PART IV CONCLUSION

21. FINDINGS

The Inquiry carried out by the Inspectors has covered in great detail the many events which occurred, and throughout the Inquiry the Inspectors received complete co-operation from all parties concerned. Needless to say, with so many people having played a part in the incident and with approximately 100 interviews having been carried out by the Inspectors, there has been some conflict in the evidence. This is not surprising when those people interviewed were having to remember details of many different events which were spread over a period of six days. The Inspectors did not feel that anybody was trying to mislead them, it was simply a case that where no detailed records of events were kept as they took place the recollections of various persons differed. In such cases the Inspectors have had to use their own knowledge and experience to come to conclusions as to what they consider was the most likely chain of events.

To reach their findings the Inspectors have also had to rely to some extent on supposition, but this was consistent with good, unbiased investigatory work. I consider that the findings given in this section of the Report are a true reflection of the actual events which occurred and I support their conclusions.

To give readers of the Report a fuller understanding of the various findings, inserted after each finding are cross references to the appropriate paragraphs in either the main body of the Report or the Annexes where that subject is discussed.

The findings of this Inquiry are as follows.

21.1 SEA EMPRESS first grounded on the western edge of Middle Channel Rocks, 230 metres west of Middle Channel Rocks Light, in a depth of approximately 15.9 metres. [Paragraph 5.27]

21.2 The immediate cause of the grounding was pilot error, namely his failure to take appropriate and effective action to keep the vessel in the deepest part of the Channel. [Paragraph 5.14]

21.3 The pilot's error was due in part to inadequate training and experience in the pilotage of large tankers. [Paragraphs 6.5, 6.6]
21.4 The pilot would have appreciated at an earlier stage in the approach that the vessel was being set to the east if it had been the normal practice to use the Outer Leading Lights for all approaches to the West Channel.
[Paragraphs 5.14, 5.15]

21.5 When the effect of the set was noticed, the Master failed to appreciate that the action then ordered by the pilot would not be adequate.
[Paragraph 5.18]

21.6 The pilot and the Master had not discussed and agreed a pilotage passage plan, as a consequence neither the Master nor the Chief Officer knew what the pilot's intentions were.
[Paragraph 5.21]

21.7 The Master failed to follow the standing orders of his Managers with respect to pilotage matters.
[Paragraphs 5.17, 5.18]

21.8 SEA EMPRESS had no known deficiencies and was in a seaworthy condition prior to the grounding.
[Paragraph 5.3]

21.9 All certification for the vessel and her crew was valid in accordance with the Flag State and Convention requirements.
[Paragraph 2.3]

21.10 The pilot and the ship's Bridge Team were adequately rested before starting their respective duties.
[Paragraphs 3.2, 6.4]

21.11 There were no communication difficulties between the pilot and the Bridge Team which might have contributed in any way to the causes of the grounding.
[Paragraphs 5.4 - 5.6]

21.12 The anchors were ready for use, with the anchor party forward, before the vessel entered the West Channel.
[Paragraph 3.3]

21.13 The use of an escort tug in the approach to the West Channel would not have avoided the initial grounding, but it might have avoided the second grounding.
[Paragraphs 9.3, 9.4]

21.14 The standards of training and examination of pilots at Milford Haven are unsatisfactory and in need of improvement.
[Paragraph 6.7]
21.15 There is a confrontational relationship between Milford Haven Port Authority and the pilots. This cannot be conducive to the safe operation of the port.
[Paragraph 6.11]

21.16 Although considered to be an important part of "best practice" in safe operations the fact that the port radar installation was not operational did not contribute to the initial grounding.
[Paragraph 7.4]

21.17 All of the organisations involved with the salvage of SEA EMPRESS had an interest, commercial or otherwise, in seeing that the salvage operation was concluded promptly, at minimum risk to human life and with minimum damage to the environment.
[Paragraphs 13.7, A.8, B.1, B.6]

21.18 The damage control efforts of the crew, to correct the list of SEA EMPRESS following the initial grounding, were well considered and effective.
[Paragraphs D.1.6, D.1.33]

21.19 Initial contractual salvage arrangements between the managers of SEA EMPRESS and the salvors were completed quickly and effectively.
[Paragraphs D.1.8, D.1.10, D.1.32]

21.20 The decision to move the SEA EMPRESS with a draught of 23.5 metres from the position of her grounding to deeper waters, in the early hours of Friday 16 February, was prudent and allowed the casualty to be secured in a position where a proper assessment of her condition was possible.
[Paragraphs 3.11, 3.12, D.1.15, D.1.34]

21.21 The emergency command/control organisation of Milford Haven Port Authority and of the Marine Pollution Control Unit was set up very soon after the initial grounding of SEA EMPRESS and the Marine Pollution Control Unit’s owned salvage equipment was promptly available.
[Paragraphs D.1.5, D.1.13, D.1.30, D.1.32]

21.22 The salvage consortium mobilised their initial response personnel and resources promptly and efficiently.
[Paragraphs D.1.10, D.1.32]

21.23 The possible requirement for lightening tonnage was recognised early in the incident and a suitable commercial charter was promptly arranged.
[Paragraphs 3.15, 17.1, 17.7, D.1.11, D.2.8]
21.24 The initial inspection of the casualty by the crew, and that subsequently carried out by the Marine Pollution Control Unit and their advisers, in the early hours of Friday 16 February, did not fully identify which cargo tanks were ruptured.
[Paragraphs D.1.7, D.1.17, D.2.3]

21.25 The decision to hold SEA EMPRESS in the 'pool' was understandable and reasonable until the difficulties of holding the casualty were demonstrated on Saturday evening.
[Paragraphs 11.4, 15.17]

21.26 The decisions throughout the salvage operation not to send the casualty to sea were correct.
[Paragraphs 15.2 - 15.11, D.5.28]

21.27 The option of bringing the casualty up to Herbrandston Jetty on Saturday 17 February was not fully explored. The draught of the casualty could have been reduced sufficiently to have done so, although this would have had the possibility of leading to the release of some additional cargo.
[Paragraphs 15.12 - 15.24]

21.28 The casualty's technical managers had a contract with Lloyd's Register of Shipping, Ship Emergency Response Service (SERS). Due to a lack of accurate data on the damage to the casualty this facility could not be used to its full potential in the early stages of the accident. However, in the latter stages of the salvage operation this facility proved invaluable.
[Paragraphs 20.29, D.3.9, D.6.1, D.7.1]

21.29 The flooding and gassing of the pump room delayed any early lightening operation and was a factor in the escalation of the incident.

21.30 The large increase in the draught and list of the casualty due to the rupture of the empty starboard segregated ballast tanks in the initial grounding was a major factor in the escalation of the incident.
[Paragraphs 15.12, 20.25, A.14, A.15, D.1.24, D.1.35]

21.31 A number of non-essential personnel were allowed to board the casualty in the early stages of the salvage without consideration being given to the associated risks and they were ill-equipped for their evacuation which was later necessary.
[Paragraphs 16.2, D.3.2]

21.32 The salvors were diverted from their main task in order to attend meetings ashore early in the incident, partly due to a lack of effective representation of the Marine Pollution Control Unit and Milford Haven Port Authority on the casualty.
[Paragraphs D.2.11, D.2.13]
21.33 The decision on Saturday 17 February to turn the casualty to face the wind and sea was correct based on good seamanship practices and the information available. The principal reason for the loss of control of the casualty after the turn was that not enough consideration was given to the effect of the tidal stream and the casualty was positioned further south and across the tidal stream.
[Paragraphs D.2.15, D.2.30]

21.34 Once the casualty had been swept aground in the evening of Saturday 17 February and had slipped her anchors and cables, it was recognised that insufficient tug capacity was available on scene to hold her in position in the ‘pool’.
[Paragraphs 11.6, D.2.26, D.3.5, D.3.6]

21.35 The two large tugs under the control of The Coastguard Agency should have been mobilised and moved towards the scene of the incident soon after the initial grounding.
[Paragraphs 11.16, 11.18, D.3.6, D.3.19]

21.36 The salvors placed too much reliance on the total nominal bollard pull available and did not take account of the weather conditions, towage equipment and manoeuvring capabilities of each tug. Powerful AHTS vessels would have been more suitable to contain the situation and the salvors should have taken early steps to contract some of these types of vessels from the spot market.

21.37 The tug DE YUE, although very powerful and closest to the scene after the crisis on the night of Saturday 17 February, was not best suited, by the very nature of her design and her limited manoeuvring characteristics, to the task she was given.
[Paragraphs 11.8, C.5, D.4.19, D.4.20]

21.38 There were no serious communication difficulties between the salvors’ representative on DE YUE and her crew. However there was a difference of opinion, between the tug’s Master and the representative of the salvors on how the tug should best be positioned. This disagreement was a factor which led to the failure of DE YUE to contribute to the salvage operations.
[Paragraphs 11.8, 11.9, D.4.19]

21.39 The decisions to totally evacuate the casualty at various times during the salvage operation were all justified due to a real risk to safety of those on board.
[Paragraphs D.3.2, D.3.11, D.5.23, D.6.2]

21.40 After evacuating the casualty early Sunday morning personnel were in need of rest. Sufficient extra key personnel although mobilised had not arrived by that time to allow for two team working.
21.41 A significant opportunity to gain control of the casualty in the evening of Monday 19 February was lost due to insufficient preparations being made against the foreseeable likelihood of the casualty floating off. [Paragraphs D.5.7, D.5.25]

21.42 There was a failure of communication, between the salvors and the representatives of the technical managers of SEA EMPRESS, concerning the possible preparation of the casualty’s main engine for the operations on the evening of Monday 19 February. [Paragraphs 18.8, D.5.27]

21.43 The fact that permission was granted for the casualty to be taken to sea on the evening of Monday 19 February without all the facts being made known to those concerned in the decision making process reflects on the poor quality of communications between the Marine Pollution Control Unit advisors on board the casualty and those in authority ashore. [Paragraphs 3.30, 13,12(v), D.5.16]

21.44 The refloating attempt on Tuesday 20 February failed, because the tidal current held the casualty firmly against Saint Ann’s Head Shoal. Sufficient tug power could not be assembled and attached to the casualty in order to pull her away from the shoal in opposition to the tidal current. [Paragraphs 11.11, D.6.11, D.6.14, D.6.15, D.7.18]

21.45 The tow-off on Wednesday 21 February succeeded because on refloating, the casualty’s draught was such that she was clear of the shoal and the tugs were able to turn her end on into the tidal stream which lessened the load on the hull and allowed them to tow her clear of Saint Ann’s Shoal. [Paragraphs D.7.18]

21.46 The most important factor in the escalation of the incident was the lack of full understanding of the tidal streams within the ‘pool’ and its immediate vicinity. [Paragraphs 4.13, D.2.31]

21.47 The principal responsibilities of some persons within the command/control organisation ashore for dealing with the salvage operation were not clearly defined and this led to some confusion. [Paragraphs 12.8, 12.13 - 12.15]

21.48 After the initial stages the incident was outside the scope of Milford Haven Port Authority’s emergency plans. [Paragraph 12.9]

21.49 The full involvement of the Marine Pollution Control Unit in a salvage incident should have been allowed for in the Milford Haven Port Authority’s emergency plans. [Paragraphs 12.8, 12.27]
21.50 Key technical personnel of the Marine Pollution Control Unit should not have been diverted from their primary tasks to brief the media at important stages of the salvage. [Paragraph 16.8]

21.51 The Marine Pollution Control Unit did not have enough staff dedicated to the salvage operation to cope with all their responsibilities. [Paragraphs 16.8, D.3.20, D.4.23]

21.52 The mechanisms for approving salvage plans by the Marine Pollution Control Unit and Milford Haven Port Authority could not keep pace with the salvage process. [Paragraphs 13.12(v), 13.13, 13.15, D.6.9, D.6.10]

21.53 Notwithstanding the secondment of the Ministry of Defence Salvage and Mooring Officers as advisors to the Marine Pollution Control Unit, it is considered that the Government should have been advised by a commercial salvage expert. [Paragraphs 12.21, 13.9]

21.54 The use of helicopters, whether military or commercial, for transporting personnel and equipment, proved to be of great value during many stages of the salvage. [Paragraphs D.3.3, D.4.9, D.4.11, D.4.13, D.4.25, D.5.6, D.7.7]

21.55 When the Marine Pollution Control Unit were unable to obtain readily the services of any vessel considered suitable for lightening the casualty, in the position where she grounded on the night of Tuesday 20 February, they were justified in underwriting potential commercial losses of an owner in order to ensure the availability of its vessel. [Paragraphs 17.9-17.13]

21.56 The onshore management team became too large and unwieldy to cope with a rapidly moving salvage incident, did not have a clear authoritative leader and communications between the team and the salvors was poor. The salvage incident would have been better managed by a small command team, acting as a single unit, with a clear leader and fully operational on a 24 hour basis. [Paragraphs 13.19, D.4.4, D.7.2]

21.57 The Marine Pollution Control Unit's Overall Commander would have been better placed in Milford Haven in direct contact with the casualty and other key members of the onshore management team rather than remaining at the Marine Emergency Operations Room in Southampton. [Paragraphs 13.12(v), 13.18, D.5.16, D.6.6]

21.58 The Marine Pollution Control Unit's National Contingency Plan is deficient in that it does not deal clearly with their involvement in the salvage of a vessel within harbour waters, does not define some key terms used which makes it difficult to positively interpret, and does not define how an escalation to a higher stage is accomplished. [Paragraphs 12.10, 12.15, 12.26-12.28]
During the night of Tuesday 20 February there was genuine confusion as to whether the Government were about to intervene. The powers of intervention under the Merchant Shipping Act were not invoked at any time during the incident, although evidence suggests that the possibility of intervention was used to influence the salvage.


Reputable salvors were engaged and they were clearly expending effort under difficult circumstances. The formal use of powers of intervention or direction would therefore have been inappropriate, either by the Government or Milford Haven Port Authority.

[Paragraph 14.20]

The salvors were reacting to the developments which were occurring, rather than anticipating them, which indicates a weakness in their strategic planning of the salvage.


There was no major failure of any machinery, equipment or system on the casualty which contributed to the outcome of the incident.

[Paragraph 18.25]

Due to the complexity and sophistication of the machinery systems on board SEA EMPRESS, the salvors experienced difficulty in operating on board generators without the assistance of the casualty’s crew.

[Paragraphs 18.25, D.4.9]

The casualty is estimated to have lost about 2,500 tonnes of oil because of the initial grounding and from then until she grounded again on Saturday 17 February the oil lost was negligible.

[Paragraphs 15.17, 19.9]

A total of 71,800 tonnes of oil was lost to the sea and 58,200 tonnes were recovered from the casualty. The total oil lost was an accumulation of individual large oil losses which occurred when the casualty was stranded over low water periods. No evidence could be found to show that oil was deliberately discharged into the sea.

[Paragraphs 19.2, 19.8, 19.15]

It is probable that oil pollution would have been avoided in the initial grounding if SEA EMPRESS had been constructed to the double hull design.

[Paragraphs 20.18, 20.31]

The initial grounding caused bottom raking damage which was 36% greater than that allowed for in the current International Convention for the Prevention of Pollution from Ships (MARPOL).

[Paragraph 20.4]
22. RECOMMENDATIONS

Based on the Inquiry into the whole incident and the findings of the Inspectors, a number of recommendations are being made. If implemented, these recommendations should prevent recurrence of a similar grounding and help towards a successful outcome to any future salvage operation which might be necessary.

Some matters considered in the course of the Inquiry call for attention and have therefore led to recommendations even though, upon examination, they did not prove to bear upon the incident. It follows that the recommendations below must not be read in isolation as an indication of causative factors.

To give readers of the Report an understanding of the reasoning behind the recommendations, inserted after each one are cross references to the appropriate findings which led to that recommendation or where there is no finding the appropriate paragraphs in the Report.

In the course of the Inquiry four interim recommendations were made. The first of these, which was addressed to the Milford Haven Port Authority, was issued on 20 September 1996. It was:

"Trials should be conducted with a number of large tankers to prove the practicability of making an approach to the Western Channel entrance from sea along the line of the 022 Outer Leads, when the tidal stream to seaward of the entrance is flooding, that is setting in an easterly direction.

Following completion of successful trials consideration should be given to making it the normal practice for inbound vessels under pilotage to approach the West Channel entrance along the line of the Outer Leads, unless there are valid reasons for not so doing."

[Paragraph 21.4]

Milford Haven Port Authority have accepted in principle this interim recommendation by proposing to conduct further simulation trials in advance of any practical trials involving large tankers.

The other three interim recommendations were addressed to the Shipping Policy Directorate of the Department of Transport and were issued on 22 November 1996. They were made at that time as it was appreciated that for action to be taken on them changes to primary legislation might be required and a Merchant Shipping Bill was currently before Parliament. The recommendations were:
"To clarify the status of the Marine Pollution Control Unit's National Contingency Plan by giving it formal recognition in the Merchant Shipping Act."
[Paragraphs 21.47, 21.58]

"To consider clarifying the scope of the Secretary of State's intervention powers to include directions to a Harbour Authority, Harbour Master or pilot under section 137 of the Merchant Shipping Act."
[Paragraphs 12.13, 14.22]

"To review the current powers available to the Marine Pollution Control Unit to charter ships, aircraft and other equipment quickly in the case of a pollution incident, including the possibility of standing commercial arrangements to allow the immediate release of such vessels, aircraft and equipment in the event of such an incident."
[Paragraphs 14.22, 17.11]

The further following recommendations are now made and addressed to the person or body who in my opinion is most fitted to implement them:

**Milford Haven Port Authority**

1. The Pilotage Authorisation Committee should amend the qualifying requirements for authorisations to perform pilotage on vessels in excess of 30,000 dwt. The requirements for each of these authorisations should be based upon a minimum number of trips under instruction from another pilot, of which at least half are undertaken at night and at least half are inward trips from sea.
[Paragraphs 21.3, 21.14]

2. The Pilotage Authorisation Committee should improve the standards of examination of pilots. There should be an examination prior to the granting of any additional authorisation, not just initial authorisation to perform pilotage on vessels up to 30,000 dwt. Each examination should be in two parts, an oral part conducted ashore followed, if successful, by a practical part conducted on board one or more vessels when the candidate should be required to demonstrate his competency in pilotage to the satisfaction of the examiner.
[Paragraphs 21.3, 21.14]

3. Consideration should be given to the use of simulators as an additional means for both training and examining pilots.
[Paragraph 21.14]
4. The port radar surveillance system should be returned to a fully operational state and be provided with a continuous recording facility. It should be continuously monitored by a trained operator, fully instructed as to the type of vessel and circumstances when its navigation is to be monitored. In such a case, the intended track of the vessel must be known by the radar operator.

[Paragraph 21.16]

5. Pilots should be instructed to ask after boarding to see any pilotage plan prepared by the vessel. A plan to be followed, taking the vessel's own plan into account, should be discussed and agreed with the Master and then notified to the port radar operator. The level of detail of the agreed plan, which should either be in writing or drawn on the chart, should be appropriate for the particular pilotage to be carried out.

[Paragraph 21.6]

6. The boarding position off Milford Haven for pilots should be such that it allows sufficient time to agree the passage plan with the Master of the vessel and sufficient searoom to allow the vessel to be lined up for the agreed approach.

[Paragraph 21.6]

7. Reforms should be introduced in the management of the pilots. In particular they should consider abolishing their wholly owned subsidiary, Milford Haven Pilotage Limited, so that the pilots become direct employees of the Port Authority and managed by them on a day-to-day basis.

[Paragraph 21.15]

8. A comprehensive tidal stream survey should be conducted along the West Channel from the entrance buoys to a position on the line joining West Blockhouse Point and East Blockhouse Point, including the waters in the immediate vicinity of the Channel. The information obtained should be provided to all who require it.

[Paragraph 21.46]

9. A comprehensive revision of the Authority's Emergency and Pollution Plans should be undertaken utilising modern techniques for hazard identification and risk assessment. The revised plans should recognise the role of the Marine Pollution Control Unit (MPCU) and be compatible with their National Contingency Plan. They should also specify clearly the role of pilots on a casualty during a salvage operation and establish a clear procedure for the briefing and debriefing of pilots.

[Paragraph 21.49]

10. The consideration being given to the employment of an escort tug at Milford Haven should be advanced further.

[Paragraph 21.13]
11. Consider and discuss with the Hydrographer of the Navy an amendment to the Admiralty Sailing Directions "The West Coasts of England and Wales Pilot", (Approaches to West Channel, paragraph 5.89 lines 29-32), to make it clear which part of the Channel the subsidiary red leading lights indicate. [Paragraph 4.4]

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12. Steps should be taken to ensure that the Company standing orders to Masters on pilotage matters are understood and complied with. In particular, bringing the vessel's prepared pilotage passage plan to the attention of the pilot after he boards and discussing and agreeing with him a plan to be followed, taking the vessel's plan into account. The level of detail of the agreed plan, which should either be in writing or drawn on the chart, should be appropriate for the particular pilotage to be carried out. [Paragraphs 21.6, 21.7]

Marine Safety Agency/Department of Transport

13. National minimum standards of pilot training and examination in the UK should be prepared. It is noted that the Sub-Committee on Standards of Training, Certification and Watchkeeping (STCW) at the International Maritime Organization (IMO) has in its work programme an agenda item to consider developing provisions for the training and certification of maritime pilots and VTS personnel. [Paragraphs 21.3, 21.14]

14. Procedures should be developed and implemented for the effective monitoring of Competent Harbour Authorities' standards of training and examination of pilots. The involvement of District Marine Safety Committees should be considered for this purpose. [Paragraphs 21.3, 21.14]

15. To encourage the revision by the International Maritime Organization (IMO) of Regulation 26 of MARPOL 73/78 (as amended) to include the requirement that all oil tankers of 5,000 tonnes deadweight or more have as part of their Shipboard Oil Pollution Emergency Plan pre-arranged, prompt access to computerised, shore-based damage stability and residual structural strength calculation programmes. [Paragraph 21.28]

16. To encourage the revision by the International Maritime Organization (IMO) of Regulation 13 of MARPOL 73/78 (as amended) to include the requirement that every oil tanker of 5,000 tonnes deadweight and above shall be fitted with a double bottom over the area of the pump room. Consideration should be given to extending the requirement to include
double bottoms over the area of the engine room. The height of the double bottom to comply with the existing regulation 13F.3(b).
[Paragraph 21.29]

17. To encourage the International Maritime Organization (IMO) to increase the existing MARPOL regulations covering the extent of bottom raking damage in the light of the SEA EMPRESS grounding.
[Paragraph 21.67]

The Coastguard Agency/Department of Transport

18. To review commercially available systems which exist for receiving significant quantities of oil from a casualty without the need of the services of a lightening tanker. Should any system be considered to be of potential value in the operations likely to be undertaken by the Marine Pollution Control Unit, it should be included in their salvage/transfer equipment stockpiles.
[Paragraph 21.55]

19. To revise the guidelines covering the use of Intervention Powers to ensure that, in an incident where competent salvors have been appointed, the powers of intervention are used for the primary purpose of assisting the salvors to identify and expedite the salvage plan which best meets the wider public interest.
[Paragraph 21.59]

20. To review the effectiveness of the Marine Pollution Control Unit's role with regard to the salvage of a casualty and their relationship with the salvors. In particular, to consider the appointment of a specialist (a Marine Casualty officer) who would represent the Marine Pollution Control Unit on board a casualty, report directly to the Overall Commander on salvage matters, liaise with the Salvage Master, and approve and monitor the plans of the salvor.

21. To review those aspects of the Marine Pollution Control Unit's National Contingency Plan which deal with casualty, salvage, and the relationship between the National Contingency Plan and the emergency plans of port authorities.

22. To review the procedures for, and the priorities given to, the use of equipment, services and personnel of other government departments and agencies, including those of the military, by the Marine Pollution Control Unit during a marine emergency in order that there successful use, as was the case in the SEA EMPRESS incident can be ensured in the future.
[Paragraph 21.54]
23. To allocate technical staff dedicated to the task of briefing the media during major incidents, in order that no operational technical staff are distracted from their primary tasks. [Paragraph 21.50]

24. To review the procedures for the mobilisation and deployment of tugs under the control of the Coastguard in emergencies which threaten (whether perceived or actual) loss of life or major pollution to the UK coast. [Paragraph 21.35]