure-resistant floats which, it was suggested, may submerge without damage under the effect of strong current or storm conditions and thus avoid much of the stresses that the traditional solid floating FAD structure undergoes. Given the reported long survival times for FADs rigged in this way the meeting expressed an interest in exploring the potential value of this innovation in the Pacific. Since that time a number of such rafts have been deployed by Pacific island countries, some with the technical assistance of SPC's Deep Sea Fisheries Develpoment Project (DSFDP) and one by New Caledonia's Marine Marchande.

2. Initial examination of the technical data on the use of this raft type by DSFDP staff and others suggested that by incorporating the pressure-float raft with catenary curve mooring systems, which was not done in the Indian Ocean, a FAD system with important advantages over the usual type might be developed. This paper gives a preliminary account of recent deployments of this FAD type.

ANNEX. 1

FAD DATA SHEET

OFFSHORE FAD 1

COUNTRY: Vanuatu **DATE DEPLOYED:** Mar. 19, 1992

PLACE: 5.6 nm SSW of Araki Is., 14.5 nm from Fisheries.

POSITION: 15° 43.14' S
167° 00.50' E

SITE DEPTH: 1057 METRES
DEGREE OF SLOPE: 2°

SPECIFICATIONS

BUOY TYPE: Indian Ocean type design; with raft comprising 30 x 200 mm pressure floats (rated to 300 metres) and 5 x 250 mm pressure floats (rated to 800 metres) at every 5th spacing. Strung on combination wire/rope with 20 mm plastic water pipe sheathing. Raft and mooring connected by 50 m length of wire/rope joined with thimbles and swivels at either end. Aggregator made from plastic strapping; tied to 10 m length of the wire/rope.

MOORING TYPE: Catenary curve mooring system.

UPPER MOORING: 50 m combination wire/rope

MAIN MOORING: 1200 m x 18 mm, 8-strand nylon rope

LOWER CHAIN: 10 m x 16 mm proof link chain

THIMBLE/CONNECTORS: Samson Nylite, 5/8"

SWIVELS: 16 mm forged eye-and-eye

SHACKLES: 12 mm screw pin, welded closed

ANCHOR:
Engine Blocks. Approximate weight of 1000 kg.

COMMENTS:

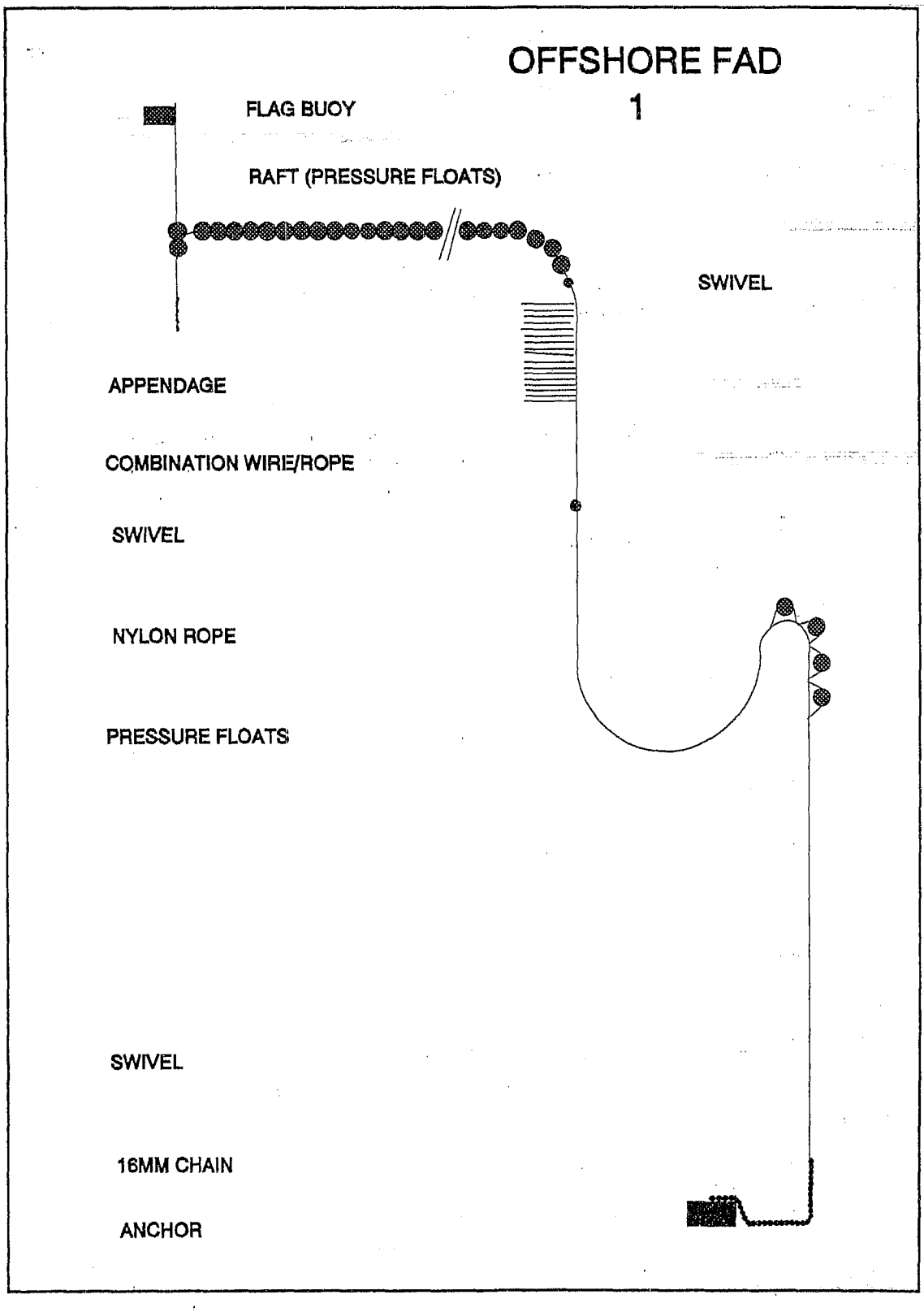
50 metres wire/rope placed between raft and mooring to discourage vandalism. Connections made, using Samson connectors and swivels.

Four, 250 mm pressure floats (rated to 800 metres) were spliced into the nylon rope at 400 metres from the top end to provide sufficient lift to keep chain and hardware off the bottom. Floats provide a total buoyancy of 44 kg.

Flag buoy made from fibreglass pole. Flag made from fibreglass matt, glassed directly onto the pole. 3 floats were used for flotation, strung on gal. pipe with chain for a counterweight. The fibreglass flag pole attached to the gal. pipe.

Position was found, using a GPS Navigator. The WPS-72 datum was used.

OFFSHORE FAD 1



FAD DATA SHEET **ANNEX. 2**

OFFSHORE FAD 2

COUNTRY: Vanuatu **DATE DEPLOYED:** Mar. 25, 1992

PLACE: 6 nm East of Ais Is., 12.5 nm from Santo Fisheries.

POSITION: 15° 25.69' S **SITE DEPTH:** 921 METRES
167° 20.58' E **DEGREE OF SLOPE:** 15°

SPECIFICATIONS

BUOY TYPE: Indian Ocean type design; with raft comprising 34 x, 200 mm pressure floats (rated to 300 m), strung on combination wire/rope, over 20 mm plastic water pipe. Combination wire/rope continued for 50 m depth to join main mooring, with swivel at connection. Aggregator made from plastic strapping, tied to wire/rope for a length of 10 m.

MOORING TYPE: Catenary curve mooring system.

UPPER MOORING: 25 m combination wire/rope

MAIN MOORING: 1200 m x 18 mm, 8-strand nylon rope

LOWER CHAIN: 10 m x 16 mm proof link chain

THIMBLE/CONNECTORS: Samson Nylite, 5/8"

SWIVELS: 16 mm forged eye-and-eye

SHACKLES: 12 mm screw pin, welded closed

ANCHOR:

Engine Blocks. Approximate weight 1000 kg.

COMMENTS:

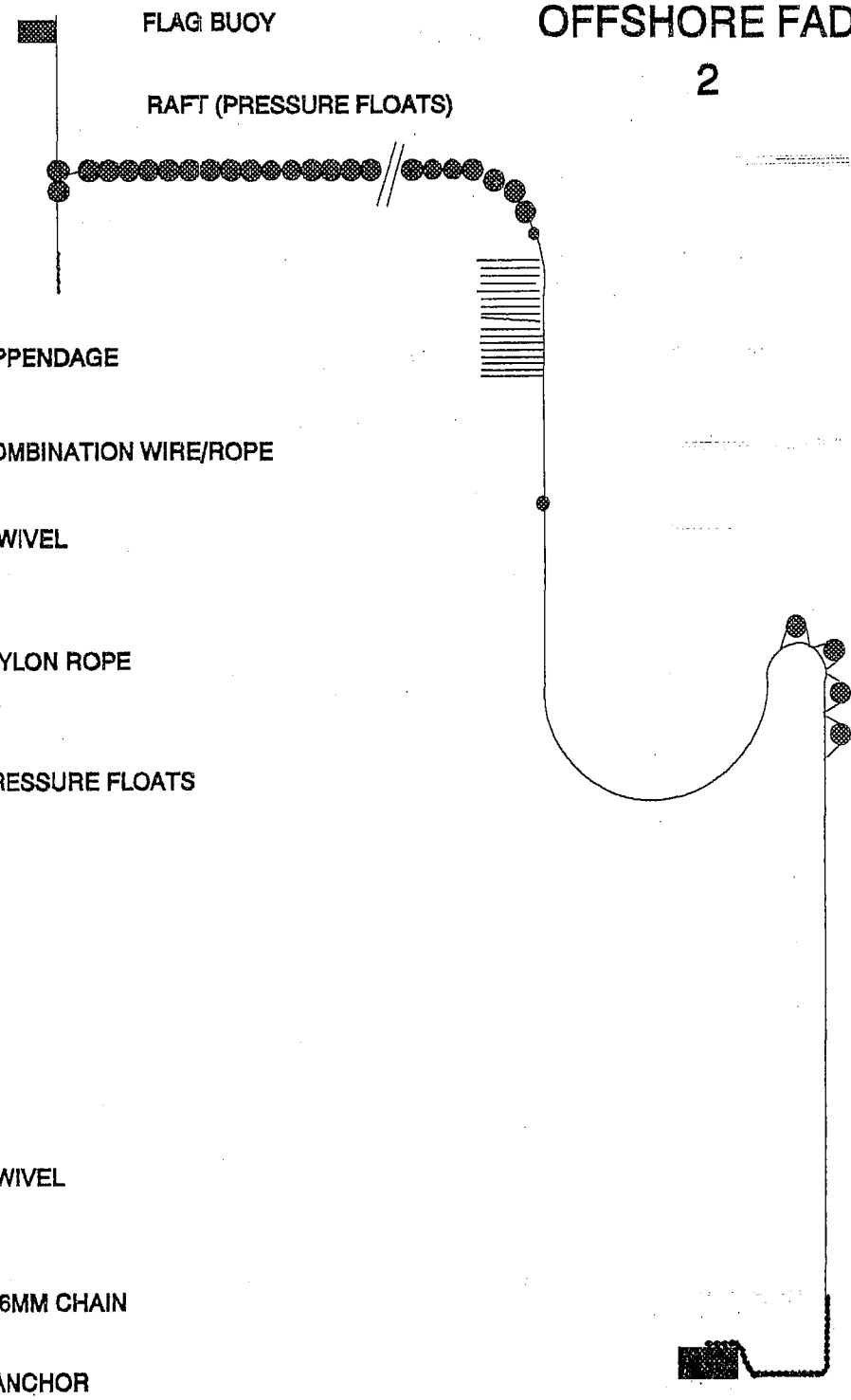
25 metres wire rope placed between raft and mooring to discourage vandalism. One continuous length from buoys to mooring.

Four, 250 mm pressure floats (rated to 800 metres) were spliced into the nylon rope at 400 metres from the top end to provide sufficient lift to keep chain and hardware off the bottom. Floats provide a total buoyancy of 44 kg.

Flag buoy made from fibreglass pole. Flag made from fibreglass matt, glassed directly onto the pole. 3 floats were used for flotation, strung on gal. pipe with chain for a counterweight. The fibreglass flag pole attached to the gal. pipe.

Position was found, using a GPS Navigator. The WPS-72 datum was used.

OFFSHORE FAD 2



ANNEX. 3

FAD DATA SHEET

OFFSHORE FAD 3

COUNTRY: Vanuatu **DATE DEPLOYED:** Jul. 22, 1992

PLACE: 3.5 nm SW of Benehour Pt., South West Bay, Malekula

POSITION: 16° 32.82' S
167° 21.91' E

SITE DEPTH: 471 METRES
DEGREE OF SLOPE: 10°

SPECIFICATIONS

BUOY TYPE: Indian Ocean type design; with raft comprising 524 foam net floats, strung on 9 x 12 mm lengths of polypropylene rope. Three strings joined and fitted with stainless steel ring at one end for attachment to mooring. The nine buoy strings were bundled together and lashed tightly. Total length of raft is 12 metres. Aggregator is made from plastic strapping, attached to combination wire/rope, over 10 m length.

MOORING TYPE: Catenary curve mooring system.

UPPER MOORING: 50 m combination wire/rope

MAIN MOORING: 580 m x 12 mm, 3-strand polypropylene rope.

LOWER CHAIN: 5 m x 12 mm galvanised chain

THIMBLE/CONNECTORS: Samson Nylite, 5/8"

SWIVELS: 16 mm forged eye-and-eye

SHACKLES: 12 mm screw pin, welded closed

ANCHOR:
Engine Blocks. Approximate weight of 700 kg.

COMMENTS:

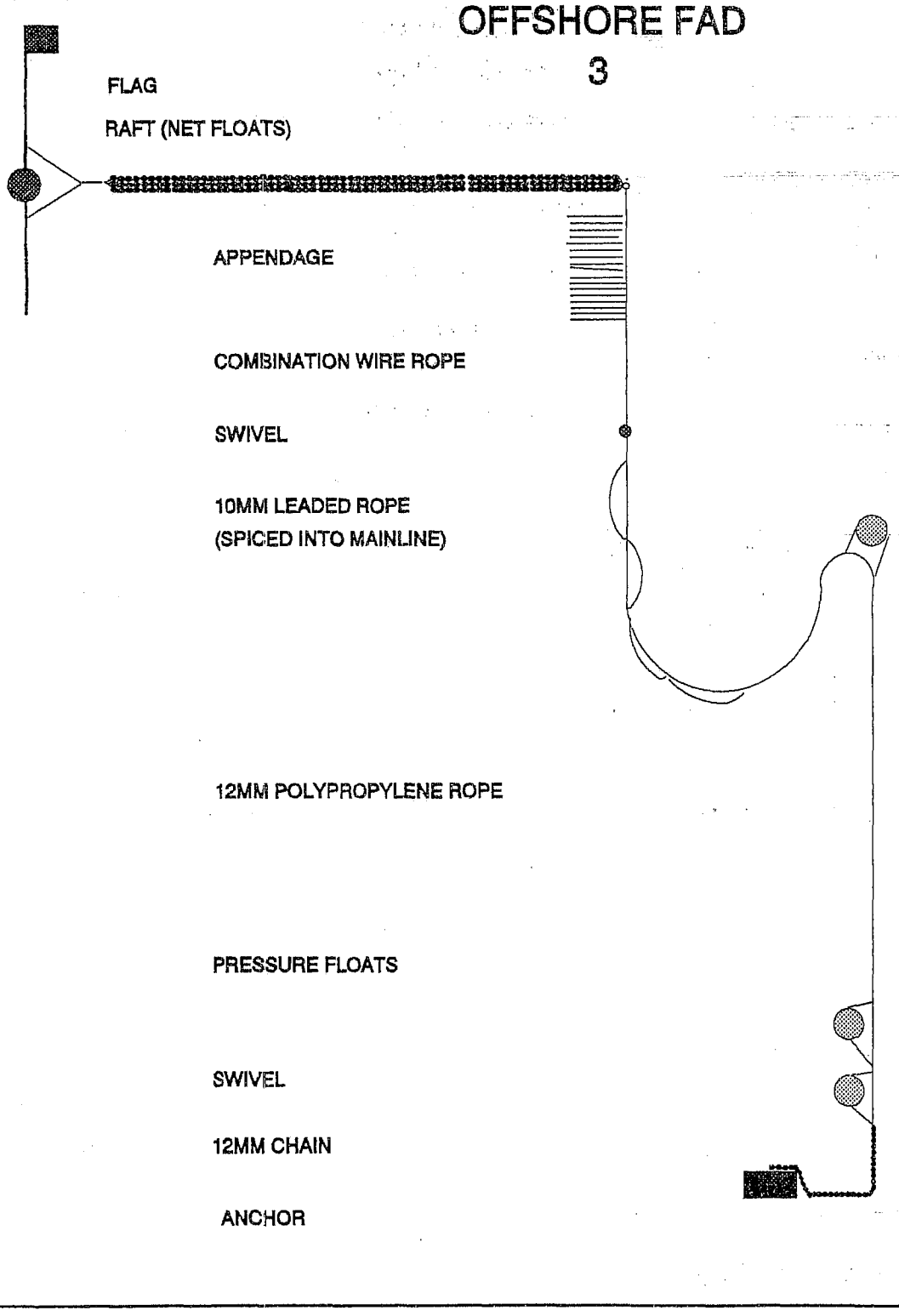
Follows the design of the Indian Ocean FAD, but uses lighter materials throughout.

3 x 5 metre lengths of leaded rope was spliced into the top 100 metres of mooring to make the polypropylene rope sink away from the surface.

2 pressure floats (rated to 800 metres) were attached to mooring, close to the bottom chain. A third pressure float was attached at 400 metres from the bottom as a safety float in case one of the bottom floats fails.

Material costs estimated at under US$1,000.

OFFSHORE FAD
3



FAD DATA SHEET ANNEX. 4

FAD #11
Isle of Pines

COUNTRY: New Caledonia **DATE DEPLOYED:** Apr. 15, 1992

PLACE: 12 nm SW of Isle of Pines, 65 nm from Noumea

POSITION: 22° 53.00' S **SITE DEPTH:** 600 METRES
167° 22.00' E **DEGREE OF SLOPE:** 2°

SPECIFICATIONS

BUOY TYPE: Indian Ocean type design; with raft comprising 50 x 200 mm pressure floats (rated to 300 metres). Total buoyancy of floats is 300 litres. Buoys are strung on 35 metres of 11 mm x 49-strand stainless steel wire, over sheathing of 20 mm o.d. plastic water pipe. All connections made with stainless steel hardware (cable stoppers, shackles, swivel, and thimbles). Appendage made from plastic strapping. A 50 kg counterweight was fitted at the lower end of the stainless wire to discourage vandalism.

MOORING TYPE: Catenary curve mooring system.

NYLON ROPE: 300 m x 18 mm, 8-strand

POLYPROPYLENE ROPE: 500 m x 20 mm, 8-strand.

SUPPLEMENTARY FLOTATION: 5 x 3 litre floats, pressure-rated to 1200 m

LOWER CHAIN: 30 m x 22 mm galvanised chain

THIMBLE/CONNECTORS: Samson Nylite, 3/4"

SWIVEL: 22 mm forged eye-and-jaw

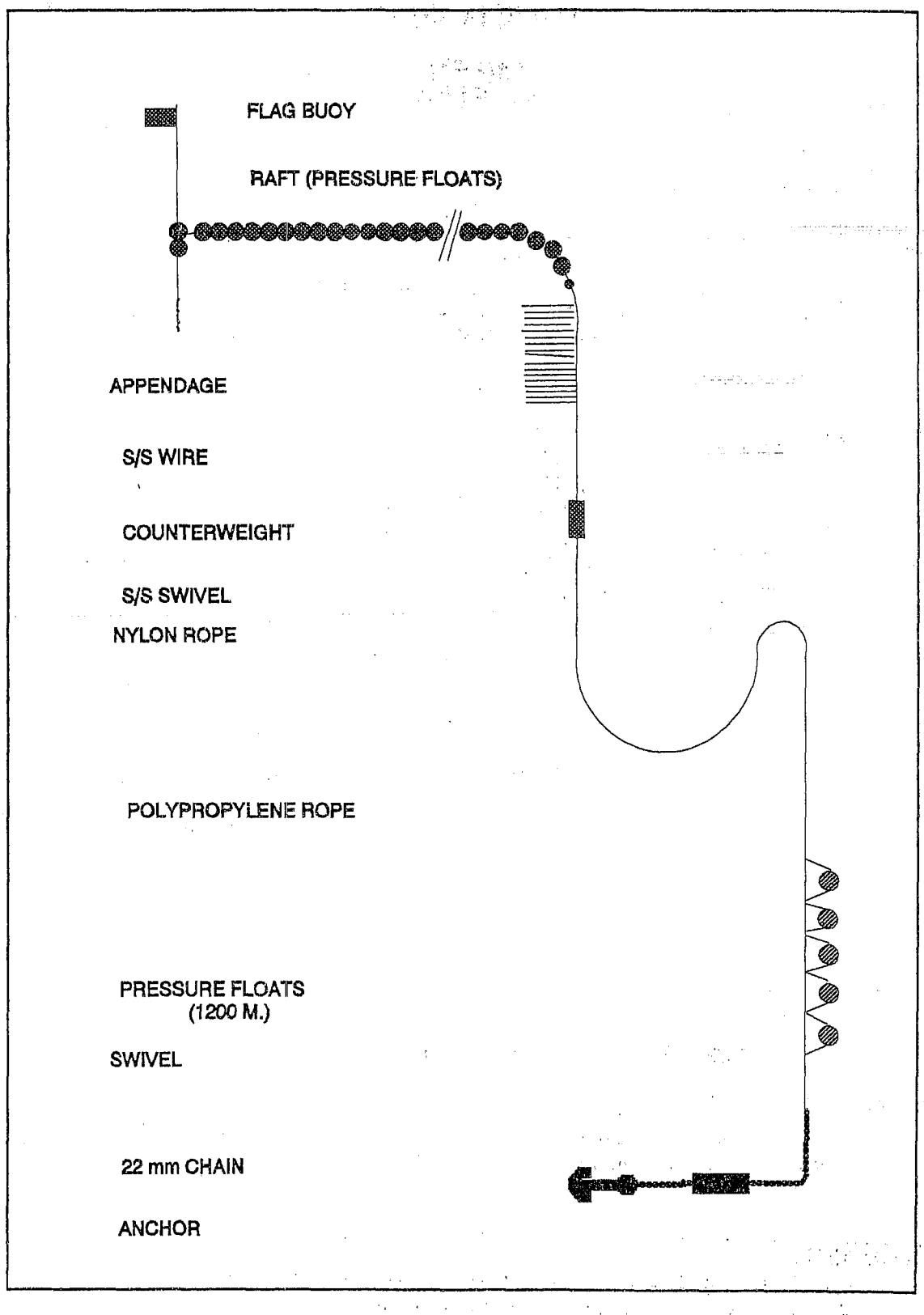
SHACKLES: 22 mm safety shackles

ANCHOR:

175 kg of concrete attached in the middle of the chain. A 250 kg plough anchor attached to the end. Total weight with chain is 650 kg.

COMMENTS:

Supplementary flotation used to buoy up mooring rope due to shallow site depth.
Raft floats were rigged with rubber disks between each pressure float to prevent chafe.
All shackles and cable stoppers were welded closed.
At slack water eight buoys are submerged (due to counterweight). No more than 15 buoys have been observed to have submerged in moderate sea conditions. It is observed that the mooring line descends at a sharp angle from the raft string, presumably due to the counterweight.


FLAG BUOY
RAFT (PRESSURE FLOATS)
APPENDAGE
S/S WIRE
COUNTERWEIGHT
S/S SWIVEL
NYLON ROPE
POLYPROPYLENE ROPE
PRESSURE FLOATS
(1200 M.)
SWIVEL
22 mm CHAIN
ANCHOR