Clive Davidson

Mr Davidson has been the Chief Executive Officer of the Australian Maritime Safety Authority (AMSA) since May 1998.

In 1997, Mr Davidson had responsibility for the Australian government's initial public offer for the one-third float of Australia's national telecommunications carrier, Telstra.

In 1996, Mr Davidson was General Manager, Navigational Services in AMSA where he had responsibility for the Australia's marine navigation aids network.

From 1991 to the end of 1995, Mr Davidson spent four years in the United Kingdom as Projects Executive for Siemens Plessey Systems where he was responsible for the company's air traffic control systems development for the UK.

Mr Davidson has had over 25 years experience in the transport and communications arena working in all modal areas. He has a Degree in Mathematics (Operations Research) and has specialised in project management and financial evaluation for much of his career.

Mr Davidson also holds appointments, as follows:

- Australian Representative to the International Maritime Organisation (IMO);
- Australian Representative to the Asia Pacific Heads of Maritime Safety Agencies;
- Member of Council of the Australian Maritime College;
- Member of the Seacare Authority;
- Member of Council of the International Association of Marine Aids to Navigation & Lighthouse Authorities (IALA);
- Member of the Australian Maritime Group;
- Member of the National Marine Safety Committee.

THE MARITIME LAW ASSOCIATION OF AUSTRALIA & NEW ZEALAND
28th ANNUAL CONFERENCE

THE REVIEW OF SHIPPING IN THE GREAT BARRIER REEF

The Review of Ship Safety and Pollution Prevention Measures in the Great Barrier Reef was undertaken by a Steering Committee comprising senior officials of the Australian Maritime Safety Authority (AMSA), Queensland Transport (QT), the Great Barrier Reef Marine Park Authority (GBRMPA) and the Commonwealth Department of Transport and Regional Services (DTRS). The Steering Committee presented an interim report to Minister Anderson on 15 December 2000, identifying key directions for discussions with stakeholders.

A discussion paper, which canvassed major issues involved in the review, was released in January 2001 and circulated to stakeholders. An initial round of consultative forums was held between 5 and 9 February 2001 in Cairns, Townsville and Brisbane. These involved separate sessions for environmental groups, indigenous representatives, shipping interests and for the general public. Separate meetings were held with pilots and pilotage providers in Cairns and Brisbane. Another series of consultations was held from 12 to 14 March 2001 on three Torres Strait islands and in Townsville.

The Final Report of the Steering Committee was presented to Minister Anderson in July 2001. Attached is the Executive Summary and the Terms of Reference. The full report can be viewed on AMSA's website at http://www.amsa.gov.au/sd/gbrreview/report.htm

Clive Davidson
Chief Executive Officer
Australian Maritime Safety Authority

REVIEW OF SHIP SAFETY AND POLLUTION PREVENTION MEASURES IN THE GREAT BARRIER REEF

EXECUTIVE SUMMARY

1. In November 2000, the Minister for Transport and Regional Services commissioned a review of ship safety and pollution prevention measures in the Great Barrier Reef and Torres Strait. The review was tasked to develop strategies to address:

   - Extension of the compulsory pilotage area in the Reef;
   - Advancing the introduction of technological developments to track and monitor shipping operations;
   - Enhancing ship routeing, traffic management and emergency response arrangements;
   - Constraining certain ship types from operating in or near the Reef; and
   - Improving legislative powers of intervention and enforcement, heightening penalties and ordering restitution.

2. The review attracted 65 submissions and involved extensive consultations with stakeholders, including coastal pilots, the shipping industry, shipping users, indigenous communities, environment groups and other interested parties.

3. The Great Barrier Reef is internationally recognised as a unique marine environment. The protection of its outstanding natural qualities was enhanced with the establishment of the Great Barrier Reef Marine Park in 1975. It was inscribed on the World Heritage List in 1981, and it was designated by the IMO as one of the world's first Particularly Sensitive Sea Areas in 1990.

4. In addition to its environmental and cultural significance, the Great Barrier Reef has important economic significance. It supports a billion dollar sector of the tourism industry and a $250 million sector of the fishing industry. In total the Great Barrier Reef is estimated to contribute around $2 billion per annum to the Queensland economy.

5. Around $10 billion of export merchandise, or about 9% of Queensland's GDP, use the eleven ports and shipping in the Great Barrier Reef region. The four major ports of Cairns, Townsville, Mackay and Gladstone are estimated to contribute some $3 billion and 23,000 jobs directly into the Queensland and regional economies.

6. The Torres Strait similarly is an important international shipping lane and contains significant fishing grounds. It has equal environmental and indigenous cultural significance to the Great Barrier Reef. It encompasses the Torres Strait Protected Zone declared under the Torres Strait Treaty.

7. The review has identified a range of considerations relating to the use of the Great Barrier Reef (GBR) region by shipping. In conducting the review, it was apparent there is no overall coordinated policy relating to shipping in the GBR and Torres Strait. Several authorities at Commonwealth and State level have regulatory responsibilities for different aspects of shipping and there is a complex web of legislative requirements.

8. The agencies with principal responsibilities for regulating shipping in the GBR and Torres Strait agree there is a need to form a Great Barrier Reef Shipping Management Group to progress the initiatives identified in this report and to work with other agencies, such as Queensland Fisheries and the Australian Fisheries Management Authority, on policies and practices to improve ship safety and environmental protection for the Great Barrier Reef and Torres Strait.

Recommendation 1 (sections 1.4 to 1.7)

The review recommends establishment of an ongoing Great Barrier Reef Shipping Management Group, including executive representation from AMSA, the Commonwealth Department of Transport and Regional Services, Queensland Transport and GBRMPA, to carry forward the review's recommendations and to ensure ongoing clarification of roles and responsibilities of all relevant agencies involved with shipping operations in the Great Barrier Reef and Torres Strait.

9. Management of shipping in the region would be improved by the development of a coordinated Shipping Management Plan. The Plan should clarify the legal regime and responsibilities of Commonwealth and State authorities, and establish broad objectives and policy parameters for shipping to guide management of the region and regulation of the industry.

Recommendation 2 (sections 1.8 to 1.10)

The review recommends that the GBR Shipping Management Group prepare a Shipping Management Plan as part of a three year rolling program of management for shipping in the Great Barrier Reef and Torres Strait.

Recommendation 3

The review recommends that the Great Barrier Reef Shipping Management Group regularly update progress on the review initiatives and provide an annual report to their respective Ministers.

10. Proper multiple-use management of the GBR Marine Park requires an understanding of the full economic, environmental and social impacts of the various activities conducted within its boundaries. It would be appropriate that a study be carried out for shipping activities.

Recommendation 4 (sections 1.11 to 1.12)

The review recommends the Great Barrier Reef Shipping Management Group develop a study of the economic, environmental and social impacts of shipping, including indigenous considerations, in the Great Barrier Reef Marine Park and Torres Strait, to assist with the long-term management of the industry within the region.

Shipping in the Great Barrier Reef region

11. Approximately 6,000 ship movements of large vessels in excess of 50 metres in length occur within the GBR region every year. Most of these vessels use the inner route with the rest entering or departing through Hydrographers, Palm and Grafton Passages. Most vessels using the Great Barrier Reef are bulk carriers carrying significant tonnages of export cargo. It is estimated that around 20% of vessels transit the inner route of the Great Barrier Reef without calling at a north Queensland port.

12. There are also some 1,500 tourism vessels and 25,000 commercial and recreational fishing vessels operating in the Great Barrier Reef.

13. During the period 1985 to 2000, there were 11 collisions and 20 groundings within the inner route of the GBR, which represents over two incidents each year. This is a relatively small rate of incidents given that over 2,500 ship movements occur in the northern section of the inner route annually, but still considerably higher than anywhere else on the Australian coast. None of the incidents in the past 15 years has resulted in significant oil spill pollution, loss of life or structural damage to the ship.

14. Most incidents are caused by human error. Many incidents, particularly collisions between a trading ship and a fishing vessel, are caused by failure to keep a proper lookout. Six of the eight groundings in the Inner Route and Torres Strait between 1995 and 2000 occurred with a coastal pilot on board.

15. A study of the impact of various control measures on the risk of shipping incidents in the Great Barrier Reef region found that:

- The risk is greatest in the Torres Strait and that the adoption of 100% pilotage for all ships traversing Torres Strait would significantly reduce the risk of grounding or collision.

- The benefits of increased pilotage in other parts of the reef region are possibly optimistic, but the potential for risk reduction from greater shore-based monitoring, vigilance and guidance is clearly apparent.

- Adoption of an upgraded vessel traffic system for the REEFCENTRE, together with adoption of Automatic Identification Systems for ships, would result in a 20% reduction in incident rates across the study area, but any system of vessel traffic control would be an extremely large undertaking.

- There is compelling evidence that crews on ships on the Outer Route would be exposed to considerably higher risk as a result of remoteness from assistance and the relatively severe physical environment.

16. The study cautioned that as the greatest source of incidents in the region is human error and that this can be manifested in many ways, caution is needed against reacting to any single incident. The risks and impacts of shipping in the Great Barrier Reef should be considered in the context of overall risks to the environment, including land based pollution and over-fishing.

Technical, legal, indigenous and operational considerations

17. Proposals for new regulatory or technological approaches will involve consideration of specific infrastructure, equipment, staffing and training, and education and awareness requirements. An important consideration for any new measures requiring take-up of new technology by international shipping is the extent to which such measures are endorsed by IMO. As not all ships will be equipped with new technologies, any unilateral requirement by Australia for such equipment in the Great Barrier Reef would mean an effective ban on such ships.

18. Implementation of the full suite of proposals considered by the review is not likely to be cost-effective for the whole Great Barrier Reef region or for specific sectors of the route.

19. Australia's powers to regulate foreign shipping in Australian waters and international straits are subject to some limitations under the UN Convention on the Law of the Sea (UNCLOS). Ships have the right of innocent passage through territorial waters, subject to such passage being "not prejudicial to the peace, good order or security of the coastal state". They have the right of transit passage through international straits and freedom of navigation on the high seas.

20. Coastal and port States have the right to establish rules and standards to enhance safety and prevent pollution, subject to their presentation and endorsement through a competent international body such as the IMO.

21. The Great Barrier Reef region encompasses all these areas of sea. The effect of UNCLOS is that Australia cannot hamper or impair the right of passages of foreign vessels through its waters, but it can subject passage to some regulation to improve safety and environmental protection.

22. The regulation of shipping and responses to shipping incidents in the Great Barrier Reef are subject to complex legal arrangements shared between the Commonwealth and State transport regulatory authorities and the Great Barrier Reef Marine Park Authority. Of particular concern are the precise boundaries of jurisdiction and the best form of regulation under which to take actions in response to specific incidents or to introduce regulatory measures.

23. Indigenous communities recognise the need for international shipping within the region, but want all possible measures introduced to ensure safety and

prevent pollution. Communities are concerned to have more information made available to them on shipping movements in local areas. They also would like opportunities to participate in planning and management arrangements for the region, and in pollution incident response and pilotage arrangements.

24. During consultation sessions in Torres Strait, the island communities indicated they would like to receive information on ship traffic in the Great North East Channel, from both ownership and waterways management perspectives.

25. The review supports Queensland Transport's efforts to explore compiling shipping data through contact with local pilotage service providers and notifying island communities of shipping activities.

26. The review also supports initiatives by Queensland Transport and AMSA to raise awareness in island communities of the movement, risk and impact of shipping and response arrangements to marine incidents and marine pollution.

Recommendation 5 (sections 2.25 to 2.31)

The review recommends improved data sharing arrangements between relevant agencies and with island communities in Torres Strait on traffic monitoring and regular dissemination of information to local communities.

Extension of Compulsory Pilotage

27. The presence of a pilot on board can enhance the safety of the vessel when it is in confined waters, but will not eliminate the risk of an incident occurring. Carriage of a pilot also does not relieve the ship's Master from overall responsibility for the safe operation of the vessel.

28. There has been strong support for the introduction of compulsory pilotage in the Torres Strait, where many shipping incidents have occurred and where the demand for accurate navigation is more exacting. The risk assessment study concludes that compulsory pilotage would significantly reduce the risk of a shipping incident in the Torres Strait. Pilotage in Torres Strait is currently recommended by the IMO.

3.1 Due to concerns about rights of transit passage through international straits, however, implementing compulsory pilotage for the Torres Strait poses complex questions of international law and foreign relations. Many IMO member states regard compulsory pilotage in international straits as a clear contravention of UNCLOS provisions.

29. Nevertheless, the review supports sustained efforts through the relevant channels to elevate the status of Torres Strait, including the Prince of Wales Channel and Great North East Channel, from recommended to compulsory pilotage. It is considered that the prospects for persuading the IMO to adopt

compulsory pilotage would be enhanced if Torres Strait is included in the IMO designated Particularly Sensitive Sea Area for the Great Barrier Reef.

Recommendation 6 (sections 3.15 to 3.20)

The review recommends that Australia should immediately initiate the process for seeking endorsement by the IMO for upgrading the current recommended pilotage area in the Torres Strait to compulsory pilotage and an extension of the GBR Particularly Sensitive Sea Area to encompass the Torres Strait to support introduction of compulsory pilotage.

Recommendation 7

In the interim, the review recommends a concerted campaign be conducted by AMSA and Queensland Transport to reinforce the existing recommended pilotage regime for all applicable ships transiting the Torres Strait. This could include notes on charts, reinforcement in Reef Guide, an international education campaign and advice by the Ship Reporting System to all ships operating in the region.

30. As well, consideration could be given to banning ships from Australian ports if they do not comply with the IMO recommended pilotage regime for Torres Strait. While any such ban would only be enforceable on ships that intend using an Australian port, it would nevertheless help to reduce the numbers of vessels transiting Torres Strait without a pilot, pending development of an IMO agreed compulsory pilotage regime for all ships in the region.

Recommendation 8 (sections 3.21 to 3.24)

The review recommends that consideration be given to raising at the Australian Transport Council the proposal that any vessel transiting the Torres Strait and arriving at an Australian port will not be given access at that port unless a pilot was used throughout the passage through the Torres Strait.

31. Extension of compulsory pilotage south of Cairns to the southern limit of the Great Barrier Reef will approximately double the length of pilotage for vessels proceeding to or from southern ports. Navigation in this part of the GBR is relatively straightforward, with wider channels and relatively sheltered waters. The risk assessment study concludes that compulsory pilotage would only marginally reduce the already small risk of an incident in the Cairns to Townsville sector of the Inner Route South,

32. Pilotage is already recommended by AMSA and Queensland Transport for ships' Masters who are not familiar with this part of the Great Barrier Reef.

Recommendation 9 (sections 3.25 to 3.30)

The review recommends the promulgation of a recommended pilotage regime through IMO for the inner route and Palm and Grafton Passages.

33. While navigation is relatively straightforward between Cairns and the southern edge of the Great Barrier Reef Marine Park, there is a potential hazard to navigation, involving a significant course change to avoid reefs shortly after the current drop-off point for compulsory pilots just south of Cairns. The review notes with concern that there have been five cases in the past 12 months similar to the *Bunga Teratai Satu*, involving other vessels which have failed to make the course alteration at Fitzroy Island.

34. The review considers that an appropriate option is to extend pilotage to or from the Inner Route north of Cairns past the Frankland Islands, to a point off Mourilyan.

Recommendation 10 (sections 31 to 3.35)

The Review recommends that ships transiting the inner route of the GBR north of Cairns should be required to embark or disembark pilots at a new pilot boarding ground off Mourilyan.

35. Compulsory pilotage has recently been extended to the Whitsunday Islands under the *Great Barrier Reef Marine Park Act 1975*. Compulsory pilotage could be further extended under Queensland legislation by declaration of a Pilotage Area under the Queensland *Transport Operations (Marine Safety) Act 1994*. This will have a wider effect than is achieved under the GBRMPA legislation for compulsory pilotage, as it will also apply to vessels smaller than the 70 metre size covered by the GBRMPA legislation.

36. The review supports the establishment of an integrated traffic management regime for vessels in the Whitsunday Islands region through the declaration of a Pilotage Area under the Queensland *Transport Operations (Marine Safety) Act 1994*.

Recommendation 11 (sections 3.37 to 3.43)

The review recommends that shipping be further discouraged from transiting the Whitsunday Islands region by removing "preferred" routes for shipping through the area from charts.

37. Transport costs can be expected to increase because of additional pilotage fees associated with extending the compulsory pilotage areas. Similar cost considerations also will apply if more shipping is strongly encouraged to voluntarily adopt pilotage that is recommended, rather than mandatory.

38. Alternatively, higher costs also will be involved if ship operators decide to use the Outer Route, where no pilotage considerations apply. These costs relate to the longer steaming times on the Outer Route and safety consequences of adverse weather and sea conditions.

39. These costs are likely to be passed on to consumers, unless Governments provide incentives to industry to adopt recommended pilotage or to offset increased compulsory pilotage costs. Acceptance of compulsory pilotage by the international shipping industry could be enhanced if costs were

ameliorated. The ability to remove commercial considerations in using a pilot would be a quick and effective tool in reducing risk ahead of any IMO sanctioned agreement to extend compulsory pilotage.

40. Direct subsidy of coastal pilotage services, however, is not consistent with Government policies, which have promoted the commercially competitive provision of services in the Great Barrier Reef region since the early 1990s.

41. Another option is to implement a differential charging scheme for maritime levies based on trading patterns and ports visited. If such a differential scheme were established, it may be possible to provide rebates on payment of the levy to offset any reasonable additional costs of pilotage.

42. There would, however, be a potential issue of cross-subsidy from shipping that does not need or use pilots, and whether such a cross-subsidy is legally defensible. The review notes that the AMSA has commissioned a review of the existing levies, which provides scope for examining a differential charging regime that encourages the use of pilots or other risk reduction measures in high risk areas such as the Torres Strait and Great Barrier Reef.

Recommendation 12 (sections 3.47 to 3.53)

This review recommends, as an intermediate step, the review of levies should also explore economic options to encourage greater usage of pilots.

43. If pilotage is made compulsory throughout the Great Barrier Reef and Torres Strait, the increased demand for pilotage services will have an impact on the availability of suitably trained and qualified pilots. In order to redress the possible lack of pilots, it may be necessary to recruit pilots from a different base and adopt a new framework for the qualification and experience levels of pilots. There is merit in considering a range of different recruitment, training, and career structures.

Recommendation 13 (sections 3.55 to 3.61)

The review recommends that an expert task force comprising AMSA, Queensland Transport, GBRMPA, training providers and pilot representatives undertake a reassessment of recruitment and licensing practices for coastal pilots. The task force should examine the training and qualification system for coastal pilots, including on the job specialised training and the potential for tiered levels of pilot licensing.

44. Another means of offsetting the costs of compulsory pilotage, without affecting risks of an incident, is to grant exemptions from the pilotage requirements for ships that can demonstrate clearly superior levels of performance and consistent compliance with regulations.

45. Any exemptions should be subject to examination of the ship's Master's knowledge of the region and medical fitness. Consideration may also need to be given to assessing the competency and knowledge of watch-keeping

officers other than the Master. Exemptions could also take into consideration any port State control reports of the vessel.

Recommendation 14 (sections 3.62 to 3.65)

The review recommends that the proposed reassessment of recruitment and licensing of pilots should encompass the criteria for issuing pilot exemptions.

46. Good passage planning and Bridge Resource Management should support consideration of dual watch officers at strategic navigational points during a voyage.

47. The review supports adoption of a dual watch system to ensure that two qualified navigating officers are on the bridge during all strategic course change points in the course of the ship's transit of the GBR, and that such measures should be incorporated as part of a ship's passage planning.

48. Pilot and or crew fatigue has been identified as an issue of concern in many submissions. There are existing measures in place to manage fatigue, including a need for each pilotage company to have a safety management system that addresses matters such as fitness and availability for duty and rest periods. Pilots have a responsibility to ensure they are sufficiently rested and medically fit before commencement of pilotage duties.

49. On 1 July 2001, AMSA implemented a Great Barrier Reef Pilotage Safety Management Code, which is designed to facilitate effective and safe management of pilotage services on the Queensland coast. AMSA reports that the Code has provided a timely reminder to pilot service providers on their obligations to address fatigue and other safety issues.

Recommendation 15 (sections 3.70 to 3.76)

The review recommends that pilotage service providers continue to be expressly included in the regulatory framework covering coastal pilotage services. The review endorses the safety systems approach promulgated in the Great Barrier Reef Safety Management Code, which encompasses both pilots and pilotage service providers.

50. There is currently uncertainty among some ship operators about the current compulsory and recommended pilotage requirements within the GBR. Given this uncertainty, pilotage requirements should be more widely promulgated with the objective of encouraging the uptake of pilots in recommended areas.

Recommendation 16 (sections 3.83 to 3.86)

The review recommends that AMSA, GBRMPA and Queensland Transport undertake extensive promulgation of pilotage requirements to promote awareness of both compulsory and recommended pilotage zones.

Advancing Technology

51. As the primary cause of marine incidents is human error, emerging technology that can minimise human error has the potential to improve the provision of safety and navigation services in the Great Barrier Reef.

52. The risk assessment study found that there would be demonstrable improvements in safety with the adoption of a suite of technological aids. The effect of these technological improvements would dominate in reducing risk in the Torres Strait, but significant safety gains also can be made on both the Inner Route and the various passages.

53. Ship-board technology will improve the performance of the quality operators in the first instance, as they are the most likely to adopt new technologies. Shore based monitoring is therefore important to identify, track and advise the lower quality vessels. The potential for risk reduction as a result of shore based vigilance and guidance was found to be significant.

54. The Automatic Ship Identification (AIS) is a shipboard system that is capable of automatically sending ship information (such as identity, position, course, speed, ship length, draught, ship type and cargo details) to shore and to other ships or suitably fitted aircraft. It is also capable of receiving such information from similarly fitted ships and to monitor and track ships, including the exchange of data with shore-based facilities.

55. While IMO has adopted a schedule for installation of AIS on ships, equipment standards are still being developed. These are expected to be finalised by the end of 2001. The IMO mandate does not apply to the implementation of coastal AIS capacity or ship to shore monitoring.

56. AMSA is conducting a series of trials to gain experience of the technology and to evaluate the effectiveness of AIS when integrated with the existing mandatory Ship Reporting System for the Great Barrier Reef. As not all ships will have AIS in the short term, a second series of sea trials is being conducted to provide data on the capability of portable AIS transponder units for carriage by pilots aboard ships.

57. If trials of pilot packs prove effective, together with coastal base station and network infrastructure, AMSA may be able to fast track the introduction of AIS in the GBR region.

58. At the international level, however, several aspects of shore-based applications of AIS remain unresolved and fast tracking AIS introduction could result in additional technical difficulties and high costs due to the immaturity of AIS technology. Associated issues are the need for integration of technology with Queensland port requirements, network engineering and equipment availability in what is a very remote region of Australia – particularly from Cairns to the Torres Strait.

Recommendation 17 (sections 4.7 to 4.19)

The review recommends AMSA and Queensland Transport prepare by March 2002 an AIS implementation plan for the Great Barrier Reef for shipping participating in the Ship Reporting System. The plan should address the capacity for introducing a vessel management system within the Great Barrier Reef. A mid term review should be conducted in 2003-04 to take account of uptake of AIS by international shipping and technological advances.

59. The use of automated pre-programmed position reports would provide an enhanced understanding of the main routes taken by shipping and improve the ability to monitor vessels that may be in increasing risk of grounding in shallow waters outside areas with radar coverage.

60. The review notes that Inmarsat C provides an opportunity to complement both radar and AIS technology throughout the SRS. Its use would have little impact on the shipping industry as most vessels operating under the mandatory reporting provisions of the SRS already have Inmarsat C installed as part of GMDSS requirements. Consideration could be given to exempting masters and pilots from mandatory VHF reporting if Inmarsat C position reporting is introduced.

Recommendation 18 (sections 4.20 to 4.25)

The review recommends that the use of Inmarsat C be required for all vessels subject to mandatory reporting requirements, to complement other technologies in providing near real time positions for vessels throughout the Ship Reporting System. The voluntary use of Inmarsat C should be encouraged for all other vessels.

61. The Ship Reporting System in the Great Barrier Reef, known as REEFREP, is largely equivalent to an IMO Vessel Traffic System (VTS) Information Service. REEFREP operates through a joint AMSA-Queensland Transport ship reporting centre at Hay Point, known as REEFCENTRE.

62. A higher level role for the SRS in managing ship movements in the Great Barrier Reef and Torres Strait, and scope for improving current technology and operational procedures, would enhance the capacity of REEFCENTRE to monitor traffic and take on more of an advisory service.

63. Organisation of ship guidance services involves a far reaching revision of public international law and centuries old maritime customs, particularly the right to freedom of navigation and the sole responsibility of the Master for navigation decisions. A significant concern with provision of a full traffic control system is the extent of the Government's exposure to liability in the event of an accident involving a ship under the direction of a traffic control service.

64. The issue of cost-effectiveness is also significant. A Vessel Traffic System (VTS) with full Navigational Assistance Service may be uneconomical given

the significant development and on-going costs and the relatively low volume of traffic in the area. The associated costs may not be fully recoverable from the maritime industry and consideration will be required of how such costs should be met.

65. The REEFREP Ship Reporting System (SRS) Management Group recently initiated a review to determine the feasibility of overlaying the current SRS with a Coastal VTS providing a Navigational Assistance Service. The review will include a full description of the proposed service, an assessment of the requirements, implications and emerging technologies, a cost-benefit analysis and a draft implementation plan. It is expected to be completed by the end of 2001.

66. This review strongly supports augmentation of the Ship Reporting System to incorporate a Coastal Vessel Traffic System (VTS) providing a Navigational Assistance Service as a means of enhancing navigational safety in Torres Strait and the GBR.

67. The review supports the proposed upgrade of the role of REEFCENTRE, pending a full cost-benefit analysis of adopting such an approach and drafting of an implementation plan.

68. There is a case for implementing variable levels of ship monitoring and reporting based on assessments of their operational status. Ship monitoring in the GBR could better target the lower quality ships. As well, the ATSB report into the *Bunga Teratai Satu* incident identified a number of features of the current SRS operations that could be improved.

Recommendation 19 (sections 4.26 to 4.51)

The review recommends that a reassessment of the role of REEFCENTRE should examine:

- **the upgrading of Ship Reporting System (SRS) monitoring capacity, with the potential for inclusion of a coastal Vessel Traffic Service providing a Navigational Assistance Service,**
- **reporting points for the SRS,**
- **operation of the alert system,**
- **restricted areas, and**
- **the impact of the planned adoption of AIS technology.**

69. The DNV risk assessment indicates that the greatest gains in reducing risk can be made in the Torres Strait, where pilotage is recommended rather than compulsory and the take up rate of pilots is still relatively low. At present there is only partial radar coverage in Torres Strait. Enhancement of radar in this area would improve the ability of the SRS to monitor and intervene with ships that do not use pilots in advance of the adoption of AIS by all ships under the IMO timetable.

Recommendation 20 (sections 4.52 to 4.55)

The review recommends improving radar coverage in the Torres Strait to enhance overall monitoring of shipping transiting this region, in consultation with indigenous communities.

70. The use of Electronic Navigation Charts (ENC) and Electronic Chart Display and Information Systems (ECDIS) is seen as a positive way to improve navigation safety and reduce human error.

71. The ENC is currently completed from Weipa, through Torres Strait and south in the Inner Route to about 90 nautical miles south of Cape York. It is available in the form of evaluation data and is being trialled by commercial vessels operating in the GBR. The ENC for the remainder of the GBR will be progressed as resources permit.

Recommendation 21 (sections 4.56 to 4.60)

The review recommends that ENC/ECDIS development be given the highest priority to complete the ENC for the Prince of Wales Channel, the Great North East Channel and the Inner Route of the Great Barrier Reef within a timeframe to be specified by the Ship Management Plan. This could involve either improving resources for the Hydrographic Office or the Hydrographic Office engaging commercial contractors to expedite the current rate of production.

72. The provision of Electronic Navigation Charts will only be useful if ships are fitted with an approved Electronic Chart Display and Information Systems (ECDIS). The use of ECDIS cannot yet be mandated and AMSA does not have in place a regime to regulate its use in Australia. There needs to be a widespread education and awareness campaign demonstrating the benefits of ECDIS. This could be conducted in concert with a campaign to improve awareness of other technologies such as AIS, DGPS and GMDSS, and of recommended pilotage areas.

Recommendation 22 (section 4.61)

The review recommends an extensive education and awareness campaign be commissioned to promote the benefits and uptake of ECDIS onboard ships.

Ship Routeing, Traffic Management and Emergency Response

73. Under international law, a coastal State may adopt laws for safety of navigation, pollution prevention, loading or unloading of commodities and control of fishing. IMO approved routeing measures include two way shipping routes, restricted shipping lanes, recommended tracks, areas to be avoided and precautionary areas, and prohibited anchorage and entry zones.

74. There are several potential routes through the GBR which have been surveyed but are not adequately marked due to the costs of establishing the necessary navigation aids. One area deserving attention is the Fairway

Channel between Cape Direction and Cape Melville, which could improve opportunities for traffic separation and provide rest points for pilots.

Recommendation 23 (sections 5.7 to 5.11)

The review recommends that work in assessing and developing the Fairway Channel should be accelerated, using the Australian Maritime College simulator, to confirm the advantages of adopting the Fairway Channel, and to determine the best route through the channel and the navigation aid configuration required to adequately mark that route.

75. Given the availability of the alternative route charted around the Whitsunday Islands and the relatively short additional steaming time this would entail, the review considers that trading ships should not be encouraged to transit the waters between the mainland and the Islands.

76. Shipping in the main tends to use recommended tracks shown on charts. Risk could be better managed by marking on charts recommended shipping routes with two-way routes, where possible. Development now of suitable traffic separation lanes would enable them to be incorporated into the Electronic Navigation Charts currently under development and paper charts as new editions are compiled.

Recommendation 24 (sections 5.15 to 5.18)

The review recommends changing recommended tracks on charts to a two way route where traffic separation is suitable.

77. Marine Environment High Risk Areas (MEHRAs) provide a distinct educational and awareness tool designed to alert mariners to areas hazardous to navigation and at risk of exceptional environmental damage. To this end, areas classified only as highly sensitive to oiling and at high risk of an incident occurring were considered as MEHRAs.

78. Mariners would be expected to exercise particular caution when transiting a MEHRA. Increased precautionary measures may include increased bridge resource management, an additional lookout, reduced speed, enhanced radio watch and communication with other vessels.

79. The MEHRAs should be communicated to shipping through Notices to Mariners, Reef Guide, Sailing Directions, Navigation Charts and other media as appropriate. Areas identified as MEHRAs also should be given high priority for the development of international standard Electronic Navigation Charts.

Recommendation 25 (sections 5.19 to 5.25)

The review recommends declaration and widespread promulgation of MEHRAs for inclusion in ECDIS and through Reef Guide and for passage planning procedures.

80. Pilots have expressed concern at the number of ships that do not use pilots in the recommended zone of the Great North East Channel and Prince of Wales

Channel in Torres Strait. They also note that masters are often discouraged from using pilots by ship owners who are attempting to reduce costs.

Recommendation 26 (sections 5.26 to 5.27)

The review recommends that AMSA, GBRMPA and Queensland Transport should conduct an international campaign to promote ship safety and environmental awareness in the Great Barrier Reef and Torres Strait. This should include:

- **providing a copy of the Reef Guide booklet to every ship transiting the region;**
- **requesting the International Chamber of Shipping Guide environment page to include a section on the Great Barrier Reef and Torres Strait; and**
- **other publicity in relevant international publications.**

81. Collisions between commercial ships and fishing boats are the second largest contributor to incidents in the GBR region. To alert mariners to take greater precautions when transiting areas of significant fishing activity, these areas should be marked on electronic charts. The Review also supports an education campaign for fishing vessel operators for the need to maintain a proper lookout.

Recommendation 27 (sections 5.28 to 5.30)

The review recommends that electronic charts should identify and mark areas of high fishing activity and that the REEFCENTRE give warnings to ships entering such areas.

82. Integration of other traffic information, such as fishing vessels, into the Ship Reporting System will provide an improved traffic picture. An integrated service will benefit all vessels participating in the system and make all vessels aware of their respective positions and movements.

83. The review supports current action to integrate fishing vessel data into the Ship Reporting System shipping data and continued consultation with AFMA and Queensland Fisheries Service on issues related to protecting commercial sensitivity of the data. The review notes, however, that the fisheries agencies may not have provision under their legislation to provide fishing vessel data to the Ship Reporting System. Where necessary, fisheries agencies may need to review and amend their respective legislation, to ensure the Ship Reporting System has access to fishing vessel data for purposes consistent with the powers under which the SRS operates.

84. Shipping interests complain that some fishing vessels have no consideration of constraints imposed on a large vessel's ability to manoeuvre, particularly in narrow channels. The review supports the extension of the Ship Reporting System Client Group to become an industry forum involving all vessel sectors

to improve communication between commercial shipping, fishing vessels and smaller craft using the GBR.

85. The recent Oil Spill Risk Assessment report highlighted the importance of ready availability of emergency towage and salvage capacity in the Great Barrier Reef region to reduce risk. The review notes that a key criticism of UK authorities raised in the enquiry into the *Sea Empress* disaster was the lack of contingent salvage resources and the ability to free up those resources when they are normally engaged in other duties.

86. However, it is not commercially viable for salvage firms to provide deep-sea salvage capacity to cover the whole of the Great Barrier Reef all of the time to meet only very occasional requirements. There are some commercial arrangements in some ports to call upon harbour tugs in the event of an emergency, as a first line of defence. However, with increasing corporatisation of ports the provision of salvage towage capacity in areas outside ports is not seen as a core business of port authorities.

87. The review notes the changing structure of harbour towage at ports within the Great Barrier Reef and the likelihood that this will not include a significant offshore salvage capacity.

Recommendation 28 (sections 5.41 to 5.53)

The review recommends that AMSA, GBRMPA and Queensland Transport should reassess emergency response measures in the Great Barrier Reef and Torres Strait. This should include the assessment of necessary salvage capacity and its operational location.

88. The concept of safe havens, places or ports of refuge, is receiving considerable international attention in the wake of several recent casualties. it is rarely possible to deal satisfactorily or effectively with a marine casualty in open sea conditions. The longer a damaged ship is forced to remain at the mercy of the elements, the greater the risk of deterioration, and of a greater hazard to the environment and loss of life and property.

89. Queensland Transport has prepared Guidelines for safe havens in the GBR region, in consultation with Queensland port authorities, the Queensland Department of Environment and Heritage, GBRMPA and AMSA. They were last updated in 1999. In light of developments in the IMO on this issue, further examination of safe havens is being conducted by the Commonwealth, States and industry, including ports, under the auspices of the National Plan Management Committee.

Recommendation 29 (sections 5.54 to 5.61)

The review recommends the regular updating and extension of the existing Queensland Guidelines for the Provision of Safe Haven for Disabled or Damaged Vessels at Sea, in line with the latest developments in the IMO.

90. Concerns were raised about the likely times to respond to incidents and the lack of spill response resources in northern parts of the Great Barrier Reef. It was suggested that local resources should be utilised to support specialist response personnel.

91. The National Plan was reviewed in 2000. As a result, Tier 1 oil spill response equipment is being allocated to the ports, and further consideration is being given to location of the remaining equipment (Tier 2 and 3) in one or two strategic stockpiles in Queensland.

92. The review supports the current reassessment and regular review of National Plan equipment stockpiles in the GBR and Torres Strait being undertaken by the Queensland State Committee, Queensland Transport and AMSA.

93. In line with the National Plan 2000 review recommendations, ChemPlan is being updated and rewritten. Any enhanced risk analysis of the quantities and nature of the cargoes, their likely impacts on the environment in which they move, should there be a spill, should address the special issues relevant to the GBR.

Recommendation 30 (sections 5.67 to 5.71)

The review recommends that the National Plan for Responding to Pollution of the Sea by Oil and Other Hazardous and Noxious Substances (NatPlan) reassessment of ChemPlan currently being pursued should be extended to include assessment of the risk of a chemical spill within the Great Barrier Reef and Torres Strait.

Constraining Ship Types

94. If more ships were persuaded or required to use alternative routes, the risk of a major incident in environmentally sensitive parts of the Inner Route could be reduced. However, consideration also needs to be given to the operational aspects of moving ships on to alternative routes, the international legal regime and the economic, social and environmental consequences.

95. Submissions from shipping, industry and defence interests opposed proposals to ban certain types of ships from the Inner Route, whereas some conservation and indigenous groups supported reducing shipping in the region.

96. The review notes that the risk assessment study concludes that rerouting of shipping to the Outer Route is not a reasonable risk control measure, because of the increased threat of total catastrophic loss faced by shipping in the event of an incident in the Coral Sea, the consequent potential for greater pollution and the difficulties in responding to a major pollution incident. The review notes the need to exercise considerable caution in respect to encouraging ships to use the Outer Route, especially since these additional vessels would be required to transit the Great North East Channel.

97. As well, the effect of the UN Convention on the Law of the Sea is that Australia cannot hamper or impair the right of passage of foreign vessels

through its waters, including Torres Strait, and the territorial waters of the area covered by the Great Barrier Reef Marine Park.

98. A 1995 study of options for using alternative shipping and land transport routes to reduce the level of shipping on the Inner Route found that:

- Closure of some or all Queensland ports would reduce, but not eliminate, shipping use of the Inner Route, and could only be achieved at very high cost in terms of alternative transport costs and social and regional economic losses;
- Complete closure of the Inner Route through the Reef would add $6 billion to Australian transport costs, with the least obtrusive restrictions adding $273 million (in 1995 dollar values); and
- Closure of the Torres Strait would add $104 million (1995 values) to costs of domestic transport and international shipping servicing north Queensland ports;
- The huge increases in transport costs would fall predominantly on bulk commodity exporters, and would in all probability make them uncompetitive in world markets; and
- Environmental benefits of reduced shipping traffic on the Inner Route would be offset to some degree by increased environmental impacts of alternative transport options.

Recommendation 31 (sections 6.4 to 6.25)

The review recommends that it is inappropriate and impractical to impose constraints on certain ship or cargo types using the Inner Route.

99. Given these safety considerations and international legal constraints on denial of innocent passage, regulatory effort is better focussed on targeting the identification of particularly poor ships and selective monitoring and possibly detention or banning their access to ports.

100. AMSA recently has strengthened its risk analysis for targeting ship inspections at higher risk ships and focusing on the inspection of particular areas of ship operation.

101. The review notes that improved electronic information exchange on port State control data with other countries and agencies in the region has the potential to track and give warning on substandard ships.

102. Full use should be made of all available ship safety data, including real time data from coastal pilots. At present some ships are not inspected under Australia's port State control, as they are transiting the GBR or Torres Strait without calling at an Australian port. To fill this gap, and to enable authorities to seek and assess international port State control information on ships with a

poor record, the Ship Reporting System could seek information from pilot bookings as a source of prior notification of ships operating in the region.

Recommendation 32 (sections 6.26 to 6.38)

The review recommends that Queensland Transport obtain forecast shipping schedules from all pilot companies for provision to REEFCENTRE.

103. The first reporting points for vessels entering the GBR region are currently within the defined boundaries of the SRS. Vessels on departure routes from the SRS may encounter substandard vessels without having received encounter information in their last traffic report from REEFCENTRE.

104. A requirement for reporting prior to entering the SRS region, for example one hour before entering the region, together with better information sharing on ships' port State control histories would enable better warnings to be given. As well, the submission of passage plans to REEFCENTRE prior to entry into the SRS would considerably enhance the capacity to monitor vessels.

Recommendation 33 (sections 6.39 to 6.40)

The review recommends that submission of passage plans and prior notice of entry into the GBR region be introduced to enhance the Ship Traffic Information provided by REEFCENTRE.

Recommendation 34

The review recommends evaluation of all available data using AMSA's Ship Inspection Decision Support System to identify high risk ships operating in the Great Barrier Reef and to target port State control inspections if these ships call at Australian ports.

105. Internationally, increasing attention is being given to proposals to ban certain ships from access to ports as a means of dissuading substandard ships from operating in particular regions.

106. While the general consensus is that a ban on all ships of a particular flag or type is not practical, as well as there being legal difficulties in banning the right of transit passage, there is increasing support for banning port access for individual ships that have a particularly poor record of detentions.

Recommendation 35 (sections 6.41 to 6.44)

The review recommends strategies be developed to improve tracking and monitoring, and to notify shipping that access to ports will be denied for ships with particularly serious port State control records.

107. One means of providing intelligence to identify particular problems is confidential reporting. Several parties are in a position to pass such information to the authorities, such as pilots, crew members, unions or seamen's missions. However, many of these people may be unwilling to

openly pass information to authorities for fear of retribution, particularly job loss.

108. Confidential reporting of hazardous or potentially hazardous incidents has been accepted in the aviation industry for several years in the USA, the UK, Canada and Australia. The program helps to identify and rectify safety deficiencies and is used to promote safety education.

109. A maritime confidential reporting system could help to identify unsafe operating practices, ships with deficient equipment, or idiosyncratic handling characteristics. It would allow ships assessed as high risk to be targeted by port State control or other marine regulatory authorities without the ship owner being aware that a ship had been subject to a report. It also would allow safety authorities to develop education and awareness campaigns for the whole industry to alert them to particular unsafe practices or particular hazards relating to passage through the Great Barrier Reef.

Recommendation 36 (sections 6.45 to 6.54)

The review recommends that the Australian Transport Safety Bureau establish a confidential marine incident reporting system and develop mechanisms to relay relevant information to AMSA, REEFCENTRE, Queensland Transport and GBRMPA.

110. Risks of pollution following a grounding may be reduced if ships are constructed with double hulls and these tanks are not used for carrying the ships' fuel.

111. The IMO recently approved a new timetable for the phasing out of single hull oil tankers. Most single hull tankers will be eliminated by 2015. A port State has the authority to deny entry to any single hull tanker operating beyond 2015.

112. The review strongly supports measures to mitigate the risk and effects of bunker spills. These measures include support for the ratification of the Bunkers Convention and for actions by IMO to review construction standards which will lessen the risk of bunker fuel spills

Recommendation 37 (section 6.55 to 6.59)

The review recommends support for IMO action in relation to phasing out single-hulled tankers and adopting interim measures to allow port States to deny entry to single-hulled tankers and for measures to improve protection against bunker fuel spills.

Legislation Review

111. Australia's ability to regulate ship safety and environment protection in relation to foreign flag ships operating in and around the Great Barrier Reef is subject to international law. The commercial shipping industry is generally

regulated in accordance with internationally agreed standards promulgated in a series of treaties, primarily by the International Maritime Organisation.

112. The review examined Australia's ability to regulate foreign shipping to the maximum extent possible under international law. It concluded that endorsement should be sought by the IMO for the introduction of compulsory pilotage in the Torres Strait to ensure compliance by foreign ships at law. In this regard, a legal issue worth exploring is the ability of Australia to exercise sovereign powers over the Prince of Wales Passage, which is bounded on either side by Australian territory, and through which passes the major shipping route in the Strait.

Recommendation 38 (section 7.20 to 7.24)

The review recommends that legal advice should be sought from the Office of International Law in the Attorney-General's Department as to whether there is scope for Australia to exercise sovereign powers over the Prince of Wales Channel, given that it passes between Australian territory and falls within Australian internal waters.

113. Commonwealth and State Governments have responsibility for different aspects of the shipping industry flowing from the Australian Constitution and inter-governmental agreements. In the Great Barrier Reef, this regulatory framework is further overlaid by legislation for management, protection and development of the marine park, which encompasses most of the Reef area.

114. The review undertook a detailed examination of the regulatory framework governing shipping operations in the Great Barrier Reef and Torres Strait. It notes that improved clarity and effectiveness of safety regulation is expected to flow from the realignment of the ship safety jurisdiction over trading ships being based on the size of vessel rather than the nature of their voyage (overseas, interstate or intrastate). However, there remains considerable complexity in the application of Commonwealth and State laws, particularly in the area of environment protection, which would benefit from rationalisation.

115. The capacity of Commonwealth and State regulatory agencies to deal with a shipping incident depends on whether it occurred in Queensland internal waters, the territorial sea, the EEZ or on the high seas. The presence of an international border with Papua New Guinea in the Torres Strait is a further complication in determining jurisdiction. The review considers that detailed computerised jurisdictional maps of the Great Barrier Reef and Torres Strait region would ensure certainty of all participants in a response action as to their legislative responsibilities and authority.

Recommendation 39 (section 7.26 to 7.35)

The review recommends, as part of the proposed Shipping Management Plan, computerised jurisdictional maps should be compiled of the entire Great Barrier Reef and Torres Strait area to enhance efficiency and certainty during responses to marine incidents.

116. While it is recognised that there are complexities inherent in the Federal system, the current situation with a multiplicity of laws, some covering the same subject matter, causes confusion to the industry and further complicates the discharge of legislative responsibilities by the main regulatory agencies.

Recommendation 40 (section 7.36 to 7.61)

The review recommends that, as part of the development of a Shipping Management Plan, the main regulatory agencies should examine the existing regulatory regime to rationalise and simplify the complex jurisdictional and legislative arrangements for regulating shipping in the Great Barrier Reef region.

117. The review's examination of the legislative framework found some gaps in regulatory agencies' powers for intervention in response to a shipping incident. It also identified potential improvements to offence and penalty provisions and action for restitution and cost recovery.

Recommendation 41 (section 7.62 to 7.75)

The review recommends that, as part of the proposed Shipping Management Plan, the main regulatory agencies should bring forward coordinated proposals to improve powers of intervention, restitution and recovery of costs, offences and penalties.

REVIEW OF SHIP SAFETY AND POLLUTION PREVENTION MEASURES IN THE GREAT BARRIER REEF

TERMS OF REFERENCE

The review is to provide strategies to address the legal, technical, operational, commercial and indigenous issues involved with implementing the following initiatives to enhance ship safety and marine environment protection in the waters of the Great Barrier Reef region:

- Extending the compulsory pilotage area along the Inner Shipping Route to improve ship safety and reduce the risk of ship sourced pollution taking into account the availability of skilled pilots and the possible impact of any changes on fatigue management;
- Advancing the introduction of technological developments to track and monitor shipping operations in the Reef;
- Enhancing existing ship routeing, traffic management and emergency response arrangements;
- Constraining certain types of ships from operation in the inner Reef, or adjacent to the Reef, having regard to the ship's condition, operational status and nature of its cargo;
- Improving legislative powers of intervention and enforcement, heightening the level of offences and penalties, and ordering restitution, to the maximum extent possible under international law.

The review is to present an interim report to the Minister for Transport and Regional Services by 15 December 2000 which is to include the review's recommended strategy to implement the extension of the compulsory pilotage area and progress in considering introduction of the other initiatives. A final report is to be presented by 29 June 2001 providing recommended strategies for carrying forward the other initiatives.[1]

[1] The Minister for Transport and Regional Services subsequently agreed to an extension of the reporting date to the end of July 2001 to allow for further consultations with indigenous communities in northern Queensland.