

# Evaluating the role of VTS in reducing risk

## An Australian perspective



Australian Government  
Australian Maritime Safety Authority

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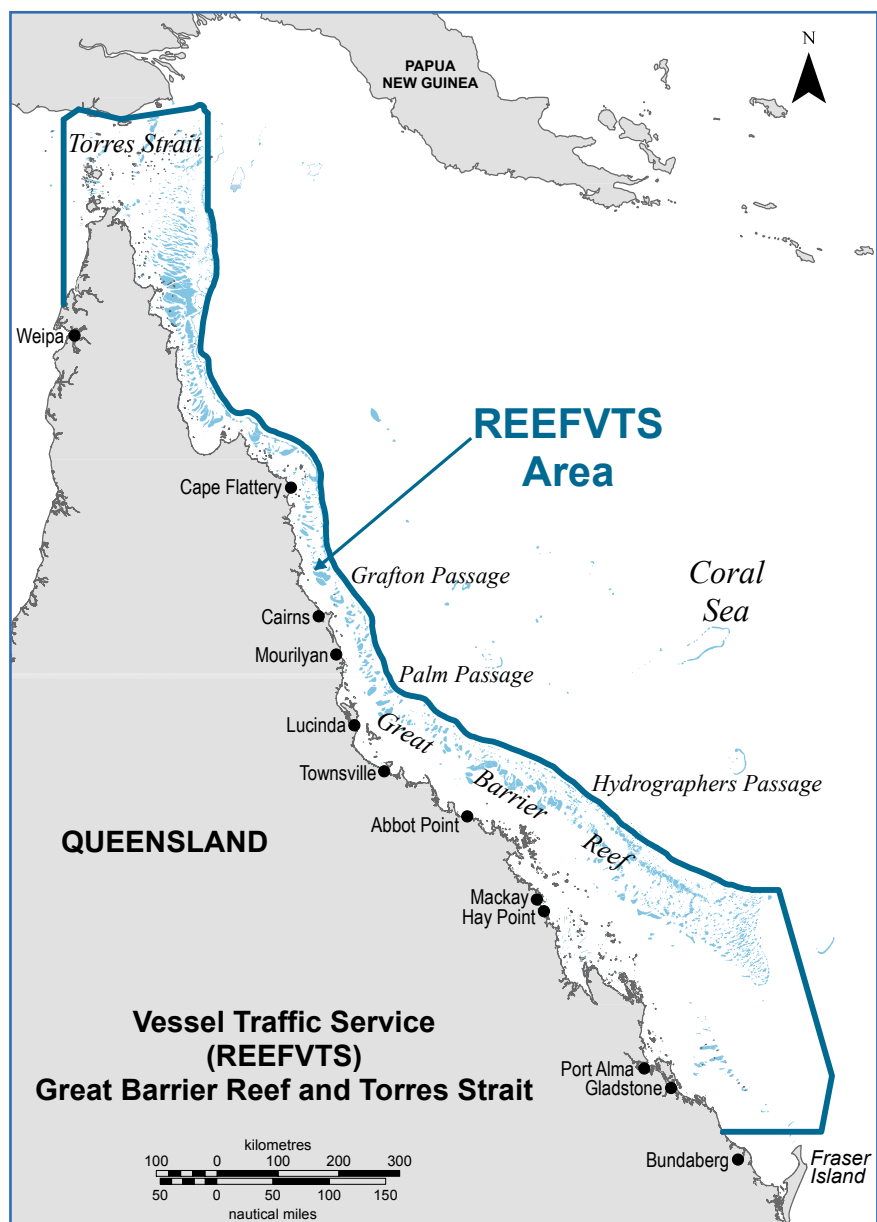
The Great Barrier Reef and Torres Strait comprise a complex network of islands and coral reefs extending over three thousand kilometres along the Queensland coast. The region's cultural and natural heritage is recognised internationally:

- ✓ The Great Barrier Reef and Torres Strait are declared Particularly Sensitive Sea Areas (PSSA) by the IMO
- ✓ The Great Barrier Reef is listed as a World Heritage Area.

The Great Barrier Reef Marine Park is a multi-use area, supporting tourism, research, recreational and commercial fishing and shipping activities. There are eleven ports operating adjacent to the Great Barrier Reef, accounting for approximately \$17 billion of Australia's annual export trade. The export of bulk cargoes and the importing of essential fuel and manufacturing resources are crucial to Australia's economy. Great Barrier Reef tourism contributes some \$5 billion per year to the Australian economy.

With increasing shipping activity in the region the Australian Government introduced the Great Barrier Reef and Torres Strait Vessel Traffic Service (REEFVTS) in 2004 as a mechanism to improve the safety and efficiency of vessel movements and to help protect the marine environment.

On 3 April 2010, the bulk carrier Shen Neng I ran aground on Douglas Shoal, approximately 70 nm south of the then southern REEFVTS boundary and hence outside the REEFVTS area. The grounding breached the ship's double-bottom fuel



tanks, resulting in the release of some bunker oil. The impact of the vessel also caused physical damage to Douglas Shoal, which may take many years to recover.

Following this grounding, and in light of projected further increases in shipping activity and planned port expansions, the Australian Maritime Safety Authority (AMSA) reassessed the range of complementary measures implemented over many years to mitigate risks associated with shipping activity, which included:

- ✓ Declaration of the region as a Particularly Sensitive Sea Area in 1990 by the IMO allowing Australia to introduce associated protective measures.

- ✓ Establishment of a compulsory coastal pilotage regime in 1991 for ships transiting the more navigationally complex shipping routes with the pilot providing detailed local knowledge to assist safe passage.

- ✓ Establishment of an IMO-adopted ship reporting system in 1997 whereby ships are required to report their position on a regular basis.

- ✓ Introduction of REEFVTS in 2004 allowing near real-time monitoring of ship traffic to provide information to a ship's master on potential traffic conflicts and other navigational information. This area extended to latitude 22 degrees south (just south of Mackay) leaving out the far southern part of the Great Barrier Reef Marine Park which is typically more open and easier to navigate.

- ✓ In 2004 a system of use zoning was introduced by the Great Barrier Reef Marine Park Authority which included the allocation of designated shipping areas.

- ✓ Implementation of an emergency management towage system and associated response arrangements in 2006 which included the provision of a dedicated emergency towage vessel.

- ✓ A concentration of Australia's extensive aids-to-navigation network including lights, buoys and a differential satellite system (DGPS).

The assessment identified that REEFVTS had significantly contributed to the reduction in groundings since it was introduced in 2004 and the AMSA report entitled *"Improving Safe Navigation in the Great Barrier Reef, April 2010"* recommended REEFVTS be extended to the southern boundary of the PSSA (that is from 22° south to 24°30' south) as VTS provided a cost effective mechanism and had

a proven track record of mitigating the risk of groundings.

Following a submission to the IMO, the southern boundary of the Great Barrier Reef and Torres Strait Ship Reporting System was extended to align with that of the PSSA on 1 July 2011. This extension included the delivery of REEFVTS services over what amounts to an additional 95,000 square kilometres of water.

Since the introduction of REEFVTS in 2004 the average number of groundings in the Great Barrier Reef and Torres Strait per year has declined from 1.42 per 10,000 transits to 0.15 per 10,000 transits, a reduction of 89 per cent.

This reduction in groundings is attributed to REEFVTS providing timely and accurate information to assist on-board decision



making by the bridge team. A suite of decision-support tools is used to monitor the transit of individual ships and escalate potentially developing situations to the attention of the duty Vessel Traffic Service Operator (VTSO) to assist in the determination of where interaction from the shore may assist on-board decision-making. This incorporates a system of electronic corridors, shallow water areas and critical waypoints to highlight situations where a ship does not alter course at a critical waypoint, deviates from a recommended route or may be in danger of running aground.

In most cases these tools provide for prompt interaction with the bridge team and help prevent developing situations from becoming critical.

The importance of this interaction is that it enables the duty VTSO to confirm the vessel's intentions and, in situations where

the vessel may be standing into danger, provide navigational assistance to mitigate the risk of grounding.

The grounding in 2009 was a piloted vessel, the Atlantic Blue, at Kirkcaldie Reef in the Torres Strait. An investigation by the Australian Transport Safety Bureau found that the ship grounded because its progress and position were not effectively monitored by the bridge team and inadequate action was taken to bring it back on track. Bridge resources were not managed effectively, off-track limits were not defined and the bridge team did not have a shared mental model of the passage. Safety actions to address all the issues have subsequently been taken by the relevant parties.

The report identified safety issues in relation to the ship's passage planning procedures, the coastal pilotage check pilot

regime and the coastal vessel traffic service's monitoring system.

With regards to REEFVTS, the report concluded that although the duty VTSO had taken immediate action in response to the shallow water alarm generated by the decision support system in accordance with REEFVTS procedures, the monitoring system did not provide adequate warning of Atlantic Blue entering shallow water because the boundary of the defined shallow water alert area was too close to dangers off Kirkcaldie Reef.

At the time of the grounding a review of the electronic corridors and shallow water areas in the Torres Strait was underway to bring them into line with enhancements previously introduced to the Great Barrier Reef region as part of operating in a continuous improvement environment. This was noted in the investigation and the report



identified the contribution of these tools to better utilise available resources to enhance traffic monitoring and complement a ship's bridge resources - potentially, the state of the bridge could have improved and changed the sequence of events sufficiently to prevent the grounding.

The enhanced use of electronic corridors and shallow water areas was extended to the Torres Strait a month after the 2009 grounding.

Recent evaluations have highlighted the value of assessing and monitoring the overall performance of VTS. REEFVTS has adopted an ongoing performance monitoring regime to help ensure continuous improvement in a changing environment. REEFVTS operates under an ISO 9001 certified Quality Management System and its VTSOs are trained by an accredited training institute in accordance with IALA Recommendation V-103 and Model Course

V-103/1, VTS Operator Training, Recommendation V-103 and Model Course V-103/2, and VTS Supervisor Training and Guideline 1014 – Accreditation of VTS Training Courses. ■

*The IALA VTS Committee in its 2010/14 Work Programme has commenced the development of a Guideline on assessing and auditing the overall performance of VTS Centres with respect to their effectiveness in mitigating risk.*

*This Guideline aims to establish a framework for verifying objective evidence of VTS processes, to assess how successfully VTS processes have been implemented, for judging the effectiveness of achieving any defined target levels and to provide evidence concerning reduction and elimination of problem areas. Should anyone have similar experiences on how to assess the performance of VTS with respect to their effectiveness for mitigating risk, please contact:*

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#### Evaluación del rol de VTS en la reducción de riesgos – Una perspectiva australiana

El artículo está escrito por Neil Trainor y Kerrie Abercrombie de la Autoridad de Seguridad Marítima Australiana (AMSA). Aquí hay un esbozo de la Gran Barrera de Coral (GBR) y del Estrecho de Torres que comprende una compleja red de islas y arrecifes de coral que se extiende por más de 3.000 km. Ambas características están declaradas Áreas Marítimas Particularmente Sensibles (PSSA) por la OMI y la GBR está listada como un Área del Patrimonio de la Humanidad. La GBR es un área multiuso que sostiene el turismo, la investigación, la pesca recreativa y comercial y las actividades de navegación y aquí hay once puertos que manejan 17 mil millones de dólares australianos en exportaciones. El turismo aporta unos 5 mil millones de dólares australianos anualmente. Evaluaciones recientes han destacado la importancia de evaluar y controlar el rendimiento total de VTS. REEFVTS ha adoptado un régimen en curso de monitoreo del rendimiento para ayudar a asegurar la mejora continua. El Comité de VTS de IALA ha comenzado la elaboración en borrador de una Directriz sobre la evaluación y auditoría del rendimiento total de los Centros de VTS con respecto a su eficacia en la mitigación de riesgos. Esta Directriz establecerá un marco para verificar las pruebas objetivas de los procesos, implementación y eficacia de VTS. Se invita a los lectores que tengan experiencias de cómo evaluar el rendimiento de VTS con respecto a su eficacia para la mitigación de riesgos a ponerse en contacto con: [neil.trainor@amsa.gov.au](mailto:neil.trainor@amsa.gov.au) ◆

#### Evaluation du rôle des STM dans la réduction du risque - Une perspective australienne

L'article a été rédigé par Neil Trainor et Kerrie Abercrombie de l'Autorité de Sécurité Maritime Australienne (AMSA). Voici un plan de la Grande barrière de corail (GBR) et le Déroit de Torres comprenant un réseau complexe d'îles et des récifs de corail s'étendant sur 3 000 km. Ces deux ensembles ont été déclarés zones particulièrement sensibles de la mer (PSSA) par l'OMI et la Grande barrière de corail est inscrite au patrimoine mondial. Elle est une zone de multi-utilisation concernée par le tourisme, la recherche, la pêche de loisirs et commerciale et des activités de navigation, regroupant onze ports traitant des exportations pour un total de 17 milliards de dollars australiens (A\$). Le tourisme contribue annuellement à hauteur d'environ 5 milliards A\$. Des évaluations récentes ont mis en évidence l'intérêt de l'évaluation et du contrôle de la performance globale des STM. Le STM « REEFVTS » a adopté un suivi de la performance en continu pour aider à assurer une amélioration continue. La commission VTS de l'AIMS a commencé l'élaboration d'un guide sur l'évaluation et l'audit de la performance globale des centres de STM en ce qui concerne leur efficacité dans l'atténuation du risque. Ce guide établira un cadre permettant de vérifier la preuve objective du traitement, de la mise en œuvre et de l'efficacité des centres STM. Les lecteurs qui ont l'expérience de la façon d'évaluer la performance de STM en ce qui concerne leur efficacité pour atténuer le risque sont invités à prendre contact : [neil.trainor@amsa.gov.au](mailto:neil.trainor@amsa.gov.au) ◆