



Accident Report  
*Ocean Reward*  
Serious Injury to Crew member  
at Sea on 6 April 2004



## KEY EVENTS

- 1.1 On Wednesday 28 April 2004, the trawler ***Ocean Reward*** departed Port Nelson bound for fishing grounds on the Challenger Plateau broadly west of Cape Egmont. On board was the Skipper and five crew. There was also a Chief Engineer (C/E) from another deep-sea vessel on board to help familiarise and train the engineer.
- 1.2 The vessel arrived at the fishing grounds and started to bottom trawl for Orange Roughy.
- 1.3 During the evening of Wednesday 28 April 2004 the trawl net came fast upon an obstruction on the sea floor. The Skipper attempted to retrieve the net by hauling in on the trawl winches.
- 1.4 At about 2100 hours New Zealand Standard Time (NZST), and while still fast, one of the hydraulic automatic relief valves failed allowing the trawl wire to pay out. The winch was braked by the Skipper but was rendered inoperable due to the valve failure.
- 1.5 Shortly after this the C/E and the vessel's trainee engineer commenced an investigation of the problem. They liaised with shore based hydraulic specialists to help them rectify the faulty valve. During this time the vessel was hanging downwind of the trawl net with the variable pitch propeller set to zero. While in this position the winches ran out on two occasions allowing more wire to escape from the drum.
- 1.6 At approximately 0100 hours, on Thursday 29 April, the faulty valve was repaired and put back into commission. At 0200 hours the trawl net was retrieved and back on deck.
- 1.7 The C/E checked the hydraulic system that runs the tension control of the trawl winches and found a forty bar difference in pressure. This was pointed out to the Skipper who agreed that it would be okay to shoot the trawl with the system 'as is.'
- 1.8 Both engineers went to bed shortly after this while the vessel steamed off to a new fishing area.
- 1.9 The C/E and the vessel engineer both got up at around 0800 hours. The C/E found that the Skipper had not yet shot the gear so he remedied the difference in oil pressure. The Skipper then shot away.
- 1.10 In the early afternoon the same day, a leak in a hydraulic pipe was reported by one of the crew to the Skipper. Both engineers then went and investigated and found a leak in a return pipe from the winches to the hydraulic oil reservoir. This leak was located on the deckhead in the factory deck.
- 1.11 The C/E reported back to the Skipper that the repair would need the winches to be shut down. As the net was in the water, and in the first hour of a four-hour tow, it was decided to keep towing and the Skipper would shut down the hydraulic winch system and isolate the hydraulics.
- 1.12 All winch hydraulics were shut down which automatically activated the spring brakes on both drums. The engineers then started to repair the leak in the factory deck.
- 1.13 At about 1400 hours, both engineers were working on the leak. This was accomplished, in part, by the C/E heating up the screws on joining flanges on the pipe and then the vessel engineer would go in and loosen the cap screws and then tighten them up in turn to re-seal the flange.
- 1.14 They had finished the first flange and the C/E was part way through heating the second flange, when the winch ran out, causing oil to be forced out through a fracture in the flange area. This vaporised and ignited on the hot steel of the flange, creating a ball of flame, which totally engulfed the C/E and partly engulfed the vessel engineer. The fire burned for only a matter of seconds and left the factory deck full of smoke.



- 1.15** Both engineers exited the factory and went into the accommodation area. The vessel engineer had singed hair and was okay but the C/E received burns to his head and arms. They alerted the Skipper who organised first aid be given to both engineers.
- 1.16** After both engineers were attended to, the trawl was hauled and the vessel returned to Port Nelson.



## KEY CONDITIONS

### 2.1 Vessel Details

- 2.1.1 ***Ocean Reward*** is a Deep-Sea trawler of steel construction built in 1998. She has an overall length of 27 metres and a breadth of 8.52 metres. A single 890 kW main engine powers the vessel through a variable pitch propeller.
- 2.1.2 Ocean Products Limited of Motueka owns ***Ocean Reward***.
- 2.1.3 The vessel has a valid Safe Ship Management (SSM) Certificate with Lloyds Register of Shipping. The vessel was fit to ply unlimited. She also has classification with Bureau Veritas.

### 2.2 Key Personnel

- 2.2.1 The Chief Engineer holds a 1st Class Diesel Trawler Engineer Certificate (1DTE) obtained in August 1989. He is currently employed by Amaltal Fishing Limited as a Chief Engineer on one of their large deep-sea factory vessels.
- 2.2.2 The Vessel Engineer holds no maritime engineering qualifications. He is employed as a trainee engineer on the vessel and is required to undertake general maintenance only.
- 2.2.3 The Skipper holds a New Zealand Offshore Master's Certificate (NZOM) obtained in 2001. He has been Skipper of ***Ocean Reward*** for two years and was relief Skipper / Mate before that.

### 2.3 Medical Assessment

- 2.3.1 The Chief Engineer sustained extensive burns and blistering to both arms with some sloughing of the skin. He also received some burns to the left side of his face. The Vessel Engineer received burned hair and burned facial hair.

### 2.4 Weather Details

- 2.4.1 The wind at the time was about 20 to 25 knots from the southwest with a 2 to 3 metre swell.

### 2.5 Winch Details

- 2.5.1 Rapp Hydema AS of Norway manufactured the winches on *Ocean Reward*. The model is a TWS 3000 series which operates at an oil pressure of 175 bar.
- 2.5.2 The Nelson agents of these winches provided information that the return line that was being repaired had a pressure of approximately 120 bar. Repair of that line should only be attempted with no load on the winches, i.e., trawl gear on deck. The agent also noted that towing the net while the winches are spring braked is not recommended, and that in an emergency repair situation, that weight should be removed from the winches by stopping the vessel or backing up on the trawl net on the bottom.
- 2.5.3 The winches basically had three methods of being braked. One was when fully operational using hydraulic oil alone. The second, using the mechanical spring brakes and residual oil pressure in the return line, and lastly using the spring brakes alone. This last method would be highly unlikely to hold the winches when under load.



## **2.6 General**

- 2.6.1** While both engineers were attempting to fix the hydraulic oil leak in the factory deck, the trawl net was in the water being towed. At this point the Skipper was doing a long 4-hour tow over flat bottom.
- 2.6.2** Due to the nature of the bottom it would be expected that the risk of an uncontrolled winch run-out would be greatly reduced.

## **2.7 Fracture**

- 2.7.1** A fracture was found to be close up to a weld attached to a through deck head flange on the hydraulic oil return line.



## CONTRIBUTING FACTORS

*N.B. These are not listed in order of importance.*

- 3.1 The extra loading when towing in rough weather while the winches were shut down and spring braked only.
- 3.2 No mechanical braking device was available to render the winches completely dead and locked in position.
- 3.3 The Skipper and C/E decided to repair the leak while still towing instead of retrieving the net first.
- 3.4 Both engineers failing to correctly identify the return line and therefore not realising that there would still be a high residual oil pressure of about 120 bar.

## CAUSE

- 4.1 The winch brakes failed allowing the drum to rotate while under load, forcing residual oil out of the fracture.



## OPINIONS & RECOMMENDATIONS

### 5.1 Opinions

5.1.1 The vessel winch brakes have undergone shore-based repair since the accident.

### 5.2 Recommendations

5.2.1 That Ocean Products Limited immediately issue a memorandum to their Skippers that when undertaking major repairs to the trawl winches that the trawl net be kept on deck for the duration of the said repairs.

5.2.2 That the vessel engineers correctly identify hydraulic oil pipes before repair is commenced.

