

MURRAY KING

**THE PROBLEM OF MISDECLARED
CONTAINER WEIGHT**

LLM SEMINAR PAPER

LAWS 538: MARITIME AND TRANSPORT LAW

FACULTY OF LAW

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI



VICTORIA
UNIVERSITY OF WELLINGTON

2014

Abstract

This paper addresses the problem of misdeclaring container weights, which causes accidents on land and sea, with serious consequences. It reviews the current international and New Zealand domestic law, and the plan to mandate verification of container weight in the Safety of Life at Sea (SOLAS) convention. It concludes that this is unlikely to be enough by itself to fix the problem. It considers the points in the supply chain where responsibility could be placed for weighing, and proposes a “chain of responsibility” approach with initial weighing by the shipper and check weighing later, especially at ports, with misdeclared containers being reportable as incidents. Such a system should rid New Zealand of the problem.

Word length

The text of this paper (excluding abstract, word length, subjects and topics, table of contents, footnotes and bibliography) comprises 7496 words.

Subjects and Topics

Maritime law – International Maritime Organisation – SOLAS

Maritime law – SOLAS – container weights

Maritime law – chain of responsibility

Land transport law – container weights

Land transport law – chain of responsibility

Contents

I	The Problem	5
II	Context	6
III	Dimensions of the Problem	7
A	Road	7
B	Rail	8
C	Sea	9
IV	SOLAS	12
A	SOLAS Chapter VI: “Carriage of Cargoes”	12
B	New Zealand’s maritime rules - weight	13
V	Proposed Amendment to SOLAS	14
VI	Ways of addressing the problem	16
A	Ships could be made stronger	16
B	Masters could be made responsible	17
C	Ports could weigh	18
D	Inland carriers could be made responsible	22
E	Shippers’ responsibility could be enforced.	23
F	Import containers and transhipments	25
VII	Suggested Solution	27
A	Chain of responsibility	27
B	Onus on shipper	28
C	Check weighing	29
D	Monitoring incidents	32
E	Inter-agency approach	33
VIII	Conclusion	34
	Bibliography	35

The Problem of Misdeclared Container Weight

Murray King

I The Problem

Misdeclarations “present the most significant risk” for container shipping,¹ and have been implicated in major shipping losses. One commentator compares the scale and importance of misdeclarations to the Victorian era loss of ships that led to the original “Plimsoll” load lines.²

Shippers (senders of goods, not shipping lines³) declare the contents of and weight of containers in shipping documents. Misdeclarations occur when the actual weight differs from this.⁴ Loading a container with more than the declared weight can reduce shippers’ costs. As well, the weight may simply be estimated,⁵ or may not include the tare weight of the container or the weight of dunnage.⁶ Or it may be simply “poorly communicated”.⁷

Most attention is focused on “overweight” containers, where the declared weight is less than the actual weight, but even an overstated weight can be a problem.⁸

¹ “Mis-declared cargoes are the biggest risks in shipping”, *Lloyd’s List Australia* (Sydney 9 January 2014) at 1.

² Peregrine Storrs-Fox “Container Weighing – an industry wide issue” (Broker briefing 6 November 2012) at slide 13; Editorial, “The 21st Century Plimsoll issue” (29 July 2011) 148 *TT Talk*, both at TT Club <www.ttclub.com>.

³ *Report to the Maritime Safety Committee* DSC 18/13, 27 July 2012, (report from the Subcommittee on Dangerous Goods, Solid Cargoes, and Containers (“DSC”)) Annex 2, Draft guidelines at [3.12].

⁴ *Draft IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTUs)*: MSC 93/9/1, 31 January 2014, Annex, at 9; See also the final version, January 2014, United Nations Economic Commission for Europe, “The new CTU Code”, Informal Document ITC (2014) No 7, <www.ece.org> at 7 [ECE].

⁵ *Development of Measures to Prevent Loss Of Containers – Verification of container weights* DSC 17/7, 15 June 2012 (Submission by Denmark, the Netherlands, The United States, Baltic and International Marine Council, the International Association of Ports and Harbors, the International Chamber of Shipping, the International Transport Workers Federation and the World Shipping Council) at [12].

⁶ Editorial, “Why is weight of containers an issue” (23 July 2012). 163 *TT Talk*, TT Club, <www.ttclub.com>.

⁷ Peregrine Storrs-Fox “Decision Time For Container Weighing” *Containerisation International* (London September 2013) at 40.

⁸ British International Freight Association “Mandatory measures to weigh containers due by 2013” (14 December 2011) BIFA <www.bifa.org> [BIFA].

A ship's master is responsible for stowage so the ship's capacity is not exceeded, and it is properly balanced ("trimmed"). If masters do not know the actual weight of each container they cannot trim correctly.

// Context

Containerisation speeds handling of goods throughout the supply chain. The faster the containers are moved, including through ports, the better the utilisation of ships, which lowers freight rates. A container ship has 3-6 times the capacity of a conventional ship per month.⁹

There is thus pressure to move containers through ports as quickly as possible.¹⁰ The Ministry of Transport publishes data on the port throughput to encourage such efficient turnaround.¹¹ There is little opportunity to check shippers' declarations.

Before containers, most cargoes were "break bulk", in small units – carcasses, butter boxes, wool bales. Their nature was obvious, and there was less need to rely on declarations apart from arcane commodities. And because the units were smaller there was less chance of making errors in trim. Masters could see what was heavy, or consult manuals.¹² These detailed the characteristics of each commodity, including its properties, stowage units, and density.

Container standardisation exacerbates the problem. On board ship, or in a terminal, all containers look the same and give no clue as to their contents nor weight, presenting an illusion of homogeneity. A report on a voyage on the *Maersk Kendal* noted that her master did not care what was inside the containers.¹³ Masters have to rely on declarations being truthful.

⁹ Marine Accident Investigation Branch [UK] *Report on the investigation of the structural failure of MSC Napoli English Channel on 18 January 2007* (report 9/2008, April 2008) at 30 [MAIB].

¹⁰ Dave Macintyre "Container terminals feel the heat" *New Zealand Shipping Gazette Special Industry Review* (Christchurch, December 2013) at 1.

¹¹ Ministry of Transport *Freight Information Gathering System and Container Handling Statistics January–December 2013* (Wellington, February 2014) at 41 [FIGS].

¹² G M Pepper Thomas' *Stowage - The Properties and Stowage of Cargoes* (5th ed, Brown, Son & Ferguson, Glasgow, 2008).

¹³ Rose George *Deep Sea and Foreign Going* (Portobello, London, 2013), at 42.

The container does not have to be overloaded beyond its capacity to be a problem. It is the misdeclaration of its weight that is important. Containers loaded beyond their rated capacity are nevertheless an issue, especially for 40ft containers, which could be overloaded even with a moderately dense commodity. Containers that exceed their certified capacity may not be loaded on a ship.¹⁴ Consequently, they are also more likely to be misdeclared.

Poor stowage within a container can also cause problems,¹⁵ but this is outside the scope of this paper. So is misdeclaration of the nature of the contents, such as dangerous goods.

III Dimensions of the Problem

Misdeclared weight can be dangerous anywhere along the supply chain. Both the advantage of, and the problem with, containers is that they integrate the whole supply chain, linking it all together. So while this multiplies the danger of misdeclared weights, affecting all stages of the supply chain, it also gives many opportunities to catch misdeclared containers before they are loaded on to a ship. Any solution to the problem ideally addresses the problem all along the chain.

A Road

Road and rail are engineered to certain standards. The standard maximum truck load (including trailer) is 44t gross.¹⁶ Overloaded trucks damage

¹⁴ International Convention for the Safety of Life at Sea, 1184 UNTS 2 (signed 1 November 1974, entered into force 25 May 1980), Annex, Regulation VI-5(5) [SOLAS]; New Zealand Maritime Rules Part 24, Carriage of Cargoes – Stowage and Securing, r 24D.20(1)(g).

¹⁵ Mike Wackett, “Hauliers believe poor container stowage a greater threat than misdeclared weight” (12 May 2014) The Loadstar <<http://theloadstar.co.uk>>.

¹⁶ Land Transport Rule: Vehicle Dimensions and Mass 2002, Schedule 2, Table 6.

bridges¹⁷ and roads, and may roll over.¹⁸ Some 8-10% are overloaded,¹⁹ including some carrying containers.²⁰

Again, the container itself need not be overloaded to be a problem.²¹ Because stacking is not an issue, overstating the weight of the container is however not usually a problem.

B Rail

Rail wagons can carry much heavier containers, but not two maximum weight 20-foot containers. So misdeclared weight may damage the vehicle, track and bridges,²² and trains may stall. Repeated overloading can cause metal fatigue, weakening the wagon, which may later fail under a relatively benign load.²³ Overstated weights are also not usually a problem for rail.

KiwiRail monitors overloading with in-motion weighbridges. A 2012 sample identified 2680 axles more than 10% overloaded (2%).²⁴ A number of these were carrying containers to or from a port.²⁵ Any overweight detection results in action, which can be as little as putting the wagon off the train at the next siding for unloading, or as much as closing the whole route the container took until it is inspected for damage.²⁶ A report to KiwiRail suggested action to correct the problem by asking the consignor to address it (for exports) or by weighing at the port (imports).²⁷

¹⁷ New Zealand Transport Agency *Proposed changes to legislation relating to overweight and high-productivity motor vehicles - Consultation document* (February 2014) at 11.

¹⁸ *Development of Measures to Prevent Loss of Containers – Verification of container weights* DSC17/7/3, 27 July 2012 (Submission by ICHCA (International Cargo Handling Coordination Association) International to the DSC) at [6].

¹⁹ C McBride and P Kirby *Strategic electronic monitoring and compliance of heavy commercial vehicles in the upper North Island* (New Zealand Transport Agency, Report 500, October 2012) at 12.

²⁰ Email from Marinus La Rooij, Freight Portfolio Strategy Manager, New Zealand Transport Agency to Murray King regarding illegally overloaded containers (21 March 2014).

²¹ Peregrine Storrs-Fox “Responsibility for accurate weight declarations in containers” (27 January 2010) 125 *TT Talk*, TT Club, <www.ttclub.co.uk>.

²² Murray King & Francis Small Consultancy *Avoiding Main Line Overloads* (Report to KiwiRail Infrastructure and Engineering April 2012) at [38]. Quoted with KiwiRail’s permission. [King].

²³ Email from Tony Pepperell, Principal Design Engineer, KiwiRail to Murray King regarding broken wagon as a result of overloading (25 March 2014).

²⁴ King, above n 22, at [5].

²⁵ King, above n 22, at [10], [13].

²⁶ KiwiRail *Overload and Imbalance* [sic] *Wagons* Train Control Instruction AO13 at 2.

²⁷ King, above n 22, at [57], [62].

C Sea

Overloaded containers should not overload the ship as a whole, as the total weight of a ship can be independently assessed, using its load lines, which must not be submerged.²⁸

But container overloading causes other problems. Unstable container stacks or poorly distributed loads may expose the ship to stresses beyond its design capacity. This may result in a ship buckling or breaking in two. Structural failure on a ship is also likely to be cumulative with repeated overloads.²⁹

The problem is worse with containers with understated weights high in deck stacks. The higher they are, the more their impact is.³⁰ Conversely, containers with overstated weights lower in the stack can also be a problem.³¹ Modern container ships have higher deck stacks than earlier ships,³² and thus more exposure to problems from misdeclarations. Even so, the problem with overweight containers is not new.³³

With both the actual weight and its distribution in the stack being unreliable, proper stowage is hindered, and stacks can become unstable.³⁴ Unplanned weight high in the stack combined with heavy rolling may cause lashings to break, losing cargo overboard.³⁵ This is a particular problem for

²⁸ International Convention on Load Lines 640 UNTS 133 (signed 5 April 1966, entered into force 21 July 1968), art 12; Maritime Transport Act 1994, s 67A.

²⁹ MAIB, above n 9, at 39.

³⁰ Herman D Tabak *Cargo Containers – Their Stowage, Handling and Movement* (Cornell Maritime Press, Cambridge (Maryland) 1970) at 47.

³¹ *Revision of the Guidelines for packing of Cargo Transport Units – Draft Code of Practice for Packing of Cargo Transport Units (CTUs)* Note by the Secretariat DSC 18/8, 3 May 2013, Annex Fig 1.15 at 51. Not included in the January 2014 version, see MSC 93/9/1, above n 4; and ECE, above n 4, nor in the collection of omitted material – United Nations Economic Commission for Europe, “Draft Informative Material” Informal Document E/GPC No 20 (2013) 29 January 2014 <www.ece.org>.

³² Maritime Research Institute Netherlands *Lashing@Sea*, 2009, at 8 [Marin].

³³ Ron Allan, “Overview Paper on Problems Caused by Heavy or Overweight Containers”, Presentation to International Cargo Handling Co-ordination Association and Chartered Institute of Transport Seminar on Overweight Containers (Auckland, March 1990).

³⁴ Marin, above n 32, at 41, 43.

³⁵ DSC 17/7/3, above n 18 at [5]; Marin, above n 32.

small and medium sized container ships, under 5000 twenty-foot equivalent units (TEU),³⁶ such as those used in New Zealand trades.³⁷

Each year 350 containers are lost at sea, other than through “catastrophic events”.³⁸ Such events need not involve the loss of a ship: in February 2014 the 8160 TEU *Maersk Svendborg* lost more than 500 containers overboard in a storm in the Bay of Biscay.³⁹ Many of these floated and were a hazard to small craft. Some washed up on the British south coast and had to be dealt with by authorities to avoid contamination and looting.⁴⁰

In 2013, the 8110 TEU⁴¹ *MOL Comfort* broke into two off Yemen and eventually sank. The evidence was lost, but there is a “strong possibility” that that incident also resulted from overweight containers.⁴² The shipbuilder has rejected any fault with the actual ship.⁴³ Large ships may be particularly susceptible to the structural impact of overweight containers.⁴⁴

In 2007, the 4419 TEU *MSC Napoli*’s hull buckled. It was subsequently beached on the south coast of England.⁴⁵ The 660 dry (unsubmerged) containers were weighed; 20% (137) differed from the declared weight by over 3t. The largest difference was 20t, and the total weight of the 137 was

³⁶ Aron Sorenson “Regulation of container weighing” *Port Technology International* (London, March 2013) 12.

³⁷ FIGS, above n 11, at 24.

³⁸ “Containers Lost at Sea”, World Shipping Council August 2011; *Development of Measures to Prevent Loss of Containers – Revision of ISO 3874 – Freight Containers – Handling and Securing* DSC 18/5/2, 12 July 2013 (Submission by International Standards Organisation to DSC) at [3].

³⁹ Marcus Hand “Svendborg Maersk Lost 520 containers overboard” (19 February 2014). Sea Trade Global <www.seatrade-global.com>.

⁴⁰ “Cigarettes galore! Millions of Marlboros washed up on British Beaches after Danish cargo ship lost containers during storms will be BURNED to make electricity”, (25 February 2014) Mail Online <www.dailymail.co.uk>.

⁴¹ Max Tingyao Lin “Counting the costs” *Containerisation International* (London, May 2014) at 19.

⁴² *Development of Measures to Prevent Loss of Containers – Verification of Container Weights* DSC 18/5/4, 25 July 2013 (Submission by the International Transport Workers’ Federation) at [3].

⁴³ “Asia: Shipbuilder rejects responsibility for MOL Comfort casualty” (4 April 2014) Lloyd’s List DCN <www.lloydslistdcn.com.au>.

⁴⁴ *Comment on the report of the eighteenth session of the Sub-Committee* [on Dangerous Goods, Solid Cargoes and Containers], MSC 93/9/2 10 March 2014 (submission by the Bahamas and Japan) at [7], [9].

⁴⁵ MAIB, above n 9, at 1.

312t more than the manifest showed.⁴⁶ Some of its cargo too washed ashore and was looted.

Ships have rolled over,⁴⁷ and whole rows of containers toppled⁴⁸ through overloading. Forklifts ashore have fallen over,⁴⁹ and overloaded containers have fallen on to the wharf,⁵⁰ and into a hold. In the latter case, the container was declared to weigh 25t but in fact weighed 46t.⁵¹ “Accidents in terminals” was the risk reported by most respondents (91%) to an International Association of Ports and Harbours (IAPH) survey on overweight and misdeclared containers in 2012.⁵²

In addition, misdeclared weight helps evade customs charges, and may hinder security measures. A Ukrainian Customs survey in 2012 found 56% of inwards containers were overloaded.⁵³ Overweight containers also increase costs, reduce ship efficiency (which adds to pollution), cause delays, and disrupt schedules.⁵⁴

A third of the 130 million containers shipped a year are estimated to have inaccurately declared weights.⁵⁵ Incidents reported to the Cargo Incident Notification System (CINS, run by shipping lines) increased by about 65% in 2013. Almost half were misdeclarations (not just weight), up fivefold from

⁴⁶ At 29.

⁴⁷ *Development of Measures to Prevent Loss of Containers – Verification of container weights* DSC 17/INF.5, 27 July 2012 (Submission by Denmark, the Netherlands, The United States, Baltic and International Marine Council, the International Association of Ports and Harbors, the International Chamber of Shipping, the International Transport Workers Federation and the World Shipping Council) Annex, at 1.

⁴⁸ At 3.

⁴⁹ At 3, 6.

⁵⁰ At 2.

⁵¹ At 6.

⁵² International Association of Ports and Harbors “Report of IAPH Survey Results on Overweight or Incorrectly Declared Container Issues in Ports” (International Association of Ports and Harbors, May 2012) at 4 [IAPH].

⁵³ Baltic and International Marine Council, the International Association of Ports and Harbors, the International Chamber of Shipping, and the World Shipping Council, “Shipping Industry Urges the IMO to Approve Container Weight Verification Requirement” (September 2013) at 1 [BIMCO].

⁵⁴ World Shipping Council and International Chamber of Shipping “Solving the Problem of Overweight Containers”, 1 December 2010, at 2 [WSC and ICS].

⁵⁵ Mike Wackett “Safety campaigners turn the spotlight on how industry can tackle poor box packing” (12 February 2014), The Loadstar <<http://theloadstar.co.uk>>.

2012. Twenty-two percent were loaded in China, and another 18 percent in the Asia-Pacific region.⁵⁶

IV SOLAS

International shipping is governed by conventions created by the International Maritime Organization (IMO) (and other bodies). The conventions are administered by individual states, in New Zealand through Maritime New Zealand (MNZ).

The principal safety convention is the International Convention on Safety of Life at Sea (SOLAS). It applies to all ships involved in international trade registered in signatory flag states.⁵⁷ It has 162 contracting states, representing 99% of the world's shipping tonnage.⁵⁸ New Zealand acceded to SOLAS on 23 February 1990, with effect from 23 May 1990.⁵⁹

The IMO works through a series of committees. The Maritime Safety Committee (MSC) is responsible for SOLAS. The Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC), now renamed the Sub-Committee on Carriage of Cargoes and Containers, (CCC),⁶⁰ is responsible for container weight and contents.

A SOLAS Chapter VI: "Carriage of Cargoes"

Chapter VI includes rules about cargoes "owing to their particular hazards to ships or persons on board, may require special precautions".⁶¹

Regulation 2 of Chapter VI provides that:⁶²

The shipper shall provide the master ... with appropriate information on the cargo sufficiently in advance of loading to enable the precautions which may be necessary for proper stowage and safe carriage of the cargo to be put into effect

⁵⁶ Editorial "Liner 'Cargo Incident Notification System' growing up" (19 March 2014) All About Shipping, <www.allaboutshipping.co.uk>.

⁵⁷ SOLAS, above n 14, art II.

⁵⁸ International Maritime Organization *Status of multi-lateral Conventions and instruments in respect of which the International Maritime Organization or its Secretary-General performs depositary or other functions*, as at 31 May 2014, at 17 [IMO status]

⁵⁹ IMO Status, above n 58, at 16.

⁶⁰ Editorial "Meeting summaries, CCC" (20 September 2013) International Maritime Organisation, <www.imo.org>.

⁶¹ SOLAS, above n 14, Annex, reg VI – 1(1)

⁶² Regulation VI – 2(1).

“Information” includes the cargo’s properties and gross weight of a container.⁶³ The container has to be packed, loaded and stowed to prevent hazard to the ship or people, or loss of cargo overboard.⁶⁴

The onus is thus on the shipper⁶⁵ to properly declare weight. However, the current system relies on the shipper’s “honesty and integrity”,⁶⁶ and is not well enforced: “[t]here is no effective port State or flag State enforcement of shippers’ current SOLAS regulation VI/2 requirements”.⁶⁷ It can be ignored by shippers.⁶⁸ In fact weighing is not part of the requirement.⁶⁹ The regulation has not avoided serious losses.

B New Zealand’s maritime rules - weight

New Zealand already has powers to control overweight containers. MNZ creates Maritime Rules under the authority of the Maritime Transport Act 1994 (MTA).⁷⁰ Part 24B of the rules (Carriage of Cargoes – Stowage and Securing) enacts SOLAS information provisions including the container’s weight.⁷¹ Masters must not accept cargo if it is unsafe.⁷² Part 24B applies to outward cargo, exports, (and coastal and New Zealand ships), but not imports.⁷³

In Part 24D (Carriage of Cargoes - Convention Containers), rule 24D.20 provides that no-one shall load or unload containers if they have “reason to believe the container is unsafe”.⁷⁴ This is a power also applying to incoming cargo, even cargo that is simply on board at a port,⁷⁵ unlike the provisions in Part 24B.

⁶³ Regulation VI – 2(2).

⁶⁴ Regulation VI – 5(1), 5(2).

⁶⁵ DSC 18/13, above n 3, Annex 2, at [5].

⁶⁶ DSC 18/5/4, above n 42 at [4.4]; 125 *TT Talk*, above n 21

⁶⁷ DSC 17/7, above n 5, at [13], [23]. See also BIMCO, above n 53, at 2

⁶⁸ Chris Bain, “Changes to SOLAS Chapter VI - ‘At the Sharp End’” Presentation to Maritime Law Association of Australia and New Zealand, New Zealand Branch Conference 2014, at slide 6.

⁶⁹ Editorial “Weighing of Containers essential” (26 July 2013) Synergy Group <www.synergymarinegroup.com>; “Maritime Industry asks IMO to Require the Weighing of Containers, (19 July 2012) Baltic and International Marine Council, <www.bimco.org>.

⁷⁰ Maritime Transport Act 1994, Part 4 [MTA].

⁷¹ Maritime Rules, r 24B.4(1), (2).

⁷² Rule 24B.4(4).

⁷³ Rule 24B.3.

⁷⁴ Rule 24D.20(1)(a).

⁷⁵ Rule 24D.3(4).

Misdeclared weights compromise safety even if the container itself is not unsafe. It is possible that rule 24D.20 could work as a sanction for misdeclared containers, but it needs to be clarified. The MTA also makes it an offence to provide false information about the safety of a ship, or anything else “used in or connected with maritime activities”.⁷⁶ These general provisions could also catch dangerous goods, yet there are specific sanctions in the MTA against breaches of dangerous goods rules.⁷⁷ A specific sanction against misdeclaring weights should be put into the MTA or Rule 24B.

MNZ can take action against the shipper, who is liable to fines of up to \$100,000 for a corporate.⁷⁸ The shipper of a New Zealand export should be readily traceable.

“All persons”, for example truck drivers,⁷⁹ also have general responsibilities for packing, labelling and other aspects.⁸⁰ No-one should load leaking or spilled packages into a ship.⁸¹ This would include a straddle carrier or crane driver; such an obligation could be extended to those who have knowledge of a misdeclared container.

V Proposed Amendment to SOLAS

The DSC has proposed a new obligation, to weigh the container or its contents and to declare this weight.⁸² New paragraphs 4, 5 and 6 are added to Regulation 2:⁸³

4. In the case of cargo carried in a container ... the gross mass ... shall be verified by the shipper, either by

- .1 weighing the packed container using calibrated and certified equipment; or
- .2 weighing all packages and cargo items [including dunnage and packing] and adding the tare mass of the container to the single masses using a certified method approved by the competent authority of the State in which packing of the container was completed.

⁷⁶ MTA s 67(1).

⁷⁷ Section 67B(1)(c).

⁷⁸ Section 67(2).

⁷⁹ Rule 24A.10(1), footnote 1.

⁸⁰ Rule 24A.10.

⁸¹ Rule 24A.10(3).

⁸² DSC 18/13, above n 3, at [5 .16].

⁸³ DSC 18/13, above n 3, Annex 1.

5. The shipper of a container shall ensure the verified gross mass is stated in the shipping document. The shipping document shall be:

- .1 signed by a person duly authorized by the shipper; and
- .2 submitted to the master or his representative and to the terminal representative sufficiently in advance, as required by the master or his representative to be used in the preparation of the ship stowage plan.

6. If the shipping document, with regard to a packed container, does not provide the verified gross mass and the master or his representative and the terminal have not obtained the verified gross mass of the packed container, it shall not be loaded on to the ship.

For the second method in paragraph 4, weight markings on sealed packages can be used instead of re-weighing.⁸⁴ Special care will be needed to ensure dunnage and the container tare are included.⁸⁵ Certification of weighing procedures and parties is “up to the State concerned”.⁸⁶ Verified weights are to be provided to the next party in the chain, such as a road or rail operator.⁸⁷

The MSC approved the proposed changes in May 2014, subject to final adoption in November 2014.⁸⁸ They are expected to enter into force in July 2016.⁸⁹ Then, the port state will be responsible for verifying compliance,⁹⁰ as well as for weighing procedures.⁹¹

Even though the main danger of misdeclared containers is on the high seas, the port state is in the best position to take action to control the weight and contents, just as it is in the best position to control ship condition.⁹² Besides, it is a shipper’s responsibility to declare accurately, and these declarations take place within port states. As well, all actions to verify the weight are also on land, even if on a port.

⁸⁴ DSC 18/13, above n 3, Annex 2 at [7.2.1]

⁸⁵ 163 *TT Talk*, above n 6.

⁸⁶ DSC 18/13, above n 3, Annex 2 at [7.2.3.1]

⁸⁷ DSC 18/13, above n 3, Annex 2 at [12].

⁸⁸ International Maritime Organisation “Draft Polar Code approved at busy Maritime Safety Committee session” (press briefing 28 May 2014).

⁸⁹ DSC 18/13, above n 3, Annex 2 at [23].

⁹⁰ DSC 18/13 above n 3 at [5.17]; Annex 2 at [21].

⁹¹ DSC 18/13, above n 3, Annex 2 at [7.2.3.1].

⁹² Bevan Marten *Port State Jurisdiction and the Regulation of International Merchant Shipping* (Springer, Cham, 2014) at 59-60.

The draft rules are a compromise.⁹³ The first method in paragraph 4⁹⁴ was originally preferred,⁹⁵ but was felt to impose too onerous an obligation on shippers.⁹⁶ A freight forwarding company, for example, may not have verified means of weighing whole containers.⁹⁷ It could comply via the second method,⁹⁸ through weighing the packages.

The new rule still relies on applying the weighing and certifying procedures honestly. The International Transport Workers Federation (ITF) believes it is no better than the current position. In their view, it is unenforceable, with no “enforcement internationally ashore” and no guarantee that states have oversight or certified approval methods in place.⁹⁹

VI Ways of addressing the problem

The proposed new SOLAS system needs to be enforced if it is to correct the problem.¹⁰⁰ But enforcement by itself will not be enough, given the scale of the issue and the large number of containers in trade at any one time. It needs effective self-regulation, or cooperative “policing” to make it work. The problem can be potentially attacked at several points in the supply chain, although verifying the weight earlier in the chain will be less costly than later.¹⁰¹ Most of the actions could be taken by New Zealand authorities.

A Ships could be made stronger

Sister ships were strengthened after the *MOL Comfort* incident.¹⁰² The report on the *Napoli* accident suggested that other ships should be investigated for propensity to buckle, and 12 were identified as not being strong enough in severe conditions.¹⁰³ As the extent of overloading becomes clearer through

⁹³ World Shipping Council, “History of the IMO Effort to Improve Container Safety”, (August 2013), at 3

⁹⁴ DSC 18/13, above n 3, Annex 1, proposed reg 2(4.1).

⁹⁵ DSC17/7, above n 5, Annex 1.

⁹⁶ DSC 17/7, above n 5, at [22].

⁹⁷ At [8].

⁹⁸ DSC 18/13, above n 3, Annex 1, proposed reg 2(4.2).

⁹⁹ DSC18/5/4, above n 42, at [7].

¹⁰⁰ Gavin van Merle “Container weights debate heats up as players try to ‘pass the parcel’”, (10 October 2012) The Loadstar <<http://theloadstar.co.uk>>.

¹⁰¹ British International Freight Association, above n 8; 148 *TT Talk*, above n 2.

¹⁰² Committee on Large Container Ship Safety *Interim Report of Committee on Large Container Ship Safety* (Japan, December 2013) at 15.

¹⁰³ MAIB, above n 9, at 40.

initiatives like CINS, ship builders might be encouraged to build wider safety margins into ships' hull strengths, through SOLAS.¹⁰⁴

However, this is not a solution for New Zealand as international container ships are not built, owned, or flagged here. Moreover, stronger ships are likely to be heavier ships, which are more costly to build and less efficient to operate. These impacts are felt by the shipper in the end, including New Zealand exporters, and so simply making stronger ships is not necessarily the appropriate solution.

B Masters could be made responsible

Masters have the primary responsibility for ship safety, including cargo safety, and are responsible for compliance with the MTA and Maritime Rules.¹⁰⁵ They could be responsible for container weight too.

However, the DSC considered that giving masters primary responsibility for weight was impracticable, as they have no capacity to verify the weight, which would be essential.¹⁰⁶ While verifying the weight is in masters' interests to do, most modern container ships do not have lifting gear and so masters have no means of weighing. Containers are loaded and unloaded by shore cranes, a port responsibility. Moreover, masters become involved very late in the originating country's supply chain, making it difficult to take action. Masters have to discharge their general responsibilities for safety in this respect by reliance on others.

It is instructive that SOLAS (and the proposed amendments) allows a master's representative on shore to receive weight notifications, not just the master.¹⁰⁷ That representative, for example the ship's agent, could well be made responsible for verifying the weight, or at least making sure it has been reliably verified.

¹⁰⁴ SOLAS, above n 14, Annex, Chapter II.

¹⁰⁵ MTA, s 19(1).

¹⁰⁶ DSC 17/7, above n 5, at [26].

¹⁰⁷ SOLAS, above n 14, Annex, Ch IV, reg 2(1); DSC 18.13, above n 3, Annex 1, proposed reg VI - 2(5.2).

C Ports could weigh

The new SOLAS system would be enhanced by weighing at the port. Ports are the obvious points to weigh containers,¹⁰⁸ as all sea-borne containers have to go through them. Before the final DSC recommendation, port operators were preparing for the obligation to be put on them.¹⁰⁹

However, involving ports adds a new layer of responsibility between shipper and master and would extend the IMO's interest to ports.¹¹⁰ Ports are not generally subject to international maritime jurisdiction.¹¹¹ The contract of carriage is between shipper and shipping company, not between the shipper (or the ship) and the port.¹¹² There was opposition (from flag states) to the prospect of SOLAS creating an obligation on ports in the shape of an international rule, administered as part of port state regulation.¹¹³ Other interests, however, supported a responsibility for ports.¹¹⁴

It is clear that the breaches take place on land (up to the point of loading on the vessel) in a sovereign state, which may lead to the reluctance of IMO to regulate ports. However, it has no qualms about regulating shippers, who are in the same position, clearly within a sovereign jurisdiction. The seriousness of the impact of misdeclarations on shipping should mean all parties should be subject to the rules, and SOLAS could well have put some obligations on ports. In any case, SOLAS leaves the local enforcement to local authorities, and there is no bar to MNZ regulating both ports and shippers. On the other hand, the SOLAS proposals still have one role for the port - a verified gross weight weighed by the port is the one that will count if there is a discrepancy.¹¹⁵

¹⁰⁸ DSC 18/5/4 above n 42 at [6].

¹⁰⁹ Editorial "Container weighing forward thinking" (2 July 2013) Port Strategy <www.portstrategy.com>.

¹¹⁰ DSC 17/7, above n 5, at [22.4].

¹¹¹ Erik Molenaar *Coastal State Jurisdiction over Vessel-Source Pollution* (The Hague, Kluwer Law International, 1998) at 101; R R Churchill and A V Lowe *The Law of the Sea* (3rd ed, Manchester, Manchester University Press 1999), at 60-61.

¹¹² DSC 18/13, above n 3, Annex 2 at [10.1].

¹¹³ Sorenson, above n 36, at 13.

¹¹⁴ WSC and ICS, above n 54 at 5.

¹¹⁵ DSC18/13, above n 3, Annex 2 at [14].

MNZ does now cover ports.¹¹⁶ Operating a port must not create unnecessary risk to ships or property “on a ship or at sea”.¹¹⁷ MNZ has the power to inspect and audit ports to ensure safety.¹¹⁸ The fine for creating these risks is up to \$100,000 (corporate),¹¹⁹ plus up to three times any commercial gain.¹²⁰ These provisions are in MTA Part 3A, which applies not only to New Zealand waters but to “maritime-related activities anywhere in New Zealand”.¹²¹

Delays or liability fears might deter ports from taking part if they had sole responsibility.¹²² Ports fear disruption as containers failing weight limits interrupt the smooth flow through their terminals.¹²³ Weighing at port is also late in the chain, and by the time a port is reached the container may have placed other modes at risk. As well, the weights have to be submitted “sufficiently in advance”¹²⁴ of loading to enable proper stowage planning. Weighing at the port might add 12 hours to the existing required time for the container to be on the terminal before the ship arrives.¹²⁵ That in turn will mean extra storage room is required, and add further cost.

“Technology exists to verify container weights without delays or significant costs to commerce”.¹²⁶ However, the Ports of Auckland note that while there may be suitable equipment, the need to frequently calibrate it will add delays and cost. Moreover productivity pressures mean that the port aims to lift two 20ft units at once, so-called “twin lift”, and the weighing equipment cannot discriminate between them.¹²⁷ The same problem exists with respect to road weighbridges for trucks carrying two containers. Rail

¹¹⁶ MTA Part 3A.

¹¹⁷ Section 33S.

¹¹⁸ Section 33T.

¹¹⁹ Section 33V.

¹²⁰ Section 409(1).

¹²¹ Section 33A.

¹²² *Development of Measures to Prevent Loss of Containers: Proposal to amend SOLAS chapter VI* DSC 17/7/1 6 July 2012 (Submission by Germany) at [6]; Van Merle, above n 100.

¹²³ Mike Wackett “Time for Action” *Containerisation International* (London, June 2013) at 58.

¹²⁴ SOLAS, above n 14, Annex, reg VI – 2.

¹²⁵ Bain, above n 68, slide 6.

¹²⁶ BIMCO, above n 53, at 2.

¹²⁷ Email from Craig Sain, General Manager Commercial Relations, Ports of Auckland, to Murray King regarding overweight containers (14 May 2014).

weighbridges, however, can (with some calculation) identify the separate weights of two containers on a wagon (but not three).¹²⁸

Concerns over ports' liability position led to a treaty in 1991.¹²⁹ However this is not yet in force, not having enough parties accede to it. It provided that goods, including containers, should be the port's responsibility while in its care.¹³⁰ Its liability would be limited.¹³¹ This treaty enabled ports to take action on undeclared dangerous goods, and be reimbursed.¹³² A similar protection for port action on misdeclared containers (for example in delaying or repacking the container) in this or another treaty could help alleviate port liability concerns. Such provisions could be also established in local law (or in commercial conditions).

As well, in the New Zealand context, substantial numbers of containers are "packed at port" (where there is land available). Because the cubic capacity of a container is much less than that of a curtain-sided truck, it is more efficient for many (lower density) commodities to be transported to the port and packed into containers there. For example, 20,000 TEU a year are packed at the container terminal in Napier,¹³³ and 16,000 at Port Otago.¹³⁴ This method also speeds the turnaround of containers, which do not have to take an inland journey. "Pack at port" means the port is the originator of the container. The port will have to verify the weight, and opportunities to check it further will be limited.

The SOLAS changes themselves may increase the trend to pack at port. Greater attention to container weights may mean carriers are less likely to carry overweight containers. They may go by rail, or the freight may be

¹²⁸ Email from Tony Pepperell, Principal Design Engineer, KiwiRail to Murray King regarding weighing of container wagons (13 May 2014).

¹²⁹ Convention on the Liability of Operators of Transport Terminals in International Trade (opened for signature 19 April 1991, not yet in force).

¹³⁰ Art 3.

¹³¹ Art 6.

¹³² Art 9.

¹³³ Email from Chris Bain, Chief Operating Officer, Napier Port to Murray King regarding overweight containers, (14 May 2014).

¹³⁴ Email from Peter Brown Commercial Manager, Port Otago to Murray King regarding overweight containers (16 May 2014).

packed at port.¹³⁵ Thus a greater proportion of containers might originate at ports than now.

Containers with understated weights are also a safety risk to port workers, which weighing would ameliorate. In The United States there is already a requirement for outbound containers to be weighed before being handled by a crane at a port.¹³⁶ If the port has no weighing equipment, then similarly to the proposed SOLAS provisions, the weight of the contents of the container can be used.¹³⁷ These regulations are part of the occupational safety and health law, and have been in place for some time.¹³⁸ They are reported as not causing any issues.¹³⁹

The ITF suggests that “Port State Control should include [container weighing] in the health and safety checklist”.¹⁴⁰ For safety risks arising in New Zealand, such as to port workers, weighing would be a “practicable step” in terms of the current health and safety law,¹⁴¹ and “reasonably practicable” in terms of its proposed replacement.¹⁴² While a ship in port is subject to the port state’s laws,¹⁴³ neither the current nor proposed employment safety laws cover foreign container ships.¹⁴⁴ However, loading an overweight container would prima facie breach health and safety laws on land, as well as Maritime Rules, without needing to extend New Zealand’s health and safety laws to the actual foreign ship in a manner comparable to the Australian coverage of the Fair Work Act 2009.¹⁴⁵ Napier’s practice of check weighing is also primarily a health and safety initiative.¹⁴⁶

¹³⁵ Deloitte, *National Freight Demand Study* (Ministry of Transport, March 2014) at 233.

¹³⁶ 29 CFR § 1917.71(b)(3).

¹³⁷ 29 CFR § 1917.71(b)(4)(ii).

¹³⁸ Synergy Group, above n 69.

¹³⁹ WSC and ICS, above n 54 at 5.

¹⁴⁰ Paddy Crumlin “Why Container Weight Checks Are Essential” *Containerisation International* (London, November 2013), at 78.

¹⁴¹ Health and Safety in Employment Act 1992, s 2A [HSE Act].

¹⁴² Health and Safety Reform Bill 2014 (192-1), cl 17 [HSR Bill].

¹⁴³ Henrik Ringbom *The EU Maritime Safety Policy and International Law* (Martinus Nijhoff, Leiden, 2008) at 214.

¹⁴⁴ HSE Act, above n 141, s 3B; HSR Bill, above n 142, cl 8.

¹⁴⁵ Marten, above n 92, Chapter 6.

¹⁴⁶ Bain, above n 68, slide 4.

Outside the United States, some 30% of ports regularly “scaled” (weighed) containers in the IAPH survey.¹⁴⁷ Weighing was mostly of exports, but some 16% weighed imports (including the United States).¹⁴⁸ Most weighing took place at the port gate.¹⁴⁹ Indian authorities now require export containers to be weighed.¹⁵⁰

A potential compromise is for ports to simply check weigh the container, and compare the weight with the declared weight. The TT Club, a Protection and Indemnity mutual insurance club specialising in container transport, says this is inevitable,¹⁵¹ but should be the limit of a port’s responsibility.¹⁵²

Containers departing significantly from the declared weight could then be more formally weighed. The shipper weight certificate will be part of the advance information ports have for stowage planning.¹⁵³ Alternatively, ports could pass the check weight to the masters for them to compare with the declaration, or make the decision to load or not based on the port’s comparison.

D Inland carriers could be made responsible

In principle all carriers could be made responsible for weighing a container before it travels on their system. In practice, this would mean the first carrier weighs it and passes that information on to subsequent carriers, who could check weigh it. However this would mean that carriers would either have to pass the container over a weighbridge, or install sophisticated load sensing devices.

Most carriers would not have their own weighbridge, which means that an overloaded container would be creating risks at least as far as a weighbridge site. Weighbridges are not cheap, and to establish a fine

¹⁴⁷ IAPH, above n 52, at 4.

¹⁴⁸ IAPH, above n 52, at 4, 12.

¹⁴⁹ IAPH above n 52 at 5.

¹⁵⁰ BIMCO, above n 53, at 1.

¹⁵¹ Editorial “Container Weighing – Control and enforcement” (26 September 2013) 179 *TT Talk* TT Club, <www.ttclub.co.uk>.

¹⁵² 125 *TT Talk*, above n 21.

¹⁵³ DSC 18/13, above n 3, Annex 1, proposed reg 2(5.1).

network of them to minimise the distance travelled unweighed would be an expensive and disruptive proposition.

In any case the carrier is not the party that actually overloads the container, and it is unfair to burden it with the responsibility for marine safety. Nevertheless, a road carrier has its own responsibilities not to overload,¹⁵⁴ and it could be a party that check weighs the load. So could the road owner, to the extent it weighs vehicles through weigh-in-motion scales.

E Shippers' responsibility could be enforced.

The proposed SOLAS rules put the onus on the shipper. That party is ultimately the one responsible for loading the container and therefore for what is in it. The shipper may not always be the cargo owner: others originating containers like freight forwarders, ports (when packed there) or other consolidators should also be responsible for declaring the weight.¹⁵⁵

The shipper is at the start of the supply chain. By placing the onus there, all movements of the container will be caught, giving the widest safety coverage. This is already done in some jurisdictions.

The United States Intermodal Safe Container Transportation Act 1992¹⁵⁶ provides for weight certification where the container is to be transported by more than one mode interstate or internationally.¹⁵⁷ All shippers must notify the cargo weight of the container (if over 29,000 pounds, 13.2t), and a description of its contents,¹⁵⁸ and certify both.¹⁵⁹ Incorrect information is prohibited.¹⁶⁰ The requirements are not limited to exports.¹⁶¹ Interestingly, the container's tare weight is not required to be included. "Cargo weight"

¹⁵⁴ Land Transport Act 1998, s 16.

¹⁵⁵ Narasimhan Sundapalayam (21 October 2013) post to Mike Wackett "Container weight rules are unnecessary and will cost shippers billions, claim" (17 October 2013) The Loadstar <<http://theloadstar.co.uk>>.

¹⁵⁶ Now in 59 USC § 5901 – 5908.

¹⁵⁷ 59 USC § 5901(7).

¹⁵⁸ 59 USC § 5902(a).

¹⁵⁹ 59 USC § 5902(b).

¹⁶⁰ 59 USC § 5903(a).

¹⁶¹ 59 USC § 5902(b)(7).

includes only the contents, including packing, ice, and dunnage.¹⁶² States may impose fines.¹⁶³

The Australian equivalent of the New Zealand Maritime Rules Part 24B, Marine Order 42,¹⁶⁴ not only covers the same requirements as to cargo information like mass, in very similar terms to Part 24B, but it also requires the shipper to ensure the gross mass of containers is the same as that declared on the shipping documents.¹⁶⁵ It does not however mandate any weighing or reweighing.

However the Australian heavy vehicle laws do mandate container weighing and verification. This means that all road borne containers must have been weighed before they reach the port. The provisions are in the Heavy Vehicle National Law, as enacted in Queensland.¹⁶⁶ They have been in force in most states since February 2014,¹⁶⁷ and are an update of earlier law.¹⁶⁸ The National Law is enacted as a Schedule to the Queensland Heavy Vehicle National Law Act 2012, but its provisions are treated as standing alone as the “Heavy Vehicle National Law (Queensland)”, with sections rather than clauses.

This law provides for a container weight declaration, which can be on or separate from the actual container.¹⁶⁹ A “responsible entity” for the container is the consignor, or the person responsible for arranging transport, or physically offering the container for transport.¹⁷⁰ This person has to give a road carrier a complying container weight declaration,¹⁷¹ and can be fined \$10,000 if it is materially false or misleading.¹⁷² The vehicle operator (the

¹⁶² 59 USC § 5901(6).

¹⁶³ 59 USC § 5904.

¹⁶⁴ Australian Maritime Safety Authority “Marine Order 42 (Cargo stowage and securing) 2003. [AMSA]

¹⁶⁵ AMSA, above n 164, cl 8.2.

¹⁶⁶ Heavy Vehicle National Law Act 2012 (Qld).

¹⁶⁷ Heavy Vehicle National Regulator “Heavy Vehicle National Law (HVNL)” <www.nhvr.gov.au>.

¹⁶⁸ Road Transport Reform (Compliance and Enforcement) Bill 2003, Model Provisions, cls 99-106; Email from Ben Baker, Consultant, National Transport Commission (Australia) to Murray King regarding Overweight Containers (23 May 2014).

¹⁶⁹ Heavy Vehicle National Law (Queensland), s 5 “*container weight declaration*” [HVNL]

¹⁷⁰ Section 5, “*responsible entity*”.

¹⁷¹ Sections 189, 190.

¹⁷² Section 187(2).

person controlling the vehicle's use¹⁷³) can also be fined for allowing the movement with a false declaration.¹⁷⁴ So can the driver.¹⁷⁵ Those involved cannot turn a blind eye, but need to actively enquire about the presence of the declarations, and also their accuracy, as the test is objective. It is a defence that the person did not know of a breach, and "could not reasonably ... have known" and took all reasonable steps to avoid the breach.¹⁷⁶

The law is clearly aimed at containers that are too heavy for roads, and provides that it is not misleading to overstate the weight.¹⁷⁷ This in practice will mean that shippers will add a margin to the declared weight, to be on the safe side, provided it is within the allowable maximum.¹⁷⁸ To be fully useful in the maritime environment, the law would need also to cover overstated weight misdeclarations.

Such a declaration and associated rules could be a workable way in New Zealand to make sure shippers do accurately and honestly weigh and declare their container shipments.

F Import containers and transhipments

These solutions should work for export containers. The problem of incoming containers may be as large,¹⁷⁹ but is more intractable.

Finding the "import" culprits and punishing them is beyond the port states' power. Their wide powers over ships when in port¹⁸⁰ are of no direct help. The overweight nature is not evident until the container is off the ship, and then the port state's jurisdiction over the container is not in doubt. Moreover the culprit is not the ship, nor the container. It is the shipper, who is in another state, on land. Australia has dealt with this issue by making agents for inbound containers liable if an overweight container leaves the

¹⁷³ Section 5 "*operate and operator*".

¹⁷⁴ Sections 187(3), 191.

¹⁷⁵ Section 192.

¹⁷⁶ Sections 618, 621

¹⁷⁷ Section 187(4).

¹⁷⁸ Section 193.

¹⁷⁹ BIFA, above n 8.

¹⁸⁰ Churchill and Lowe, above n 111, at 66; *Cunard v Mellon* 262 US 100.

port by road.¹⁸¹ In New Zealand however, imports are not covered by the Maritime Rules Part 24, unless carried by a New Zealand ship.¹⁸² There is increasing pressure on forwarders (who can act for shippers in the receiving country) to take responsibility for the risks to high value cargo, so it is not a large step to include responsibility for weight.¹⁸³

The container could also be reported through CINS, to the shipping line and to the competent authority in the shipper's country. A similar system exists in the European Union for reporting individual ship quality.¹⁸⁴

Some 34,000 containers that are neither destined for nor originate in New Zealand ("re-exports"), are temporarily unloaded and put on the ground for transshipment between international ships.¹⁸⁵ The port systems might also detect some of these as overweight. Rule 24B.3(2), however, excludes from MNZ coverage those containers coming from and destined to a country other than New Zealand.¹⁸⁶ Landing an overweight container and not taking action appears to neglect the country's obligations to promote maritime safety. At the very least MNZ should require action to be taken on containers that are detected during the transshipment process, even if that is only reporting the discrepancy to the master, and back through CINS.

It is a potential flaw in the current SOLAS approach to leave weight control entirely to the individual exporting states. Ultimately, a means whereby a country imposes a legal sanction on a shipper on the advice of an authority elsewhere in the world would help eradicate the problem. This could be a topic for further amendments to SOLAS.

¹⁸¹ Editorial "Australia acts against overweight containers" (16 November 2005) 73 *TT Talk* TT Club, <www.ttclub.com>; HVNL, above n 169, s 5 "*responsible entity*".

¹⁸² Maritime Rules, r 24b.3.

¹⁸³ Andrew Kemp "The Changing Face of Liability Risk" *Containerisation International* (London, April 2014) at 50.

¹⁸⁴ Ringbom, above n 143 at 42.

¹⁸⁵ FIGS, above n 11, at 18-19.

¹⁸⁶ Maritime Rules, Rule 24B.3(2)(a).

VII Suggested Solution

A Chain of responsibility

Responsibility could be placed anywhere along the supply chain. But putting it just in one place without oversight risks errors and potentially fraudulent behaviour being undetected. The system will still rely on that party's honesty, and the experience with the current SOLAS rules suggest that more is required than reliance on honesty. Wherever the primary responsibility is placed, the weight needs to be checked elsewhere before the system can be relied on. What is needed in New Zealand is a "chain of responsibility" approach.¹⁸⁷

In the newly-approved¹⁸⁸ container packing code, chain of responsibility refers to the linking of parties in the supply chain, each of whom has responsibilities. While the primary responsibility should be on the shipper to "deliver a cargo which is safe and suitable for transport",¹⁸⁹ other parties have responsibilities and the shipper could hold them responsible for non-compliance.¹⁹⁰ The code has extensive lists of who should be responsible for what.¹⁹¹ Its role is however advisory, not mandatory; any regulation based on it is left to states.¹⁹²

"Chain of responsibility" is used in Australian and New Zealand road transport rules to refer to a system which sheets home the responsibility for a breach to the ultimate causer. This is usually the shipper, but may be the consignee. For instance, putting such pressure on schedules that driving hours have to be breached is an offence for the shipper, as well as for the driver. This is rather weakly developed in New Zealand, but is given a much more thorough treatment in Australia. In New Zealand a person who

¹⁸⁷ Ringbom, above n 143, at 42; John Hunter (8 May 2014), post to Martin Roebuck, "New container weight regulation in 2016 will be critical to the entire supply chain" (5 February 2014) The Loadstar <<http://theloadstar.co.uk>>.

¹⁸⁸ International Maritime Organisation, press briefing, above n 88.

¹⁸⁹ MSC 93/9/1, above n 4, Annex, at 14; ECE, above n 4, at 11.

¹⁹⁰ MSC 93/9/1, above n 4, Annex, at 14; ECE, above n 4, at 11.

¹⁹¹ MSC 93/9/1, above n 4, Annex, at 14-17; ECE, above n 4, at 11-14.

¹⁹² United Nations Economic Commission for Europe "UNECE endorses new global code of practice for packing of containers (CTU Code)" ECE press release (Geneva, 27 February 2014) <www.ece.org>.

“directly or indirectly causes or requires” a driver to breach speed limits, work and rest time rules, or weight limits can be fined \$25,000.¹⁹³

In Australia, the provisions of the National Heavy Vehicle Law cited above,¹⁹⁴ along with provisions on other aspects such as driving hours, work together to provide a more comprehensive system. The object of the “regulatory framework” under the law includes obligations on those who influence driver and vehicle compliance.¹⁹⁵

The Australian system should work to deter overloaded containers from reaching a ship. But it is not aimed at that, and a New Zealand approach well could be tailored to that specific need, including coverage of overstated weights. The New Zealand land transport law needs in addition to be expanded to the level of detail and comprehensiveness of the Australian one to give effective control of the problem.

B Onus on shipper

The most important action is to put the onus squarely on the shipper in line with the SOLAS changes. In interpreting the SOLAS requirement for a “verified weight”, New Zealand should adopt the Australian concept of a weight certificate to accompany the container. “Accompany” could mean electronically or physically. The shipper should be tasked with providing this, by either of the SOLAS routes, and be responsible for its accuracy, but not just confined to overweight containers.

As in Australia, the law should provide for circumstances where the owner of the goods does not load the container, so that the “packer”¹⁹⁶ should then take the primary responsibility for the safety and other reasons discussed above. This would cover the situation of packing at port, or at a freight forwarder’s terminal.

Part 24B of the Maritime Rules can readily be adapted to reflect the new requirements for weighing. The current requirements for providing cargo

¹⁹³ Land Transport Act 1998, ss 79T, 79U.

¹⁹⁴ HVNL, above nn 169-178

¹⁹⁵ Section 4; email from Ben Baker, above n 168.

¹⁹⁶ HVNL, above n 169, s 5, “*pack* and *packer*”.

information are closely modelled on SOLAS Chapter VI,¹⁹⁷ and additional subrules could be added using the proposed SOLAS wording for weight verification. That in itself will not be enough, however. MNZ will have to develop rules for standards and procedures for verifying weight, and make weight misdeclaration a clearer offence. The law should also include ways of checking that the declared (and verified) weight is accurate.

It will be important to decide in those rules whether a defined margin of difference from the precise requirements (a “tolerance”) is acceptable. There needs to be both an upper and lower limit to the tolerance, given the need to avoid both overstated and understated weights. Tolerances are not new in transport law in New Zealand. The Land Transport Act 1998, for example, provides for a 10% tolerance (on wheel, axle, or gross vehicle weights) before an overloaded vehicle can be stopped from proceeding.¹⁹⁸

Napier Port has a tolerance of 500kg before it takes action on a misdeclared container.¹⁹⁹ The TT Club suggests the tolerance should be no more than 1%,²⁰⁰ although they also support plus or minus 200kg per container.²⁰¹

The exact tolerance needs technical consideration in terms of the impact on ships and handling gear of the misdeclared amount of weight, and is outside the scope of this paper. However, a national standard tolerance should be established in the law, to avoid a multitude of local rules.

C Check weighing

After the shipper, every opportunity that another operator has to check weigh (for example, via road or rail weighbridges or lifting appliances) should be taken and exceptions reported (and if necessary the journey stopped until the shipper repacks the container). There should be a presumption that the weight declaration is honest until found otherwise, so intermediate carriers should not be prosecuted unless they reasonably should have known about

¹⁹⁷ Maritime Rules, r 24B.4

¹⁹⁸ Land Transport Act 1998, s 126(1)(b).

¹⁹⁹ Bain, above n 68, slide 5.

²⁰⁰ 148 *TT Talk*, above n 2.

²⁰¹ 179 *TT Talk*, above n 151.

the wrong weight (for example, from the behaviour of their vehicles, from advice from other parties, or their own weighing).

Not many intermediate carriers will have the ability to weigh, and so most of the responsibility for check weighing would be with ports, and should be mandatory. As long as the container is not actually over its rated capacity then the accurate knowledge of the actual weight is more important than the extent to which it exceeds (or undershoots) its declared weight. The master can then make the right trimming decisions. If the container exceeds its rated capacity, the port should have authority to force its repacking.

It should be made clear that the weighing by ports (and intermediate carriers) produces check weights only, and not the weights that should bear responsibility (except where the port is the packer). Otherwise, ports will be deterred from check weighing, and that is an essential check on the honesty of the shippers. Interpreting the SOLAS regulation that the port weight is to be definitive²⁰² as applying to all weights measured by ports may deter them from weighing all containers as a check weighing. The port weight mandated for use by SOLAS appears to be a more accurate weight than would be revealed by a system of check weights; if a definitive weight is required (after the check weight screening) then local regulations will need to provide for greater accuracy and responsibility, and enable ship owners or masters to be charged for the extra service.

Check weighing is expected to involve some costs,²⁰³ which are likely to be passed on to customers. But they are likely to be small with modern technology, less than NZD 50 cents per TEU.²⁰⁴ Effectively, customers overall are now already paying for the costs of poor weight declaration, through ship operational inefficiencies, container losses, ship losses, and

²⁰² See above n 115.

²⁰³ Andrew Colgan, "Tipping the Scales – Proposed Changes to SOLAS Chapter VI Rules on Container Weighing" Maritime Law Association of Australia and New Zealand, New Zealand Branch Conference 2014, quoted in Bevan Marten, "NZ port shows possible weigh forward on new rules to prevent box mis-declarations", (*Lloyd's List Australia*, (Sydney, 1 May 2014) at 3.

²⁰⁴ Beat Zwygart "Container weighing service to shipping lines" *Containerisation International* (London, March 2013) at 29.

insurance, so if the measures eliminate the problem, the weighing cost is trivial.

A manual system of weighing may not be a viable option, as it demands too many resources. On New Zealand roads, manual systems cover only a tiny fraction of loads, 0.02%. This results in a very low probability of detection, with strong economic incentives to cheat, resulting in poor compliance.²⁰⁵ Only an automated weighing system would produce a sufficient level of detection to make a difference to compliance.²⁰⁶ So too for containers at ports. To produce a meaningful compliance level only an automated weighing system will cope.

Eventually the system could be further automated. The radio frequency identification (RFID) technology already used in other sectors and some ports, for example Rotterdam and Singapore,²⁰⁷ could be used to attach the weight to a container, via a RFID “tag” or “e-seal”²⁰⁸, at the entry port. When loaded, this would be programmed with the actual weight through handheld devices by the shipper. This would then be read by handheld or fixed devices by authorised people en route. The need to electronically tag the container and the ability for it to be read by others should work to promote honesty. It would not be expensive relative to the potential benefits – NZD 2-3 for the tag and up to NZD 5000 for readers.²⁰⁹

There were some 1.7 million containers handled in New Zealand in 2013.²¹⁰ Already there are over 6 million cattle and deer movements²¹¹ recorded by the similar electronic National Animal Identification and Tracing scheme,²¹² for biosecurity purposes, so doing the same for fewer containers and for human safety should not be a substantial issue.

²⁰⁵ McBride and Kirby, above n 19 at 17.

²⁰⁶ At 56

²⁰⁷ J Narsoo, W Muslun and M S Sunhaloo “A Radio Frequency Identification (RFID) Container Tracking System for Port Louis Harbor: The Case of Mauritius” 6 *Issues in Informing Science and Information Technology* (Santa Rosa, California, 2009) 127 at 130.

²⁰⁸ Bert Moore “Container tracking: RFID vs. Satellite – an honest evaluation” 34 *Port Technology International* (London, 2011) at 153.

²⁰⁹ Email from Antony Dixon, Chief Executive, Times-7, to Murray King regarding RFID for container weight verification (15 May 2014).

²¹⁰ FIGS, above n 11, Table 3 at 18.

²¹¹ Deloitte, above n 135, Fig 3.31 at 70.

²¹² National Animal Identification and Tracing Act 2012; NAIT <www.nait.co.nz>.

Ideally, such an electronic scheme could be introduced world-wide, with the RFID tags built into the containers. That would be a way of achieving what Chris Bain (Port of Napier) describes as “some form of recognised and verifiable exchange record [which] would seem the next worthwhile SOLAS goal”.²¹³ It would however be a very large project, and would take much negotiating, even just over the technical details.²¹⁴

D Monitoring incidents

To put teeth into the check weighing, all misdeclarations uncovered should be regarded as reportable incidents. Monitoring incidents is a powerful way of both detecting potential safety problems and ensuring compliance. Incorrectly declared goods “identified by anyone in the supply chain” should be reported in the United Kingdom.²¹⁵

Incidents can be precursors to accidents. The TT Club has applied James Reason’s “Swiss Cheese” model²¹⁶ of accident causation to the container weight problem.²¹⁷ This model shows accidents occur when a number of faults or omissions get into alignment. Reason calls these “organisational accidents”.²¹⁸ They are of the same nature as the long term “process safety” issues identified in the Pike River enquiry.²¹⁹ The risk of an incident in itself causing an accident might be small, but when circumstances align, the consequences can be very large.

Thus the more chances that are taken to weigh or check the container the less there is likelihood of it slipping through the cracks. Similarly patterns of incidents can identify potential “holes”.

Incidents must be reported to MNZ currently. An incident is “any occurrence, other than an accident, that is associated with the operation of a

²¹³ Bain, above n 68, at slide 8.

²¹⁴ Moore, above n 208 at 153.

²¹⁵ Maritime and Coastguard Agency (UK), *International Maritime Dangerous Goods (IMDG) Code and Cargoes Carried in Cargo Transport Units* (Marine Guidance note MGN340 (M)), at [10].

²¹⁶ James Reason *Managing the Risks of Organizational Accidents* (Ashgate, Aldershot, 1997) at 9-13; *Royal Commission on the Pike River Coal Mine Tragedy* (Volume 2, 2012) at 29 [Royal Commission].

²¹⁷ Storrs-Fox, above n 2, at slide 8.

²¹⁸ Reason, above n 216, at 1.

²¹⁹ Royal Commission, above n 216, at 28.

ship and affects or could affect the safety of operation”,²²⁰ words wide enough to include a misdeclared container. However, the obligation to report is primarily on masters, or involving ships,²²¹ so land-side “incidents” may not be reported. Incidents are also reportable for rail,²²² with a similar definition,²²³ but not for road.

At present, the MNZ focus matches the focus on monitoring incidents internationally, that is, involving the vessel itself,²²⁴ including pollution incidents.²²⁵ Overweight containers are not regarded as incidents by IMO, although they could be included as “contributing factors”,²²⁶ which can be “remote from the casualty site”.²²⁷ The Transport Accident Investigation Commission has not reported on an overweight container as an incident in the last ten years.²²⁸ The MTA and Maritime Rules Part 24B should be amended to specifically include misdeclared containers as incidents, and to make it an offence not to report them.

E Inter-agency approach

Such a scheme would fit well with MNZ’s compliance strategy. This strategy seeks to promote a “safety culture”, and “eliminate or minimise behaviours that are unsafe”.²²⁹ Its priorities include practices that cause death and injury, or make them more likely.²³⁰ Its processes include monitoring incidents,²³¹ and its focus is on prevention of accidents and incidents, “proactive

²²⁰ MTA, s 2, “incident”

²²¹ Section 31(1), (3).

²²² Railways Act 2005 s 13(3)

²²³ Section 5, “incident”.

²²⁴ *Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code)* Resolution MSC.255(84) adopted 16 May 2008, Annex; United Nations Convention on the Law of the Sea, 1833 UNTS 3, (opened for signature 10 December 1982, entered into force 16 November 1994, art 94(7)).

²²⁵ MTA s 225, “pollution incident”, ss 227, 228; Maritime Protection Rules, rr 120.15 – 120.17.

²²⁶ *Guidelines to Assist Investigators in the Implementation of the Casualty Investigation Code (Resolution MSC.255(84))* IMO Assembly resolution A28/Res.1075, adopted 4 December 2013, Annex at 4.

²²⁷ Assembly Resolution a28/Res.1075, above n 226, Annex at 5.

²²⁸ Transport Accident Commission, “Marine Occurrence Reports”, <www.taic.org.nz>.

²²⁹ *Maritime New Zealand Compliance Strategy* (Wellington, undated) at 2 (MNZ).

²³⁰ MNZ, above n 229 at 3.

²³¹ MNZ, above n 229, at 7.

activities”.²³² This involves concentrating on “patterns of problems or issues”.²³³ The scheme suggested in this paper does all of these things. Most importantly, it seeks to use regulation to alter behaviour, and to detect and follow up on patterns of dangerous misdeclarations. Prosecutions need only be the last resort.

However, MNZ standing alone is unlikely to be effective, especially since the problem starts inland and the enforcement needs also to be on land. Making it their responsibility alone could spread their resources too thinly and overlap the roles of other agencies. A whole of government, inter-agency, approach, involving the New Zealand Transport Agency,²³⁴ would make the system more effective. This would require amendments to the Land Transport Act 1998 to stiffen the chain of responsibility provisions. Most of the changes about container weight declaration would need to be made in that Act. It would also require reporting of incidents to be recognised as a powerful tool for safety in the road transport area, and amendments also made to incorporate it.

VIII Conclusion

The problem with falsely declaring weight is serious. It has led to total losses of ships. The IMO’s new rules on weight will tighten the control on overloading, but they are not an absolute bar and are unlikely to solve the problem by themselves. In New Zealand, a “chain of responsibility” approach with all parties contributing to a solution is suggested as a way forward. Putting the onus on shippers, checking weights and reporting incidents will enable persistent offenders to be identified and dealt with. Ultimately the system should rid New Zealand of the problem.

²³² MNZ, above n 229, at 8.

²³³ MNZ, above n 229, at 8.

²³⁴ Email from Marinus La Rooij, above n 20.

Bibliography

I Primary Sources

A Cases

Cunard v Mellon 262 US 100.

B Legislation and rules

1 New Zealand

Health and Safety in Employment Act 1992.

Land Transport Act 1998.

Maritime Transport Act 1994.

National Animal Identification and Tracing Act 2012.

Railways Act 2005.

Land Transport Rule: Vehicle Dimensions and Mass 2002.

Maritime Rules:

Part 24A Carriage of Cargoes – Dangerous Goods.

Part 24B Carriage of Cargoes – Stowage and Securing.

Part 24D Carriage of Cargoes – Convention Containers.

Part 47 Load Lines.

Maritime Protection Rules:

Part 120 Discharge of Oil.

Health and Safety Reform Bill 2014 (192-1).

2 Australia

Heavy Vehicle National Law Act 2012 (Qld).

Heavy Vehicle National Law (Queensland) 2014.

Australian Maritime Safety Authority “Marine Order 42 (Cargo stowage and securing) 2003.

Road Transport Reform (Compliance and Enforcement) Bill 2003 (model provisions).

3 United States

29 CFR § 1917.71.

59 USC § 5901 – 5908.

Intermodal Safe Container Transportation Act 1992.

C *Treaties*

International Convention for the Safety of Life at Sea, 1184 UNTS 2 (signed 1 November 1974, entered into force 25 May 1980).

International Convention on Load Lines 640 UNTS 133 (signed 5 April 1966, entered into force 21 July 1968).

United Nations Convention on the Law of the Sea 1833 UNTS 3, (opened for signature 10 December 1982, entered into force 16 November 1994).

United Nations Convention on the Liability of Operators of Transport Terminals in International Trade (opened for signature 19 April 1991, not yet in force).

D *Parliamentary and government materials*

Stephen E Flynn, “Overcoming the Flaws in the US Government Efforts to Improve Container, Cargo, and Supply Chain Security” (Testimony before the Homeland Security Appropriations Subcommittee, Committee on Appropriations, US House of Representatives, 2 April 2008).

National Transport Commission (Australia) “Chain of responsibility” *Information Bulletin* February 2004.

New Zealand Transport Agency *Proposed changes to legislation relating to overweight and high-productivity motor vehicles - Consultation document* February 2014.

Maritime Transport Amendment Bill, Third Reading (15 October 2013) 694 NZPD 13861.

Maritime and Coastguard Agency (UK), *International Maritime Dangerous Goods (IMDG) Code and Cargoes Carried in Cargo Transport Units* (Marine Guidance note MGN340 (M)), at [10].

Maritime New Zealand *Advisory circular Issue No 24B-3* (Wellington, June 2012).

Maritime New Zealand *Compliance Intervention Guidelines* (Wellington, undated).

Maritime New Zealand *Compliance Strategy* (Wellington, undated).

Memorandum of Understanding on Port State Control in the Asia-Pacific Region (1994).

Tokyo MOU *Annual Report on Port State Control in the Asia-Pacific Region* (2012).

Victorian Freight and Logistics Council *Container weight declaration: Chain of responsibility* (undated).

E International Maritime Organization Documents

Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code) Resolution MSC.255(84) adopted 16 May 2008, Annex.

Revision of the Guidelines for Packing of Cargo Transport Units – Outcome of Group of Experts for the Revision of the IMO/ILO/UNECE Guidelines for Packing of Cargo Transport Units DSC 17/6, 14 June 2012 (Submission by the Secretariat).

Development of Measures to Prevent Loss Of Containers – Verification of container weights DSC 17/7, 15 June 2012 (Submission by Denmark, the Netherlands, The United States, the Baltic and International Marine Council, the International Association of Ports and Harbors, the International Chamber of Shipping, the International Transport Workers Federation and the World Shipping Council).

Development of Measures to Prevent Loss of Containers: Proposal to amend SOLAS chapter VI DSC 17/7/1 6 July 2012 (Submission by Germany).

Development of Measures to Prevent Loss of Containers – Verification of container weights DSC17/7/3, 27 July 2012 (Submission by ICHCA (International Cargo Handling Coordination Association) International to the DSC).

Development of Measures to Prevent Loss of Containers – Verification of container weights DSC 17/INF.5, 27 July 2012 (Submission by Denmark, the Netherlands, The United States, the Baltic and International Marine Council, the International Association of Ports and Harbors, the International Chamber of Shipping, the International Transport Workers Federation and the World Shipping Council).

Development of Measures to Prevent Loss of Containers - Report of the Correspondence Group DSC 18/5, 14 June 2013 (Submission by the United States).

Development of Measures to Prevent Loss of Containers – Revision of ISO 3874 – Freight Containers – Handling and Securing DSC 18/5/2, 12 July 2013 (Submission by the International Standards Organisation to DSC).

Development of Measures to Prevent Loss of Containers – Verification of Container Weights DSC 18/5/4, 25 July 2013 (Submission by the International Transport Workers' Federation).

Revision of the Guidelines for packing of Cargo Transport Units – Draft Code of Practice for Packing of Cargo Transport Units (CTUs) DSC 18/8, 3 May 2013.

Report to the Maritime Safety Committee DSC 18/13, 30 September 2013, (report from the Subcommittee on Dangerous Goods, Solid Cargoes, and Containers).

Guidelines to Assist Investigators in the Implementation of the Casualty Investigation Code (Resolution SC.255(84)) IMO Assembly resolution A28/Res.1075, adopted 4 December 2013, Annex at 4.

Amendments to the 1974 SOLAS Convention and associated instruments, MSC 93/3, 6 December 2013 (Note by Secretariat).

Draft IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units (CTUs), MSC 93/9/1, 31 January 2014 (Note by the Secretariat).

Comment on the report of the eighteenth session of the Sub-Committee [on Dangerous Goods, Solid Cargoes and Containers], MSC 93/9/2 10 March 2014 (submission by Bahamas and Japan).

Reporting Accidents and Incidents MSC 93/15/2, 11 February 2014 (Submission by the International Chamber of Shipping, the International Union of Marine Insurance, the Oil Companies International Marine Forum, the International Association of Independent Tanker Owners (Intertanko), Protection and Indemnity Clubs, the Society of International Gas Tanker and Terminal Operators, and the International Association of Dry Cargo Shipowners (Intercargo)).

“Draft Polar Code approved at busy Maritime Safety Committee session” (press briefing 28 May 2014).

Status of multi-lateral Conventions and instruments in respect of which the International Maritime Organization or its Secretary-General performs depositary or other functions (as at 31 May 2014).

F Accident reports

Committee on Large Container Ship Safety *Interim Report of Committee on Large Container Ship Safety* (Japan, December 2013).

Marine Accident Investigation Branch [UK] *Report on the investigation of the structural failure of MSC Napoli English Channel on 18 January 2007* (report 9/2008, April 2008).

Royal Commission on the Pike River Coal Mine Tragedy (October 2012).

Transport Accident Investigation Commission, “Marine Occurrence Reports”, <www.taic.org.nz>.

G Other official reports

Deloitte, *National Freight Demand Study* (Ministry of Transport, March 2014) at 233.

European Organisation for the Safety of Air Navigation *Revisiting the <<Swiss Cheese>> Model of Accidents* (EEC note No. 13/06, October 2006).

Ministry of Transport *Freight Information Gathering System and Container Handling Statistics January –December 2013* (Wellington, February 2014).

United Nations Commission on International Trade Law “Liability of operators of transport terminals: report of the Secretary- General (a/CN.9/252) 15 *Yearbook* (1984) 287.

United Nations Economic Commission for Europe, “Draft Informative Material”, Informal Document EG GPC No, 20 (2013) (January 2014).

United Nations Economic Commission for Europe, “The new CTU Code”, Informal Document ITC (2014) No 7 (January 2014).

II Secondary Sources

A Texts

R R Churchill and A V Lowe *The Law of the Sea* (3rd ed, Manchester, Manchester University Press 1999).

Bevan Marten *Port State Jurisdiction and the Regulation of International Merchant Shipping* (Springer, Cham, 2014).

Erik Molenaar *Coastal State Jurisdiction over Vessel-Source Pollution* (The Hague, Kluwer Law International, 1998).

Henrik Ringbom *The EU Maritime Safety Policy and International Law* (Martinus Nijhoff, Leiden, 2008).

B Online sources

United Nations Economic Commission for Europe <www.ece.org>:

“UNECE endorses new global code of practice for packing of containers (CTU Code)” ECE press release (Geneva, 27 February 2014).

International Maritime Organisation <www.imo.org>:

“International Convention for the Safety of Life at Sea (SOLAS) 1974”.

“Meeting summaries, CCC” and “Meeting Summaries, DSC”.

Maritime New Zealand <www.mnz.govt.nz>.

“MNZ Compliance Operating Model”.

“Prosecution Policy”.

Heavy Vehicle National Regulator <www.nhvr.gov.au>.

Roads and Maritime Services, New South Wales, <www.rms.nsw.gov.au>:

Container Weight Declaration – Chain of Responsibility (December 2011).

Department of Transport and Main Roads (Queensland)
<www.tmr.qld.gov.au>:

“Chain of Responsibility” (12 February 2014).

III Non-legal sources

A Books

Rose George *Deep Sea and Foreign Going* (Portobello, London, 2013).

G M Pepper *Thomas’ Stowage - The Properties and Stowage of Cargoes* (5th ed, Brown, Son & Ferguson, Glasgow, 2008).

James Reason *Managing the Risks of Organizational Accidents* (Ashgate, Aldershot, 1997).

J Mark Rowbotham *Marine Reporting and Territorial Maritime Controls* (Seamanship Tutor, Liverpool, 2011).

Herman D Tabak *Cargo Containers – Their Stowage, Handling and Movement* (Cornell Maritime Press, Cambridge (Maryland) 1970).

B Articles and presentations

Ron Allan, “Overview Paper on Problems Caused by Heavy or Overweight Containers”, Presentation to the International Cargo Handling Co-ordination Association and Chartered Institute of Transport Seminar on Overweight Containers, Auckland, March 1990.

Allianz Global Corporate and Specialty *Safety and Shipping Review 2014* (Allianz Munich March 2014).

Chris Bain, “Changes to SOLAS Chapter VI - ‘At the Sharp End’” Presentation to the Maritime Law Association of Australia and New Zealand, New Zealand Branch Conference 2014.

Colin Barrett “Overweight Marine Containers” 255 *Traffic World* (31 August 1998) 50.

Andrew Colgan, “Tipping the Scales – Proposed Changes to SOLAS Chapter VI Rules on Container Weighing” Paper to the Maritime Law Association of Australia and New Zealand, New Zealand Branch Conference 2014.

Adrian Coventry “Options and opportunities of container weight verification” 60 *Port Technology International* (November 2013) 38.

Paddy Crumlin “Why Container Weight Checks Are Essential” *Containerisation International* (London, November 2013).

International Chamber of Shipping, World Shipping Council and Global Shippers’ Forum “Safe Transport of Containers by Sea: Industry Guidance for Shippers and Container Stuffers” (undated).

Andrew Kemp “The Changing Face of Liability Risk” *Containerisation International* (April 2014) 50.

Chris Lewis, “Containership accidents: a weighty matter” *Trade International Digest* (April 2010) 25.

Max Tingyao Lin “Counting the costs” *Containerisation International* (London, May 2014).

Dave Macintyre “Container terminals feel the heat” 17 *New Zealand Shipping Gazette Special Industry Review* (December 2013) 1.

Bevan Marten, “NZ port shows possible weigh forward on new rules to prevent box mis-declarations”, *Lloyd’s List Australia*, (Sydney, 1 May 2014).

Lars Meurling “Preparation for legislation on verification of container weights” 59 *Port Technology International* (September 2013) 44.

“Mis-declared cargoes are the biggest risks in shipping”, *Lloyd’s List Australia* (Sydney 9 January 2014).

Bert Moore “Container tracking: RFID vs. Satellite – an honest evaluation” 34 *Port Technology International* (London, 2011) 152.

J Narsoo, W Muslun and M S Sunhaloo “A Radio Frequency Identification (RFID) Container Tracking System for Port Louis Harbor: The Case of Mauritius” 6 *Issues in Informing Science and Information Technology* (Santa Rosa, California, 2009) 127.

Oliver Probert “Mapping the risks in box shipping” *Lloyd’s List Australia* ((January 2014) 6.

Janet Porter “Class Societies Take Action” *Containerisation International* (March 2014) 50.

Helen L Richardson “Overweight Containers: Whose Problem?” 33 *Transportation and Distribution* (April 1992) 24.

Aron Sorenson “Regulation of container weighing” 57 *Port Technology International* (London, March 2013) 12.

Peregrine Storrs-Fox “Container Weighing – an industry wide issue” (Broker briefing 6 November 2012).

Peregrine Storrs-Fox “Decision Time For Container Weighing” *Containerisation International* (London September 2013) at 40.

Peregrine Storrs-Fox “The Perils of Packing” *Containerisation International* (October 2013) 41.

“The Heavy Wait” *Lloyd’s List Australia* (6 February 2014) 1.

Mike Wackett “Time for Action” *Containerisation International* (London, June 2013) 57.

World Shipping Council, “History of the IMO Effort to Improve Container Safety”, August 2013.

Beat Zwyygart “Container weighing service to shipping lines” 57 *Containerisation International* (London, March 2013).

Jim Wilson “Box Weights Shifting” *Lloyd’s List Australia* (6 February 2014) 10.

C *Reports*

Baltic and International Marine Council, International Association of Ports and Harbors, International Chamber of Shipping, and World Shipping Council, “Shipping Industry Urges the IMO to Approve Container Weight Verification Requirement” (September 2013).

International Association of Ports and Harbours “Report of IAPH Survey Results on Overweight or Incorrectly Declared Container Issues in Ports” (IAPH, May 2012).

KiwiRail *Overload and Imbalance Wagons* Train Control Instruction AO13.

Maritime Research Institute Netherlands *Lashing@Sea*, 2009.

C McBride and P Kirby *Strategic electronic monitoring and compliance of heavy commercial vehicles in the upper North Island* (New Zealand Transport Agency, Report 500, October 2012).

Murray King & Francis Small Consultancy *Avoiding Main Line Overloads* (Report to KiwiRail Infrastructure and Engineering April 2012).

World Shipping Council, “Containers Lost at Sea”, August 2011.

World Shipping Council and International Chamber of Shipping “Solving the Problem of Overweight Containers”, 1 December 2010.

D *Online sources*

All About Shipping <www.allaboutshipping.co.uk>:

“Liner ‘Cargo Incident Notification System’ growing up” (19 March 2014).

Asian Shipper <www.asianshipper.org>:

Chris Dupin “Shipper rift develops over container weights” (13 September 2013).

Baltic and International Marine Council <www.bimco.org>:

“Ports and Carriers United on the Need to Weigh Loaded Containers”
(13 December 2011).

“Watchkeeper: Certainty on the Weight of the Box” (27 June 2012).

“Maritime Industry asks IMO to Require the Weighing of Containers”
(19 July 2012).

British International Freight Association <www.bifa.org>:

“Overweight containers – is it time to get tough?” (April 2011).

“Mandatory measures to weigh containers due by 2013” (14 December 2011).

Daily-Cargo <www.daily-cargo.com>:

Shippers vehemently protest measurement of container weight under SOLAS” (October 3 2013).

CNN <<http://edition.cnn.com>>:

Tim Lister “Ship loses more than 500 containers in heavy seas” (22 February 2014).

<www.containerownersassociation.org>:

“CINS – Cargo Information Notification System” (undated).

Freight Net <www.freightnet.com>:

“Weighing containers: is it really that difficult?” (22 April 2010).

Harwood Andrews <www.harwoodandrews.com>:

Geoff Donovan “Chain of Responsibility Laws – Crack Down” (28 March 2012).

Lloyd’s List DCN <www.lloydslistdcn.com.au>:

“Asia: Shipbuilder rejects responsibility for MOL Comfort casualty” (4 April 2014”).

The Loadstar <<http://theloadstar.co.uk>>:

Gavin van Merle “Container weights debate heats up as players try to ‘pass the parcel’”, (10 October 2012).

Gavin van Merle “Dutch u-turn throws mandatory container weighing into doubt” (27 March 2013).

Narasimham Sundapalayam (21 October 2013) post to Mike Wackett “Container weight rules are unnecessary and will cost shippers billions, claim” (17 October 2013).

Mike Wackett “Safety campaigners turn the spotlight on how industry can tackle poor box packing” (12 February 2014).

Mike Wackett, “Ship and crew safety fears increasing as number of mis-declared containers soars” (20 March 2014).

John Hunter (8 May 2014), post to Martin Roebuck, “New container weight regulation in 2016 will be critical to the entire supply chain” (2 May 2014).

Mike Wackett, “Hauliers believe poor container stowage a greater threat than misdeclared weight” (12 May 2014).

Mike Wackett “Weighing containers will become law, but where in the supply chain will it happen?” (20 May 2014).

Mail Online <www.dailymail.co.uk>:

“Cigarettes galore! Millions of Marlboros washed up on British Beaches after Danish cargo ship lost containers during storms will be BURNED to make electricity”, (25 February 2014).

National Animal Identification and Tracing <www.nait.co.nz>.

Port Strategy <www.portstrategy.com>:

“Container weighing forward thinking” (2 July 2013).

Seatrade <www.seatrade-global.com>:

Charlie Bartlett “MOL Comfort sisterships to be sent for hill-strengthening.

Marcus Hand, “Svendborg Maersk Lost 520 containers overboard” (19 February 2014).

Synergy Group <www.synergymarinegroup.com>:

“Weighing of Containers essential” 26 July 2013.

TT Club, <www.ttclub.com>:

“Australia acts against overweight containers” (16 November 2005) 73 *TT Talk*.

Peregrine Storrs-Fox “Responsibility for accurate weight declarations in containers” (27 January 2010) 125 *TT Talk*.

“The 21st Century Plimsoll issue” (29 July 2011) 148 *TT Talk*.

“Why is weight of containers an issue” (23 July 2012) 163 *TT Talk*.

“Container Weighing – Control and enforcement” (26 September 2013) 179 *TT Talk*.

TT Club, “Another step towards reducing supply chain accidents” (4 March 2014) *TT Talk* (unnumbered).

World Shipping Council <www.worldshipping.org>:

Cargo Weight” Progress of IMO Action” (2014).

E Email correspondence

Email from Marinus La Rooij, Freight Portfolio Strategy Manager, New Zealand Transport Agency to Murray King regarding illegally overloaded containers (21 March 2014).

Email from Tony Pepperell, Principal Design Engineer, KiwiRail to Murray King regarding broken wagon as a result of overloading (25 March 2014).

Email from Tony Pepperell, Principal Design Engineer, KiwiRail to Murray King regarding weighing of container wagons (13 May 2014).

Email from Chris Bain, Chief Operating Officer, Napier Port to Murray King regarding overweight containers, (14 May 2014).

Email from Craig Sain, General Manager Commercial Relations, Ports of Auckland, to Murray King regarding overweight containers (14 May 2014).

Email from Antony Dixon, Chief Executive, Times-7, to Murray King regarding RFID for container weight verification (15 May 2014).

Email from Peter Brown, Commercial Manager, Port Otago to Murray King regarding overweight containers (16 May 2014).

Email from Natasha Brown, Media and Communications Officer, International Maritime Organization, to Murray King, regarding MSC decision re SOLAS Ch IV (23 May 2014).

Email from Ben Baker, Consultant, National Transport Commission (Australia), to Murray King regarding overweight containers (23 May 2014).

Email from Paul Monk, Operations Manager, Lyttelton Port Co Ltd, to Murray King, regarding overweight containers (30 May 2014).