Story of

This is a story of failure – and success. The loss of 50,000 tons of oil anywhere at sea, and grave damage to a ship, is a disaster in anybody's language. But the salvage of *Metula* with over 75% of her cargo, in so remote a location and such hostile conditions, was remarkable enough for the experiences and lessons learnt to be shared with the whole shipping world.

The story behind the grounding and subsequent refloating of the 200,000-ton tanker *Metula* – which went aground with a cargo of 190,500 tons of oil in the Straits of Magellan on August 9 last year – was revealed at a public presentation at Shell Centre in London in February.

A number of Shell marine experts unravelled a complex web of circumstance, organisation and expertise that covered the 63 days between the vessel's arrival at the Straits and the end of the salvaging operations.

The presentation was for representatives of the international shipping industry and a wide range of international bodies concerned with all aspects of safety, insurance and salvage.

Captain Alec Dickson, Manager of Shell International Marine's Operational Services, explained that the reason for the presentation was the hope that others could learn from the experience and improve the oil industry's 'accident threshhold'.

First, Captain Bill Lawrence discussed the navigational circumstances surrounding the accident. 'Probably the first question that will spring to mind is "Why was the *Metula*, a VLCC, in the Magellan Straits?",' he said.

He pointed out that the Straits had been widely used and were adequately charted, well marked and lit. 'It was our judgement that the Magellan, whilst always a challenging navigational problem, was no more so for VLCCs than for the many ships which regularly use this passage. Therefore we concluded that the Magellan was suitable for VLCCs and this view was confirmed by the Chilean Maritime Authorities, whom we consulted early in 1974.'

Three VLCCs had navigated the Straits without incident or difficulty before the *Metula* accident. Since then there had been two loaded and two ballast voyages.

'The grounding is still the subject of official enquiries, but our own investigations have established that there was no failure of the ship's equipment, and that the ship's size in no way contributed to the grounding,' said Captain Lawrence.

An urgent telegram

The initial response to the accident was reported by Captain Hans den Ouden, Fleet Manager of Shell Tankers BV – operators of the *Metula* – in Rotterdam.

'Our first knowledge of the casualty was an urgent telegram from the Master, which reached us at 7.30 a.m. on Saturday, August 10, and stated that the ship was solidly aground forward over a length of about 80 metres.'

A number of tanks had been ruptured and between 5,000 and 6,000 tons of bunkers and cargo had been lost.

'The situation was bad at the time, but not hopeless – provided rapid transfer of cargo and ample tug assistance could be available.' An immediate search began for tugs and tankers for taking off the oil.

But on the following day the Master of *Metula* reported the bad news that the heavy tidal current had swung the *Metula* about, grounding and rupturing the bottom of her aft section.

Early that day, members of a joint salvage team of senior marine personnel of Smit International and Shell had already started the long flight from Europe to the tip of the South American continent. A special pollution advisory team was on the scene shortly after.

Under advice from the salvage and pollution teams, a vast amount of equipment had to be acquired and flown in. This included fenders from Houston, pumps and hoses from Rotterdam, the U.K. and San Francisco, oil dispersant from Brussels and Houston.

Problems for the salvage team

The complexities of refloating the *Metula*, and the removal of its cargo, were described to the conference by Maurice Holdsworth of Shell International Marine.

The main problems confronting the salvage team – headed by Rom Colthoff, of Smit International, and Captain Dirk Jongeneel, of Shell Tankers BV – were the strong winds and currents. A further complication was that the periods of 'slack water' were shortlived.

If the *Metula* was to be refloated, it would have to be between the periods ▶

How help arrived

Fast and massive planning was needed to bring the specialised salvaging equipment, tugs and tankers to the remote Magellan Straits.

August 9
Metula grounded

19 days –
assembling equipment and preparing for cargo offtake

17 days –
taking off oil into the *Harvella*

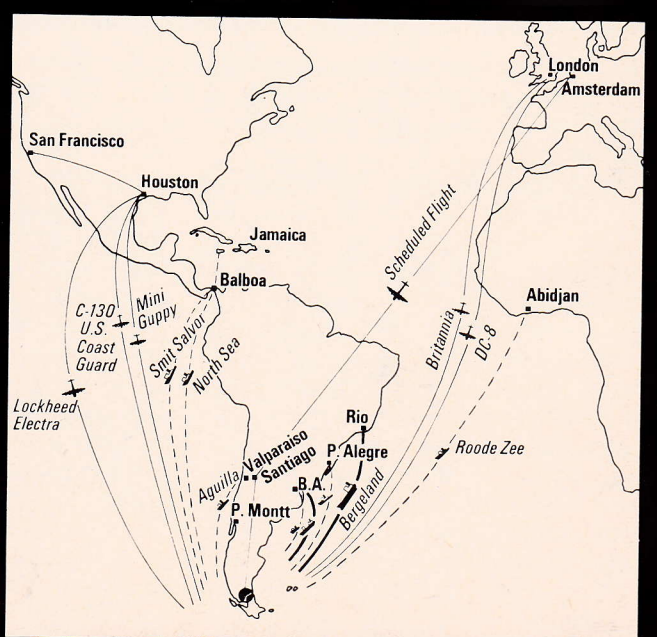
11 days –
preparing for refloating

September 25
Refloated

16 days –
transfer of rest of oil

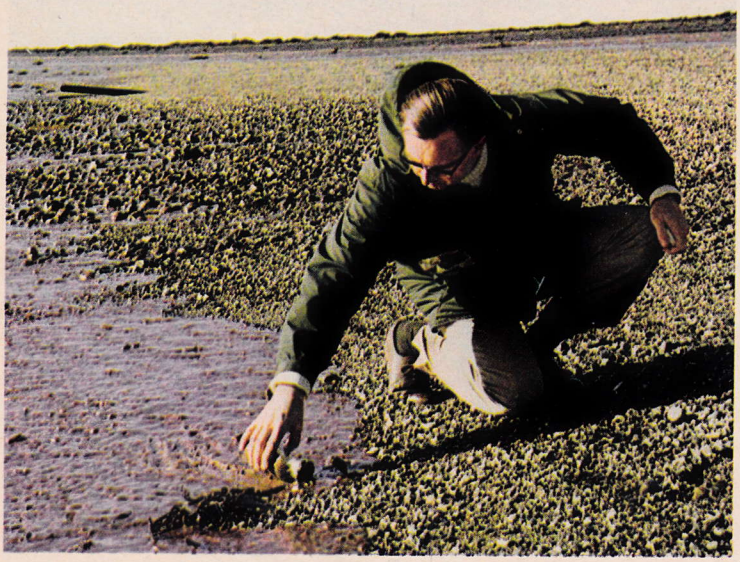
32 days –
preparation for towage

November 12
Metula leaves



a salvage

The tug *Zwarte Zee* is moored alongside the *Metula* as the stricken tanker lies low in the water in the Straits of Magellan. The *Zwarte Zee* was one of two tugs that towed the *Metula* from the Straits after refloating. Photographs by Mike Jolivet.



John Butt, one of the pollution advisory team called in to advise on clean-up procedures, inspects the shoreline at Punta Espora. Fortunately, there was little ecological damage.

Officers of the *Metula* take in the mooring ropes as the *Harvella* comes alongside. The *Harvella* transferred a total of 50,000 tons to the *Bergeland*, anchored nearby.

of high water. And it would need a rapid increase in buoyancy, because if she were not refloated before the succeeding high water, the current could push her farther up on the bank – in which case she would probably be irretrievably holed.

In an effort to gain this rapid increase in buoyancy, it was decided to attempt to transfer some of the oil to another tanker, replace this oil with ballast water, and discharge this water when the time came for the refloating attempt.

The 19,000-ton Shell tanker *Harvella* was called in for this operation. The very strong currents and their direction in relation to *Metula* made bringing *Harvella* alongside very difficult. The first two attempts failed, but after a different approach manoeuvre, the third attempt succeeded.

The *Harvella* then made three more successful transfers of oil from the *Metula* – making a total of 50,000 tons between August 28 and September 13. This was retransferred to the 90,000-ton tanker *Bergeland,* and delivered to Quintero Bay.

Computer calculations

Preparations for refloating were now nearing completion and it was decided to make an attempt in the Neap tides between September 21 and 26. Lloyds Register of Shipping was involved in computer calculations of buoyancy and structural stress.

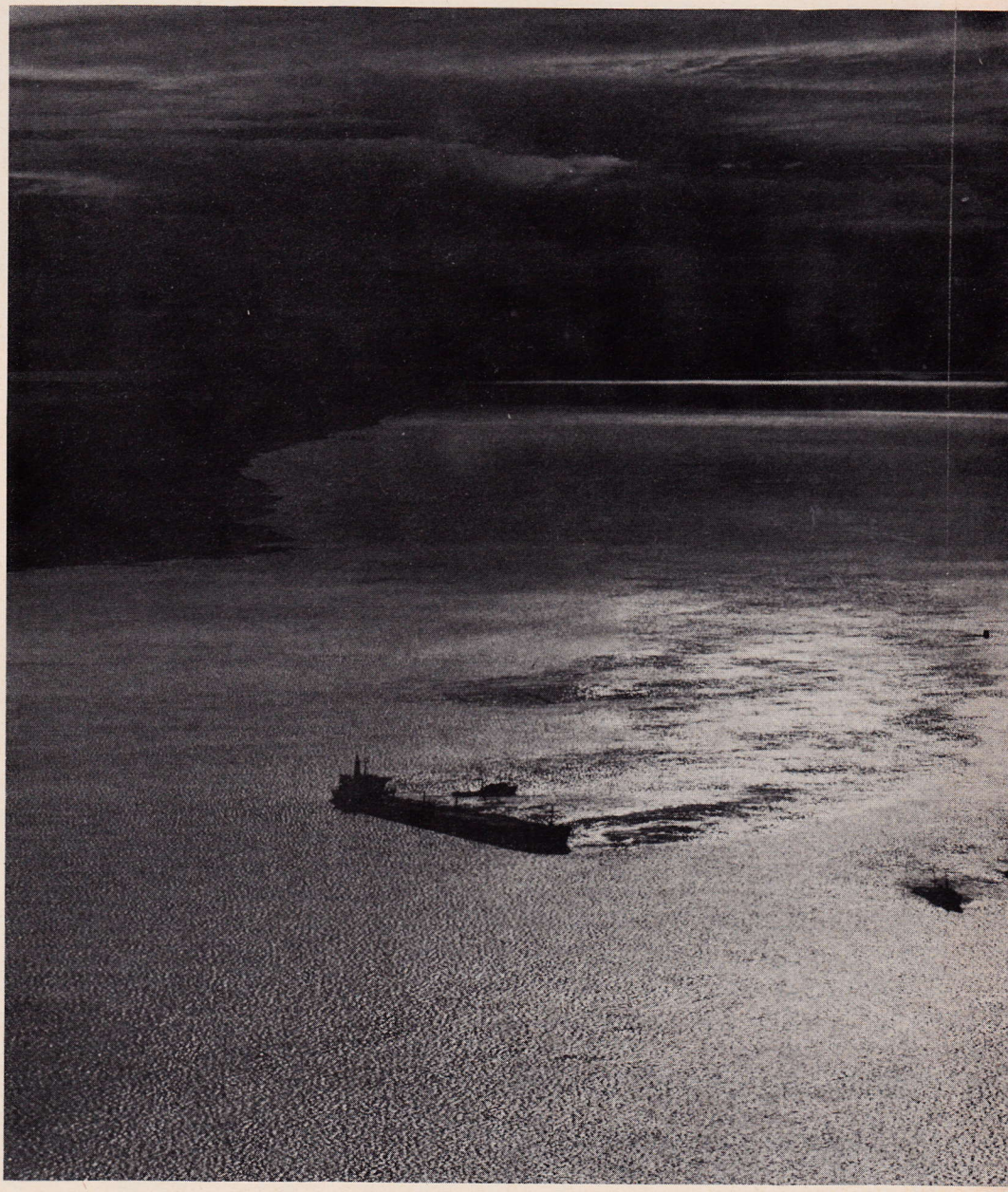
The main problem was to discharge the ballast water rapidly enough to achieve sufficient buoyancy to refloat in the 10 hours available between one high water and the beginning of the west-going current three hours before the next high water.

The plan adopted incorporated four separate means of obtaining buoyancy – the run-down by gravity of the intact tanks; the pumping of the water bottoms in the intact tanks; continual air pressurisation of the ruptured tanks and the rapid discharge of air from the empty cargo and ballast compartments to any compartment requiring extra buoyancy.

On the afternoon of September 24, 'all systems were go'. But the *Metula* remained fast.

'The team had to make a quick decision. Should they open the tank suction and release the pressurisation to sit the ship down again? Or should they hold on to the buoyancy gained, risk a movement up the bank at high water, and hope to continue pumping and pressurising with a view to refloating on the next slack water rising tide 12 hours later?

'They decided immediately on the latter course.'



She suddenly started to move

At 2.15 a.m. on September 25, at the beginnings of the flood tide, the *Metula* suddenly started slowly to move ahead. Three powerful tugs were able to overcome the current and *Metula* was at last afloat in deep water. She was towed to Bay Felipe, some 20 miles away, and by 10.15 a.m. was anchored.

It was there that the tanker *Bergeland* took off 90,000 tons of oil from *Metula* over eleven days, leaving some 3,500 tons of cargo distributed as an inches-deep layer in each cargo tank on top of the ballast water.

After detailed investigations, calculations and adjustments, the *Metula* was towed at an average speed of 5.5 knots to a quiet anchorage at Isla Grande, 70 miles west of Rio de Janeiro, to await a decision on her future. By this time, the *Metula* had lost some 50,000 tons of oil – mainly at the point where she had gone aground.

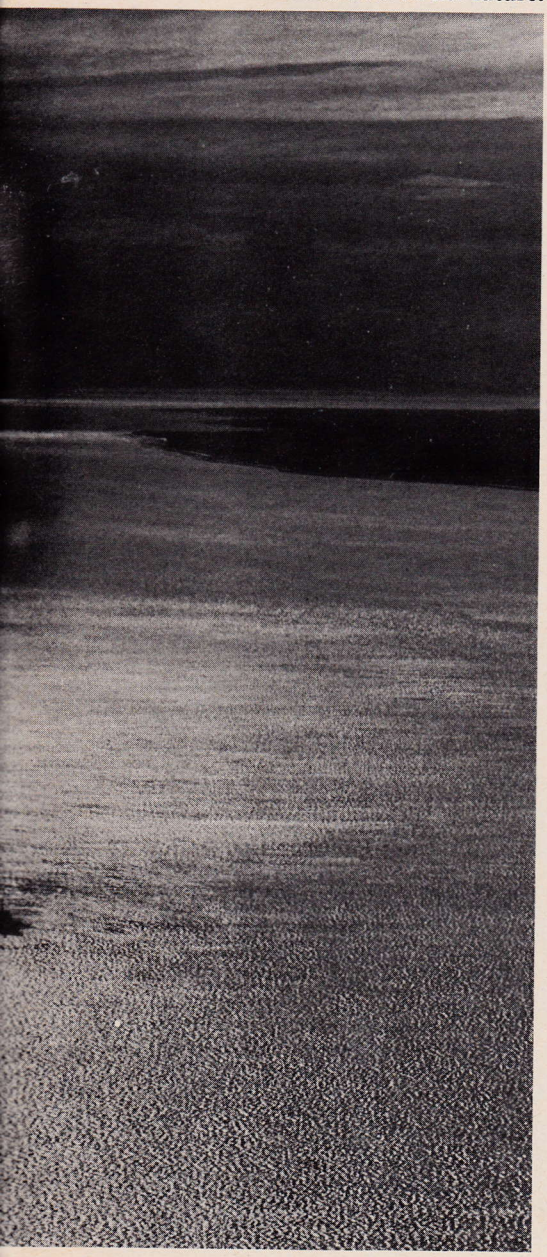
The pollution and ecological consequences were discussed at the meeting by John Butt of Shell International Marine, who – with Rex Palmer, of the Protection and Indemnity Club, and John Wardley-Smith of Tovalop – formed the pollution advisory team.

The Chilean authorities had delegated authority to the Naval Commander-in-Chief at Punta Arenas, Admiral E. Allen (who spoke at the presentation).

'Throughout we had the closest possible consultation and every action taken had

Harvella **alongside the stranded** ***Metula***. **In very difficult conditions she took off four loads of oil. Special tribute was paid at the conference to the extremely skilful way in which this was done.**

More than 13 weeks after the grounding, ***Metula*** **under tow on the way to Isla Grande, 70 miles west of Rio, where she awaits a decision on her future.**



his full support,' said John Butt.

While the rough conditions of the Straits posed problems in salvage, it proved a helpful factor in minimising the seriousness of pollution and ecological damage.

On the shore

The ever-prevailing north winds blew most of the oil out into the Atlantic and those parts of the shoreline that were polluted were largely uninhabited and of little amenity value.

Mr Butt said that up to 24,500 tons had probably dispersed naturally and would rapidly biodegrade. Some 17,500 tons would have evaporated and 500 dissolved – leaving about 7,500 tons deposited on the beaches.

Dr. Jennifer Baker, of the Orielton Field Study Centre Oil Pollution Research Unit, was called in by Shell as an independent observer to report on ecological damage.

'It is her plan to discuss this at the Institute of Petroleum Conference in April and to publish her findings at the same time.'

Summarising the conclusions of her report, Mr. Butt said that the kelp-beds – key to the marine life in that area – appeared to be unaffected. The estimate of birds killed was between 1,000 and 1,500 – mainly cormorants, and including about 100 Magellan penguins. Many thousands of these birds were safely in their breeding colonies by October 2, 'so it seems unlikely that the population as a whole will be much affected.'

Lessons to be learned

Captain Dennis English summed up by saying: 'If there is one overall lesson to be learned from this casualty – apart from the eternal need to minimise accident causes – it is that very large tankers can be salved and oil spill limited, even under such extreme difficulties as you have heard described.

'But the margin between success and failure in this salvage – and, for that matter, in the stranding – were narrow.

'As always after major accidents – our own and other people's – we have searched the known facts to see where and how we can improve.

'The successful salvage depended, in the first instance, on Shell being able and willing to disburse several million dollars at short notice. If salvors may be increasingly reluctant to put themselves to enormous financial risk of offering services in major casualties on "No cure – no pay" terms, this can only mean that someone else has to put his money on the table immediately,' commented Captain English.

'Might it not, therefore, be considered whether arrangements can be worked out to give shipowners the immediate capability of funding an operation?'

Captain English paid tribute to the skills of the salvors and the other specialists who took part in the various operations that followed the grounding.

'Mention must also be made of the extraordinary amount of help given enthusiastically – sometimes at nominal or no charge – by a wide variety of organisations and individuals in Chile and far away. It does reveal that the world at large has a genuine concern to help ships in distress.'

He added: 'Because of its location and complexity, this casualty posed an enormous and costly communications burden which stretched from Europe to Punta Arenas up to San Francisco and eastwards to Tokyo – touching most places in between.'

The operational needs covered the salvage and pollution teams on site; the affected Governments, contractors and suppliers; the charterers; cargo owners; insurers and others commercially concerned.

The presentation was a further exercise in communications, he said, 'intended to share our experiences with you for the advancement of safety and pollution avoidance in the tankers business.' □

'Your company has a reputation which I suggest is unparalleled by any other company in its contribution to marine and tanker safety. Today's presentation carries on a tremendous tradition of Shell's in making available to the industry your experience, to our great and continuing benefit'—Sandy Marshall, speaking for the International Chamber of Shipping.