

DEEP WATER FISHING VOYAGE ON MT LUNEDA, FEBRUARY,
1974

TECHNICAL REPORT NO. 108

AUTHOR; *Hugh McLean*

AUTHORISED FOR
ISSUE; *W. J. Field* (10/4/74)
(Chief Development Engineer)

SUMMARY

The wet fish stern trawler LUNEDA (J. Marr and Sons, Fleetwood) was chartered by the White Fish Authority on behalf of the Ministry of Agriculture, Fisheries and Food for a 14 day voyage in February, 1974. The purpose of the voyage was to make a start upon the assessment of the commercial viability of the stocks of deep water fish, especially grenadiers, which had been found in depths between 400 and 700 fathoms in surveys in 1973.

During the voyage only 8 days fishing were possible because of bad weather conditions but the vessel nevertheless landed 680, ten stone kits of various species. The proportion of grenadiers landed (27% of the catch) was lower than anticipated from the earlier surveys but this was more than compensated for by a high catch (329 kits) of blue ling, which was not expected at these depths in these quantities.

Most of the grenadiers were sold on contract prior to the landing; all other fish was sold by auction on Fleetwood market. The blue ling, a known commercial species, realised a high price, but reasonable prices were paid for the unusual species also.

WHITE FISH AUTHORITY
Industrial Development Unit

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1. Introduction

Following the survey voyages of CIROLANA and SWANELLA in 1973 it was concluded that the catch rates on deep water species, particularly grenadier, were encouraging from the commercial point of view. It was decided therefore that a voyage should be undertaken to start to establish the commercial fishing potential of the deep water resources to the West of Britain and to assess the marketability of the fish. The M.T. LUNEDA, a wet fish stern trawler from Fleetwood, owned by J. Marr and Sons, was chartered for this purpose by the White Fish Authority acting on behalf of M.A.F.F. who were financing the project.

The results of the voyage, which took place in February, 1974, are the subject of this report.

2. Objectives

2.1. Catching and Marketing Deep Water Species The charter allowed for a 14 day voyage including a steaming time of approximately 30 hours each way. The main objective was to make a truly commercial voyage, fishing for grenadiers, but also keeping other species thought to have market value. These included sharks, red director (gephyroberyx), trachyscorpia and blue mouthed reds (helicolenus). In addition, any common species caught, e.g. hake, were to be kept. Samples of various species were to be retained for further scientific investigation by Torry Research Station.

2.2. Handling and Processing The handling and processing problems shipboard and ashore were to be further studied. The fishing operation provided another opportunity to assess the gear requirements and deck machinery requirements for this fishery.

3. Particulars of Vessel

SHIP: 'LUNEDA': Length 151' 946m) Skipper W. Reader.
REG. NO: FD 134
MAIN ENGINE English Electric CSW 12
1750 BHP at 750 r.p.m.
Gear Box 2.967:1
PROPELLER: 3 Bladed Liaaen C.P. Type 966
Dia. 2600 mm.
AUXILIARY MCHY: Lister type 6A6
109 BHP at 1500 r.p.m.
Lister type HRMS
41.25 BHP at 2000 r.p.m.
ELECTRICAL GENR: Laurence Scott
120 KW 220 volts D.C. 545 amps
MAIN WINCH: Robertsons 500 HP (240 KW)
Capacity 1200 FM. $3\frac{1}{4}$ " circ wire
MAIN WINCH DRIVE: Electric Ward Leonard
Generator and Motor Welland Scott
220 volts 1100 amps.
BRIDGE EQUIPMENT: Decca Navigator MK12 Plotter
Loran A/C
2 x Decca 326 Radars
2 x Microtechnica Gyro Repeaters (one with master).
2 x MS 44 Kelvin H. Echo Sounders with and without
bottom lock.
Warp Tension R.D.L. Type TCU1.

4. Trials Equipment

4.1. Fishing Gear Ship's normal 96' headline Portuguese trawl was used with 40 fathom bridles. See Fig.3.

Additional warp to a total length of 1300 fathoms ($3\frac{1}{4}$ " circ) on each drum was supplied.

Deepwater floats 8" Nokalon and Philips xx were supplied by the W.F.A., to replace normal aluminum floats.

A complete rig of 18" and 21" rubber bobbins and 21" (spherical) rubber danlenos were supplied to replace vessel's own iron bobbins and danlenos.

Globe Boiler 10' x 5' flat wooden doors specially weighted by extra skids and side weights to 1.5 tons each were used instead of the vessel's usual flat doors. N.B. These were the same doors as used on Swanella, see Technical Report 101.

Figures 1 and 2 illustrate the ground gear and doors respectively.

4.2. Navigational and Fish Finding Equipment A Teledyne Corp'n Loran C receiver was installed to augment the Decca Navigator near the limits of the Decca coverage.

A W.F.A. Trawl Temperature Indicator was supplied.

5. Trials Narrative

Luneda sailed from Fleetwood at 0300 on 11th February and steamed through the Minches to deepwater West of the Flannans arriving there at 1800 on 12th February. Altogether 36 tows each of 2 hours duration were carried out in depths of between 370 and 570 fathoms along the edge from North of the Flannans to West of St. Kilda. Heavy weather caused cessation of fishing for a total of 41 hours during this period.

On 21st February, vessel steamed Southwards to grounds West of Barra. However, bad weather prevented fishing there and the vessel continued to steam South towards grounds West of Tory Island. Fishing continued West of Tory for a further 13 tows. During this period 26 hours were spent dodging at Tory due to heavy weather. Vessel completed fishing at 1417 on the 24th and steamed for Fleetwood arriving at Noon on the 25th. Fish were landed during the early hours of 26th February.

6. Results

6.1. Fishing Logs Detailed haul by haul fishing logs are attached, see tables 1 and 2.

6.2. Summary of Catches

6.2.1 Flannan and St. Kilda Catches at Flannan and St. Kilda varied between 20 and 70 baskets (each estimated to be of 37 kg) the predominant species caught was blue ling with grenadiers comprising only a small percentage of the catch. Despite indications of large hauls of grenadiers on the same tows only a month earlier no concentrations were found. The best two hour catch of grenadiers in this area was 12 baskets or about 440 kg.

Catches of blue ling per 2 hour tow varied from about 10 baskets to a high of 40 baskets (1.5 tons) per 2 hour tow. However, practically all of the catch, 90 + %, was of marketable or potentially marketable species.

Only very small quantities of smoothheads (aleppocephalus) and rabbitfish (chimaera) were taken. This feature, as was the absence of grenadiers in quantity, was in marked contrast to the earlier voyages.

6.2.2 West of Tory Catch rates per two hour tow were lower than at Flannan about 21 baskets per two hour tow, the difference mainly being due to lack of blue ling off Tory. Catches of grenadiers were however, also negligible for the first 9 tows in various depths. However, on haul 46 the first good catch 33 baskets, 1200 kg., of grenadiers were taken.

The remaining three tows on this particular ground yielded 20, 17 and 24 baskets respectively.

Again, as at Flannan/Kilda, hardly any smoothheads or rabbitfish were taken and therefore, the bulk of the fish were kept. There was a slightly higher percentage of sharks at Tory and as a result the proportion of catch rejected was higher, upto 50% on occasion as only 'darkie-charlie' sharks were being retained.

6.3. Fish Landed at Fleetwood, 10 stone kits (64 kg.)

Grenadiers	183	Skate	9
Red Director	33	Hake	2
Blue ling	329	Tusk	2
Scabbards	13	Total	680 kits
Monks	18		
Mora	22		
Sharks	69		

6.4. Prices Realised for Deep Water Fish per 10 stone kit

Grenadiers	£11.00
Red Director	£ 5.00 to £10.00
Blue Ling	£16.50 to £17.00
Scabbards	£ 5.00 to £10.00
Monks	£18.50 to £19.00
Mora	£11.80 to £12.50
Sharks	£ 3.00 to £ 4.50
Hake	£35.00 to £50.00
Tusk	£12.00

(Total price realised £8969)

N.B. The bulk of the grenadiers were sold on contract prior to landing. The rest of the fish was auctioned.

7. Discussion

7.1. Catch Rates of Grenadiers Reference to tables 1 and 2 indicates the almost total absence of grenadiers in any quantity caught up to haul No.45. However, hauls 46 to 49 inclusive, yielded acceptable quantities of these fish, about 12b/hour or about 400 kg./hr.

The interesting feature of these last four hauls was that the codends and catch were well 'sandied up'. Even the gills of the grenadier fish were full of sand and their normally grey skins were quite sandy brown in colour. This gave the impression that these fish were lying at least partly imbedded in the sandy bottom and the feeling that they may have been present in other places but not catchable with normal round fish gear.

Overall catch rate of grenadiers was $3\frac{1}{2}$ bsks/hr. (129 kg./hr.)

7.2. Blue Ling Catches of blue ling off Flannan and Kilda were similar to those of grenadier off Tory. This species was not found in any quantity on previous deepwater voyages. Average catch per hour towed at Flannan was 5 baskets/hour.

7.3. Effective Fishing Time Tows of two hours duration were carried out, the time of towing was deliberately limited owing to previous experience of codend damage due apparently to the presence of sharks.

6 full tows were carried out in 24 hours, the cycle time from shooting to codend aboard being, about $3\frac{1}{2}$ hours.

Damage to gear was negligible and in fact on only seven tows was the catch rate likely to have been affected. On three of these occasions locked doors caused the gear to cease fishing and thus significant loss of fishing time.

7.4. Distribution of Species Results from the three Cirolana voyages, the Swanella voyage, and the Luneda voyage have indicated that, though the areas of best fishing, i.e. Tory in 400-500 fathoms and Flannan in 350-600 fathoms have been confirmed, the proportionate distribution of species has varied greatly, the most marked change being the relative quantities of blue ling and grenadiers found by Cirolana on a particular tow West of Flannans in mid January and Luneda's catch some four weeks later, on the same tow.

Earlier comparative results between Cirolana's spring and early summer trips and Swanella's autumn voyages indicated quite different proportions of grenadiers to smoothheads on each occasion.

7.5. Fishing Techniques No difficulty was experienced in shooting and hauling in these depths despite the initial inexperience of skipper and mate. Limitation of tows to two hours maximum caused some inconvenience to crews who were used to at least 3 hours. Obviously on occasion it was time for hauling as soon as handling of the previous haul was completed. The fish handling time was of course increased on this latter voyage due to the time spent dumping sharks, a tedious task.

7.6. Fish Finding Location of fish is at present strictly by geographical location, i.e., use of Decca or Loran C to repeat profitable tows. No fish marks are normally seen from these depths.

The use of Loran C again proved essential on the outer edges of Decca coverage.

7.7. Fish Handling As on previous voyages hauls of grenadiers and sharks proved very difficult to handle in the gutting space ramp area as these fish will not slide even with the aid of water jets.

Gutting the grenadiers, scabbards and red directors proved fairly straightforward though slower than with cod and haddock. The thick skin of the grenadier soon blunted gutting knives.

Sharks were difficult to handle, mainly for the reason stated in first paragraph above, coupled with the weight of individual fish. It was not practicable to dump excess or unwanted sharks through the normal gutting space overside chutes and they had to be manhandled up through the fish hatch then dropped down the stern ramp.

8. Conclusions

8.1. Catch Rates The interesting point to come out of this voyage was the availability of fairly large quantities of blue ling in these depths at this season. Catch rates as stated previously were as high as 20 baskets per hour with an average of 5 baskets/hour at Flannan. Grenadiers were found latterly, apparently partly buried in sand at Tory with catch rates of 12 baskets/hour, in this area.

8.2. Gear Handling and Fish Handling

8.2.1 Gear Handling Gear handling on Luneda was a very smooth and remarkably trouble free operation due mainly to (1) bridge control of the main winch, and (2) very good positioning of trawl door handling arrangements at the stern. The

independent wire/tipping block release and re-stowage arrangement is particularly well designed.

8.2.2 Fish Handling Fish handling problems centred around the fact that these catches, due to their rough skin, will not slide during processing. This is a major problem and must be overcome for possible commercial operations to be really efficient.

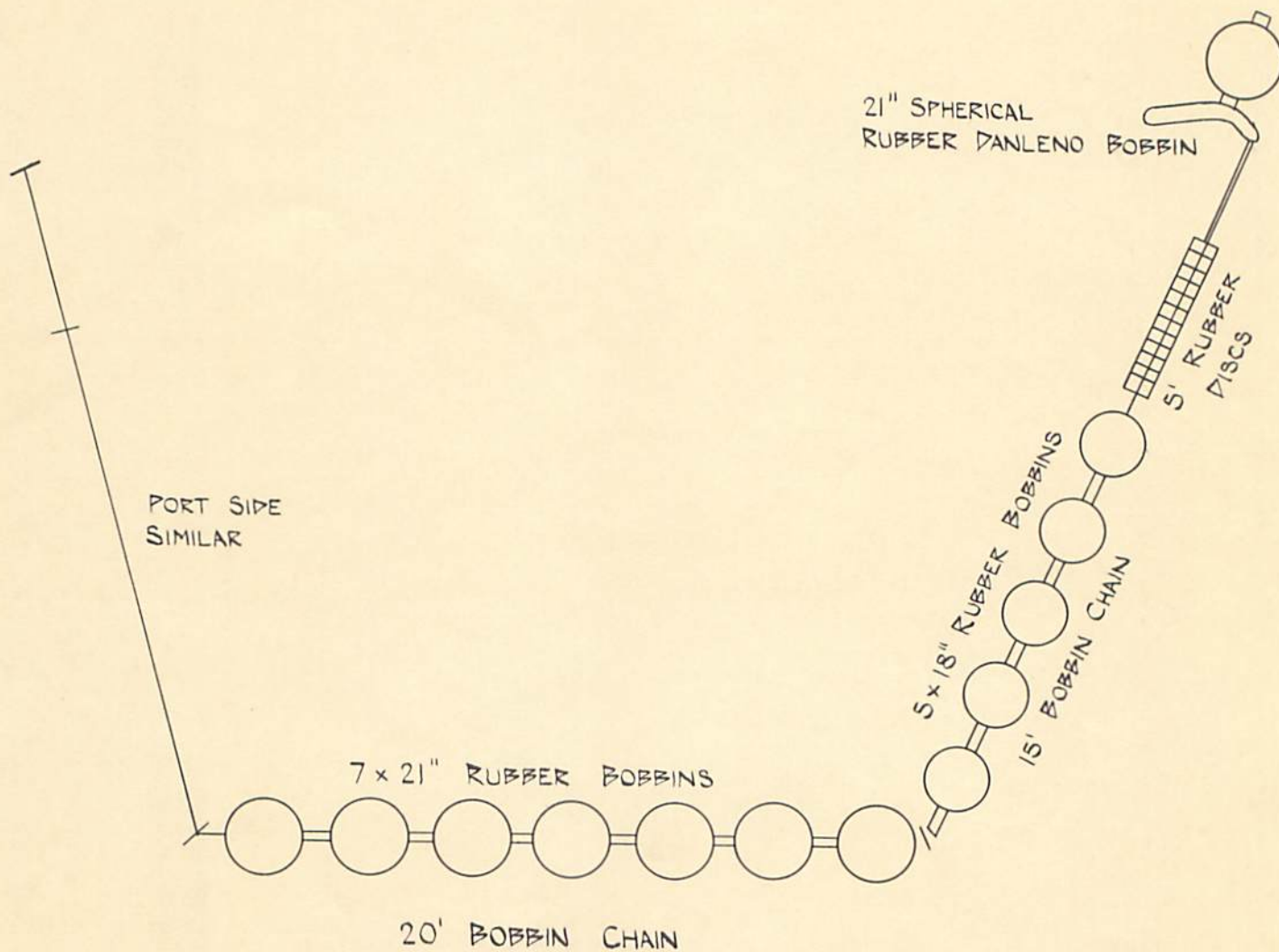
8.3. Fish Location Commercial exploitation of these waters would be greatly assisted if there were a suitable fish finding facility to enable locations of highest fish density to be accurately recorded. Work presently in hand using towed body transducers may provide this facility.

8.4. Fish Sales The fish sold well in Fleetwood market, especially considering the unfamiliar nature of many of the species.

H.McDIARMID

Principal Fisheries Development Officer

FIG. 1. GROUNDROPE BOBBIN RIG



SPECIFICATION OF TRAWL NET

UPPER

18

34 1/2

87 FLYMESH

TOP WING

100

80

280

200

SQUARE

DAITINGS OR BELLY

80

48'

19'

60

60

20'

29'

5 1/2" MESH POLYTHENE

LOWER

4

42 1/2

93 FLYMESH

LOWER WING

50

100

50

200

BELLY

80

48'

19'

60

60

20'

29'

5" MESH POLYTHENE OR NYLON

HEADLINE: 96 ft. - 3 x 21 ft. 2 x 16½ ft. 10 ft. Headline Leg

FOOTROPE: 156 ft. - 2 x 15 ft. + 1 x 20 ft. Bobbin Chains (High T'ne)
2 x 5 ft. Rubber Footropes
2 x 47 ft. Ground Chains

Headline Leg 10 ft.

34 Backstrops (10 ft. legs. 24 ft. single)
43½ ft. pennant
Doors 10 ft. x 5 ft. Wooden Rectangular

TABLE 1

'LUNEDA' 11/2/74-25/2/74 - ESTIMATED CATCH BASKETS (ABOUT 37 Kg. each)

Haul No.	Grenadier	Scabbard	Gephyro + Helicolents	Blue Ling	Shark	Mora + Phycis	Monk	Total
1	15	1	$\frac{1}{2}$	7	11	-	-	
2	2	-	-	-	2	-	-	
3	-	-	NO FISH	-	-	-	-	
4	12	2	13	10	10	-	-	
5	5	5	$\frac{1}{2}$	40	8	-	2	
6	10	-	$\frac{1}{2}$	10	5	2	$\frac{1}{2}$	
7	3	7	1	15	7	1	-	
8	1	1	2	4	5	Codends	damaged lg. stone	
9	5	-	1	9	5	-	-	
10	9	1	$\frac{1}{2}$	20	3	$\frac{1}{2}$	1	
11	9	<	-	20	3	1	1	
12	TRAWL	BADLY	TORN	VERY	FEW	FISH		
13	6	6	-	30	8	$\frac{1}{2}$	-	
14	8	<	$\frac{3}{4}$	15	7	$\frac{1}{2}$	-	
15	12	-	3	4	6	1	-	
16	5	-	$\frac{1}{2}$	25	4	-	1	
17	5	-	1	4	3	-	-	
18	2	1	-	8	-	1	-	
19	10	-	6	7	5	$\frac{1}{2}$	1	
20	5	-	3	10	5	-	1	
21	8	-	7	10	5	1	$\frac{1}{2}$	
22	7	-	3	2	7	-	3	
23	2	-	-	3	3	-	-	
24	6	-	-	18	1	-	2	
25	5	-	-	8	5	$\frac{1}{2}$	1	
26	6	-	-	5	3	-	-	
27	2	-	-	15	3	-	-	
28	1	-	$\frac{1}{2}$	6	1	-	-	
29	2	<	9	3	6	1	-	
30	5	-	2	8	5	-	-	
31	3	-	$\frac{1}{2}$	10	5	-	-	
32	2	-	-	25	8	2	$\frac{1}{2}$	
33	-	2	-	5	-	-	1	
34	-	NO FISH	LOCKED	DOORS	-	-	-	
35	1	-	-	2	4	-	-	
36	2	-	-	25	22	2	4	
TOTAL FLANMAN	176	26	57 $\frac{1}{2}$	383	175	15 $\frac{1}{2}$	19 $\frac{1}{2}$	852 $\frac{1}{2}$
37	3	$\frac{1}{2}$	-	2	-	1	1	
38	2	1	-	1	2	1	2	
39	3	-	-	2	-	-	-	
40	8	<	-	-	-	-	$\frac{1}{2}$	
41	2	-	-	3	2	1	2	
42	5	<	-	4	13	2	1	
43	3	-	2	2	-	2	1	
44	2	-	4	-	-	-	-	
45	-	-	-	3	-	$\frac{1}{2}$	-	
46	33	-	-	1	-	1	2	
47	20	<	-	4	-	1	2	
48	17	$\frac{1}{2}$	-	5	-	1	-	
49	24	-	-	3	-	1	2	
TOTAL TORY	122	2	6	30	17	11 $\frac{1}{2}$	13 $\frac{1}{2}$	202
GRAND TOTAL	298	28	63 $\frac{1}{2}$	413	192	27	33	1054 $\frac{1}{2}$

(1)

TABLE 2

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
12/2	1	58 17N 09 38W 58 24N 09 26W	510 f	1150 f	1828	1900 1915*	2115	2153	2.00	3.4	4.8	* * 660 90	<u>Total 38 baskets</u> 15b grenadiers 7b blue ling 1b small sharks 1b scabbards 10b darkie charlies 1b gephyroberyx	* Gear settled and towing ** Revs and pitch setting Course 210° WX W-5 Speed 3.3
12/2	2	58 23 09 22 58 16 09 40	510	1150	2205	2240 2300	0100	0145	2.00	3.2	4.8	660 91	<u>Total 4 baskets</u> 2b grenadiers 2b darkie charlies	CO210 Spd 3.8 'locked doors' a little mending, 10 mins H 9.3 B 32.8 E 75.8 (decca at start of tow)
13/2	3	58 15 1/2 09 42	510	1150	0203	-	-	0300						Winch break binding, slipped clutch and hauling back at 600 f. H 8.8 B 32.6 E 75.3
13/2	4	58 14 09 46 58 05 09 47	510	1150	0410	0455 0510	0710	0848	2.00	3.2	4.6	660 90	<u>Total 55b (kept 50b)</u> 12b grenadiers 10b darkie charlies (sharks) 3b small sharks 10b blue ling 13b gephyroberyx 2b scabbards dumped 5b sharks & 1 'orekettle'	Co 190-172-195 SPD 3.6 WX W-2 H 9.0 B 32.5 E 75.0
13/2	5	58 07 09 42 58 14 09 42	480's	1150	0802	0843 0858	1058	1137	2.00	2.5 3.0	4.2 4.7	660 92	<u>Total 70b</u> 40b blue ling 5b scabbards 1b gephyroberyx 5b grenadiers	Co 020° WX VAR 1-2 SPD 3.2 H 10.8 B 30.3 F 55.5

(2)

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
13/2	6	58 15 09 35 58 24 09 32	510	1150	1230	1305 1320	1525	1600	2.05	2.5	4.6	660 90	<u>Total 33b</u> 10b grenadiers 10b blue ling $\frac{1}{2}$ b gephyroberyx 1b mora 1b fycis $\frac{1}{2}$ b angler, 5b sharks	Co 020 WX VAR 1-2 SPD 3.6 H 9.0 B 32.5 E 76.4
13/2	7	58 25 09 26 58 32 09 10	460 500	1100	1618	1650 1705	1905	1940	2.00	4.5 3.8	4.5 4.0	660 90	<u>Total 46b</u> 3b grenadier 15b blue ling 1b mora 7b scabbard 1b gephyroberyx 7b sharks	Co 070 WX SW 2-3 SPD 3.6 H 6.5? B 34.4 E 66.7
13/2	8	58 32 $\frac{1}{2}$ 09 10 58 25 09 30 $\frac{1}{2}$	504	1150	1952	2030 2045	2245	2320	2.00	3.8	4.3	660 90	<u>Total 13b</u> 4b blue ling 1b grenadiers 2b gephyroberyx 1b scabbard 5b darkie charlies	Co 226 WX SSW 2-3 SPD 3.6 4.0 H 4.2 B 35.8 E 59.6 1 large stone, several small net torn Codends out
14/2	9	58 24 09 31 58 21 09 34	500 510	1150	0047	0125 0140	0340	0418	2.00	4.0	4.0	660 90	<u>Total 25b</u> 5b grenadier 9b blue ling 1b gephyroberyx 5b sharks	Mending 2330 to 0045 Co 250 SPD 3.3 WX SE6
14/2	10	58 17 09 33 58 09 09 41	510	1150	0427	0504 0519	0719	0755	2.00	3.8	4.0	660 90	<u>Total 36b</u> 9b grenadiers 20b blue ling 1b scabbard 1b monks 1b skate $\frac{1}{2}$ b gephyroberyx $\frac{1}{2}$ b mora, 3 sharks	Co 185 WX SE-6 SPD 3.0 Bunt torn, mending 0800-0820 H 10.6 B 30.7 F 53.5

(4)

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
15/2	16	58 40 08 37 58 36 09 01	540	1150	2140	2215 2230	0030	0117	0200	3.7	4.8	660 90	Total 40b 4b sharks 25b blue ling 5b grenadiers 1b gephyros also 2 skate (2 fish) 2 monks, 6 mora, 4 scabbards.	Co 250 WX NWXW 3-4 SPD 3.2 WX NE 6 Temp. at trawl 10°C G 23.7 B 37.0 D 78.8 Heavy swell Some mending to 0215
16/2	17	58 16 09 47 58 24 09 31	510	1150	2225	2310 2320	0120	0158	200	3.7	4.7	660 90	Total 14b 5b grenadier 4b blue ling 1b gephyros 3b sharks (1 skate)	Steamed to SW Flannan Dodged in Nhy gale Co 010 WX N 5-6 SPD 3.3 H 8.9 B 33.1 E 75.6
17/2	18	58 22 09 44 58 13 09 51	480 490	1100	0208	0244 0300	0500	0540	2.00	3.5	4.6	660 90	Total 12b 2b grenadier 1b mora 1b scabbard 8b ling Few small sharks and rejects.	Co 235 WX N 3-4 SPD 3.5 H 7.4 B 34.5 E 69.2 Square out Mending until 0620
17/2	19	58 11 09 42 58 03 09 40	520 500	1150	0625	0708 0725	0925	1002	2.00	3.1	4.6	650 88	Total 30b 5b sharks 1b monks 7b blue ling 6b gephyros 10b grenadier, 1b mora, (2 skate)	Co 210 WX E 1-2 SPD 3.3 H 10.2 B 31.0 F 53.1 Torn right across bellies. Mending for 10 mins.
17/2	20	58 03 09 40 58 11 09 43	500	1100	1020	1053 1107	1307	1340	2.00	3.8	4.8	660 90	Total 25b 5b grenadiers 10b blue ling 3b gephyros 1b monk 5b shark 1b skate	Co 000 WX S-3 SPD 3.0 H 11.55 A 47.35 F 59.5

(3)

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
14/2	11	58 08 09 45 58 19 09 35	515	1150	0820	08 57 09 12	1115	1155	2.02	3.7	4.2	660 90	Total 36b 9b grenadiers 20b blue ling 1b fycis 1b monk 3b shark 1b gephyros. Few scab 8 skate	Co 030 WX SSE 6-8 SPD 2.4 Mending various tears. 1230-1330 Steamed to N. end, WX SE 8 H 10.6 B 30.6 F 54.4
14/2	12	58 36 08 48 58 42 08 31	370	900	1645	1712 1723	1925	2000	2.00	4	4	650 85	A few fish only	Co 048 WX ESE 7-8 Co 090 H 2.7 B 35.9 E 55.2 Trawl paralysed. Mending from 2000, new fore part dodged all night, bad wx.
15/2	13	58 37 08 55 58 42 08 34	490	1100	0925	1006 1020	1230	1310	2.10	4	4.6	650 90	Total 71b 30b blue ling 6b scabbard 6b grenadier 1 1/2b mora 8b shark (reject 20b)	Co 050 SPD 3.3 Mending damaged trawl from previous haul. G 23.6 B 37.0 D 78.5 10 mins mending
15/2	14	58 42 08 34 58 37 1/2 08 45	570	1150	1340	1418 1430	1635	1717	2.05	3.4	4.8	660 90	Total 46 1/2b 15b blue ling 8b grenadiers 3 1/2b gephyros 1 1/2b mora 7b shark (reject 15b)	Co 240 WX 53-4 SPD 3.3 Temp. at trawl 10.6°C 25 mins mending odd tears. G 23.5 B 37.0 D 78.0
15/2	15	58 37 08 54 58 42 08 31	570	1150	1750	1825 1840	2045	2125	2.05	3.4	4.8	660 90	Total 48b 12b grenadiers 4b blue ling 3b gephyros 1b mora 6b sharks	Co 065 WX VAR 1-2 SPD 2.7 - 3.0 Temp. at trawl 10.5°C H 2.0 B 36.5 E 54.4

(5)

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
17/2	21	58 11 09 42 58 01 09 48	520 530	1100	1352	1426 1440	1640	1715	2.00	3.6	4.8	660 90	<u>Total 33b</u> 8b grenadier 10b blue ling 7b gephyros 1b monks 5b sharks 1b skate	Co 185 WX 5-3 SPD 3.4 H 10.1 B 31.3 F 51.3
17/2	22	58 01 09 44 57 51 09 43	520 530	1100	1722	1757 1810	2010	2047	2.00	3.4	4.6	660 90	<u>Total 28b</u> 7b grenadier 2b blue ling 3b gephyros 7b sharks 3b monks 3b skate	Co 190 WX W-3 3-4 SPD 3.5 H 11.7 A 46.7 F 62.1 Few small holes in square. Mending 20 mins.
17/2	23	57 51 09 44 57 42 09 49	500	1100	2115	2150 2200	0000	0040	2.00	3.6	4.7	660 95	<u>Total 9b</u> 3b ling 3b sharks 2b grenadiers Single fish - 4 monks 1 gephyro, 5 scabbd. 5 mora.	Co 185 WXS 5-6 SPD 2.9 Changed Cables, dodging N to Flannans, WX SE7. H 12.8 A 44.4 F 72.0
18/2	24	58 03 09 36 58 12 09 32	490	1100	0300	0336 0353	0553	0630	2.00	4.1	4.8	660 80	<u>Total 27b</u> 6b grenadiers 18b blue ling 1b sharks	Co 000, SPD 2.8 WX 5-6 H 11.5 A 47.3 F 58.5
18/2	25	58 11 09 27 58 20 09 38	510	1100	0645	0718 0735	0935	1013	2.00	3.7	4.8	660 90	<u>Total 20b</u> 5b grenadier 8b blue ling 1b monk 5b sharks 1b mora	Co 000 WX NW 3-4 SPD 3.0 H 10.3 B 31.2 F 52.0

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DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
18/2	26	58 20 09 38 58 12 09 40	500 520	1100	1020	1051 1105	1305	1343	0200	4.0	4.8	660 85	<u>Total 14b</u> 5b blue ling 6b grenadiers 10 sharks (single fish) 2 monks, 1 tusk 1 coley.	Co 225 WX VAR 1-2 SPD 2.8 H 7.8 B 33.7 E 71.2
18/2	27	58 12 09 38 58 19 09 35	480 490	1050	1353	1420 1440	1640	1717	0200	4.0	5.0	655 82	<u>Total 21b</u> 15b blue ling 1b mora 2b grenadier 3b sharks	Co 020 WX VAR 1-2 Very heavy Wly swell, 'boxing first' Chimera from previous tow. Speed 3.0, H9.8 B 31.5 E 79.4 2 bxs chimaera 44 fish.
18/2	28	58 23 09 30 58 27 09 34	515	1100	1726	1758 1815	2015	2057	0200	3.9	4.9	650 85	<u>Total 11b</u> 6b blue ling 1b sharks 1b mora 1b grenadier 1 1/2b gephyros	Co 020-060 SPD 3.7 k. WX N-4 Heavy westerly swell H 5.7 B 35.3 E 65.2 Check cod ends for small holes
18/2	30	58 32 09 15 58 36 08 59	570	1175	2120	2155 2210	0010	0112	0200	4.6	5.0	660 85	<u>Total 21b</u> 2b grenadier 9b gephyro 6b sharks 1b mora	Co 060 SPD 3.3 WX N 3.4 B 35.9 E 60.0 'Locked doors'
19/2	30	58 36 08 58 58 39 08 40	570	1150	0130	0212 0220	0420	0500	0200	4.0	4.7	660 85	<u>Total 20b</u> 5b grenadier 8b blue ling 2b gephyroberyx 5b sharks (12b sharks reject)	Co 065 WX NX 3-4 SPD 3.4 B 36.3 E 55.3 B 36.7 E 50.4 (END) Few small holes, 10 mins mending.

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DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
19/2	31	58 40 08 44 58 36 08 57	520 530	1125	0527	0605 0620	0820	0858	0200	3.3	5.2	650 80	<u>Total 21b (kept)</u> 10b blue ling 3b grenadiers 1b mora 1 1/2b gephyros, 5b shark single fish 2 monks 1 skate (10b sharks reject)	Co 230 WX NW 3-4 SPD 3.0 H 0.5 B 37.0 E 50.6 Replaced lower wing piece trawled up a quantity of rope.
19/2	32	58 37 1/2 08 51 58 41 08 38	510	1100	0926	1000 1018	1218	1300	200	3.4	4.8	660 85	<u>Total 37 1/2b</u> 25b blue ling 2b grenadier 2b mora 8b shark (4 reject)	Co 060 WX NW 3-4 SPD 3.0 H 1.85 B 36.4 E 53.55 Belly out. New one fitted
19/2	33	58 42 08 29 58 37 1/2 08 48	360 370	900	1420 1500	1448	1700	1730	2.00	3.6	4.8	660 90	<u>Total 12b</u> 5b blue ling 2b scabbards 1b monk 4b sharks	Co 235 WX W2-3 Speed 3.7 G 23.6 B 36.5 E 78.4 H 1.9 B 36.2 E 53.5 (end of tow)
19/2	34	58 39 08 46 58 35 09 05	570	1150	1745	1820 1840	2040	2150	2.00	4.0 4.5	4.0 4.5	660 95	NIL	Co 245 WX NSW 4 SPD 3.8 - 3.5 'Locked doors' split belly, 30 mins mending holes in cod end 10 mins. H 1.4 B 36.5 E 52.3
19/2	35	58 35 08 54 58 41 08 38	540	1125	2227	2314 2330	0130	0215	2.00	4.5	5.6	660 75	<u>Total 7b</u> 2b blue ling 1b grenadier 4b sharks	Co 080 WX SW 4-5 SPD 2.8 Some tears in bellies, mending and renewing settings WX SSW6, Heavy Swell. H 2.5 B 36.0 E 55.3

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DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL S ₆	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
20/2	36	58 41 08 39 58 36 08 50	500	1100	1000	1038 1050	1250	1332	2.00	4.2	4.4	660 82	<u>Total 55b</u> 25b blue ling 2b grenadiers 2b mora 4b monk 22b sharks	V/L dodged in heavy swell for eight hours. C 240, W to WSW 5 SPD 3.0 H 0.0 B 36.9 D 79.4
21/2	37	55 26 09 57 55 33 09 46	440	1050	0810	0838 1856	1056	1132	2.00	4.6	5.1	650 05	<u>Total 9b kept (10b reject shark)</u> 3b grenadiers 2b blue ling 1½b hake ½b scabbard 1b monk, 1b mora	Steamed to Barra West 'ly grds. Steamed to Tory grounds WX W6. (LD3) SPD 3.3 B 0.7 B 43.1 G 68.6
21/2	38	55 34 09 44 55 41 09 34	400 500	1100	1135	1215 1230	1430	1512	2.00	4.7 4.1	5.0 4.4	660 90	<u>Total 9b kept</u> 2b grenadier 2b monk 1b mora 1b scabbards 1b blue ling 2b sharks	Co 320 WX SXW 5.6 SPD 3.3 A 19.8 (B 39.0) G 77.9
21/2	39	55 42 09 31 55 54 09 30	550 640 mainly 600	1150	1533	1612 1630	1830	1915	2.00	4.7	5.1	660 80	<u>Total 5b</u> 3b grenadier 2b ling	Co 000 WX SW6 SPD 3.0 A 14.6 B 35.3 H 57.4. Vessel dodging in wly gale very heavy swell 26 hours.
22/2 TO 23/2	40	55 21 10 05 55 16 10 09	530 450	1050	2120	2158 2217	0017	'Single ender' door back at 0115	2.00	4.2	4.6		<u>Total 11b kept</u> 8b grenadier (2 bxs TRS) 2b chimaera (Rabbit fish)(2 bxs TRS) 6 fish scabbard(TRS) 6 fish deania (TRS) 4 fish monk	Warp broken near door when hauling. Co 180 SPD 3.8 WX NW 6 LD7 C 1.8 E 44.8 filled 3bxs for TRS

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DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL S _Q	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
23/2	41	55 14 10 08 55 07 10 07	400 500 330	1000	0204	0238 0255	0420	0455	01.25	3.8	4.7	660 75	Total 12b (kept) Reject 13b sharks 3b blue ling 2b monks 2b grenadiers 1b mora 2b sharks	Co 180 WX W 4-5 C 3.3 E 37.8 SPD 3.2 15 mins. mending warp load stbd up to 10 tons hailed early. Torn bunt. Filled two boxes smooth's for TRS
23/2	42	55 08 10 08 54 59 10 16	350 460	1050	0521	0556 0615	0815	0850	2.00	4	4	660 75	Total 13b (kept) Reject 17b sharks 5b grenadiers 2b mora 1b monk 4b blue ling 2b hake	Co 180 WX WNW 3 SPD 3.6 Heavy NW swell C 7.0 D 42.0
23/2	43	54 56 10 18 54 52 10 30	300 200 500	1100	0905	0938 1000	1230	1302	2.30	3.6	4.8	660 80	Total 10b 3b grenadiers 2b blue ling 2b gephyros 2b mora 1b monk Single fish - 4 hake 1 skate	Co 190-260 WX NW -3 Heavy swell SPD 3.6 C 10.9 C 45.9
23/2	44	54 51 10 32 54 47 10 38	640 700 540	1150	1315	1350 1405	1605	1700	2.00	3.8	4.7	660 80	Total 6b * 2b grenadiers 4b gephyros	Co 250 WX VAR 1-2 SPD 3.6 (1 box gephyros TRS). * 'Locked Doors' Warpends damaged, cut back 100 fathoms.
23/2	45	55 08 10 11 55 17 10 03	200 300 Mainly 400s	1000	1930	2000 2010	2210	2244	2.00	4.6	5.0	660 75	Total 4b 3b blue ling 1b hake 1b mora Single fish - 6 gren., 3 scabbd.	Co 325 WX VAR 1-2 010 SPD 3.6 C5.8 D 47.2 START C 1.0 E 42.8 END

WHITE FISH AUTHORITY

and

J. MARR AND SONS LIMITED

A G R E E M E N T

in respect of Hiring of trawler "LUNEDAN"
Official Number 341751.

S¹

Secretary,
White Fish Authority,
10 Young Street,
EDINBURGH, EH2 4JQ.

(10)

DATE	NO	POSNS	DEPTHS	WARP	SHOT	ALL SQ	K.O.	CODEND IN	TOWING	WLP	WLS	REVS & PITCH	CATCH	REMARKS
23/2	46	55 18 10 02 55 28 09 51	380 450 480	1050	2302	2340 2355	0155	0233	2.00	4.5	4.9	660 70	Total 40b (kept) Reject 10b sharks. 33b grenadiers 2b hake 2b monk 1b blue ling 1b mora 1b blue mouth reds	Co 000 WX VAR 1-2 SPD 3.0 Co 016 E 44.7 Catch very muddy, or fine sand. 1 box gren. for TRS
24/2	47	55 29 09 54 55 24 09 59	450 480	1050	0253	0332 0350	0550	0625	2.00	3.5	4.2	650 80	Total 27 $\frac{1}{2}$ b (kept) Reject 13b sharks. 20b grenadiers 4b blue ling 2b monk 1b mora $\frac{1}{2}$ b hake	Co 220 WX SXW 3 B 20.25 F 39.45 SPD 3.6 'grenadier grills full of sand'.
24/2	48	55 21 10 03 55 34 09 53	450 500	1050	0702	0738 0755	0955	1030	2.00	4.2	4.7	660 70	Total 24b (kept) 10b sharks rejected. 17b grenadier 5b blue ling 1b mora $\frac{1}{2}$ b hake, $\frac{1}{2}$ b scabbard.	Co 060-020 WX SW3 SPD 3.3 Co 017 E 45.6 B 19.85F 42.4
24/2	49	55 31 $\frac{1}{2}$ 09 50 55 23 10 00	450 480	1050	1042	1123 1140	1343	1417	2.03	3.7	4.7	660 73	Total 30b (kept) Reject 10b sharks 24b grenadiers 3b blue ling 2b monks 1b mora Single fish - 2 skate	Co 215 WX SW 3-4 SPD 3.4 B 18.7 F 42.7 v/l steamed toward Fleetwood

THIS AGREEMENT is made the Eighth APPENDIX 1
day of February One thousand nine hundred and Seventy four
BETWEEN THE WHITE FISH AUTHORITY of Ten Young Street, Edinburgh,
EH2 4JQ (hereinafter called "the Authority") of the one part and
J. MARR AND SONS LIMITED of St. Andrew's Dock, Hull, in the County
of York (hereinafter called "the Owners") of the other part

WHEREAS the Authority have been commissioned by the Ministry
of Agriculture, Fisheries and Food to make a voyage to the edges
of the Continental Shelf in the North East Atlantic for the pur-
poses specified in Appendix I to this Agreement and for such other
ancillary purposes as may from time to time be determined by them
and in accordance with the broad programme at Appendix I AND
WHEREAS the Owners have agreed to make the trawler "LUNEDA"
Official Number 341751 (hereinafter called "the trawler") available
for these purposes on the terms hereinafter set out)

NOW THIS DEED WITNESSES as follows:-

1. THE OWNERS will hire the trawler to the Authority for a
period of fourteen (14) days or such longer or shorter period
as may be agreed between the parties as necessary for the satis-
:factory completion of the purposes of this hiring
2. SUBJECT ALWAYS to the trawler being fit and ready for sea
the hiring shall commence and the hiring charge hereinafter
referred to become payable as from a date and time in the month
of February One thousand Nine hundred and Seventy four to be
agreed between the parties
3. THE HIRING shall cease and the hiring charge be no longer
payable on the trawler arriving at the port of Fleetwood or other
port in the United Kingdom as may be agreed between the parties
on completion of the voyage thereto
4. THE AUTHORITY will pay to the Owners upon accounts being
submitted a sum of £1,350 (One thousand three hundred and fifty
Pounds) in respect of each completed period of twenty four (24)
hours of the hiring and £56.50 (Fifty six Pounds fifty Pence)
per hour in respect of each hour in excess thereof, such accounts
to be rendered after Completion of the programme described in
Appendix I
5. IN CONSIDERATION of the payment to be made to the Owners under
Clause 4 of this Agreement the Owners agree to undertake and accept
financial responsibility for:
 - (a) the routine management of the trawler
 - (b) the ordering and supplying of all fuel oil provisions
stores and water except any excess costs due to bunkering
at ports other than Fleetwood and to the use of finer
quality oil
 - (c) the settlement of all normal port charges pilotage
agencies commissions and all other normal charges
appertaining to the working or efficiency of the trawler
including subscriptions to be reasonably incurred in
accordance with the programme at Appendix I but excluding
the costs and other expenses mentioned in Clause 8
 - (d) the engagement and payment of master and crew
 - (e) all repairs necessary on the hull and machinery of the
trawler the property of the Owners
 - (f) any other matters in relation to the trawler properly
their responsibility in relation to the effective
carrying out of this hiring
 - (g) /

(g) the White Fish Authority agree to re-imburse the Owners for extra fuel charges due to any increase in oil prices payable after the date of signing the contract.

- Ed. C. 12*
MR. J. W. H. 1973
24th November, 1973
G. B. 11
6. FISHING GEAR all normal fishing gear will be provided by the Owners at their expense for the purposes of this voyage but any warp used additional thereto will be paid for by the Authority. In addition the Authority may at their expense equip the vessel with special fishing gear.
7. FISH CAUGHT (with the exception of liver and liver oils which shall be the property of the Owners) shall be the property of the Authority except as defined in Clause 20.
8. THE LANDING of fish caught will be the responsibility of the Owners. Arrangements for the disposal of the fish caught, once landed shall be the responsibility of the Owners. The Authority agree to pay any unusual landing charges incurred over and above those normally incurred landing a similar quantity of common commercial fish.
9. THE AUTHORITY shall be at liberty during any period that the trawler is in port prior to the hiring commencing (but not so as to obstruct or interfere in any way with the normal working of the trawler) to install at their own expense any equipment which may be necessary for the purpose of the hiring and to carry out any alterations necessary thereon.
- At the termination of the hiring (or by agreement with the Owners at some later date when the trawler is in port between commercial voyages) all such equipment shall be removed by the Authority and the trawler restored at the expense of the Authority to her former condition (fair wear and tear excepted) and for this purpose on and off surveys shall be arranged at the commencement and completion respectively of the hiring at the cost of the Authority.
- In the event of the trawler being delayed in port for the purposes of installing or removing the said equipment and restoring the vessel as aforesaid for a period longer than would be normal between commercial voyages the Authority will pay to the Owners a sum of £407.50 (Four hundred and seventy pounds Fifty Pence) in respect of each completed period of Twelve hours (or one tide) of such delay which sum shall include all normal port charges. This amount will also be paid for any period incurred during landing over and above a normally accepted landing duration for a similar quantity of common commercial fish.
10. THE MASTER of the trawler for the purposes of the hiring shall be a person approved by the Authority
11. THE OWNERS their servants and agents shall during the hiring give every assistance to the Authority their servants or agents in the carrying out of the purposes of this hiring and shall comply with all proper directions of the Authority their servants or agents to that end subject only to the trawler or those aboard her not being put in hazard.
12. THE OWNERS shall permit such number of persons as may be nominated by the Authority to be on board the trawler during the hiring or any part of it and shall provide accommodation including bunks and bedding as well as victuals for such persons in accordance with Authority requirements.

13. THE OWNERS shall provide sufficient life rafts in accordance with the requirements of the Merchant Shipping (Life Saving Appliances) Laws 1965 in respect of persons nominated by the Authority to be on board the trawler during the hiring the cost of providing the same insofar as the number of persons nominated by the Authority exceeds the crew (including the master) carried on a normal commercial voyage to be reimbursed by the Authority on the rendering of an account by the Owners at the end of the hiring

14. THE OWNERS shall at their own expense insure the hull and machinery of the trawler (with the exception of any machinery or equipment the property of the Authority) and the master and crew in accordance with their usual practice

15. THE AUTHORITY shall insure employers' liability and/or legal liability at Common Law of any persons authorised by the Authority to sail on the trawler to all officers and crew and/or other personnel under the control of the Owners at all times and/or places during the operation of this hiring

16. ALL SALVAGE and assistance to other vessels to be for the equal benefit of the Owners and the Authority after deducting:

- (a) the masters and crews proportion
- (b) all legal and other expenses
- (c) hire paid under the hiring for the time being lost in the salvage
- (d) repairs or damage to the trawler hull machinery and equipment
- (e) fuel consumed

the Authority to be bound by all measures taken by the Owners to secure payment of salvage and fix its amount.

- 17.
- (a) If the trawler breaks down on her voyage to the selected fishing grounds, or on her return voyage to the United Kingdom, payment of hire will forthwith cease and will not resume until such time as the voyage can proceed
 - (b) If the trawler by reason of a defect cannot proceed on the voyages referred to in (a) above at her normal speed charter hire shall not be payable by the Authority in excess of the amount which would be payable if the voyages were being undertaken by the trawler at her normal speed.
 - (c) If by reason of a defect or break-down of the trawler the objectives set out in Appendix I cannot be carried out to the satisfaction of the Authority then payment of hire shall forthwith cease until the Authority are satisfied that she is in an efficient stage to resume working for those purposes
 - (d) /

(d) In the event of any of the circumstances referred to in sub-paragraph (a), (b) and (c) above where the break-down or defect is a direct result of work being carried out by the Authority in furtherance of the objectives set out in Appendix I then payment of charter hire in accordance with this Agreement shall not be affected

(e) If the trawler cannot proceed in accordance with sub-paragraph (a) of this clause or resume working in accordance with sub-paragraph (c) within a period of fourteen days the Authority may terminate this hiring and in that event no further payment shall be due to the Owners save only in respect of any sums which may be payable in accordance with Clause 10 of this Agreement.

18. SHOULD THE trawler be driven into port or into anchorage or be unable to carry out the purposes of the hire by reason of stress of weather such detention or loss of time shall be at the Authority's risk and expense. Except as hereinbefore provided the Owners and the Authority hereby mutually exempt each other from all liability arising from any Act of God and the Queen's enemies fire restraint of Princes, Rulers and people and all other dangers or accidents of the sea rivers and navigation.

19. IN THE event of the loss of the trawler the Authority shall only pay for the hire up to and including the date of the loss.

20. ANY FISH caught on the voyage will be landed and sold by the Owners as directed by the Authority. The gross value of the catch to be divided as follows:-

75% to the Authority

25% to the Master and crew

of the trawler to be shared between them by the Owners in the same proportions as the proceeds of a normal catch. The latter is an ex gratia incentive payment by the Authority's Principals to encourage the crews' co-operation on this unusual voyage.

21. ANY DISPUTE arising under this Agreement to be referred to arbitration in London (or such other place as may be agreed) one arbitrator to be nominated by the Owners and the other/

APPENDIX I

Purposes for the hiring of "Luneda"

Exploratory Fishing Voyage in Deep Water in North East Atlantic

This project is to be carried out on behalf of the Ministry of Agriculture, Fisheries and Food, by the White Fish Authority, Industrial Development Unit. Technical responsibility rests jointly with MAFF Fisheries Laboratory, Lowestoft, DAFS Marine Laboratory, Aberdeen, and MAFF Torry Research Station, Aberdeen, and the Industrial Development Unit of the White Fish Authority.

The objective of the proposed voyage is to locate and fish commercially significant quantities of fish of deep water stocks previously surveyed which may be sold on the open market in the U.K. The voyage of about fourteen days duration will involve proceeding from Fleetwood to areas of good fishing recently reported by F.R.V. "Cirolana". Associated objectives may have to include development of refinement of methods for detection, capture and preservation of the catch.