

Australian Government Australian Transport Safety Bureau

Serious injury on board the passenger ship *Seven Seas Voyager*

Sydney, New South Wales | 1 February 2014



Investigation

ATSB Transport Safety Report

Marine Occurrence Investigation 306-MO-2014-001 Final – 23 January 2015 Cover photo: Courtesy of Peter F Williams

Released in accordance with section 25 of the Transport Safety Investigation Act 2003

Publishing information

Published by:	Australian Transport Safety Bureau
Postal address:	PO Box 967, Civic Square ACT 2608
Office:	62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone:	1800 020 616, from overseas +61 2 6257 4150 (24 hours)
	Accident and incident notification: 1800 011 034 (24 hours)
Facsimile:	02 6247 3117, from overseas +61 2 6247 3117
Email:	atsbinfo@atsb.gov.au
Internet:	www.atsb.gov.au

© Commonwealth of Australia 2015



Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.

Creative Commons licence

With the exception of the Coat of Arms, ATSB logo, and photos and graphics in which a third party holds copyright, this publication is licensed under a Creative Commons Attribution 3.0 Australia licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form license agreement that allows you to copy, distribute, transmit and adapt this publication provided that you attribute the work.

The ATSB's preference is that you attribute this publication (and any material sourced from it) using the following wording: *Source:* Australian Transport Safety Bureau

Copyright in material obtained from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Addendum

Page	Change	Date

Safety summary

What happened

On 1 February 2014, a crew member carrying out routine maintenance on the passenger ship *Seven Seas Voyager*'s waste incinerator was injured when a pneumatically (air) operated valve closed against his body. The ship was berthed in Sydney and the crew member, a fitter, was taken to a local hospital.

The fitter was treated for serious bruising and shock before returning to the ship. While it was expected that the fitter could resume duties after 2 days, his condition did not sufficiently improve and he was later discharged from the ship to recuperate at home.

What the ATSB found

The ATSB found that the incinerator ash dump valve's control systems had not been properly isolated and residual air pressure remained in the valve's operating system. The fitter assumed that it was safe to start his assigned task of replacing the incinerator ash grates, and accessed the incinerator through the ash dump valve. He then inadvertently activated the electric sensor that automatically closed the valve – driven by the pressure of the residual air remaining in the valve operating system.

The investigation identified that Seven Seas Voyager's engineering staff did not have an adequate understanding of the incinerator's control systems and its maintenance. Furthermore, the task of replacing the ash grates was not adequately planned and shipboard safety management system requirements, including taking necessary risk mitigation measures and completion of a permit to work before the task, were not complied with.

The investigation also found that neither the ship's planned maintenance system (PMS) nor the incinerator manufacturer's instruction manual contained any information with respect to the maintenance or replacement of the ash grates. Such information would have been useful to shipboard staff planning the grate replacement task, particularly with identifying all the risks associated with the task.

What's been done as a result

The ATSB has issued a recommendation to *Seven Seas Voyager*'s manager to take action to address the safety issue with respect to the ship's PMS. The ATSB has also recommended that the incinerator manufacturer address the safety issue concerning the equipment's instruction manual.

Safety message

Shipboard equipment and machinery commonly incorporates automated, power-operated systems which must be isolated, stored energy released and locked out before undertaking maintenance or repair tasks. Safely completing a task relies on personnel having a proper understanding of the system involved, coupled with adequate planning, risk assessment and the effective implementation of all safety management system requirements - including permits to work.

Contents

The occurrence	1
Context	3
Seven Seas Voyager	3
Waste incinerator	3
Ash removal	4
Ash grate replacement	5
Safety analysis	6
The incident	6
Planned maintenance	6
Manufacturer's instructions	7
Risk management	8
Findings	9
Contributing factors	9
Other factors that increased risk	9
Safety issues and actions	10
Planned maintenance system	10
Safety issue description:	10
Manufacturer's instructions	11
Safety issue description:	11
General details	12
Occurrence details	12
Ship details	12
Sources and submissions	13
Sources of information	13
Submissions	13
Australian Transport Safety Bureau	14
Purpose of safety investigations	14
Developing safety action	14

The occurrence

On 31 January 2014, the 206 m long passenger ship *Seven Seas Voyager* (Figure 1) berthed alongside the wharf at the Overseas Passenger Terminal (OPT) in Sydney. The ship was scheduled to remain in port overnight and sail for Brisbane on the following evening.

Figure 1: Seven Seas Voyager



Source: ATSB

At 0730¹ on 1 February, the staff chief engineer² held the daily meeting to discuss the work plan for the day with the first engineer, mechanics, fitters and wipers. The first engineer suggested replacing the waste incinerator ash grates with spare grates on board. The incinerator had been shut down for about 30 hours and had cooled sufficiently. The staff chief engineer agreed with the suggestion and a fitter was assigned to assist the first engineer with the task.

At 0800, the first engineer briefed the assigned fitter about the personal protective equipment (PPE) and the tools that would be required for the ash grate replacement. The fitter began arranging the necessary items for the task in the incinerator room, while the first engineer started to fill out a permit to work.

At 0840, the first engineer inspected the incinerator furnace through the inspection hatch (Figure 2) and found that it needed to be cleaned of ash before work could commence. The incinerator operator attended and used the manual controls to open the ash grates and the sliding ash chamber dump valve to release the ash into an ash waste bin. The first engineer then shut off the air to the incinerator's operating system.

At 0850, after the ash bin had filled, the incinerator operator removed it and returned to his other duties. When the first engineer inspected the internals of the incinerator furnace, he noted that further cleaning was required. He organised a wiper to vacuum the ash out.

At about 0900, the vacuum cleaner stopped after its dust bag filled so the wiper went to get a replacement dust bag. At about the same time, the first engineer went to change into working clothes before starting the task.

By then, the fitter had prepared tools and donned PPE. He moved to a position under the incinerator to inspect the ash grates through the open ash chamber dump valve and determine how to remove the grates. He saw the taper pins holding the grates in place and attempted to hammer the pins free. Unsuccessful, the fitter then stood up through the open ash dump valve

¹ All times referred to in this report are local time, Coordinated Universal Time (UTC) + 11 hours.

² On passenger ships, the staff chief engineer is usually responsible for all maintenance on board.

and the partially closed, worn out grates. He could now look down on the grates as he moved them back and forth.

Meanwhile, the wiper had returned to the incinerator room and started changing the vacuum cleaner dust bag. He did not notice that the fitter was standing under the incinerator with his upper body inside it.



Figure 2: Diagram showing main components of waste incinerator

Source: ATSB

At about 0908, as the fitter went about moving the grates, the ash dump valve began to close. The fitter did not notice the slowly moving dump valve until it was too late for him to get clear. As the valve closed on his lower body, he began to shout for help.

At about 0910, when the first engineer returned to the incinerator room, he heard the fitter's shouts. The first engineer was on the deck above the incinerator, where its electro-pneumatic control cabinet was located, and he quickly checked that the air supply was still closed.

At 0912, the first engineer phoned the staff chief engineer and advised him of the incident and the need for immediate assistance. At the same time, the wiper phoned the bridge and advised the officer of the watch, who then broadcast an all ship medical emergency for the incinerator room.

At 0913, the staff chief engineer arrived in the incinerator room. The first engineer was unable to move the dump valve by hand or by the control system, so he and the staff chief engineer began removing the air pipes to the dump valve and ash grate pneumatic cylinders. Shortly afterwards, the ship's senior officers and the medical response team and arrived on the scene.

When the staff chief engineer and first engineer had removed the air lines, they were able to force the dump valve open and free the fitter. He was stretchered to the ship's hospital for assessment and treatment. An ambulance soon arrived at the OPT wharf and the fitter was taken to a local hospital for further treatment.

At the hospital, the fitter was treated for serious bruising and shock before returning to the ship later that day. He returned to light duties 2 days later but continued to suffer from the effects of the incident. Consequently, on 11 February, he was discharged from the ship to recuperate at home.

Context

Seven Seas Voyager

Seven Seas Voyager is a passenger ship with a capacity of 730 guests. At the time of the incident, it was operated by Prestige Cruise Holdings and engaged in round-the-world cruises. It was registered in the Bahamas and classed with Lloyd's Register (LR).

The ship had a multi-national crew of 451, including the master who joined the ship on the day of the incident. The master had 20 years of seagoing experience, of which the last 12 had been on passenger ships. He held a master mariner's certificate of competency and had been sailing as master for 3 years. This was his sixth time on board *Seven Seas Voyager*.

The staff chief engineer had 27 years of seagoing experience, of which the last 21 years had been on passenger ships. He held a certificate of competency as a chief engineer and had been sailing in that rank for 5 years .This was his first time on board *Seven Seas Voyager* and he had been on board for about 2 weeks.

The first engineer had about 7 years of seagoing experience, of which the last 4 years had been spent on passenger ships. He held a second engineer's certificate of competency and had been sailing as first engineer for 1 month. This was his fourth time on board *Seven Seas Voyager* and had been on board for 2 months.

The fitter had 10 years of seagoing experience, of which 4 years had been with Prestige Cruise Holdings. He held a degree in marine engineering from the Philippines. This was his first time on board *Seven Seas Voyager* and he had been on board for 5 months.

Waste incinerator

Seven Seas Voyager was fitted with a 300 kg/hour ISIR Pyrall 150 ADA type waste incinerator (Figure 3). Shredded solid waste was fed from the deck above into the incinerator furnace through its forward end. The furnace internals were refractory lined and the incinerator was fired via a side-mounted gas oil burner.



Figure 3: Sketch of incinerator ash dumping system and sensors

Source: ATSB



Figure 4: New ash grates (for replacement)

The accumulated ash in the incinerator's ash chamber was held in check by two cast iron grates (figure 4). A sliding ash dump valve was located below the grates and sealed the incinerator ash chamber. When dumping ash, the sliding ash dump valve was opened and the grates swung down to open. This allowed the ash to fall out of the incinerator into an ash bin.

The ash grates and ash dump valve were operated by pneumatic cylinders which were fitted with sensors to detect their position (open or closed). Another sensor was fitted to detect when an ash bin was in place under the incinerator. A control switch was mounted on the side of the incinerator for manual activation of the ash dumping system.

Source: ATSB

Ash removal

Accumulated ash had to be periodically manually released by the incinerator operators (Figure 5). To do this, the incinerator was shut down, allowed to cool and a waste bin was placed under the ash dump valve, making contact with the bin sensor, energising the control circuit.





Source: ATSB

When the control switch was moved to position 1, the ash dump valve would open and then in position 2, the grates would open and the ash would fall into the ash bin. When the ash bin was full, the control switch would be moved to position 0. The grates would close and, once in the fully closed position, the dump valve would close. If the ash bin was removed while the manual control switch was not in position 0, the grates and dump valve would automatically close in the same sequence. If either grate did not fully close, the dump valve would not receive the signal to close and, hence, would remain open.

Ash grate replacement

The incinerator ash grates rotated on a steel shaft passing longitudinally through the grate body and were secured to the shaft with tapered pins (Figure 6). The ash grates opened in a downwards direction and released ash below. However, this did not allow access to remove the tapered pins. The grates needed to be swung 90° upwards to expose the bottom of the pin. This would require disconnection of the pneumatic cylinders, which in turn depressurised the system.



Figure 6: Ash grate removal (photograph shows the worn out ash grates)

Source: ATSB

Safety analysis

The incident

At 0850 on 1 February 2014, when the incinerator operator completed dumping ash into the ash bin, the de-ashing toggle switch was left in position 2 (Figure 5). The subsequent removal of the ash bin released the bin sensor switch, initiating the closing sequence for the ash grates and then the ash dump valve. However, as the after ash grate did not fully close, the ash dump valve was not signalled to close and remained open.

Figure 7: Fitter's position standing in the ash chamber



Shortly after 0900, the fitter decided to see what the ash grate replacement task involved. The open ash dump valve allowed him to access the grates (Figure 7). Assuming that it was safe to start removing the grates, he began punching the taper pins holding the grates. Unable to hit the punch squarely on the pin, he then stood up within the opening of the dump valve and the deteriorated ash grates to get a better view.

As he stood with his upper body inside the ash chamber, the fitter began moving the grates to better position them and punch the taper pins out. When he moved the after grate to the fully closed position, the sensor switch signalled the ash dump valve to close. The air to the valve's operating system had been shut off but residual air in the system allowed the valve to close against the fitter's body.

Source: ATSB

At the time, the incinerator electro-pneumatic control systems had not been properly isolated and it was not safe to start the grate replacement task. Isolating the air to the system was only one part of the process. The residual air pressure in the pneumatic system still needed to be released. In addition, it was necessary to isolate the system's electrical power and prevent sensor switches activating.

Planned maintenance

All maintenance tasks on board *Seven Seas Voyager* were managed through the ship's computerised planned maintenance system (PMS). Scheduled (routine) maintenance checks for the incinerator system were detailed on individual work orders. They stated safety precautions were to be observed and the manufacturer's instruction manual referred to prior to and during maintenance.

The incinerator operator was responsible for reporting all technical problems (and related issues) with the incinerator to the first engineer. It was then the first engineer's responsibility to maintain the machinery as required. This included updating the PMS, such as entering non-scheduled work orders and job histories.

While such systems provide flexibility and convenience, their effectiveness is directly related to the information used to populate various fields and the ongoing recording of maintenance related information.

In early 2013, the deteriorated condition of the ash grates was reported to the first engineer. The first engineer ordered replacement ash grates, which were received in April. In November that year, the first engineer's handover notes indicated that the ash grates required replacement.

However, *Seven Seas Voyager's* planned maintenance system (PMS) contained no information about waste incinerator ash grate replacement, a task that would have been periodically undertaken by different engineering staff since 2003. Therefore, in this respect, the shipboard procedures that documented requirements for the PMS had not been effectively implemented.

Manufacturer's instructions

The incinerator manufacturer's instruction manual contained detailed instructions for isolating its control systems before starting any maintenance (Figure 8). The instructions warned that the loss of electrical power to the control system while there was residual air pressure in the pneumatic circuit would result in the ash dump valve automatically closing. The electro-pneumatic control cabinet door also had a warning notice that stated 'before maintenance to sluice valves (ash grates) discharge the pressure inside the pneumatic circuit'.

However, the manual contained no instructions or guidance for ash grate replacement. With the incinerator being used regularly, the grates would deteriorate and need periodic replacement. Therefore, it could reasonably be expected that the manual should have provided some instructions or guidance to safely complete the task.

While the instructions for isolating the system and the warnings on the electro-pneumatic cabinet were appropriate, they were not followed on 1 February. It is possible that shutting off the air was considered sufficient isolation for the task at hand. The inclusion of some level of instructions in the manual could have prompted other precautions to be taken. Such instructions could also have been included by the ship's engineers in the PMS during the ship's life.

Figure 8: Isolation of pneumatic system



Source: ATSB

Risk management

Replacement of the incinerator ash grates was a non-scheduled and non-routine operation.

Seven Seas Voyager's safety management system (SMS) contained procedures for non-routine operations, requiring that a risk assessment be undertaken for the task using a defined process.

According to the ship's SMS, such tasks needed to be planned and broken down into logical steps, with the assumption that the work team did not have any specific knowledge of the activities to be carried out. All identified hazards associated with each step were to be assessed and the associated risks identified and minimised. Subsequently, the general equipment and area were also to be inspected and any other hazards identified and minimised. Regarding the incinerator, this step would have included isolation of the energy supplies (power and air) and locking out of the system. A pre-work briefing was required to explain the essential elements of the completed risk assessment to the work team.

The ATSB investigation found that the *Seven Seas Voyager*'s engineering staff had had ample time to correctly scope and plan the work. Spare ash grates had been ordered and received on board several months before the incident. Furthermore, the need to replace the grates was identified in the handover notes of the first engineer a couple of months earlier.

However, on 1 February, the ash grate replacement task was not planned or undertaken in the manner described above. On that day, the incinerator had cooled, its operation was not required, spare grates were available and there was sufficient time to complete the task. The discussion at the morning meeting primarily covered these aspects of the task and assigning a team for it.

Permit to work

As part of the broad risk management process, the ship's SMS also required that a permit to work be completed for the task. The permit to work process formalised and documented the key actions required to ensure that all the necessary safety checks and conditions were in place before work was allowed to start. Accurate completion of the permit to work required a sound knowledge of the systems and equipment being worked on.

In this instance however, neither the first engineer nor the fitter had any previous experience of this particular task. The actual work involved in replacing the ash grates was to be determined as the task progressed. Furthermore, there were no specific manufacturer's instructions available for the grate replacement task and the ship's PMS did not contain any information and history to assist the engineering staff.

In preparation for the commencement of work, the first engineer had correctly shut off the operating air to the control system but had not released the residual air pressure or isolated the electrical power because of his limited understanding of the control system. The permit to work that he had started to prepare was not completed when the fitter started work on the incinerator.

At interview, the fitter indicated that he thought the incinerator's system had been isolated and the permit to work had been completed. He had assumed the system was safe to work on. The work team had not discussed the precautions, the work permit conditions or when it would be safe to start work and who was responsible for giving the go ahead to start work.

Findings

On 1 February 2014, a fitter carrying out routine maintenance on *Seven Seas Voyager*'s waste incinerator was injured when the pneumatically operated ash chamber dump valve closed against his body. He was freed and taken to a hospital ashore where he received treatment for serious bruising and shock. The fitter returned to the ship that day and was subsequently repatriated 10 days later to recuperate at home.

From the evidence available, the following findings are made. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

Safety issues, or system problems, are highlighted in bold to emphasise their importance. A safety issue is an event or condition that increases safety risk and (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

Contributing factors

- Assuming that it was safe, the fitter accessed the incinerator's ash chamber to replace its ash grates and inadvertently activated the electric sensor that automatically closed the ash chamber dump valve against his body.
- The ash dump valve's electro-pneumatic control systems were not properly isolated and air pressure in the valve's operating system was not released, leaving residual pressure that allowed the valve to close.
- The ship's engineering staff did not have an adequate understanding of the incinerator's control systems and requirements of this specific task.
- The ash grate replacement task was undertaken on an opportunistic basis and not in accordance with shipboard safety management system requirements and good work practices. Consequently, the task was not adequately planned and risk assessed, and the necessary permit to work and conditions required by the permit were not in place.

Other factors that increased risk

- Seven Seas Voyager's planned maintenance system (PMS) contained no information about waste incinerator ash grate replacement, a task that would have been periodically undertaken by different engineering staff since 2003. Therefore, in this respect, the shipboard procedures that documented requirements for the PMS had not been effectively implemented. [Safety issue]
- The manufacturer's instruction manual for Seven Seas Voyager's waste incinerator contained no specific instructions for ash grate maintenance or replacement. Such instructions would have provided useful information for the ship's crew to plan and safely complete periodic ash grate maintenance. [Safety issue]

Safety issues and actions

The safety issues identified during this investigation are listed in the Findings and Safety issues and actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

All of the directly involved parties were provided with a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

Planned maintenance system

Number:	MO-2014-001-SI-01
Issue owner:	Prestige Cruise Services
Operation affected:	Marine: Shipboard operations
Who it affects:	All persons charged with maintaining equipment

Safety issue description:

Seven Seas Voyager's planned maintenance system (PMS) contained no information about waste incinerator ash grate replacement, a task that would have been periodically undertaken by different engineering staff since 2003. Therefore, in this respect, the shipboard procedures that documented requirements for the PMS had not been effectively implemented.

Response to safety issue by Prestige Cruise Services

Prestige Cruise Services did not submit a response.

ATSB action in response:

The ATSB has issued the following recommendation to Prestige Cruise Services.

ATSB safety recommendation to Prestige Cruise Services

Action number: MO-2014-001-SR-001

Action status: Released

The ATSB recommends that Prestige Cruise Services take action to ensure that all shipboard repetitive non-routine maintenance activities are addressed and appropriately documented within the ship's planned maintenance system.

Current status of the safety issue

Issue status: Not addressed

Justification: Prestige Cruise Services has not taken action to address this safety issue.

Manufacturer's instructions

Number:	MO-2014-001-SI-02
Issue owner:	ISIR Impianti Srl
Operation affected:	Marine: Shipboard operations
Who it affects:	All persons charged with maintaining equipment

Safety issue description:

The manufacturer's instruction manual for *Seven Seas Voyager*'s waste incinerator contained no specific instructions for ash grate maintenance or replacement. Such instructions would have provided useful information for the ship's crew to plan and safely complete periodic ash grate maintenance.

Response to safety issue by ISIR Impianti Srl

ISIR Impianti Srl did not submit a response.

ATSB action in response:

The ATSB has issued the following recommendation to ISIR Impianti Srl.

ATSB safety recommendation to ISIR Impianti Srl

Action number: MO-2014-001-SR-002

Action status: Released

The ATSB recommends that ISIR Impianti SrI take action to ensure that their equipment maintenance instructions contain all detail necessary to allow the safe completion of routine and non-routine maintenance activities.

Current status of the safety issue

Issue status: Not addressed

Justification: ISIR Impianti Srl has not taken action to address this safety issue.

General details

Occurrence details

Date and time:	1 February 2014 – 0910 (UTC + 11 hours)		
Occurrence category:	Serious incident		
Primary occurrence type:	Serious injury (Crew member crushed)		
Location:	Overseas Passenger Terminal, Sydney, New South Wales		
	Latitude: 33° 51.50' S	Longitude: 151° 12.62' E	

Ship details

Name:	Seven Seas Voyager
IMO number:	9247144
Call sign:	C6SW3
Flag:	Bahamas
Classification society:	Lloyd's Register
Ship type:	Passenger/Cruise
Builder:	Cantiere Navale Visentini Srl - Porto Viro, Italy
Year built:	2003
Owner(s):	Voyager Vessel Company, USA
Operator:	Prestige Cruise Services, USA
Manager:	Prestige Cruise Services, USA
Gross tonnage:	42,363
Deadweight (summer):	5,400 t
Summer draught:	7.100 m
Length overall:	206.50 m
Moulded breadth:	28.80 m
Moulded depth:	15.70 m
Main engine(s):	Wartsila 9R38A, four stroke, single acting, in-line diesel x 4
Total power:	23,760 kW
Speed:	20 knots
Damage:	Nil

Sources and submissions

Sources of information

On 3 February 2014, investigators from the ATSB attended *Seven Seas Voyager* while the ship was berthed in Brisbane, Queensland. The master and directly involved crew members were interviewed and each provided their account of the accident. Photographs of the ship and copies of relevant documents were obtained, including log books, statutory certificates, reports, manuals and procedures.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to Seven Seas Voyager's master, staff chief engineer, first engineer, environmental officer, fitter, wiper and incinerator operator, the Australian Maritime Safety Authority, Prestige Cruise Services, ISIR Impianti Srl and the Bahamas Maritime Authority.

Submissions were received from *Seven Seas Voyager*'s master, the Australian Maritime Safety Authority, and the Bahamas Maritime Authority. The submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Australian Transport Safety Bureau

Enquiries 1800 020 616 Notifications 1800 011 034 REPCON 1800 011 034 Web www.atsb.gov.au Twitter @ATSBinfo Email atsbinfo@atsb.gov.au

ATSB Transport Safety Report

Serious injury on board the passenger ship *Seven Seas Voyager* Sydney, New South Wales, 1 February 2014

306-MO-2014-001 Final – 23 January 2015