Federal Court  Cour fédérale

**Date: 20160122**

**Docket: T-520-10**

**Citation: 2016 FC 69**

**Ottawa, Ontario, January 22, 2016**

**PRESENT: The Honourable Madam Justice Strickland**

**BETWEEN:**

**J.D. IRVING, LIMITED**

**Plaintiff**

**and**

**SIEMENS CANADA LIMITED, MARITIME MARINE CONSULTANTS (2003) INC., SUPERPORT MARINE SERVICES LTD., NEW BRUNSWICK POWER NUCLEAR CORPORATION, BMT MARINE AND OFFSHORE SURVEYS LTD., AND DANIEL MACPHERSON carrying on business as MACPHERSON MARINE GROUP**

**Defendants**

**JUDGMENT AND REASONS**

[1] This is an action commenced by J.D. Irving Limited ("JDI") seeking a declaration that it is entitled to limit its liability in relation to cargo that fell into the sea while being loaded on the deck of a barge on October 15, 2008, in Saint John, New Brunswick, including with respect to any person for whose act, neglect or default JDI is responsible, to the amount of CDN$500,000.00 plus interest to the date of the constitution of a limitation fund, pursuant to the *Marine Liability Act*, SC 2001, c 6 ("MLA").

## I. Overview and Procedural Background

[2] On September 1, 2006 Siemens Canada Limited ("Siemens") entered into a contract with Atomic Energy of Canada Limited concerning the refurbishing and upgrading of the Point Lepreau Nuclear Generating Station located at Point Lepreau, New Brunswick ("Point

Lepreau"). The contract was subsequently assigned to the New Brunswick Power Nuclear Corporation ("NB PNC").

[3] Pursuant to that contract, Siemens was to provide NB PNC with three new low pressure modules ("LP Modules") and to refurbish and upgrade a generator rotor. Each LP Module is comprised of an outer low pressure cylinder casing ("LP Casing") and an internal low pressure turbine rotor ("LP Rotor" or "rotor"). Each LP Rotor weighs approximately 115 tons, is approximately 4.1 metres in diameter and 7.8 metres in length.

[4] On January 11, 2007 Siemens issued a purchase order to Irving Equipment, a division of JDI, pertaining to the transport of the LP Modules and generator rotor ("Siemens PO"). For the purposes of these reasons, any reference to JDI includes Irving Equipment. The Siemens PO described three main services to be provided by JDI: to transport the generator rotor from Point Lepreau to alongside a ship located at the Port of Saint John for further transport by sea for refurbishment; to transport the refurbished generator rotor from alongside a ship at the Port of Saint John back to Point Lepreau; and, to transport the new LP Rotors from alongside a ship at the Port of Saint John to Point Lepreau, by sea, and to transport the LP Casings by road. The Siemens PO also set out other services connected with the transport, including the provision by JDI of all necessary equipment, personnel, tugs and barges, and attached Siemens' standard terms and conditions.

[5] To effect the transport of the LP Rotors, JDI entered into a BIMCO Standard Barge Bareboat Charter Party on October 15, 2008 with Superport Marine Services Ltd ("Superport"),

the owner of the barge "SPM 125" ("SPM 125" or the "barge"). JDI also chartered the tug "Mary Steele" from Superport to assist with the move.

[6] JDI retained Maritime Marine Consultants (2003) Inc. ("MMC") to provide naval architectural and consulting services by way of a Purchase Order dated August 13, 2008 ("Irving Equipment PO"). Mr. Don Bremner ("Bremner") is the principal and owner of MMC.

[7] BMT Marine and Offshore Surveys Limited ("BMT") was retained by Siemens and/or its insurer, AXA Corporate Solutions ("AXA"), to provide marine surveying services for the move of the LP Rotors. The attending surveyor was Mr. Douglas Hamilton ("Hamilton").

[8] On October 15, 2008 each of the LP Rotors were placed on a self-propelled multi-wheeled transporter ("transporter") owned by Irving Equipment. This allowed them to be driven, or "rolled", on and off the "SPM 125". While in the process of loading, the second transporter ("T2") to be driven on to the "SPM 125", tipped to starboard, fell over and off the barge into Saint John harbour. The LP Rotor which had been placed on the first transporter ("T1") immediately followed, T1 itself remained on its side on the port side of the "SPM 125" ("incident" or "loss").

[9] Unsurprisingly, this prompted a flurry of litigation. The history of that litigation was set out by Justice Heneghan in *JD Irving, Limited v Siemens Canada Limited*, 2011 FC 791 [*JDI FC*]. In essence, Siemens commenced an action in the Ontario Superior Court of Justice against JDI, BMT, MMC and Superport claiming breach of contract, negligent misrepresentation,

negligence and/or gross negligence, failure to warn and damages in the amount of $45,000,000.00. Siemens also claimed joint and several indemnification from JDI, MMC, BMT and Superport in respect of all claims made against Siemens by NB PNC. Siemens subsequently filed a second action in the Ontario Superior Court of Justice pertaining to the incident claiming $45,000,000.00 against twelve individuals, including Bremner, and against Atlantic Towing Limited, a division of JDI.

[10] On April 7, 2010 JDI filed this limitation action pursuant to ss 29(6), 29.1 and 32(5) of the MLA seeking to limit its liability to $500,000.00 as against all claims related to the incident. MMC filed a Statement of Claim in this Court on April 30, 2010 also seeking to limit its liability pursuant to the MLA in relation to the loss, naming Siemens, Superport, NB PNC and BMT as defendants (T-666-10). And, by Notice of Third Party Claim filed on July 28, 2010, BMT claimed contribution and indemnity in relation to the incident against AXA, Siemens' cargo insurer.

[11] On June 29, 2011, Justice Heneghan heard several motions in the two limitation actions and, pursuant to s 33(1) of the MLA, granted the motions of JDI, MMC and BMT to enjoin any other proceeding before any court or tribunal with respect to the incident. Justice Heneghan also dismissed Siemens' motion to stay this action and T-666-10, and, ordered that a limitation fund be constituted, pursuant to s 32 of the MLA. The Federal Court of Appeal upheld Justice Heneghan's decision (*Siemens Canada Limited v JD Irving Limited*, 2012 FCA 225 [*JDI FCA*]).

[12] Subsequently, on July 5, 2013, Justice Heneghan ordered that the limitation action proceed before the liability action. A limitation fund of $500,000.00, plus interest accrued to the date of its constitution, being $546,007.31, as prescribed by Justice Heneghan's Order of July 18, 2013, was constituted by guarantee bond on behalf of JDI on July 29, 2013. In the result, the sole issue to be decided at this limitation trial was whether JDI, MMC and BMT may benefit from the limitation of liability pursuant to the MLA.

[13] However, on the day prior to trial, BMT advised that the principal and all indemnity proceedings both by and against BMT had been settled. BMT therefore did not participate as a party in the limitation hearing, although Hamilton was called as a witness by JDI. BMT filed a Notice of Settlement on October 6, 2015. At trial, counsel for MMC also advised that Bremner, MMC and Siemens had reached an agreement whereby Siemens would limit its enforcement of any judgment obtained against them. The specifics of the agreement were not disclosed, however, MMC still sought a declaration that it was entitled to limit its liability pursuant to the MLA.

## II. Legislative Provisions

[14] The relevant legislative provisions of the MLA, which incorporates into Canadian law Articles 1 to 15 of the *Convention on Limitation of Liability for Maritime Claims, 1976*, as amended by the *Protocol of 1996 to amend the Convention on Limitation of Liability for Maritime Claims, 1976* (collectively, the "*Limitation Convention*") are as follows:

**PART 3 LIMITATION OF LIABILITY FOR MARITIME CLAIMS**

**Interpretation**

24. The definitions in this section apply in this Part.

**"Convention"**

"Convention" means the Convention on Limitation of Liability for Maritime Claims, 1976, concluded at London on November 19, 1976, as amended by the Protocol, Articles 1 to 15 of which Convention are set out in Part 1 of Schedule 1 and Article 18 of which is set out in Part 2 of that Schedule.

**"maritime claim"**

"maritime claim" means a claim described in Article 2 of the Convention for which a person referred to in Article 1 of the Convention is entitled to limitation of liability.

…

**"Protocol"**

"Protocol" means the Protocol of 1996 to amend the Convention on Limitation of Liability for Maritime Claims, 1976, concluded at London on May 2, 1996, Articles 8 and 9 of which are set out in Part 2 of Schedule 1.

**PARTIE 3 LIMITATION DE RESPONSABILITÉ EN MATIÈRE DE CRÉANCES MARITIMES**

**Définitions et dispositions interprétatives**

24. Les définitions qui suivent s'appliquent à la présente partie.

**« Convention »**

« Convention » La Convention de 1976 sur la limitation de la responsabilité en matière de créances maritimes conclue à Londres le 19 novembre 1976 — dans sa version modifiée par le Protocole — dont les articles 1 à 15 figurent à la partie 1 de l'annexe 1 et l'article 18 figure à la partie 2 de cette annexe.

**« créance maritime »**

« créance maritime » Créance maritime visée à l'article 2 de la Convention contre toute personne visée à l'article 1 de la Convention.

…

**« Protocole »**

« Protocole » Le Protocole de 1996 modifiant la Convention de 1976 sur la limitation de la responsabilité en matière de créances maritimes conclu à Londres le 2 mai 1996, dont les articles 8 et 9 figurent à la partie 2 de l'annexe 1.

| | |
|---|---|
| … | … |
| 25. (1) For the purposes of this Part and Articles 1 to 15 of the Convention, | 25. (1) Pour l'application de la présente partie et des articles 1 à 15 de la Convention : |
| (a) "ship" means any vessel or craft designed, used or capable of being used solely or partly for navigation, without regard to method or lack of propulsion, and includes | a) « navire » s'entend d'un bâtiment ou d'une embarcation conçus, utilisés ou utilisables, exclusivement ou non, pour la navigation, indépendamment de leur mode de propulsion ou de l'absence de propulsion, à l'exclusion des aéroglisseurs et des plates-formes flottantes destinées à l'exploration ou à l'exploitation des ressources naturelles du fond ou du sous-sol marin; y sont assimilés les navires en construction à partir du moment où ils peuvent flotter, les navires échoués ou coulés ainsi que les épaves et toute partie d'un navire qui s'est brisé; |
| (b) the definition "shipowner" in paragraph 2 of Article 1 of the Convention shall be read without reference to the word "seagoing" and as including any person who has an interest in or possession of a ship from and including its launching; and | b) la définition de « propriétaire de navire », au paragraphe 2 de l'article premier de la Convention, vise notamment la personne ayant un intérêt dans un navire ou la possession d'un navire, à compter de son lancement, et s'interprète sans égard au terme « de mer »; |
| … | … |
| (2) In the event of any inconsistency between sections 28 to 34 of this Act and Articles 1 to 15 of the Convention, those sections prevail to the extent of the inconsistency. | (2) Les articles 28 à 34 de la présente loi l'emportent sur les dispositions incompatibles des articles 1 à 15 de la Convention. |

**APPLICATION**

26. (1) Subject to the other provisions of this Part, Articles 1 to 15 and 18 of the Convention and Articles 8 and 9 of the Protocol have the force of law in Canada.

…

27. For purposes of the application of the Convention, Canada is a State Party to the Convention.

…

29. The maximum liability for maritime claims that arise on any distinct occasion involving a ship of less than 300 gross tonnage, other than claims referred to in section 28, is

(a) $1,000,000 in respect of claims for loss of life or personal injury; and

(b) $500,000 in respect of any other claims.

**SCHEDULE 1 (Section 24 and subsections 26(2) and 31(1))**

**PART 1**

Text of Articles 1 to 15 of the Convention on Limitation of Liability for Maritime Claims, 1976, as amended by the Protocol of 1996 to amend the Convention on Limitation of Liability for Maritime Claims, 1976

**CHAMP D'APPLICATION**

26. (1) Sous réserve des autres dispositions de la présente partie, les articles 1 à 15 et 18 de la Convention et les articles 8 et 9 du Protocole ont force de loi au Canada.

…

27. Pour l'application de la Convention, le Canada est un État partie à la Convention.

…

29. La limite de responsabilité pour les créances maritimes — autres que celles mentionnées à l'article 28 — nées d'un même événement impliquant un navire d'une jauge brute inférieure à 300 est fixée à :

a) 1 000 000 $ pour les créances pour décès ou blessures corporelles;

b) 500 000 $ pour les autres créances.

**ANNEXE 1 (article 24 et paragraphes 26(2) et 31(1))**

**PARTIE 1**

Texte des articles 1 à 15 de la Convention de 1976 sur la limitation de la responsabilité en matière de créances maritimes telle que modifiée par le Protocole de 1996 modifiant la Convention de 1976 sur la limitation de la

responsabilité en matière de créances maritimes

**CHAPTER I. THE RIGHT OF LIMITATION**

**CHAPITRE PREMIER — LE DROIT À LIMITATION**

**ARTICLE 1**

**ARTICLE 1**

**PERSONS ENTITLED TO LIMIT LIABILITY**

**PERSONNES EN DROIT DE LIMITER LEUR RESPONSABILITÉ**

1. Shipowners and salvors, as hereinafter defined, may limit their liability in accordance with the rules of this Convention for claims set out in Article 2.

1. Les propriétaires de navires et les assistants, tels que définis ci-après, peuvent limiter leur responsabilité conformément aux règles de la présente Convention à l'égard des créances visées à l'article 2.

2. The term "shipowner" shall mean the owner, charterer, manager and operator of a seagoing ship.

2. L'expression « propriétaire de navire », désigne le propriétaire, l'affréteur, l'armateur et l'armateur-gérant d'un navire de mer.

…

…

4. If any claims set out in Article 2 are made against any person for whose act, neglect or default the shipowner or salvor is responsible, such person shall be entitled to avail himself of the limitation of liability provided for in this Convention.

4. Si l'une quelconque des créances prévues à l'article 2 est formée contre toute personne dont les faits, négligences et fautes entraînent la responsabilité du propriétaire ou de l'assistant, cette personne est en droit de se prévaloir de la limitation de la responsabilité prévue dans la présente Convention.

5. In this Convention the liability of a shipowner shall include liability in an action brought against the vessel herself.

5. Dans la présente Convention, l'expression « responsabilité du propriétaire de navire » comprend la responsabilité résultant d'une action formée contre le navire

lui-même.

6. An insurer of liability for claims subject to limitation in accordance with the rules of this Convention shall be entitled to the benefits of this Convention to the same extent as the assured himself.

6. L'assureur qui couvre la responsabilité à l'égard des créances soumises à limitation conformément aux règles de la présente Convention est en droit de se prévaloir de celle-ci dans la même mesure que l'assuré lui-même.

7. The act of invoking limitation of liability shall not constitute an admission of liability.

7. Le fait d'invoquer la limitation de la responsabilité n'emporte pas la reconnaissance de cette responsabilité.

**ARTICLE 2**

**CLAIMS SUBJECT TO LIMITATION**

1. Subject to Articles 3 and 4 the following claims, whatever the basis of liability may be, shall be subject to limitation of liability:

**ARTICLE 2**

**CRÉANCES SOUMISES À LA LIMITATION**

1. Sous réserves des articles 3 et 4, les créances suivantes, quel que soit le fondement de la responsabilité, sont soumises à la limitation de la responsabilité :

(a) claims in respect of loss of life or personal injury or loss of or damage to property (including damage to harbour works, basins and waterways and aids to navigation), occurring on board or in direct connexion with the operation of the ship or with salvage operations, and consequential loss resulting therefrom;

a) créances pour mort, pour lésions corporelles, pour pertes et pour dommages à tous biens (y compris les dommages causés aux ouvrages d'art des ports, bassins, voies navigables et aides à la navigation) survenus à bord du navire ou en relation directe avec l'exploitation de celui-ci ou avec des opérations d'assistance ou de sauvetage, ainsi que pour tout autre préjudice en résultant;

(b) claims in respect of loss resulting from delay in the carriage by sea of cargo,

b) créances pour tout préjudice résultant d'un retard dans le transport par mer de la

passengers or their luggage;

(c) claims in respect of other loss resulting from infringement of rights other than contractual rights, occurring in direct connexion with the operation of the ship or salvage operations;

…

2. Claims set out in paragraph 1 shall be subject to limitation of liability even if brought by way of recourse or for indemnity under a contract or otherwise. However, claims set out under paragraph 1(d), (e) and (f) shall not be subject to limitation of liability to the extent that they relate to remuneration under a contract with the person liable.

cargaison, des passagers ou de leurs bagages;

c) créances pour d'autres préjudices résultant de l'atteinte à tous droits de source extracontractuelle, et survenus en relation directe avec l'exploitation du navire ou avec des opérations d'assistance ou de sauvetage;

…

2. Les créances visées au paragraphe 1 sont soumises à la limitation de la responsabilité même si elles font l'objet d'une action, contractuelle ou non, récursoire ou en garantie. Toutefois, les créances produites aux termes des alinéas d), e) et f) du paragraphe 1 ne sont pas soumises à la limitation de responsabilité dans la mesure où elles sont relatives à la rémunération en application d'un contrat conclu avec la personne responsable.

**ARTICLE 4**

**CONDUCT BARRING LIMITATION**

…

A person liable shall not be entitled to limit his liability if it is proved that the loss resulted from his personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably

**ARTICLE 4**

**CONDUITE SUPPRIMANT LA LIMITATION**

…

Une personne responsable n'est pas en droit de limiter sa responsabilité s'il est prouvé que le dommage résulte de son fait ou de son omission personnels, commis avec l'intention de provoquer un tel dommage, ou commis

| | |
|---|---|
| result. | témérairement et avec conscience qu'un tel dommage en résulterait probablement. |

**III. Matters in Dispute and Summary of the Parties' Submissions**

[15] It is not disputed that JDI is a shipowner as defined by s 25(1)(a) of the MLA and is thereby entitled to limit its liability under the *Limitation Convention*. Similarly, there is no dispute that the gross tonnage of the "SPM 125" is less than 300 tons and, therefore, that the amount of limitation, if applicable, is CDN$500,000.00 pursuant to s 29 of the MLA.

[16] What is at issue is whether JDI is barred by its conduct from limiting its liability, pursuant to Article 4 of the *Limitation Convention*. With respect to MMC and Bremner, the question is whether they are entitled to limit their liability pursuant to Article 1(4), as persons for whose acts, neglect or default JDI is responsible, and, if so, whether that entitlement is barred by their conduct pursuant to Article 4.

[17] The determination of these issues requires the interpretation of Article 1(4) and Article 4 and the application of the facts and evidence of this case to those provisions.

[18] Siemens does not assert that any party intended to cause the loss. It does, however, assert that the evidence establishes, or that the Court should infer, that JDI and MMC acted recklessly and with knowledge that loss of the cargo would probably result, within the meaning of Article 4 of the *Limitation Convention*.

[19] Siemens acknowledges that, to forfeit the right of limitation, the loss must have resulted from the personal acts or omissions of the shipowner. In the case of JDI, the impugned acts or omissions of particular individuals must be attributed to the corporation. In this regard, Siemens argues that two of JDI's employees, Mr. Roderick Malcolm ("Malcolm"), project manager of the cargo move, and Mr. David McLaughlin ("McLaughlin"), senior rigging engineer, had the authority to and did act on behalf of JDI in fulfilling the contract with Siemens. In that regard, Malcolm and McLaughlin's functions in the company were the same as to be expected by JDI itself and their actions and knowledge can be attributed to JDI.

[20] Siemens further submits that JDI is responsible for the conduct of MMC and Bremner as JDI engaged, instructed and paid MMC. JDI identified MMC, for the purposes of the cargo move, as its naval architect.

[21] JDI submits that, pursuant to Article 4, Siemens was required to prove that JDI was reckless and that JDI actually knew that the loss sustained by Siemens would probably result from its recklessness. According to JDI, Siemens has failed to prove the actual cause of the incident or that a proven cause was recklessness. Further, neither Malcolm's nor McLaughlin's actions were attributable to JDI for this purpose. And, in any event, Siemens has failed to prove that anyone involved in planning or implementing the move was reckless.

[22] In this regard, it is of note that in its Statement of Claim JDI asserted that none of the individual JDI employees or affiliates, named by Siemens as defendants in the Ontario or other actions commenced by Siemens, were directing minds of JDI for the purposes of Article 4.

Subject to that, however, for the purpose of its limitation action only, JDI accepted that the acts of its employees in relation to the incident were its acts, and JDI accepted responsibility for those acts as limited by the provisions of the MLA. Further, and on the same basis, JDI accepted that the acts of its affiliates were its acts and accepted responsibility for them.

[23] In their respective Defence, Counterclaim and Crossclaims filed in response to JDI's limitation action, MMC and Bremner each admitted that JDI was entitled to limit its liability pursuant to the MLA and also claimed that their own liability was so limited. In its responding Reply and Defence to Counterclaim(s), JDI admitted that MMC is entitled to limit its liability pursuant to the MLA, provided that JDI has the same entitlement and accepted that all claims against MMC and JDI were, collectively, limited to $500,000.00. In this action, MMC and Bremner submitted that their right to limit arises from Article 1(4) of the *Limitation Convention*. They interpret Article 1(4) to extend the limitation of liability to independent contractors, provided that the shipowner is responsible for their actions as a matter of law. MMC submitted that JDI's legal responsibility for MMC and Bremner arises pursuant to s 43(2) of the MLA which incorporates the Hague-Visby Rules and states that a shipowner has a non-delegable obligation to make its ship seaworthy. Therefore, an independent contractor who by its act, neglect or default, renders a ship unseaworthy, may limit its liability if sued by the owners of the damaged cargo. MMC and Bremner also assert, for the same reasons as JDI, that the evidence does not engage the Article 4 bar to limitation.

## IV. Purpose of the Limitation Convention

[24] In my view, as a starting point, it is important to understand the history and purpose of the *Limitation Convention*.

[25] This has been described in many prior cases, including the reasoning for the extremely high threshold required to break limitation under Article 4 in Canada. In *Canadian Pacific Railway v "Sheena M" (The)*, [2000] 4 FC 159 [*The Sheena M*], this Court stated that:

> [8] A part of the reasoning behind the 1976 Convention is neatly set out in Griggs and Williams, *Limitation of Liability for Maritime Claims*, Lloyd's of London Press, 1998, at page 3, which begins by the authors referring to the 1957 Limitation Convention:
>
> > It was recognized that the previous system of limitation had given rise to too much litigation and there was a desire that this should be avoided in future. There was agreement that a balance needed to be struck between the desire to ensure on the one hand that a successful claimant should be suitably compensated for any loss or injury which he had suffered and the need on the other hand to allow shipowners, for public policy reasons, to limit their liability to an amount which was readily insurable at a reasonable premium.
> >
> > The solution which was finally adopted to resolve the competing requirements of claimant and defendant was (a) the establishment of a limitation fund which was as high as a shipowner could cover by insurance at a reasonable cost, and (b) **the creation of a virtually unbreakable right to limit liability.**
> >
> > The text of the 1976 Convention finally adopted by the Conference therefore represents a compromise. **In exchange for the establishment of a much higher limitation fund claimants would have to accept the extremely limited opportunities to break the right to limit liability**. Under the 1976

> Convention the right to limit liability is lost only when the claimant can prove wilful intent or recklessness on the part of the person seeking to limit (Article 4).

[emphasis added]

[26] More recently, the purpose and history of the *Limitation Convention* was addressed in *Daina Shipping Company v Te Runanga O Ngati Awa*, [2013] 2 NZLR 799 [*Daina Shipping*]:

> [26] The 1976 Convention brought about a "dramatic change". Under the 1957 Convention the owner claiming an entitlement to limit liability had to establish that the occasion giving rise to the claim occurred without the owner's actual fault or privity. Article 4 of the 1976 Convention shifted the burden. The owner was no longer required to establish an absence of fault and an absence of privity. Article 4 requires a claimant opposing limitation to establish that the owner intended to cause the loss suffered by the claimant, or was reckless in that regard and acted with knowledge that the loss would probably result.
>
> …
>
> [28] In *The Bowbelle*, Sheen J described art 4 as imposing "a very heavy burden" on the claimant. In *The Leerort* Lord Phillips of Worth Matravers MR, immediately after citing the observation of Sheen J, commented: "It is worth pausing to consider just how heavy that burden is." His Lordship then considered the extent of the burden and concluded: "[W]hen a claim is made for damages resulting from a collision, it is virtually axiomatic that the defendant ship owner will be entitled to limit his liability."
>
> [29] **The extent of the difficulty faced by a claimant seeking to break the limitation is reflected in numerous expressions similar to those just cited. Sheen J expressed it differently, but to the same effect, when he said that the owner has an "almost indisputable right to limit". In The *Saint Jacques II and Gudermes* Gross J said that "it is likely that only truly exceptional cases will give rise to any real prospect of defeating an owner's right to limit".**
>
> [30] In *The Tasman Pioneer* Williams J cited with approval an observation of Dr Jackson that **"it seems accepted that the limits will normally be unbreakable - a trade off for the higher limits**

> **established in the 1976 Convention". The *Travaux Préparatoires* of the 1976 Convention, and 1996 Protocols, makes it clear that this was the express intention.** That this was the intention can also readily be inferred by comparing art 4 with the provisions of the 1957 Convention. Under the 1957 Convention it was more difficult for the owner to secure a limitation of the amount of liability but, if secured, the cap was low. It was a "derisory" limit as one commentator has noted.
>
> [footnotes omitted, emphasis added]

[27] Similarly, the history and purpose of the *Limitation Convention* has been addressed in the context of English law in *Margolle and another v Delta Maritime Company Limited and others (The Saint Jacques II)*, [2002] EWHC 2452 (Admlty) [*Saint Jacques II*] which also addressed the nature of recklessness and knowledge as elements of Article 4:

> [16] For present purposes, the legal framework may be summarised as follows:
>
> …
>
> (1) for reasons of policy, the right of shipowners and certain others to limit their liability is long-established in English law and is now (as already remarked) contained in the 1976 convention. Three features stand out when the 1976 convention is compared with its predecessor convention, the International Convention relating to the Limitation of the Liability of Owners of Sea-going Ships 1957 (TS 52 (1960); Cmnd 3678); the 1976 convention provides: (i) for a higher limit of liability; (ii) that the burden of proof now rests on the party seeking to 'break' the limit; (iii) that that burden is (intentionally) a very heavy burden. Sheen J's observations in *The Bowbelle* [1990] 3 All ER 476, [1990] 1WLR 1330 that the 1976 convention conferred on the shipowner an 'almost indisputable right to limit', were cited with approval in *MSC Mediterranean Shipping Co SA v Delumar BVBA* [2000] 2 All ER (Comm) 458 at 460, [2000] 2Lloyd's Rep 399 at 401 (esp at paras 11 and following) and in *Schiffahrtgesellschaft MS 'Merkur Sky' mbH & Co KG v MS Leerort NTH Schiffahrts GmbH & Co KG 'The Leerort'* [2001] EWCA Civ 1055 at [9] and following, [2001] 2Lloyd's Rep 291 at [9] and following.

(2) A glance at art 4 of the 1976 convention suffices to indicate just how heavy is the burden resting on the party challenging the shipowner's right to limit. As David Steel J expressed it in the *MSC Mediterranean Shipping case* ([2000] 2 All ER (Comm) 458 at 461, [2000] 2Lloyd's Rep 399 at 401 (para 14)):

> ... absent, as in the present case, any allegation of intent, the person challenging the right to limit must establish both reckless conduct *and* knowledge that the relevant loss would probably result. (My emphasis.)

(3) The nature of these two requirements (recklessness and knowledge) and the relationship between them appear from two authorities on the Warsaw Convention for the Unification of Certain Rules Relating to International Carriage by Air1929, as amended at The Hague in 1955 and set out in Sch 1 to the Carriage by Air Act 1961, governing the carriage of goods and persons by air (the Warsaw Convention). As to conduct being reckless, Eveleigh LJ said in *Goldman v Thai Airways International Ltd* [1983] 3 All ER 693 at 699, [1983] 1 WLR 1186 at 1194:

> When conduct is stigmatised as reckless, it is because it engenders the risk of undesirable consequences. When a person acts recklessly he acts in a manner which indicates a decision to run the risk or a mental attitude of indifference to its existence. This is the ordinary meaning of the word ... One cannot therefore decide whether or not an act or omission is done recklessly without considering the nature of the risk involved.

In *Nugent v Michael Goss Aviation Ltd* [2000] 2 Lloyd's Rep 222 at 227 Auld LJ spoke of recklessness as involving 'an obvious risk of damage and failure to give any thought to the possibility of it or recognition of the risk and going on to take it'. It is plain that 'knowledge' here means *actual* not *constructive* knowledge. Again, in *Nugent*'s case, Auld LJ said (at 229):

> ... the additional ingredient is actual knowledge, in the sense of appreciation or awareness at the time of the conduct in question, that it will probably result in the type of damage caused. Nothing less will do.

Plainly, the two requirements of recklessness and knowledge are separate and cumulative; a challenge to the right to limit will fail if

(for instance) only recklessness but not knowledge is established. However, and still further in *Nugent*'s case, Auld LJ said (at 227):

> Adding a further ingredient ... of knowledge of the probability of damage may or may not, depending on the obviousness of the risk, add much to the task of inferring that a carrier recognized the risk and went on to take it. The greater the obviousness of the risk the more likely the tribunal is to infer recklessness and that the defendant, in so doing, knew that he would probably cause damage. As a matter of proof the two will often stand or fall together ... As so often, practical considerations of what a tribunal is prepared to infer as to a defendant's state of mind may be more determinative than fine matters of principle of what one legal concept adds to another ...

(4) Valuable as are these authorities on the Warsaw Convention as to the meaning of 'recklessly' and 'knowledge' in the present context, matters do not end with them. **The test under the 1976 convention for defeating the right to limit is still higher than that found in the Warsaw Convention, in respect of both the act or omission in question and the relevant knowledge,** so: (i) under the 1976 convention, the act or omission in question must be the 'personal' act or omission of the party seeking to limit; by contrast, the exception to the right to limit contained in the Warsaw Convention applies to the act or omission of 'the carrier, his servants or agents' (see art 25 of the Warsaw Convention); (ii) under the Warsaw Convention, the relevant knowledge is that 'damage would probably result' (see art 25); under the convention, the relevant knowledge under art 4 is that 'such loss' would probably result.

(5) These considerations were addressed by Lord Phillips MR in *Schiffahrtgesellschaft MS 'Merkur Sky' mbH & Co KGv MS Leerort NTH Schiffahrts GmbH & Co KG 'The Leerort'* [2001] EWCA Civ 1055 at [13]-[19], [2001] 2 Lloyd's Rep 291 at [13]-[19], as follows:

> 13. The limitation provisions in relation to merchant shipping provide even greater protection than those in relation to carriage by air. It is only the personal act or omission of a shipowner which defeats the right to limit. A shipowner is defined in art. 1 as the owner, charterer, manager or operator of a seagoing ship. Thus, to defeat the right to limit, it is

> necessary to identify the causative act or omission on the part of such a person that caused the loss. Furthermore, it is only conduct committed with intent to cause such loss, or recklessly with knowledge that such loss would probably result, that defeats the right to limit. It seems to me that this requires foresight of the very loss that actually occurs, not merely of the type of loss that occurs. That certainly appears to have been the conclusion of Mr. Justice Steel in [*MSC Mediterranean Shipping Co SA v Delumar BVBA* [2000] 2 All ER (Comm) 458, [2000] 2 Lloyd's Rep 399] ...
>
> …
>
> [emphasis added]

[28] Finally, I note that the Supreme Court of Canada recently addressed the purpose of the *Limitation Convention*, and the interpretation and application of Article 4, in *Peracomo Inc v Telus Communications Co*, 2014 SCC 29 [*Peracomo SCC*]. That case dealt with intent to cause loss under Article 4 of the *Limitation Convention*, rather than recklessness as in the present case. However, the Court addressed the purpose of the *Limitation Convention* and recklessness in the context of exclusion from insurance coverage due to wilful misconduct, as differentiated from recklessness under Article 4.

[29] There, Mr. Vallée was the sole shareholder and officer of Peracomo Inc, and it was conceded that he was the alter ego of that company. While fishing, Mr. Vallée snagged a cable which he cut, believing it to be abandoned. The cable was, in fact, a working communication cable owned by Telus. The trial judge found that, because Mr. Vallée cut the cable on purpose, the Article 4 bar to limitation applied. The Federal Court of Appeal upheld the trial judge's decision (*Peracomo Inc v Société Telus Communications*, 2012 FCA 199 [*Peracomo FCA*]).

However, the Supreme Court of Canada disagreed. It found that the limit of liability applied but that the loss was excluded from Mr. Vallée's insurance coverage on the basis of wilful misconduct. He was found to be personally liable for damages as limited by the MLA.

[30] The Supreme Court found that Article 4 establishes a very high level of fault based on the *Limitation Convention*'s purpose to establish "a virtually unbreakable limit on liability":

> [24] I turn first to the *Convention*'s purpose. The contracting states to the *Convention* intended the fault requirement to be a high one - the limitation on liability was designed to be difficult to break: *Margolle v. Delta Maritime Co.* (*The "Saint Jacques II" and Gudermes"*), [2002] EWHC 2452, [2003] 1 Lloyd's Rep. 203, at para. 16; *Schiffahrtsgesellschaft MS "Merkur Sky" m.b.H. & Co. K.G. v. MS Leerort Nth Schiffahrts G.m.b.H. & Co. K.G. (The "Leerort")*, [2001] EWCA Civ 1055, [2001] 2 Lloyd's Rep. 291, at para. 18. The *Convention* has been described as a "trade-off": "As a *quid pro quo* for the increase of the [limitation] fund, the article providing for the breaking of limitation became tighter, so that it is almost impossible for the claimants to break the right to limit": A. Mandaraka-Sheppard, *Modern Maritime Law and Risk Management* (2nd ed. 2007), at p. 865. Meeting the threshold fault requirement requires a high degree of subjective blameworthiness: *Nugent*, at p. 229 (interpreting the similarly worded Warsaw Convention, 137 L.N.T.S. 11, as amended by the Hague Protocol, 478 U.N.T.S. 371). The fault standard set by art. 4 has been described as "a virtually unbreakable right to limit liability" (P. Griggs, R. Williams and J. Farr, *Limitation of Liability for Maritime Claims* (4th ed. 2005), at p. 3) and as "an almost indisputable right to limit . . . liability": *The "Bowbelle"*, [1990] 1 Lloyd's Rep. 532 (Q.B.D.), at p. 535; see also D. Damar, *Wilful Misconduct in International Transport Law* (2011), at p. 168; R. P. Grime, "Implementation of the 1976 *Limitation Convention*" (1988), 12 *Marine Pol'y* 306, at p. 313; P. Heerey, "Limitation of Maritime Claims" (1994), 10 *MLAANZ Journal* 1, at p. 3; T. Ogg, "IMO's International Safety Management Code (The ISM Code)" (1996), 1 *I.J.O.S.L.* 143, at p. 149; J. F. Wilson, *Carriage of Goods by Sea* (7th ed. 2010), at p. 288; E. Gold, A. Chircop and H. Kindred, *Maritime Law* (2003), at p. 728. **It is worth noting that the contracting states considered, but expressly rejected, the inclusion of "gross negligence" as a sufficient level of fault to break the liability limit:** Comité Maritime International, *The*

> *Travaux Préparatoires of the LLMC Convention, 1976 and of the Protocol of 1996* (2000), *Article 4*. Conduct barring limitation, at pp. 123-32.
>
> [25] In my respectful view, the Federal Court of Appeal's approach to breaking the limit on liability lowered the intended fault element and thereby undermined **the *Convention*'s purpose to establish a virtually unbreakable right to limit liability.**
>
> [emphasis in bold added]

[31] The Supreme Court of Canada concluded that whatever else might be said about Mr. Vallée's conduct, he did not actually know that his actions would probably result in damage requiring repair: "It was therefore an error of law to conclude that Mr. Vallée intended to cause a loss or was reckless knowing that such loss would probably occur, within the meaning of art.4" (para 34).

[32] The Court went on to consider whether the loss was caused by Mr. Vallée's wilful misconduct and was thereby excluded from coverage under his insurance policy terms pursuant to s 53(2) of the *Marine Insurance Act*, SC 1993, c 22. In doing so the Court found that the fault standards under the *Limitation Convention* and the *Marine Insurance Act* differed based on their respective purposes and texts. The mental state required for wilful misconduct under the insurance exclusion includes recklessness as to consequence, that is actual knowledge of a risk and running it anyway, a different and lower fault standard than is called for by the *Limitation Convention*.

[33] The Supreme Court found that there was no doubt that Mr. Vallée's acts were so far outside the range of conduct to be expected of him in the circumstances as to constitute

misconduct and that his misconduct was "wilful". It also noted the trial judge's finding that Mr. Vallée's conduct was "reckless in the extreme" and stated that:

> [67] While the threshold to break liability under the *Convention* requires intention or recklessness with knowledge that the loss will probably occur, wilful misconduct under the *Marine Insurance Act* does not require either intention to cause the loss or subjective knowledge that the loss will probably occur. It requires, in the context of this case, simply misconduct with reckless indifference to the known risk despite a duty to know. The trial judge's reasons, read in light of the record, show that at the time he cut the cable Mr. Vallée, who had a duty to know better, subjectively adverted to the risk that the cable might be live and decided to cut it anyway on the sole basis of some handwriting that he had seen for a few seconds on a map on a museum wall - a map which was not a marine chart and was of unknown origin or authenticity. Cutting the cable in those circumstances constitutes wilful misconduct as that term is defined in all of the authorities to which I have referred.

[34] For the purpose of the matter now before me, the significance of the Supreme Court's decision in *Peracomo SCC* is that the contracting states to the *Limitation Convention* intended the fault requirement to be high, resulting in a virtually unbreakable right to limit liability. Recklessness in the context of Article 4 requires subjective knowledge that the loss that actually occurred would probably occur, while recklessness in the context of wilful misconduct has a lower fault element requiring only reckless indifference to the known risk despite a duty to know.

## V. Preliminary Issue: Admissibility of Harquail Notes

[35] Immediately after the incident JDI retained counsel, Mr. Paul Harquail of Stewart McKelvey ("Harquail"), who interviewed several JDI employees and others who were involved in the incident and took notes of those interviews.

[36] It is important to recognize that the interview notes, for the most part, were made at the site of and immediately following the incident. They are not formal statements but are Harquail's hand-written records of the interviews, primarily in a form of aid memoirs in short hand or bullet form notations, complete with diagrams and questions to self. They are difficult to decipher, except perhaps by their author, and were obviously intended for the internal use of counsel. They were later transcribed into typed versions.

[37] After JDI had called all of its evidence, Siemens called Harquail as a witness. Counsel for Siemens stated that the purpose of doing so was to prove the interview notes and statements made by a number of witnesses who testified and upon which the experts for JDI had relied in forming their opinions.

[38] JDI objected to this stated purpose. It submitted that the notes were only admissible insofar as statements from them were put to factual witnesses, as prior inconsistent statements, pursuant to s 11 of the *Canada Evidence Act*, RSC 1985, c C-5. Further, that the mere fact that the notes formed a part of the information that the experts generally considered in forming their opinions did not serve as a basis for their admission in whole.

[39] Siemens submitted that the notes formed part of the foundation of the JDI expert reports and that it was entitled to determine how the experts treated the information contained in the notes, that is, to test the foundation of the experts' opinions. This, it submitted, would allow Siemens to make submissions as to the weight to be given to the expert testimony based on the strength of the foundation.

[40] At trial I ruled that, to the extent that the notes were being used to impeach specific testimony of a factual witness, they were admissible. However, I reserved my ruling as to admissibility on any other basis or for any other purpose.

[41] Harquail was then called and testified that his notes were not verbatim records and were gathered in a hectic environment. He was gathering information and, in some instances, making observations or noting his own thoughts, but that he had endeavoured to accurately capture what he was being told, or his impression of it. Counsel for Siemens introduced and questioned Harquail on five of the sets of notes that he had taken in the course of interviewing three JDI employees, Mr. Craig Singleton ("Singleton"), Mr. Jeff Mazerolle ("Jeff Mazerolle") and McLaughlin (collectively, the "Harquail Notes" or "notes"). JDI made several objections and observed that the notes were not put to the witnesses whose statements they recorded, or that the witnesses were only made aware of small portions of the notes. JDI further observed that even when portions of the notes were put to witnesses, they did not contradict the witnesses' testimony.

[42] For the reasons set out below, and contrary to what Siemens argues, in my view none of the Harquail Notes that were put to witnesses are admissible under the prior inconsistent statement rule. Further, even if JDI's experts had relied on the notes, and I am not convinced that they did, that reliance would be insufficient to admit the Harquail Notes for the truth of their contents. However, I find that they are admissible based on their relative reliability and necessity in accordance with a principled approach to hearsay evidence. Regardless, and as explained in the course of these reasons, I have ultimately accorded them little weight.

[43] Section 11 of the *Canada Evidence Act* is the "prior inconsistent statement" rule, being a codification of the rule from *Browne v Dunn*, (1893), 6 R 67 (HL Eng). That rule requires counsel to give notice to those witnesses whom the cross-examiner intends to later impeach (*R v Lyttle*, 2004 SCC 5 at para 64 [*Lyttle*]) so as to give the witness the opportunity to provide an explanation for prior statements that contradict his current evidence (*R v Quansah*, 2015 ONCA 237 at para 75 [*Quansah*]). It is aimed at fairness and is not fixed (*Lyttle* at para 65; also see *Quansah* at para 80).

[44] The notes of Harquail's October 15, 2008 interview of Singleton (Exhibit D28) included the entry "felt like the barge could not handle it - past move, it felt more stable". On cross-examination, Singleton was asked only if he recalled telling Harquail that, in his experience, it felt like the barge couldn't handle the load. He responded that he did not know if he used those exact words but confirmed that his comment was that the barge looked small compared to prior moves.

[45] Portions of the statements in the Harquail Notes from his interview of Jeff Mazerolle (Exhibit D25) were put to Mazerolle on cross-examination, however, his evidence was that he did not recall the content of the interview.

[46] The Harquail Notes from interviews with McLaughlin (Exhibits D26 and D27 the latter, dated December 3, 2008, are incorrectly identified as recording an interview with Ron Mazerolle) were not put to McLaughlin at trial, even in a general way. However, Siemens submits that a read-in from discovery evidence, wherein McLaughlin testified that he did not

remember making the statement "barge was livelier/go with what you get" as recorded in the Harquail Notes, was sufficient to permit the admission of those notes. However, the read-in confirms that McLaughlin did not recall describing the barge as "livelier".

[47] Based on the above, in my view, none of the portions of the interview notes put to these witnesses are admissible on a strict application of the prior inconsistent statement rule as they are neither contradictions nor denials of the prior statements.

[48] As to Siemens' submission that the Harquail Notes are admissible because they form part of the foundation of expert evidence, I do not agree. Even if an expert reviewed and relied on the notes, this does not assist Siemens in admitting the documents for the truth of their contents (Sidney Lederman, Alan Bryant and Michelle Fuerst, *Sopinka, Lederman & Bryant: The Law of Evidence in Canada,* 4th ed, (Markham: LexisNexis, 2014) paras 12.175-12.176 at 840-841 [Sopinka], citing *R v Lavallee,* [1990] 1 SCR 852; *Khan v College of Physicians and Surgeons of Ontario,* (1992) 9 OR (3d) 641 at 31).

[49] Also stated by Sopinka, there are several approaches that may be adopted when an expert relies upon hearsay information in his or her opinion (Sopinka, para 12.174, at 840). Each approach ultimately deals with the weight that should be assigned to the expert opinion, not with the admissibility of the underlying hearsay evidence independent of the opinion. The fact that an expert relied on hearsay evidence does not permit admission of that hearsay evidence solely because it formed part of the foundation for the expert's opinion, as Siemens seems to argue (Sopinka, paras 12.175-12.176).

[50] In any event, none of the JDI experts or the BMT expert who was called by JDI testified that they relied on the Harquail Notes. Some of those expert reports list the interview notes along with the other evidence reviewed in preparing their report. Further, some of those expert witnesses testified that they were aware of the notes and their contents. However, there was no evidence of specific or significant reliance on the notes by any of those expert witnesses in reaching their conclusions. I conclude, therefore, that Siemens has not established that any of the JDI or BMT experts specifically relied on the Harquail Notes as a foundation for their conclusions.

[51] To be admissible, the hearsay must fall under one of the traditional common law exceptions or under the principled approach. While traditionally hearsay evidence was only admissible if it fell under an established common law exception such as the prior inconsistent statement rule, beginning with *R v Khan*, [1990] 2 SCR 531, the assessment of hearsay evidence moved toward a principled approach in which the assessment of the reliability and necessity of the evidence is paramount. In *R v B (KG)*, [1993] 1 SCR 740, the Supreme Court of Canada found that where the tests of necessity and reliability are met, prior inconsistent statements could be admitted for the truth of their contents even if the witness refused to acknowledge their truth when confronted at trial. Thus, while the traditional categorical exceptions to hearsay, including the prior inconsistent statement rule, continue to be useful for assessing hearsay, today the primary method of analysis is the principled approach (Sopinka at para 6.88 at 263).

[52] In this regard, the Harquail Notes were reliable in that they were taken by JDI's counsel who testified at trial. They were also made contemporaneously with the incident which is

significant as, other than a report by and email from Hamilton to BMT, they are the only such record in evidence. This, therefore, speaks to necessity. Even though the reliability of the notes is not absolute, as they were taken in a rushed manner, they may contain some of Harquail's own observations or queries, and, portions of them are difficult to interpret as their form is abbreviated and lacks explanatory detail, and recognizing that Singleton, Jeff Mazerolle and McLaughlin all testified at trial and were cross-examined, I find that the Harquail Notes are admissible on a principled approach.

## VI. Facts and Evidence

[53] The trial of this matter lasted for nearly three weeks and included thousands of pages of documentary evidence, many hours of witness testimony, both factual and expert, read-ins as well as detailed oral and written submissions of the parties. What follows is a summary of the facts and evidence pertaining to the course of events that preceded the incident as well as the incident itself. It identifies what I have determined to be the most relevant evidence relied on by the parties, addresses inconsistencies in that evidence and sets out my factual findings, which are necessary to my analysis of the expert evidence and to the application of Article 4.

[54] For purposes of this narrative it is perhaps of assistance to first describe the participants in the Siemens project and their respective roles.

[55] As noted above, Malcolm was the project manager for the Siemens project. He testified that he obtained a bachelor's degree in mechanical engineering in 1973 and is a professional engineer. He joined Irving Equipment in 1983, has occupied various positions and, since 2004,

has worked in JDI's equipment division where his duties include overseeing heavy lifts, moves and marine logistics. He testified that his work on the Siemens project began following a request for a proposal from Siemens, after which he prepared an outline plan and a budget, negotiated with Siemens and finalized the contract. Following this preparatory work he began allocating responsibilities to people inside and outside JDI. He then transitioned into a supervisory role, supervising the contract and maintaining communications with Siemens and, finally, managed and oversaw the execution of the work. He reported to Mr. Mike Hussey, General Manager, Crane Group, Irving Equipment ("Hussey").

[56] McLaughlin is a mechanical engineer. He joined Irving Equipment in 1987 and in 2000 assumed the title of Senior Rigging Engineer, the position he held in connection with the Siemens project. He testified that he oversaw the planning department and supervised big lifts or big transporter moves. Like Malcolm, McLaughlin reported to Hussey. McLaughlin testified that, amongst other things, for the October 2008 movement of the LP Rotors, he planned the configuration and loading of the transporters, the configuration of the jetty for the barge and undertook site supervision to ensure the move went according to plan. He testified that he was responsible for safely rolling the transporters on to the barge.

[57] Singleton testified that he has been an employee of Irving Equipment since 2005 and is a master mechanic. In 2008, he was responsible for conducting preventative maintenance on JDI equipment including the transporters used in the Siemens move. On the day of the incident, Singleton was a standby mechanic reporting to McLaughlin and/or Ron Mazerolle, a foreman with Irving Equipment.

[58] Jeff Mazerolle testified that he has been an employee of Irving Equipment since 2003, he is a crane operator by trade who also holds a tractor-trailer Class 1 license. He began operating transporters in 2004 and, on the day of the incident, he operated T1. He testified that he took instructions from both McLaughlin and Ron Mazerolle.

[59] Mr. Leo Arsenault ("Arsenault") operated T2 on October 15, 2008, he did not testify at trial.

[60] Bremner is a naval architect and marine consultant with 37 years of experience. For the move of the LP Rotors, MMC was retained by JDI to provide an initial stability and hydrostatic analysis to be used for that move and then to prepare barge loadout ballast calculations and plan, sea fastening calculations and design, and, to attend the loadout and discharge, all pursuant to the Irving Equipment PO. In his testimony, Bremner agreed that he was responsible for determining whether the LP Rotors could be safely loaded onto a particular barge, and, if they could, to determine how they should be loaded and secured to maintain barge stability.

[61] Hamilton testified that he holds a bachelor of science in marine engineering, an unlimited chief engineer's license and had 33 years of experience as a marine surveyor at the time of the incident. In 2005 he retired from his position with BMT Marine Offshore Surveys (the successor to the Salvage Association), but continued to work with them as a consultant. He inspected the "SPM 125" and issued recommendations for the tow. He described his role with respect to the move as "to look at the barge to see if it was suitable for the movement, to witness the on-loading and securing of the turbines onto the barge, to approve the tug for the tow, and to witness

the offloading at Point Lepreau". His mandate was to act as the "eyes and ears" of AXA and Siemens as he was on site to look out for cargo interests. Although BMT settled prior to trial, Hamilton was called to testify by JDI.

[62] At this stage it is perhaps also useful to provide a brief description of the transporters as they, and their characteristics and functions, feature prominently in the incident and these reasons. Also known as self-propelled multi wheel transporters, T1 and T2 were manufactured by Scheuerle.

[63] The transporters are propelled by means of a "power pack" that is attached at and extends from the back of each unit, unsupported by wheels. The power pack itself can be raised or lowered. Each unit is comprised of 6 axles. Each axle has four tires, two per side, for a total of 24 tires. The deck of the transporter, on which cargo sits, can be manipulated vertically or transversely (tilted side-to-side) by raising or lowering hydraulic rams, or pistons, on both or either side of the transporter. The steering of the transporter, as well as the manipulation of its deck, can be done by way of a remote control, tethered to the power pack by an umbilical cable approximately 20' long and generally worn by the operator. The transporter deck can also be controlled from a panel located on the power pack. The transporters can be set in three or four point mode, which refers to groupings of the hydraulic cylinders into groups of three or four.

[64] For the purposes of this matter, it is significant to note that the tilting of the transporter deck will necessarily also tilt the cargo carried on its deck, causing a shift of its centre of gravity.

As will be described below, the degree of tilt that the transporters can withstand before the cargo becomes unstable and topples is prescribed and calculable.

A. *Evidence of witnesses*

[65] By the conclusion of the trial Siemens' arguments boiled down to the assertion that JDI knew that the "SPM 125" was too small and was unsuitable for the intended move. It submitted that although JDI employees knew the margin of error within which the transporters could deviate off the centreline of the "SPM 125" during loading was small, they failed to mark the centreline. As a result, the transporters predictably veered off that centreline during loading. JDI employees were aware of the deviation, but failed to pause and address it and instead continued loading. This caused the barge and the cargo to list. According to Siemens, this was the initiating cause of loss. When McLaughlin tried to correct the off-centered load by manipulating T2's deck, T2's centre of gravity deviated too far from the centreline and the cargo fell into the harbour. Siemens submits that the loss was the obvious and anticipated result of recklessly loading cargo on to an undersized barge without any effort to keep it on centre.

[66] According to Siemens, it is not necessary for the Court to reconcile conflicting evidence concerning the sequence of events that led up to the loss, or to trouble itself to grapple with the stability calculations generated by the expert reports. Rather, it is sufficient to establish that JDI and MMC knowingly departed from the load plan in critical respects with knowledge of the consequences.

(1) Selection and suitability of the "SPM 125"

[67] Given Siemens' position concerning the size of the "SPM 125", in my view an appropriate starting point is to address the evidence concerning its selection and suitability in order to determine, ultimately, whether JDI and/or MMC and Bremner were reckless in this regard.

[68] At trial, Malcolm testified that Atlantic Towing had been issued a subcontract by Irving Equipment to provide a tug and barge for the October move of the LP Rotors. However, by mid-2008, he was becoming concerned about that process and started his own parallel search for an available barge. He testified that he was looking for a barge that was suitable for the task, the criteria being: size, as the barge could neither be too big nor too small; the physical shape of the barge because access to the jetty at Point Lepreau required a raked bow; the condition of the barge including deck strength; and, finally, availability. He testified that if he could have designed his dream barge for the job it would have been around 180' x 50' with a good bow rake.

[69] Malcolm addressed availability in some detail during his testimony. He stated that at the start of the project Atlantic Towing had five barges, all of which he would have been happy to use. However, one of these was subsequently sold and the other four were damaged and therefore not available. Malcolm testified that he considered, but discarded, a number of barges based on their failure to meet the criteria described above. Other than the "SPM 85", the rejected barges were all larger than the "SPM 125".

[70] By email of April 29, 2008, Dan MacPherson ("MacPherson"), an independent broker, brought the "SPM 125" and the "SPM 85" to Malcolm's attention. By email of August 12, 2008, Malcolm advised Bremner that, as usual, they were having trouble finding a barge and asked him to "do a quick and dirty to see what stability would look like" for the "SPM 125". When asked on direct examination what he meant by this, Malcolm explained that he needed to know if using the "SPM 125" was even an option before conducting extensive engineering work. Bremner responded by email the same day indicating that "From a quick look at the stability, with one or two rotors each on a single transporter, it should be good for the voyage", with the caveat that his advice was based on the barge being suitable and his approximation of hydrostatics and lightship. Malcolm testified this told him that it was, therefore, worthwhile to proceed with detailed engineering and a condition assessment of the "SPM 125".

[71] Malcolm was also considering the "Malbaie", a 140' x 40' barge. He testified that he preferred the "Malbaie" based on its flat deck, but had concerns about its condition, although these were based only on the fact that it was being sold by its owners at the time. When discussing the potential use of the "Malbaie", in an email dated September 16, 2008, Malcolm stated that because it was on the small side he thought they should plan for two trips over three days. At trial, he testified that his comment reflected that the "Malbaie" was not big enough to take all three rotors at once. The email chain confirms that Atlantic Towing was contemplating one trip, while Malcolm had indicated that two were anticipated.

[72] In an email dated August 14, 2008 to Jason Singleton, an engineering draftsman/technologist at Irving Equipment, Malcolm stated that there were then a couple of

barge options on the table, being the "SPM 125" and a 60' x 90' barge from RMI, neither of which "filled him with confidence". When asked on direct examination what he meant by this, Malcolm testified that he was not familiar with either barge. The 60' x 90' would not meet the shape criteria as it did not have a rake and was not a conventional, towable barge. He also testified that the "SPM 125" was not a barge that he knew. Therefore, he was not comfortable with it until he saw the Barlett Marine Surveys report on the "SPM 125", which he received on August 20, 2008, and after he had spoken to the barge's owner. At this point in time, Malcolm was still considering both the "SPM 125" and the "Malbaie".

[73] Prior to the move of the LP Rotors, JDI had used a barge called the "Pugwash" to move the generator rotor from Point Lepreau to the Port of Saint John. At 240' x 72', with a deadweight of 815 long tons, it was considerably larger than the "SPM 125", whose dimensions were 125' x 33' with a deadweight of 125 long tons. The generator move occurred without incident. On September 16, 2008 McPherson emailed Malcolm to say that if Malcolm could wait until the end of October the "Pugwash" might be available, but would be expensive. When Malcolm asked where the "Pugwash" was, MacPherson replied "north", that he had not yet looked into it and that he was assuming that it would be "somewhere close sometime soon. Let's use SPM". In his testimony Malcolm described this exchange as a red herring and that MacPherson had quickly discarded the idea of using the "Pugwash".

[74] Finally, on September 30, 2008 Atlantic Towing advised Malcolm that the "Malbaie" was still in Montreal and would not be in Saint John in time for the loadout. In his testimony, Malcom confirmed that had the "Malbaie" been available, and if it had a good survey, then he

would have preferred to use it, not just because it was larger but also because this was the option presented by Atlantic Towing, which was under contract to Irving Equipment to provide barge services. Similarly, had the "Pugwash" been available it too would have been a practical option. Both were larger and, therefore, had greater transverse stability than did the "SPM 125". He also confirmed that the narrower the barge, the narrower the margin for potential deviation off the centreline when loading the transporters. Therefore, this would be a less critical factor on a larger barge.

[75] Bremner testified that he had no involvement in the selection of the barge which was JDI's responsibility. Rather, his role was to review the suitability of a barge identified by JDI by calculating the stability of that barge. Initially, MMC was considering the structure and stability of the "SPM 125" and then, from September 4 to 22, it was also doing so for the "Malbaie". On September 30, 2008 JDI made the decision to go with the "SPM 125" and, from that point forward, all of Bremner's time was spent with respect to that barge. This was confirmed by MMC's time sheet, which was entered into evidence at trial (Exhibit D15).

[76] By email of August 13, 2008, Malcom provided MMC with the Irving Equipment PO. This tasked Bremner with the provision of stability and hydrostatic analysis for barge work for the LP Rotor move. A second line item was subsequently added which concerned the preparation of barge loadout ballast calculations and plan ("loadout plan"), sea fastening calculations and design for loadout of the LP Rotors on the "SPM 125" and attendance at loadout and discharge.

[77] At trial Bremner agreed that he was responsible for determining whether the LP Rotors could be safely loaded onto the "SPM 125". He also testified that he was satisfied that the "SPM 125" was suitable for the planned move, that he had no concerns about the size of the "SPM 125" for the intended load and that he knew that JDI relied on his advice as to suitability.

[78] Based on the foregoing I am satisfied that, prior to selecting the "SPM 125", JDI canvassed the available suitable barges, almost all of which were larger than the "SPM 125". I am also satisfied that JDI would have preferred to use a larger barge for the job, but that one was not available at that time. When Malcolm sent his August 14, 2008 email stating that neither the "SPM 125" or the 60' x 90' barge "filled him with confidence" he had already received Bremner's email of August 12, 2008 with his preliminary stability advice. Therefore, it is also probable that Malcolm's lack of confidence at that time was at least in part related to the size of the "SPM 125". However, regardless of its size and even though it was smaller than what Malcolm considered to be ideal, I also find that JDI understood the "SPM 125" to be suitable for the intended move based on the preliminary stability advice provided by Bremner.

[79] And, although Siemens makes much of the fact that the "SPM 125" was not JDI's ideal barge, in my view this was not the relevant measure. The real question is, once the full stability analysis was completed by MMC, did it confirm that the "SPM 125" was suitable for the intended loadout, regardless of its size, and, if so, was that stability analysis correct?

[80] To assess that question first requires review of the facts that were relevant to MMC's stability analysis, including events which took place on the day of the incident. And, secondly,

review and analysis of expert witnesses' testimony and their reports which address the "SPM 125"'s stability and suitability, including assessment of MMC's stability calculations. However, prior to embarking on that exercise, I will continue with the factual narrative and evidence leading up to the incident and make the requisite finding of fact in that regard.

(2) Events leading up to the day of the loss

[81] On September 30, 2008, Bremner, Malcolm, Jason Singleton and Clyde McPhee, the barge superintendent for Superport, met to discuss the loadout details if the "SPM 125" was to be used. Malcolm testified that no concerns with the "SPM 125" were raised at that meeting. The following day, Bremner began the stability and tie down calculations for the "SPM 125" and LP Rotors on the transporters. Various pieces of information were exchanged and, by email of October 5, 2008, Bremner sent Malcolm the final layout of tie downs ("layout plan"), the stability calculations, the hydrostatic and tank curves, and, the securing manual. On October 6, 2008 Malcolm forwarded the information to various persons including Hamilton, McLaughlin and Rowen Baker, the JDI contact at Siemens. By email of October 10, 2008 Bremner sent a tide range diagram, the layout plan, the securing manual, an eleven step description of the loading process, and, a revised set of stability calculations for the first load. The stability calculations generated by Bremner are comprised of thirteen trim and stability conditions specific to the "SPM 125". Each condition represents the barge at a particular stage in the planned loadout and voyage.

[82] The first such calculation is the "SPM 125"'s lightship, which is a non-operational condition. This establishes the displacement of the barge with no cargo, equipment or ballast on

board. This was determined to be 125 long tons. That figure is then used in each following condition calculated.

[83] In each condition, data was inputted specific to that condition, such as the weight of cargo during each stage of loading (in this case T1 and T2 rolling onto the barge axle by axle, each carrying an LP Rotor), deck equipment (ballast pumps), any ballast on board in that condition, and, the longitudinal centres of gravity ("LCG") and vertical centres of gravity ("VCG") of each such item. From this the displacement, VCG and LCG of the barge in that condition was determined. Based on these inputs and a geometric barge model, the computer program used calculates measures of the barge's stability in that condition, including making any correction for the free surface effect of any liquids in the barge's tanks. For purposes of this matter, the most significant indicator of stability as calculated by Bremner was the metacentric height ("GM") of the "SPM 125".

[84] The Martin Ottaway Report, which is addressed further below, describes GM as the mathematical representation of the stability of the barge. If GM is positive, the barge is stable. A larger positive GM provides an initial, stronger resistance to heel and, therefore, may indicate a more stable vessel. A more in depth explanation was provided in the report but, for purposes of this decision, the above will suffice.

[85] For reasons that will shortly become apparent, it is also useful to note at this point that the GM of a vessel may be negatively impacted by fluids in its tanks. As I understand it, when a tank in a vessel is partially filled with a liquid that is free to move within that tank as the vessel

heels, the surface of the free liquid (the free surface) tends to remain level with the waterline assumed by the vessel (free surface effect) as it heels. Free surface causes a reduction in GM, because of the change in the centre of gravity of the liquid in the tank as the ship heels, and consequently reduces stability. The larger the free surface area, due to the size or shape of the tank or the amount of water in it, or both, the greater the consequent reduction in GM. When a tank is completely full, or "pressed up", there is no free surface, however, when this is not the case and free surface exists, then the free surface effect correction must be recorded in the stability calculations to accurately represent the ship's GM.

(a) *MMC's ballast plan error*

[86] In preparing his stability conditions and loadout plan, Bremner incorrectly assumed that the "SPM 125" had 10 tanks. He testified that he relied on the Bartlett's Marine Surveys report ("Bartlett Survey Report") (Exhibit P16) concerning the "SPM 125", which was sent to him on September 5, 2008 by the broker, as received from Superport, the owner of the "SPM 125". Bremner testified that he assumed that the surveyor would have inspected at least 50 percent of the tanks and, by entering the tanks, would have seen if the fore and aft peak tanks were not divided. However, that same package of information also contained a diagram of the "SPM 125" which showed undivided aft and fore peak tanks. Bremner testified that he did not know why the there was a discrepancy between the Bartlett Survey Report and the diagram. But, because there was no indication of when or how the drawing was produced, he had relied on the report narrative as he considered it to be more accurate.

[87] On cross-examination, however, Bremner testified that he had found the Bartlett Survey Report by searching his files after the discovery and that this would be why in his drawing he had incorrectly inserted a longitudinal bulkhead in the fore and aft peak tanks. However, in his discovery evidence he had testified that he could not recall if he relied on the Bartlett Survey Report or not. Still later, when cross-examined by counsel for JDI, he testified that he had been thinking about the issue and thought that he received the Bartlett Survey Report very shortly after the start of the project. He did not recall whether he noticed the attached diagram, he did not draw JDI's attention to the contradictory information and he relied on the survey narrative when preparing the loadout plan.

[88] It is correct that the Bartlett Survey Report states that the barge is divided into 10 tanks, six in the main body section, two in the fore peak and two in the aft peak and that the same package of information contains a schematic depicting the barge layout which shows each of the fore and aft peak tanks to be single tanks running the full width of the barge. As this was the only evidence of the "SPM 125"'s tank layout available to Bremner when he prepared his stability calculations, this must be what he based his understanding of the tank configuration on. However, I do not accept his testimony that he chose to rely on the Bartlett Survey Report narrative rather than on the schematic. Faced with a discrepancy, and given the importance of the aft peak tank and its utilization in ballasting of the barge for the subject cargo move, had he noticed the discrepancy then he would have been compelled to determine what the actual configuration was and to base his stability calculations on that. There is no evidence that he did so and I find that Bremner, by oversight, overlooked the schematic and, therefore, based his calculations on the incorrect Bartlett Survey Report.

[89] I would also note that Hamilton confirmed in his testimony at trial that he received the email from Malcolm dated October 6, 2008 forwarding the calculations and plans prepared by MMC, including the layout plan and stability calculations. Hamilton testified that he reviewed these to see if they contained anything that struck him as odd or unusual which he should ask questions about, but that they did not. He also testified that, with respect to ascertaining the suitability of the "SPM 125", he attended and inspected it at Port Hawkesbury, including entering the fore and aft peak tanks, and made recommendations to its owner as to minor damage to be repaired, which was done.

[90] Hamilton prepared a report, dated November 6, 2008, in which he described his inspection of the "SPM 125" in Port Hawkesbury on October 7, 2008 as well as the October 15, 2008 loadout and the incident ("BMT Report") (Exhibit P18). He testified that he had taken notes on both occasions and that the BMT Report contained the content of his notes, which were no longer in his possession. Hamilton states in the BMT Report that the "SPM 125" had one forward rake tank and one after rake tank, yet there is no evidence that, prior to the cargo loss, Hamilton advised Bremner or JDI that his tank inspection had found a configuration that differed from that used by Bremner in his stability calculations and loadout plan. I find that Hamilton too overlooked the discrepancy.

(b) *MMC's misunderstanding of the transporter operating features*

[91] Bremner's stability conditions and loadout plan also did not take into consideration the fact that the transporter decks had the ability to tilt transversely.

[92] During his examination in chief, Bremner testified that he did not know that the transporter decks could tilt transversely, a fact he claims he relied on in producing the "SPM 125" stability and deck strength calculations for JDI. He testified that the transporter information sheet sent to him on August 12, 2008 by Malcolm provided the weight, capacity, dimensions and minimum and maximum vertical elevations for the transporters but did not convey any operating features or that the deck could be moved on a transverse plane.

[93] He also testified that he relied on statements made to him by JDI to the effect that each transporter wheel "takes a direct proportion of the load". He stated that he believed the transporters "would tilt in uniform with the deck of the barge, that they would be solid; that if the barge heels, everything heels in direct proportion". This was the basis for both his deck strength and stability calculations and that JDI had been alerted to his assumption by his emails concerning the securing and tie down data, specifically, the load data sheet. He received no feedback from JDI, BMT nor Siemens as to the plans or the assumptions they contained. However, he conceded that nor did he expect to and he did not ask JDI any questions relating to how the transporters worked or for a copy of the transporter manufacturer's manual.

[94] Bremner testified that it was only after the incident when he was interviewed by Transport Canada that he learned of what he called a "self-levelling" feature, by which a transporter would increase pressure to try to keep its deck horizontal, and that when he learned of this, he just said "that's what happened", meaning that this explained the cargo loss.

[95] When asked if he would have done anything differently had he known this information at the time, he replied "definitely". This would have meant investigating a completely off centered load because, once hydraulic leveling of the deck of a transporter is started, a force was then being applied at 3' off the centreline, being the position of the set of wheels on that side, with a resultant barge heeling moment. As I understood it, Bremner was making the point that this differed from the circumstance where the centre of gravity of the load would be a few inches off the barge centreline because of a deviation by the transporter during the roll on.

[96] During cross-examination, Bremner testified that it was the levelling effect of the transporter, and not failing to keep the transporters on the centreline of the barge, that caused the incident and that he still did not know at what angle of heel the transporter "start[s] to correct itself". However, he agreed with counsel for Siemens that levelling effects and deviations from centreline could both cause the centre of gravity for the loads to go off the centreline and occur simultaneously. He testified that had he known of the tilting function of the transporters, that "we may not have used the "SPM 125" and that it was quite possible that he would not have approved it. He further agreed that, keeping in mind the capabilities of the transporters, the "SPM 125" was too small and narrow to bring two LP Rotors onto the barge on the transporters.

[97] However, under cross-examination by counsel for JDI, Bremner agreed that because he did not have information concerning the ability of the transporter decks to tilt, it was unknown how that information would have affected the loadout plan that he prepared, or what instructions he might have given Malcolm or McLaughlin. One possibility was that he might have just told them not to tilt the transporters.

[98] Bremner's evidence that he did not know that the transporter decks were capable of tilting transversely, and his failure to make inquiries in that regard, was not seriously challenged nor was there any evidence establishing that this function was known to him. I note that his post-incident understanding that the transporters could automatically self-level was not supported by any other factual or expert witness and was challenged by Siemens' expert. I find that Bremner's understanding as to the self-levelling ability of the transporters is in error. I also find that whether he should have been or not, Bremner was not aware, prior to the incident, that the transporter decks could be transversely tilted. Similarly, although JDI employees did know that the transporter deck could be tilted transversely, I find that the evidence does not establish that they knew that Bremner's stability calculations were based on an erroneous contrary assumption.

(3) The loadout and the loss

(a) *Change in ballast plan*

[99] The MMC loadout plan required that, prior to the commencement of loading T1 and T2, the "SPM 125" would be ballasted by filling the port and starboard aft peak tanks with 62 long tons of sea water. As discussed above, the ballasting plan was based on Bremner's erroneous belief that the "SPM 125" had two aft peak tanks.

[100] The tug and barge arrived in Saint John the night before the loadout. The barge was positioned in a corner of the wharf such that its starboard side was adjacent to the wharf, its bow pressed against the wharf and its port side and stern were unobstructed. That evening, there was a problem with one of the ballast pumps and Malcolm went to the barge. Although his evidence

varied as to whether he learned that the aft peak ballast tank was undivided that evening, or on the morning of the loadout, I accept his testimony that the tug crew informed him in the morning that their initial ballasting set up the night before had demonstrated that putting water in one side filled both sides of the ballast tank. Bremner's recollection of how he learned that the aft peak tank was undivided was not entirely consistent with other evidence but I accept that he, like Malcolm, learned of this on the morning of the loadout.

[101] Two steel plates were to be used to span the gap between the wharf and the bow of the barge, acting as a bridge for the transporters to drive over. A third steel plate would be placed longitudinally on the bow of the barge, for use in the offloading at Point Lepreau. T1 and T2, each loaded with an LP Rotor, would be lined up at the wharf ready to drive on. The loading process would be slow, it would start with T1 which would drive on power pack first and progress one axle at a time. As each axle came on board, the weight of the load would cause the bow of the barge to sink. The crew would then stop the transporter and wait for the tide to rise, lifting the bow of the barge back to level with the wharf, and ready for the next axle to be driven on.

[102] The loadout plan required further ballasting of the aft peak tanks to commence when T1 started to roll on, this too assisted in raising the bow of the barge. The ballasting would continue until T1 was on board and had moved sufficiently aft on the barge to allow T2 to start to roll on, at which point the deballasting of the aft peak tanks would commence. Once all axles of T2 were on board and the aft peak tanks were empty, the transporters could be moved into their final positions and secured for the voyage.

[103] However, the discovery that the aft peak tank was undivided meant that the existing ballasting plan could not be carried out. Bremner testified that with one aft peak tank instead of two "the free surface correction would put the barge at risk for stability". Faced with this, he considered three options: stopping the loadout, pumping out the aft peak tank and proceeding without ballast, or, fully ballasting the aft peak tank eliminating the free surface. He discussed the situation with Malcolm and they decided to adopt the third option. In making that decision, they considered that the weather was perfect, the sea flat calm, there was a good forecast, and, that pressing up the tank would eliminate free surface and would also provide the required range of tide to load the LP Rotors. Bremner testified that he did not redo the stability calculations because he knew that the free surface correction of the GM was about two feet, that by pressing up the tank free surface would be eliminated, and, that it would also probably lower the centre of gravity making the barge more stable. He testified that he was not rushed in considering the problem and that he knew that JDI relied on his advice. He did not speak to Hamilton about the change but understood, after the fact, that Malcolm had done so.

[104] Bremner testified that the ballast pumps were already running when he arrived on the morning of the loadout and that the aft peak tank was pressed up before T1 came onto the barge as ballast water had overflowed from the starboard side manhole cover. The ballast plan was, therefore, not followed at any stage.

[105] Malcolm's testimony differed from Bremner's on this point. Malcom testified that Bremner decided to proceed with the original ballast plan until the aft peak tank was completely full. It would then remain pressed up for the duration of the loadout. This represented a

departure from the original ballast plan which contemplated deballasting when the loading of T2 commenced. Malcolm testified that he was not concerned about the change in the ballasting plan as the trim requirements would be maintained exactly as originally planned and because there was no stability concern as the aft peak tank would be pressed up. Further, that the discovery of the undivided ballast tank was discussed with Bremner and Hamilton and that Hamilton agreed with the proposed change.

[106] For his part, Hamilton testified that he had no role in the ballasting on the day of the move and was not aware of any deviation from the ballast plan, although he stated that such deviation is not unusual. On cross-examination he was asked if he had discussions with either Bremner or Malcolm on that morning approving the changes to the ballast plan, he stated that he did not recall such discussions, but it was possible. He testified that he had no personal knowledge of how much ballast was in the aft tank during the move, but was told afterward that it was 95 percent full.

[107] The only two witnesses to speak to changes to ballasting procedure were Malcolm and Bremner and their evidence, which is not disputed on this point, is in agreement that, by the time T1 was fully on board, the aft peak tank had overflowed. Therefore, I find that the aft peak tank had been filled by the time T1 was fully on board.

[108] Two concerns arise from the deviation from the ballasting plan. The first is whether the stability of the barge in the revised loading conditions was acceptable. That is, did the deviation from the planned ballasting process cause the barge to be unstable in the new loading conditions

up until T1 was on board and the aft peak tank was overflowing? Secondly, was the filling of the aft peak tank effective in eliminating free surface effect in the loading conditions from that point forward given the evidence that the port and starboard manhole covers to the aft peak tank were not closed? And, if not, what impact did this have on the barge's stability? Both of these issues are addressed by the expert evidence.

(b) *Marking the centreline and deviations of the load*

[109] The evidence is clear and undisputed that the layout plan situated T1 and T2 one behind the other on the centreline of the barge and that this was known to all of the participants as was the importance of the load remaining on the centreline at all times.

[110] Malcolm testified that it was important to know where the centreline of the barge was so that the transporter operators would know the path to follow during the loading, thereby ensuring that the cargo always remained on centre as planned. Although chalk lines are used to mark the centreline, he did not know if chalk had been used in this case. However, he testified that marking the deck was not the only reliable way to bring the transporters on the centreline, noting that the centreline longitudinal bulkhead under the "SPM 125""s deck was clearly visible because of the marked depressions of the deck plating between the barge's underlying structural members. Further, he recalled seeing McLaughlin measure the deck prior to the steel plates being laid down and again at least one more time when T1 was partially on deck. Malcolm testified that he therefore believed that McLaughlin had identified, to his own satisfaction, the centreline of the barge. He also testified that, while keeping the transporters on the centreline

was important, this was also a question of degree. The transporters being off an inch or two would not cause him any concern.

[111] As to the actual loading, Malcolm testified that the width from one outside edge of the transporter tires to the other was close to 8' and that the barge longitudinals were placed at 2' centres. As a result, when the transporters were moving aft on the barge's deck, the outside edge of each tire on each side of the transporter was running right along the second longitudinal member off centre. During loading, this was what he was looking at rather than the centreline. He initially described T1 as deviating about 1" to 2" off centre, which deviation was corrected. After further cross-examination, he testified that he saw T1 deviate between 2" and 3" to starboard about halfway down the deck while moving aft, however, he could not say whether it was off centre when it stopped. Malcolm also testified that while he was aware that sufficient deviation of the transporters off centre would cause problems, he was not aware of what the margin for error was in this regard.

[112] Bremner confirmed that his layout plan required the transporters to be on the centreline of the barge, as close to amidships as possible and keeping the transporter decks as low as possible. Because an offset load would introduce a heeling moment, being the weight of the load times the distance from the centreline, the plan was to keep the loads on the centreline.

[113] Bremner testified that, to determine the location of the barge centreline, he counted the deck longitudinal bulkheads which were very obvious. He also testified that these were spaced at 2' centres from the centreline and the width of the transporters was 8'. Therefore, the outside

edge of the transporter tires should be right on the longitudinal 4' off the centreline and that is what the operators were told to follow. He testified that there were no chalk or spray paint markings made by anyone at JDI on the barge deck or on the steel plates to indicate centreline. While he agreed that no measurements were taken to determine the centreline, he stated that this was because it was unnecessary. The centreline could easily be found by counting the longitudinals. When asked if he was using his naked eye to determine whether the transporter was centered, he referred to the use of the longitudinals and also noted that any form of lane marking would be followed by sight.

[114] When asked if he had considered a margin of error for the transporters to move off the centreline, Bremner testified that he had done calculations for 3" increments. Three inches would give about a half degree of list, 6" about 1 degree. He testified that he told McLaughlin to stay within 3" of the centreline.

[115] On cross-examination by counsel for Siemens, Bremner testified that he would have accepted 6" off centre, but that to his knowledge there was never a deviation beyond 3". When cross-examined by counsel for JDI, he testified that when calculating the margin of error, he took this as far as 12", but was not happy with the results at that point, as 9" was getting over the limit. He had not informed JDI of the calculation. Faced with contradictory discovery evidence, Bremner then testified that he was not sure that he mentioned 6" to 9" to McLaughlin, but that he certainly mentioned 6". Regardless, that during the course of the move, he did not see any deviation beyond 6", which he believed was safe.

[116] Bremner's evidence as to actual deviations off the centreline during loading of T1 and T2 was inconsistent. What can be gleaned from it is that, at worst, T2 was off centre by 3" to 5" to starboard and that T1was off-centre to port by about 1.5" with an overall resultant starboard offset of 3.5". Bremner, unlike any of the other witnesses, testified that T1 had been deliberately moved off centre to correct for deviations by T2. Bremner testified that T1 and T2 were never so far off centre that he was concerned about stability.

[117] As to McLaughlin, he testified that on the morning of October 15, 2008 he went to the barge to place the steel plates and to establish a centreline. He would do this by measuring and he might have marked the centre bulkhead which was clearly visible. He understood that the transporters were to be loaded on the centreline of the barge within a reasonable tolerance. The first steel plate to be loaded was to be used for offloading at Point Lepreau. And, to put it on the barge, it had to be marked and centered. McLaughlin testified that he could not remember what he did as regard to markings to identify the centre longitudinal on the barge and to centre the first steel plate, but stated that it was his consistent practice to mark centres with paint or chalk. He referred to photographs taken during the loadout and pointed out that in some photos unrelated orange paint marks on the steel plate could be clearly seen while in others the same marks could not be discerned, the suggestion being that although paint or chalk markings could not be seen, they may have been there.

[118] McLaughlin testified that he spoke with Bremner just before the start of the loadout and that Bremner told him to keep the load on the centreline. He did not recall receiving any indication from anyone as to what the margin of error would be for doing so. He later testified

that he knew that it was important to keep the load on the centreline when it was rolling on to the barge and that, at some point, if it deviated from the centreline, the barge and load would become unstable. He recalled that the "view" on October 15, 2008 was that if they kept the transporters within plus or minus 3" of the barge centreline, which they could do, there would be no concern. He did not, however, view 3" as the safe margin of error, and assumed that the margin would be larger than that.

[119] Because much has been made of the term "coming on blind" by Siemens in the context of the loadout, it is important to set out exactly what McLaughlin's evidence on this point actually was. At trial, on cross-examination by counsel for Siemens, McLaughlin testified that to ensure that the load was driven on to the centreline of the barge there had to be a mark or indication so that the transporter could be lined up, the following exchange then ensued:

> Q. Well I am suggesting to you, sir, that you have to have centre line clearly marked on the wharf and on the plate, you can't just drive on without such a mark: correct?
>
> A. We have to have a mark so we can reference to so that we can bring the transporter on centre.
>
> Q. And if there is no mark when you are driving on, you are coming on blind; right?
>
> A. If there is no marker, if you haven't done a measurement, if you don't know where you are coming on, obviously.
>
> Q. And if you are driving on without a center line marked to aim at, you are coming on blind; correct?
>
> A. That not true, we could have an offset mark. We could have had - we measured. We marked.
>
> Q. I am going to ask you to look at -
>
> A. I just can't tell you where.
>
> Q. Well "where" is pretty important; isn't it?

A. No, but I mean would we mark the offset? Do we mark the centerline and offset? I don't know? But it was on centre.

[120] McLaughlin was then referred to his discovery evidence where he also stated that he could not remember what marks were used, but that there had to have been something to line up to:

A. That is what I say, because we - there had to have been a mark on the wharf because we have to line up to something. We just can't, and we don't drive on. We obviously have a mark, a guide, or whatever, to go to.

Q. But I am not seeing it.

A. I don't see it in this picture either, no.

Q. All Right.

A. But there has to be something that we used because if, not we would be coming on -

Q. Blind?

A. - we would be coming on blind and we - I don't do that. (p 631)

[121] He testified at trial that at no point did he think that the transporters were being moved on blind.

[122] Although McLaughlin could not identify marks in the photos admitted into evidence, he testified that he was certain that they measured the deck, either from edge to edge, or using marks, to identify the centreline.

[123] As to deviations off the centreline, McLaughlin testified that once T1 was centered on the wharf and started coming on the barge the operator, Jeff Mazerolle, used the centreline bulkhead to line it up. Further, that Ron Mazerolle was guiding T1, using the edge of the tires running along a longitudinal stiffener. The two were in radio communication. No one raised any problems or concerns while T1 was being moved on the barge.

[124] McLaughlin testified that once T2 was fully on the barge, he and Ron Mazerolle re-measured the barge deck and discovered the front end of T2 was 3" off centre to starboard. Following McLaughlin's first adjustment of T2's deck, Mazerolle instructed Craig Singleton to correct the 3" deviation by adjusting the wheels of T2 as he drove it 6' to 8' aft on the deck of the barge. They then re-measured to ensure that T2 was now centered and it was.

[125] I would note that the Harquail Notes of his interview with McLaughlin, dated October 15, 2008, make two references to measurements including, with respect to T2, "had measured it, yaw off 3"" and, "off-centre measured it off few inches yaw-picked back up" "Dave correction on front back 3"" (Exhibit D26). The Harquail Notes of his December 3, 2008 interview of McLaughlin record two references to measurements (Exhibit D27), including the following:

> …
> → lined up from center.
> → stiffeners on barge – 1st part - plates
> → once to bottom of plate notice off a bit – 2-3" to shore side
> → correction
> → just do correction
> …
> When I measured plates – diff 3" left peak – peak to understate of barge

[126] Although the notes provide little real clarity as to events, and for this reason I place little weight on them, they do at least tend to confirm that measurements were taken.

[127] McLaughlin was asked if he deliberately placed either of the transporters off centre to port or starboard in order to balance the barge and testified that he did not.

[128] As to Hamilton, during cross-examination, he testified that he could not recall seeing markings on the deck of the barge or on the two bridging steel plates on the day of the incident and that he could not see any in the photographs. He also testified, however, that the centreline was identifiable. He could not recall measurements being taken on the day of the incident to determine where T2 was in relation to centreline.

[129] Jeff Mazerolle, who operated T1, testified that he followed McLaughlin's directions to keep T1 on centre, that only very minor and normal left or right adjustments were made and that T1 was centered when T2 toppled.

[130] Like Jeff Mazerolle, Singleton testified that there were no issues or concerns when loading T1. He did not observe T1 going off centre but agreed that this was not something he was watching for.

[131] Based on the whole of this evidence, I find that it is unlikely that McLaughlin used chalk or paint to mark the centreline of the barge. This was a significant omission because all participants knew the importance of keeping the transporters on the centreline during loading for

the voyage. However, I also accept that, as Malcolm and McLaughlin testified and the Harquail Notes of the McLaughlin interview indicate, measurements were taken during loadout to determine if the transporters were off centre. I also accept that the barge longitudinals could serve and were used as a guide for loading.

[132] Further, although Bremner did not provide JDI with a written calculation of the margin of safety, being the distance off centre that T1 and T2 could travel before causing stability concerns, I find that all personnel were aware that they were to keep the transporters on the centreline and that JDI personnel were taking steps intended to accomplish this before and during the loadout.

[133] As to how far off centreline the transporters actually deviated during the loadout, based on the above evidence as well as the read-ins, T1 was either on-centre, according to McLaughlin, Singleton and Jeff Mazerolle when it stopped moving aft or deliberately off by 1.5" to port, according to Bremner. T2, based on Bremner's evidence at trial, was at worst 3" to 5" to starboard, however, given that no other witnesses testified that T1 was deliberately offset, I do not accept Bremner's evidence on this point. But, even using his evidence as the worst case situation, this results in a 3.5" starboard offset. Indeed, in its closing submissions, Siemens conceded that the evidence indicated that the transporters never went much beyond 3" off centre. What is significant about this is that there is no evidence that either T1 or T2 ever deviated off centreline by as much as 6", being the figure that Bremner testified that he was confident was a safe deviation. And, as will be discussed in the context of the expert evidence, the amount of

deviation is directly related to the degree of the angle of heel that it would cause the barge, and therefore the transporters and their LP Rotor cargo, to assume.

(c) *Barge list and cargo tilt*

[134] In addition to deviations off centreline, there was much evidence concerning the listing of the barge, the tilting of T2 and the adjustments made to T2's deck during the loadout. This is significant as Siemens asserts that there was a perceivable barge list that should have signalled to the participants that there was a problem. This should have caused them to stop the loadout and properly address the issue which would have avoided the cargo loss. The question is, therefore, whether there was a perceivable list other than immediately prior to T2 tipping and, if there was, whether the JDI personnel were aware of it and chose to ignore it.

[135] As to T1, McLaughlin, who was directing the loadout, testified he switched T1 from 3 point to 4 point mode as it transitioned from the wharf to the barge. He made no mention of any other adjustment of T1. Significantly, no witnesses testified that there was a list of the barge during the loading of T1.

[136] As to T2, the evidence is less clear. Because McLaughlin was actually making the adjustments to T2's deck, I have set out his evidence in some detail below.

[137] McLaughlin testified that he did a check of the hydraulic pressure gauges on T2 before loading began and found that they were even, indicating that the deck of the transporter was level. He noticed T2 leaning to port when it had all six axles on the barge. Because of this lean,

T2 was stopped, and they remeasured the barge deck centre. He testified that T2 was off centre to starboard, the opposite direction of the lean of T2.

[138] To correct T2's port lean, McLaughlin testified that he raised the B lever on T2's hydraulic panel to raise the port side of the transporter deck, this leveled out the deck of T2. Following this adjustment, but with T1 in the same position on the deck of the barge, McLaughlin lowered the whole deck of T2.

[139] He testified that T2 then continued driving aft on the barge for 6' to 8' during which progression it was steered back on centre. At this point he stopped T2 again and raised its whole deck vertically, to clear the knuckles of T2 which were coming close to or were touching the deck of the barge at the bottom of the bow rake (Exhibit 5). He then asked Ron Mazerolle how T2 looked and Ron Mazerolle responded that the load was leaning slightly to the wharf (starboard). McLaughlin testified that raising the deck exactly vertically is difficult and that the slight starboard list "… was more of me raising it not getting the levers maybe exactly right, that's why it would have been leaning inboard a little bit". He then "thumped the A lever" to level out the starboard lean by raising the starboard side of T2 slightly. At this point there was nothing that particularly concerned him.

[140] Immediately after finishing this adjustment and as he was walking away from the control panel, McLaughlin glanced back and noticed T2's pressure gauges A and B were moving. This caused him concern because it meant that the load was moving off level. He responded by raising the B lever. The gauges leveled, but the lean to port returned more quickly and he

adjusted the B lever at least once more. Finally, he lowered T2's deck as there was nothing else to do, but the cargo was already tipping over. He described the incident as "quick and violent".

[141] On cross-examination McLaughlin testified that T2 was leaning to port when it was driven on to the barge, but that he did not notice the barge having a port list at that time. McLaughlin agreed that if the barge had a port list then, as a result, T2 could as well. However, he did not agree that this was the only explanation for T2's port lean. It was put to him that if T2's deck was flat and did not move (tilt) then the reason for a port list of the barge was that T2 had come on off centre. He agreed that this was a possibility, but that it was not probable because they had measured T2 and it was not off centre to port.

[142] Malcolm's evidence was that once T2 was on board the barge, he noticed that it had stopped moving and walked forward to determine why. He saw McLaughlin at the hydraulic control panel of T2 and realized that McLaughlin was raising the deck and rams of T2 to clear its knuckles, which were coming close to or had contacted the deck of the barge. Malcolm testified that up to the time that T1 and T2 were both fully on the barge, he had not noticed any significant list in the barge itself, something that he testified he would have noticed from his position at its aft end as water would have come out of the aft peak tank hatches which were open. He testified that when filling the open aft peak tank the port side manhole did overflow fractionally, a minute or so, before the starboard side. This would perhaps indicate a very slight port list, but was not a concern, as any list whatsoever would cause one side to overflow before the other. Further, had an unplanned barge list developed, then this would have indicated that something was going wrong and they would have had to stop and investigate. On cross-

examination, when faced with his discovery evidence, he stated that he could not say that while ballasting the starboard manhole had also overflowed, only that the pumps were shut down when "both" tanks were full. He testified that there was no further escape of water from the manholes until the barge heeled during the incident.

[143] Having returned to his original position on the barge, Malcolm noticed that the starboard side of T2 was rising. He testified that T2's deck slowly and gradually began to tilt to port. His initial reaction was that McLaughlin was levelling the transporter but then realized that the hydraulic rams on T2 were continuing to move. They moved for perhaps 20-25 seconds, at which point he realized the move was unplanned and the situation was out of control. Initially the barge did nothing, then, as the angle of the load continued to increase, the barge heeled gently perhaps a degree or a degree and half, as would be expected from a slight transfer of load on the barge. As the rams reached their full extension, the starboard side wheels of T2 lifted off the deck. Things then happened very quickly, and the transporter "essentially pole vaulted over the side of the barge". Malcolm attributed a significant heel in the barge, 30 to 40 degrees, to the tipping of T2 which "took the T1 load and trailer over on its side". He did not know why T2 behaved as it did.

[144] Bremner's testimony on the existence of a barge list prior to the actual loss was inconsistent. At first, he testified that he did not recall the barge listing at any time prior to the incident. However, during cross-examination, he testified that there was a slight list to starboard as T2 was coming on board, though it is unclear whether the list referred to is a list of the barge or of the transporter. When confronted with his discovery evidence, being that when T2 was

completely on the barge he noticed a slight list to port, he agreed that it was possible that there was a slight list to port.

[145] On the topic of McLaughlin's adjustments to the transporter platforms, Bremner testified that he expressed concern to McLaughlin that the steel plates bridging the gap between the wharf and the barge would contact T2's power pack and cause damage. McLaughlin told him he could raise the power pack and then proceeded to the controls. Bremner testified that he understood that McLaughlin had things under control and proceeded back toward T1. After about a minute, he felt the barge deck drop very quickly and he dove toward the centre of the barge. He testified that he had no expectation or inclination that something like that was about to or would likely happen.

[146] Hamilton testified that during the loadout he was observing the process, walking back and forth on the wharf and barge and taking notes as to what time each axle came on board. He did not notice a list of the barge when T1 was being loaded and he believed, based on his years at sea, that he would have if he was on the barge. Nor did he notice any list of the barge at any time prior to T2 tilting to starboard.

[147] His first indication that something was wrong occurred just before the incident. At some point after T2 was on the barge, Hamilton moved from the wharf onto the barge to observe. He testified that he was on the port side of the barge alongside T2 and could see that its power pack was hitting the steel plates that had been used to bridge the gap between the wharf and the barge. McLaughlin was at T2's controls and it looked to Hamilton that he was trying to adjust the

height of T2. The port side of T2 then started to lift and its deck started to lean to starboard. On cross-examination Hamilton stated that the lift may have been about 6" and he guessed that the tilt was about 5 degrees. A couple of seconds later T2 lowered back down to level. Hamilton walked aft and then towards the barge centreline between T2 and T1. He next observed the deck of T2 lift again, first straight or flat, and then the starboard side continued to lift higher so that T2's deck was at a greater angle. Its starboard wheels started to lift off the barge deck and, within a couple of seconds, T2's deck seemed to continue to lift and then T2 rolled over. The time between the port and starboard tilts was about 20 seconds, it was not minutes, and once T2 started tilting to port and falling over, it may have been 10 seconds.

[148] Hamilton testified that at the point when the starboard wheels of T2 started to lift off the barge deck he started taking a couple more steps towards the centreline of the barge because, at that time, the barge started to list. He dove toward the high side of the barge, there was a lot of crashing and noise and then the barge came back, more or less, to level. He agreed that the entirety of the weight of T2 was on its port side wheels once the starboard wheels lifted off the barge deck.

[149] Jeff Mazerolle testified that his first indication that there was a problem was when the barge started to heel, at which point he started looking for an escape. He felt no list while T2 was being driven onto the barge, only once T2 was on the barge. When describing the events from the time when he felt the barge list, saw lashings sliding to port to when he jumped off the barge, he stated "It was very quick". He had just enough time to jump off and, when he looked back, the load had gone over.

[150] Craig Singleton testified that he did not recall feeling any list prior to T2 coming on the barge; his first indication of a problem was when T2 had an axle or two on board. He testified that as it started to come on he felt a bit of an uneasy feeling with the barge shifting a bit towards the tug. When asked how much time passed from the time he observed that things just didn't feel right to when the load went in the water, he stated that it happened pretty quickly. He had twice mentioned to Jeff Mazerolle that something didn't feel right. The comments were made seconds apart. Jeff Mazerolle did not respond after the first comment and there was no time to respond after the second comment. Jeff Mazerolle had only enough time to remove the remote and then "it was over".

[151] However, in answers to undertakings filed by Siemens with its read-ins, Singleton had responded that the barge list increased as T2 axles came on board. He also stated that his "uneasy feeling" began 60 to 90 seconds before the incident. He subsequently corrected this to 10 seconds.

[152] It is difficult to reconcile all of the testimony and the events. However, I find that T1 did not tilt at any time during the loadout process prior to the toppling of T2. All witnesses reported that the barge did not have a list during the loading of T1. Most witnesses, including Hamilton whose role it was to observe the operation, did not observe a port list of the barge until almost immediately prior to the incident. While Bremner in cross-examination described a possible slight list to port when T2 was completely on the barge and Singleton's evidence was conflicting, I prefer Hamilton's evidence and accept as fact that, until T2 was completely on board, there was no discernable port barge list. I also find that the list was not apparent until after McLaughlin

had started manipulation of T2's deck. Moreover, as described by all witnesses, after the manipulations of T2's deck had commenced, the loss happened very quickly. The significance of these two points will be apparent in the context of the expert evidence, particularly with regard to the cause of the loss.

B. *Expert evidence*

[153] Prior to addressing the expert reports and evidence it will be helpful to set out two further pieces of factual evidence as these will come into play when considering the expert opinions.

[154] The first of these is the securing manual prepared by Bremner and circulated to JDI, Hamilton and Siemens. This set out the voyage conditions for the contemplated transit from Saint John to Point Lepreau. It specified that during off-loading the bow of the barge would be grounded and that this could only occur in calm conditions. Further, that the voyage would take approximately 5 hours, that a maximum sea state, being sea state 4, had been adopted with a 12 hour weather window prior to departure. Sea state 4 criteria were set out, including a maximum wind speed of 20 knots and it was noted that heel for a natural roll in that sea state was about 5 degrees. The sea fastenings (deck lashings) would, however, be designed for a 10 degree heel.

[155] Secondly, McLaughlin testified that in September 2008 he made calculations to determine the centre of gravity and stability base of the transporters in 3 and 4 point mode. Those calculations were hand written and were included in the documentary evidence. McLaughlin testified that the reason for doing so was because, at that time, there was a possibility that there would be steel beams placed under each rotor so that they could be laid on

blocks and then later picked up by a transporter. The use of the beams would raise the centre of gravity by about 12". He prepared the calculations to ensure that the loaded transporter stability still fell within the normal range and determined that at an angle of approximately 7.5 degrees they would become unstable and tip over.

(1) Summary of expert opinions

[156] There were four expert reports tendered and five persons were qualified and gave expert evidence at trial.

[157] The first expert witness was Mr. Hendrick van Hemmen ("van Hemmen"), the author of the Martin Ottaway report dated February 9, 2015 ("Martin Ottaway Report") which was prepared at the request of JDI. van Hemmen holds a Bachelor of Science in aerospace and ocean engineering and is a licensed professional engineer in the State of New York. He is the president and senior partner of Martin Ottaway which is described as a firm of marine consultants, engineers, surveyors, naval architects and appraisers. He was qualified as an expert in marine engineering and naval architecture, the details of his professional experience and qualifications were set out in his curriculum vitae.

[158] In summary, the Martin Ottaway Report concluded that there were no indications that the failure of the loading of the LP Rotors was inevitable and, within a reasonable range of probability, it could have progressed without incident and resulted in the safe delivery of the cargo. In that regard, the MMC stability calculations had indicated that the barge was stable during the entire process. The Martin Ottaway Report found that there were no indications that

basic stability could not be achieved during the loadout. Rather, its technical review indicated that the failure was related to the margin of safety being unexpectedly exceeded. That margin of safety was related to the sufficient loss of stability which would allow the load to tip. This was expressed by two central measures, the GM of the barge and the exceeding of a heel angle that resulted in load loss. Both of these measures had been considered prior to loading and the designed GM's and heel angles for the project were acceptable and inherently would not result in failure. However, on the day of the incident a condition occurred that resulted in the two measures combining to an extent that the load toppled.

[159] More specifically, the failure was the result of an undesirable angle of list and, had it not occurred or had it been corrected without mishap, the process would not have failed. The Martin Ottaway Report concluded that the actual cause of the events that led to the list had not been and likely could not be established but listed ten potentially contributory items. Of particular note, and as will be discussed further below, these included an off centre load, the additional free surface effect of the undivided aft peak ballast tank, the manipulation of the load on T2 by McLaughlin and a loss of situational awareness. The Martin Ottaway Report concluded that an unexpected combination of some or all of these factors and the other listed factors resulted in the loss.

[160] The Atlantic Marine Associates ("AMA") report dated February 10, 2015 ("AMA Report") was prepared at the request of counsel for JDI. The report was prepared by Mr. John Poulson ("Poulson"), Mr. Sean Murphy ("Murphy"), as well as Mr. John Tirel.

[161] At trial Poulson was qualified as an expert in marine engineering and in ship stability. Amongst other qualifications and positions, Poulson holds a United Kingdom Department of Transport First Class Certificate of Competency as a marine engineer, having served as a marine engineer through the ranks from 1977 to 1989. He holds a Master in Science Degree in maritime studies and is a chartered engineer. He joined the Salvage Association in 1989, which became BMT Salvage Limited in 2001. His duties there included casualty investigation and the conduct of warranty and condition surveys on behalf of underwriters and other clients. In May 2007 he opened the New York office of Noble Denton, acting as president until 2012. In September 2012 he joined AMA as an executive vice president and principal surveyor.

[162] Murphy was qualified as a naval architect at trial. He holds a Bachelor of Science degree in naval architecture and marine engineering, graduating in 2013 and began work with AMA in August 2013.

[163] The AMA Report concludes that the "SPM 125" was of sufficient size and capacity, was suitable for the intended project and that it had appropriate stability to meet criteria set out in the GL Noble Denton Technical Policy Guidelines for Marine Transportations ("ND Guidelines") which were referenced in the report prepared by Siemens' expert, Malin Marine Consultants.

[164] The AMA Report states that the stability conditions that it considered in its analysis of the "SPM 125" closely followed the stability conditions produced by MMC prior to the loadout but included greater detail concerning the barge's dynamic stability and also investigated the threshold of the operations with respect to the load being off centre. It stated that while it would

have been beneficial for MMC's analysis to have given consideration to righting arms at various angles of heel for the barge, in the loading plan that was developed by MMC the barge was stable and the operational conditions considered were adequate for the planned route.

[165] Further, the limited deviation of the transporters from the centreline of the barge during the loading was not sufficient to cause significant listing or to overcome the inherent stability of the barge. And, given the inherent stability of the barge, the modifications to the ballasting program during the loadout were not significant or causative. While it did not appear that MMC wholly considered the effect that free surface would have on the barge as a result of the aft peak tank being undivided, and the free surface moment associated with that tank at 95 percent full was significant, this did not have any substantial effect on the barge's stability. At no time was the barge's stability overcome.

[166] In addition to the conditions during loading, the calculated stability (GM) of the barge loaded with T1 and T2, with an allowance for a 10 degree list, was sufficient for the contemplated voyage of approximately 20 nautical miles. The stability calculations that AMA developed in support of its findings were appended as Appendix B of its report.

[167] Based on its analysis, and the elimination of other possible causes, AMA concluded that the most probable cause of the incident was a malfunction or mal-operation of T2's hydraulically manipulated transverse inclination control leading to a tilting of the transporter bed. This transverse tilt would have caused both a rising and transverse movement of the centre of gravity of T2, causing it to tip, incline the barge and, ultimately, result in both units falling off the barge.

AMA opined that JDI conducted due diligence throughout the project and the incident could not reasonably have been foreseen.

[168] The third expert report was prepared by Mr. George Randall ("Randall") and was dated February 9, 2015 ("Randall Report"). Randall was retained on behalf of BMT and was called as a witness by JDI. Randall holds a Bachelor of Science Naval Architecture from the Massachusetts Institute of Technology (1970), a Diploma in Applied Statistics from Oxford University (1973) and a Master of Science degree in Ocean Engineering from London University (1976). He is a Chartered Engineer (United Kingdom) and is a fellow of the Royal Institute of Naval Architects, was previously a member of the council of that institution, and is a Member of the Society of Naval Architects and Marine Engineers. He worked with the Salvage Association from 1973 to 1991, being Principal Naval Architect from 1980 to 1991. Since then he has worked as a consultant naval architect and marine engineer. At trial, he was qualified as an expert in naval architecture.

[169] The Randall Report opined that the "SPM 125" was suitable for its intended purpose, the loading operation was professionally planned and executed up to the time of the loss, and, the loss was caused either by error of the operator of T2 or by malfunction of its hydraulic control system or valving.

[170] As to the suitability of the barge, the Randall Report noted that the Transport Canada Report, which was appended, concluded that the barge was stable. Further, that MMC's stability calculations for the loadout had been reviewed and checked and that Randall had also made his

own independent calculations which confirmed both the accuracy of the hydrostatic and other data on which the MMC calculations were based and the stability of the barge as loaded. Based on all of this, the report concluded that the barge was suitable for the intended operations, assuming correct operating during the loading of the transporters.

[171] The Randall Report acknowledged that the MMC loading plan and stability calculations incorrectly assumed that the aft peak ballast tank was subdivided into independent port and starboard tanks and that this error caused the calculated stability to be overestimated by a factor of two in the planned conditions where that tank was partially full. However, it concluded that having corrected for the error, the stability of the barge was still acceptable, even assuming the worst case, i.e. the maximum free surface effect in the full width aft peak tank. And, at the time of the incident, the stability was better than the worst case as free surface had been eliminated by pressing up that tank. Further, that the additional ballast would actually improve the originally calculated stability at the cost of only a minor increase in trim.

[172] Siemens' expert report was prepared by Malin Marine Consultants ("Malin"), dated December 30, 2014 ("Malin Report") and included a reply report dated September 7, 2015 ("Malin Reply") in answer to issues raised in the Randall Report and the Martin Ottaway Report. The Malin Report was presented by Mr. Taggart Smith ("Smith") who graduated from the Universities of Glasgow and Strathclyde in 2007 with a Master's Degree in Naval Architecture and Ocean Engineering. Since then he has worked with Henry Abram & Sons, a company specializing in heavy cargo transport and its sister company, Malin, which provides consultancy

work in that regard. He was qualified as an expert in the fields of naval architecture and heavy lift engineering.

[173] The Malin Report responds to a number of questions asked by counsel for Siemens. Its responses are based on a set of provided assumed facts and Malin's document review and calculations. The questions put to Malin included: what essential information, expertise and work was needed to prepare a loadout plan; what standards are applicable to the contemplated voyage; what must be done to determine if a barge is suitable for a proposed move, did JDI do this and was the "SPM 125" suitable; was the loadout/ballast plan appropriate as designed and as modified; were the steps taken to keep the transporters on the barge centreline and to monitor the loadout appropriate; and, what was the cause of the loss?

[174] There is overlap in the Malin Report's response to many of these questions. However this, in summary, is captured in Malin's findings on causation and in its conclusions. Malin concludes that the root cause of the cargo loss was that the "barge was not stable enough for the load" and the transporters were loaded without the simple precaution of a swept pathway to ensure that they remained on the barge centreline during loading. It refers to its calculations, found in Appendix A of its report, in support of this and lists six physical contributors being: the lack of a marked swept pathway on the barge deck; the combined centre of gravity of both of the LP Rotors and transporters being off the barge centreline; extreme trim of the barge due to the aft peak tank being near full and T1 having been loaded to the stowed position; the free surface effect of the ballast water in the aft peak tank; the initial heel of the barge; and, the dynamic effect of manipulating the transporters. As to non-physical contributors, these were listed as: the

dynamic stability of the barge was not checked; the maximum allowable offset of the LP Rotors was not established; the change in the ballast plan with no engineering verification; conduct of the loadout without a proper method statement; no command and control structure for the operation; and, insufficient levels of engineering with respect to barge and transporter stability.

[175] Malin concludes that its report establishes that industry practice was not followed in the areas of preliminary planning, loadout engineering, project management, site management/loadout supervision and execution of loadout. Within each of those areas fundamental errors were made that, if identified or corrected, could have prevented the loss. These included: knowingly selecting an unsuitable barge; using incorrect information as to the configuration of the aft peak ballast tank leading to the development of an incorrect ballast plan; lack of verification of the information used; changes to the loadout plan being made without checks as to suitability; and, the loadout proceeding without any means of control or with respect to industry practice, in particular, by use of a swept pathway over the centreline.

[176] Its penultimate paragraph states that:

> Ultimately the loss of the cargo was due to a lack of stability of the barge compounded by the decision to load without using a swept pathway to ensure that the load was kept on centreline. The personnel involved as experienced loaders, engineers, architects and surveyors were aware of these factors but for reasons which are not clear chose to ignore them. By ignoring these factors they chose to run the risk of the load moving off centre-line on a barge that was recognized as being too small to begin with, knowing that the cargo could become extremely unstable.

[177] Each of the Martin Ottaway, AMA and Randall Reports specifically addressed many of the Malin assertions.

[178] My approach in analyzing the issues raised by the expert reports and testimony is to address the suitability of the "SPM 125" for the intended operation, which is a function of its stability, and the cause of the incident. The ultimate question is whether, based on the evidence and my factual findings, Siemens has established that the loss resulted from the acts or omissions of JDI and/or MMC and Bremner and, if so, were those acts or omissions committed recklessly and with the knowledge that such loss would probably result. That is, whether they are barred from limiting their liability pursuant to Article 4.

(2) Findings on barge stability

[179] The Malin Report took issue with the stability calculations produced by Bremner as they did not account for dynamic transverse stability of the barge and were based on the erroneous assumption that the aft peak ballast tank was divided. Further, that the ND Guidelines were applicable, as an industry standard, to the "SPM 125" and that the stability criteria set out therein were not met.

[180] The Malin Report based its conclusion that the "SPM 125" did not meet the ND Guidelines criteria on three vessel stability calculations, A1 to A3, that Malin produced. A1 represents the "SPM 125" with no ballast in any tank. Smith testified that the purpose of A1 was to determine the seagoing stability of the barge during towage.

[181] However, as pointed out by the other experts, Malin Conditions A1-A3 are not representative of either the planned loadout and voyage conditions or the conditions as revised by the change in the ballasting plan on the morning of the incident.

[182] This can be contrasted with the stability conditions generated by AMA. In his testimony, Murphy explained that he had prepared the AMA stability calculations using a computer program known as General Hydrostatics ("GHS") which, in essence, developed a model of the barge based on inputted basic information that described its geometry. He also explained in detail the calculations as presented.

[183] Murphy generated a number of stability conditions for the "SPM 125", mimicking Bremner's calculations. Based on these inputs and the barge model, GHS then calculated measures of the barge's stability in that condition, including any correction for the free surface effect of any liquids in its tanks. On the first page of each condition calculation, this would be represented by the ship's metacentric height (GM), freeboard, trim and heel.

[184] The second page of each condition calculation is comprised of a table of righting arms versus heel angle. As explained by Murphy, the GHS program generated, at 5 degree intervals, the righting arm and freeboard for that condition at that angle of heel. As I understand it, the righting arm is a function of a vessel's centre of gravity and buoyancy and the distance between the two. If a vessel is heeled, its centre of buoyancy moves off the centreline and is therefore offset from the ship's centre of gravity through which the downward force of gravity acts. The force of buoyancy acts upward through the centre of buoyancy to right the vessel. The righting moment concerns the force of buoyancy and the distance that separates the forces of buoyancy and gravity ("GZ"), the GZ is known as the ship's righting arm. The angle of vanishing stability, being the angle of heel at which the vessel no longer has a positive righting moment, or ability to

right itself, is also identified on each table for that condition. Murphy testified that beyond that angle, the vessel will no longer return to an equilibrium position and will capsize.

[185] The third page of each condition calculation is a graphical depiction of GM and righting arm (or GZ). Murphy testified that at small angles of heel, perhaps 0 to 7 degrees, GM is used as a measure of stability. It is calculated separately from the GZ by GHS and both are plotted on the graph. Thus, GM is a measure of initial stability, while at larger angles of heel the GZ is utilized for that measure.

[186] Murphy first generated a set of conditions that mimicked those prepared by Bremner prior to the incident, being a lightship condition and operating conditions 1 to 13. However, he corrected these to address Bremner's error in treating the aft peak tank as divided. So, for example, AMA's Trimmed for Loading Condition mirrored MMC Condition 1 but did not treat the aft peak ballast tank as longitudinally divided as had MMC. This meant that the MMC condition had a smaller free surface moment, and resultant higher GM, than did the AMA condition. Murphy explained in his testimony that the GHS program generated the maximum possible free surface moment for the aft peak tank. Further, that the free surface moment takes into account the amount of ballast and the effect that it has on the stability of the barge when it heels. In the result, the GM generated by MMC in its Condition 1, trimmed for loading, was 37.41 feet while in AMA's mirror condition, corrected for the increased free surface effect, the GM was 32.28 feet. Murphy testified that this meant that the barge had a very high GM and, therefore, was very stable in that condition.

[187] This comparison continued for the remainder of the MMC Conditions. All resulted in positive GMs that were close to, although lower than, those predicted by Bremner. In MMC Condition 11 - Ready for Sailing, Bremner had calculated a GM of 8.69' while AMA calculated a GM of 8.88'. AMA also calculated an angle of vanishing stability of 40.52 degrees in that condition.

[188] Thus, this set of stability calculations by AMA was intended to and did demonstrate that if the ballast and loading plan had proceeded as originally planned by Bremner then, even with the increased free surface effect factored in, the stability of the barge was adequate. And, if the ND Guidelines were applicable, all of the criteria were met.

[189] The Randall Report also takes issue with the Malin stability calculations stating that they contain an error which invalidated Malin's conclusion that the "SPM 125" is unsuitable for an unrestricted ocean voyage. Randall testified that Malin used a VCG for the loaded transporters of 7.21 meters (23.65'), which is about 1 meter (3.28') higher than the figure used by MMC (20.2'), which figure Randall had checked and confirmed. Randall testified that his own independent VCG calculation was 20.35'. This error translated into a 2' underestimation of GM by Malin. Further, that the loaded barge, in the condition intended for the voyage, would actually be 40 percent more stable than assumed by Malin in its calculations and it would also pass all five of the ND Guideline criteria to which Malin referred. The calculation at Tab 10 of the Randall Report recreates Malin Condition A-1, barge with no ballast in any tank, and then does so using a corrected VCG of 5.02 meters (16.47') (as opposed to Malin's figure of 5.728 meters). This resulted in the barge meeting all five of the ND Guidelines criteria referenced by

Malin, including an angle of vanishing stability of 38.6 degrees which exceeded the 36 degrees stipulated in the Malin Report. As to Malin Conditions A-2 and A-3, Randall discounted these as they were not reflective of any ballasting condition that MMC had intended and planned for in its stability conditions.

[190] As noted by the other experts, Malin did not explain in its report how it arrived at the VCG figure that it utilized in its stability calculations. In response to the criticism of that figure raised by Randall, the Malin Reply stated that its VCG figure assumed that the LP Rotors were stowed on support stools with the transports lowered off. Further, that this was assumed as it was Malin's view that this represented the prudent manner of stowage of the rotors for the voyage. As to the VCGs assumed for the transporters, as this was an unknown value, a conservative assumption was made to lump the mass of the transporter at the VCG of the LP Rotor.

[191] However, when considering this explanation, it must be recalled that the evidence was clear that neither JDI nor Bremner had ever intended to place the LP Rotors on stools for the 20 nautical mile voyage. Thus, while Malin Condition A1 may demonstrate Malin's opinion of how the loadout should have been effected, it is not representative of an as-planned or revised and actual loadout condition. Therefore, although in the Malin Condition A1, one of the ND Guidelines criteria was not met, the angle of vanishing stability, this does not establish that the criteria would not have been met in an as-planned or actual condition.

[192] As the ND Guidelines were interpreted and applied by Malin, the barge was required to have a range of intact stability of 36 degrees, meaning that if it experienced a heel or list of up to 36 degrees the barge would have sufficient GZ stability to right itself. Thirty six degrees was the angle of "vanishing stability" after which the barge would not recover and would capsize. At trial, Smith testified that when the Malin Report stated that the MMC calculations did not account for dynamic transverse stability he was referring to the absence in Bremner's stability conditions of a GZ curve showing the angle of vanishing stability. Similarly, when it stated that its stability checks showed that the barge was not suitable with respect to stability, this was also in reference to the absence of a GZ curve. Smith also testified that he had realized the day before he gave evidence at trial that he had erred when he prepared his report as, in fact, the "SPM 125" was a small barge as defined in the ND Guidelines which, therefore, required a range of intact stability to 40 degrees.

[193] Although a great deal of time was spent debating the fineries of the Malin VCG, as opposed to that used by Bremner and others, and whether or not the ND Guidelines as an industry standard were even applicable or, if they were to be used as a guideline, whether a lesser angle of vanishing stability should be applied given that this was a 20 nautical mile voyage of less than 5 hours to be conducted in a clear weather window in which the sea state was prescribed, ultimately what was at issue was the purported failure to meet one criteria, the angle of vanishing stability. In that regard, I am satisfied that the AMA calculations confirm that the "SPM 125"'s stability for the voyage as-planned met the ND Guidelines, even when the additional free surface effect of the undivided aft peak tank was taken into consideration. And,

in any event, Smith ultimately acknowledged that that the alleged failure to comply with the standard did not cause the loss and that the barge itself had a high degree of stability.

[194] There is also a practical consideration pertaining to the angle of vanishing stability. As addressed below, prior to sea fastening, the transporters could withstand, at most, a heel of 7.5 degrees before they would topple. It was generally agreed by the experts at trial that 6 degrees was the appropriate figure. The sea fastening calculations prepared by MMC predicted a roll of 5 degrees but designed the fastenings to 10 degrees. Thus, had the cargo been loaded successfully, sea fastened and the voyage commenced, if the barge were exposed to a force that caused it to heel beyond 10 degrees, then the cargo would have exceeded its transverse stability limit and/or fastenings limitations and toppled. The barge, on the other hand, would have continued to be stable and had the ability to right itself – at worst using Malin's calculation – up to 32 degrees. Thus, while Bremner undoubtedly should have generated the GZ curve, whether the barge would capsize at 32 rather than 36 or 40 degrees was not particularly relevant to the planned voyage, which was weather restricted to conditions that would have seen a maximum roll of 5 degrees.

[195] To this point, when discussing the alleged failure to meet the 36 degree angle of vanishing stability, the Malin Reports states:

> This means that whilst the barge is at sea the dynamic motion of the barge rolling from side to side does not satisfy the criteria and the barge will capsize (overturn). By that measure the barge is then not suitable either for the loading of the two Turbines. There is no purpose in loading cargo that cannot safety be transported.

This is somewhat misleading, as when asked at trial when the barge would capsize, Smith testified that this would be when the angle of vanishing stability is reached, which he calculated to be 32.36 degrees. This is well beyond both the designed for voyage sea state limitations and the sea fastenings.

[196] Based on the foregoing, I find that Siemens has not established that, for the as-planned loadout and voyage and as corrected for the undivided aft peak ballast tank, the "SPM 125" was unstable and, thereby, unsuitable for the intended purpose.

[197] After addressing the ND Guidelines, the Malin Report went on to state: "However, if loading is considered in isolation from voyage, then the barge can be shown to be capable by calculation only of loading two LP Turbines…". The Malin Report also noted that, in order to achieve the safe loading of both rotors, normal industry practice required that the loading had to be split over two separate tides and that each item of cargo be set down on supports and, as a minimum, be partially sea-fastened before another item of cargo was loaded to prevent shifting. Malin commented that, "although it was theoretically possible to load both LP Rotors over two high tides, it was an extremely risky job with an unacceptably narrow margin of error".

[198] In essence, Malin is acknowledging that the stability of the barge during loading is acceptable, but takes issue with loading both LP Rotors on the same tide. Under cross-examination at trial, Smith testified that Malin avoids loading multiple cargos on the same barge on the same tide as it is always its preference to plan the loadout to make the best use of the tide that it is working with. However, he acknowledged that the method used by JDI and MMC,

agreed to by Hamilton and found to be acceptable to Randall, Poulson and van Hemmen, although not the process he had been taught or had witnessed other operators utilize, did not mean that it was not correct.

[199] In my view, nothing in the evidence establishes that the loading over one tide cycle resulted in a cargo shift or that the operation was otherwise at risk by this approach.

(a) *Change in ballast plan / Free surface effect*

[200] As to the change to the ballasting plan, the question put to Malin was if, upon learning that the aft peak ballast tank was not configured as the MMC ballast plan contemplated, it was appropriate for JDI and MMC to proceed on the basis of a new ballast plan. The response in the Malin Report was that the manner in which it was done was not appropriate. Rather, that a management of change procedure should have been implemented. In its conclusions, the Malin Report asserted that the change was made with no engineering verifications, under cross-examination Smith stated that this referred only to confirming the ballast tank structure.

[201] In his testimony, Smith stated that the decision to press up the aft peak tank, rather than gradually filling as planned, was a significant change and that free surface effect would only be eliminated if the manhole covers had been closed and the tank sealed. He stated that management of change can be an onsite review process, it does not need to be particularly complex, but it will ensure no new risks arise from the change.

[202] Significantly, the Malin Report did not refer to any calculation demonstrating how the ballasting change impacted the stability of the barge during the actual, as compared to the planned, loadout. It takes issue only with the manner in which it was done.

[203] As noted above, the AMA calculations mimicking the MMC stability condition calculations for the intended loadout, but corrected for the free surface effect of a single aft peak tank, concluded that the stability of the barge still met all of the ND Guideline criteria (assuming an applicable intact stability range of 36 degrees). AMA also produced calculations for an Estimated Loaded Condition - Time of the Incident. This may not have exactly replicated the longitudinal positions of T1 and T2 at the time of the incident, but it did reflect a single aft peak tank at 95 percent full, the worst case scenario. GM was calculated to be 3.27' and the angle of vanishing stability was 35.54 degrees.

[204] The Martin Ottaway Report stated that Bremner made a "thinking error" in his attempt to remove free surface. While a full tank would not have free surface, in this case, because the aft peak tank had open manhole covers on each side, water could flow out when the barge heeled and the free surface effect reduced the barge's stability. However, even with a worst case assumption, the barge's GM would not have been reduced to zero. Martin Ottaway conducted its own stability calculations and stated that it could reasonably conclude that the free surface effect on its GM reduced the barge's stability, but not to the extent that the barge was unstable.

[205] Randall testified that he did not agree with van Hemmen that Bremner made a thinking error in this regard. He also did not agree, that at small angles of heel, there would be no free

surface effect only if the tank was sealed and water could not flow out of the manholes when the barge listed, he was instead of the opinion that its stability would have been reduced negligibly. When it was put to him that van Hemmen stated that the GM on the barge could be reduced to 2' as a result of the manhole covers being left open and water flowing out, his response was that there would be a full free surface effect if the tank became fully slacked. However, this did not happen because that amount of water was not reported to be coming out of the manholes. The level of the water in the tank would have had to drop by several feet for the GM to fall to 2' and, by his calculation, the lowest it could go in any case would be about 2.6' which would include the full deleterious effect of the aft peak tank free surface. Randall also testified that this was well in excess of a permissible minimum of 6" and that a GM of 2.6' was acceptable. With respect to the AMA Report, Randall disagreed that the tank was 95 percent full and believed that AMA was being conservative in its calculations by making that assumption.

[206] Randall also testified that Bremner had a good grasp of the principles, the calculations involved and of the operation. The calculations were fresh in his mind and removing the prior free surface correction and replacing it with zero by way of a mental calculation was a simple thing to do at the time.

[207] Bremner himself testified that he did not do any actual calculations, but stated that he had been working on the project for the previous few weeks, was very familiar with the figures and was content to proceed.

[208] From all of this it is clear that the free surface correction required as a result of the discovery, on the day of the incident, that the aft peak tank was one single tank running the full width of the barge was significant and that the resultant free surface effect detrimentally impacted the GM, the stability, of the "SPM 125". I also accept AMA's view that Bremner made a thinking error in failing to account for the open manholes, as this meant that the tank was not pressed up and the free surface effect was therefore not eliminated. However, while Martin Ottaway, Randall and AMA may disagree on exactly how much impact this had on the barge's stability, they all agreed that it did not cause the barge to become unstable. As noted above, the Malin Report does not address the impact, only the manner in which the change was made.

[209] From this I find that the failure to determine that the tank was undivided and then to seal the manholes when it was decided to proceed with the loadout by pressing up the aft peak tank did detrimentally impact the stability of the barge. However, it did not cause it to be unstable and, therefore, although the Malin Report takes issue with the manner in which the change to the ballasting plan was made, this was not significant in and of itself. Rather, as will be discussed below, the resultant reduction in the barge stability was one of several factors that, acting in combination, contributed to the loss.

(b) *Swept path*

[210] Much of the Malin Report's criticisms and conclusions revolve around the allegation that JDI failed to establish a swept path. Malin asserts that it is industry practice to produce a swept path drawing to delineate the route from the point where the cargo was collected to where it was to be placed on the barge. This would identify concerns, such as gas or electrical lines, and

allow the operator to know what his limitations were for deviations of the transporter on the barge. Malin claims that the failure to do this contributed, in large part, to the loss of the cargo.

[211] However, as the Randall Report points out, not taking steps to mark the barge centreline is not the same as showing that JDI did not know where the centreline was or that JDI did not have an acceptable means of guiding the transporters on to the barge.

[212] The Randall Report also notes that photographs, entered into evidence at trial, show that the lines of the underdeck longitudinals, including the centreline longitudinal, were very visible on the barge deck. These would provide guidance in exactly the same manner as a chalk-marked centreline would have done, with the additional benefit that the off centre longitudinals could be used to directly indicate the path of the outside transporter wheels. The Randall Report states that this would be a much more useful guide for tracking the load down the centreline than trying to keep a centre mark on the front to the transporter directly above a chalk marked centreline on the deck some feet below.

[213] Based on the evidence presented at trial, there is no question that a formal swept path plan was not prepared by JDI or MMC. Further, all of the factual witnesses acknowledged and agreed that they knew that the loading plan required the transporters to be kept on the barge centreline and that it was important to do so. However, as I found above, while I am not persuaded that chalk or paint centreline markings were made, McLaughlin, Malcolm and Bremner testified that the clearly visible longitudinals were used to guide the transporters on board once the transporters passed the bow area that was obscured by the steel plate. It is also of

note that during the loadout McLaughlin recognized that T1 was initially off centre as was T2 and attempted to address the offset. This demonstrated an awareness of where the centreline was and the need to keep the transporters on it within an allowable deviation of 3" to 6".

[214] Thus, while there was no formal swept path drawing, JDI and Bremner were aware of the need to load the transporters on the centreline and were attempting to do so. Accordingly, I find that the lack of a swept path drawing was not causative. In any event, as discussed below, the deviation off centreline by T2 by approximately 3" was not sufficient to cause a barge list of 6 degrees and, thereby, to cause the transverse stability of the transporters to be exceeded. In other words, the off centre deviation alone did not cause the loss.

(c) *Barge list and transporter stability*

[215] The Malin Report also asserts that the "SPM 125" "was not stable enough for the load". When asked on cross-examination what was the basis of this assertion, Smith stated that what Malin was looking at was not so much the GM of the barge or the amount of roll that it could withstand, but rather the combination of barge stability and how it reacted to small excursions of cargo offset. He testified that a suitably stable barge would not have assumed so much heel when the cargo deviated off centre. Thus, while he accepted the testimony of Poulson, Randall, Murphy and van Hemmen and the finding in the Transport Canada Report that the barge was stable, for Malin it was not just a case of whether or not the barge was stable, rather it was concerned with an "overall effect" of how stable it was.

[216] In that regard, the Malin Report included its Table 1: Table of Turbine Offsets and Corresponding Heel Angle with Change in Freeboard. This indicates that with T1 situated at 3" (0.075m) to port of the barge centreline, a 1.61 degree port list would result; if T1 and T2 were both 3" to port, a 2.64 degree port list would result, and, if T1 was 3" port and T2 was 6" to port, a 3.43 degree list would develop. Freeboard in each case was also stated; in the last case, with a 3.43 degree port list, freeboard would be 0.63" on the port and 24.25" on the starboard side of the barge. Thus, the Malin Report asserted that a barge heel should have been noticeable to persons on board near the deck edge and by an experienced warranty surveyor and that the loadout should then have been stopped as it would have been clear that something was not right.

[217] However, on cross-examination Smith was referred to the Scheuerle stability figures of the transporters in 3 point mode which gave an angle of 7.2 degrees for total load and agreed that this was consistent with McLaughlin's handwritten calculations in 3 point mode of 7.42 degrees. He also agreed that the transporters would topple at 7.42 degrees. Thus, when referred to Malin Table 1, he confirmed that if T1 had no tilt and even if the barge was heeling to 1.61 degrees to port, that T1 would not tip over. Nor would it do so if the barge was heeled to 3.43 degrees.

[218] It is also of note that, the resultant degree of heel of the "SPM 125" caused by a transporter offset as calculated by Malin was in dispute. AMA produced a stability condition entitled Threshold Check (SPMT Stability Limit for Offset COG). Murphy testified that the Scheuerle manuals provided payload displacement tables which, when applied to a transporter carrying an LP Rotor, permitted a transverse maximum centre of gravity offset of 1.83'. The AMA condition was based on MMC Condition 10, corrected to reflect one aft peak ballast tank.

In his testimony, Murphy noted that the free surface calculated in this condition was "true" which meant that it was calculated in that specific condition, which I understood to mean that worst case free surface was not assumed. GM in that condition was calculated to be 5.33' and, with T2 1.83' (22") off the centreline to port of the barge, and the barge angle of heel calculated was 6.13 degrees to port. Bremner's evidence was that a 6" offset would result in about a 1 degree list and the Martin Ottaway Report made a generalized finding that a 33' wide barge would assume a 1.7 degree list if the cargo moved off the centreline by 12".

[219] However, as discussed above, based on the testimony of the witnesses, the worst case transporter deviation was a 3.5" to starboard offset. Thus, without making a finding as to its accuracy, even applying Malin's Table 1 calculations, this would result in an angle of heel of the barge of 1.61 degrees, which would not be sufficient to cause the transporters to topple nor to cause the barge to unstable. It would, however, impact the available range of transverse stability of the transporters, which is discussed further below, in the context of the cause of loss.

[220] The Malin Report also asserts that a barge list should have been apparent to those on the barge and that they should have stopped the loadout to determine what was causing it. In that regard, the Randall Report stated that there was no evidence of significant listing of the barge at any time prior to the severe listing caused by the toppling of T2. In support of this it referred to a photo showing T1 and T2 on the barge, with the knuckles of T2 close to the deck, being the position where McLaughlin had attempted to elevate and then level T2.

[221] The Malin Reply disputed this. It imported that photographic image into a computer assisted design program and rotated it so that the downpipe gutter on a building in the background, used as a reference point, was vertical. Running a horizontal line from that point toward the pump housing permitted the calculation of a barge heel of 1.5 degrees. At trial, Randall disputed the accuracy of this result on the basis that the pump housing was curved. Smith agreed that, if this was the case, then that would indicate that it could not reliably be used as a reference point, as both the Randall Report and the Malin Reply had done. Accordingly, I give no weight to Malin's assertion of the proof of barge list based on its analysis of this photograph.

[222] The calculated angle of heel resulting from a cargo offset is in dispute. I am, therefore, unable to determine with certainty what the actual angle of heel would be if T2 was off centre by 3". However, such a determination is not necessary as I accept the evidence of the witnesses who were onsite and, based on that, I find that any barge list was so small as to be undetectable, and was not detected, prior to T2 coming fully on to the barge. This is, in fact, consistent with the Malin Report which took as an assumption that the barge began to list to port when T2 was fully on board.

## VII. Cause of Loss

[223] The Martin Ottaway Report concluded that the barge was stable and that it was generally agreed that the maximum angle of heel that the transporters could withstand before toppling was 6 degrees. Further, that the undesired list that preceded the loss of the cargo was likely caused by a combination of factors. These could have included an off centre load, which may not have

become apparent until the load was being manipulated immediately prior to the failure, although that factor alone was unlikely to have been causative. Similarly, the free surface effect on the barge's GM reduced its stability but not to the extent that it made the barge unstable. Both of these factors have been addressed above and I agree with the Martin Ottaway Report conclusions in that regard.

[224] The Martin Ottaway Report also identified the manual manipulation of T2's deck as a potential contributory factor. It noted that the incident appears to have occurred during the manipulation of the load and that the barge response may have confused the operator. The report also notes that Hamilton noted an extreme lift and tilt of the T2 load which may indicate operator error. In his testimony, van Hemmen stated that the manipulation or malfunction of T2 resulted in the capsizing of the system. The tipping of T2 induced the list of the barge, which caused T1 to tip. He viewed this as a reasonable sequence of events.

[225] AMA considered the barge stability but, based on its analysis and the elimination of other causes, concluded that the most probable cause of the incident was a malfunction or mal-operation of T2's hydraulically manipulated deck. The transverse tilt would have caused both a raising and transverse movement of the centre of gravity of T2 which was sufficient to cause it to tip, heel the barge and, ultimately, cause both LP Rotors to fall off the barge.

[226] According to AMA, the problem started following the slight correction to T2's deck when both transporters were on board the barge. T2 began to list to port, likely due to the adjustment. T2 then reached an angle whereby its starboard side wheels began to lift off the

barge deck. Once T2 listed to 7.5 - 8.0 degrees its centre of gravity was sufficiently displaced to port to cause the load to topple. As a result of T2 toppling over on to the barge's deck and then into the water, the barge listed, subsequently causing T1 to also tip over. T2's stability limits were exceeded before the barge attained a sufficient list to cause T2 to topple.

[227] At trial, Poulson testified that the evidence in the discovery transcripts and during trial, which he had attended, did not change the opinions expressed in the AMA Report. Rather, the evidence suggested that it was the stability of T2 that was overcome, not the barge. As to the sequence of events, Poulson testified that the last thing that was done before the casualty occurred was the operation of the control unit for T2. As a result of T2 tipping over on to the barge's deck, the barge began to list and the loss of T1 was a reaction to the initial tipping of T2. If it were the case that the barge had taken a list significant enough to topple the LP Rotors, then it could reasonably have been expected that both rotors would have fallen together, which did not happen.

[228] On cross-examination, Poulson agreed that ultimately the "failure process" was expressed in an undesirable angle of heel of the barge and that, if a list had not occurred or had been corrected without mishap, the process would not have failed. He agreed that eventually the tipping point of the transporter could be reached if the transporter continued to be driven on the barge in the direction of a list, or, if the transporter was stopped and the transporter deck load was tilted in the direction of the barge list. Further, that those two factors together could cause the "tipping moment" of the transporter to be reached. He pointed out, however, that in this case T2 had stopped, the barge had assumed a list and the last thing that happened was the

manipulation of the transporter deck before the load was lost over the starboard side, being the direction of the tilt of T2's deck.

[229] The Randall Report, in addressing the proximate cause of the loss, states that the salient fact was that at the time that T2 toppled the transporter operator was actively engaged in manipulating its hydraulics. The transporters had safely been on board for 5 to 10 minutes prior to the loss, they had been moved to the centreline of the barge to the extent that there was no significant barge list, they were not moving longitudinally at that time and the hydraulics of T2 were being actively operated. The reported sequence of events demonstrated that the loss of the LP Rotors overboard was caused by the initial tipping of T2's deck relative to the barge deck, rather than the initial listing of the barge during the operation. The tipping of T2 caused a significant heel of the barge to port, which caused T2 to slip off, and caused T1 to topple and lose its load.

[230] In his testimony at trial Randall stated that having heard the evidence of those called before him, he remained of the opinion that there were only two possible causes of the loss and that he now tended to favour hydraulic failure rather than operator error.

[231] The Randall Report notes that Malin did not provide any stability calculation of the barge at the time of the incident or offer any explanation as to how the barge, with substantial positive stability and no appreciable list, capsized within seconds while the transporters were not in motion. Further, because the barge was stable, any list seen to be developing as a result of a transporter moving off the centreline could be prevented from increasing by stopping the

transporter and stopping any adjustment of the transporter hydraulics. The list could then be corrected at leisure by incremental movements of the transporter or adjustments of the hydraulics. Experienced marine professionals would recognize a list beginning at about 1 degree and certainly before two degrees which is to be compared with the calculated capability of the transporters to withstand a 7 degree list before toppling. Randall, of course, was of the view that there was no significant barge list prior to T2 exceeding its transverse stability limit.

[232] On cross-examination Randall agreed that if there was a port barge list and if the transporter deck was manipulated to port, that would exacerbate the port list by moving the effective centre of gravity to port and, if the transporter exceeded its own safe margin for transverse movement, by moving its centre of gravity outside of its wheels, then it would tip. He agreed that this is what happened, but not because of the port list of the barge deck.

[233] In my view, the Malin Report conclusion as to the cause of the loss really does not differ so very much from the above conclusions of the other experts.

[234] The Malin Report states:

> It should be noted that there is a point of heel (tilt) where the hydraulic stability of the trailers will fail. That is to say when the axles on one side become overloaded and are not able to lift the cargo to level it off. This angle has been identified as being 6 (deg). At this angle the hydraulic failure results in the cargo tilting further until such time that the geometric stability of the trailer fails, i.e. the centre of gravity moves outside the axle line. This causes the trailers to tilt such that the axles on one side lift up off the barge deck, when that occurs the combined center of gravity of the trailers and cargo move instantly from 3" (75mm) off of the centreline to about 31.5" (800 mm) off the centreline. Due to this sudden shift in weight on the deck, the barge reacts by immediately

> heeling (tilting) about 10 (deg). Such a sudden heeling motion would be sufficient to topple the trailers over completely.

[235] At trial, Smith testified that "trailer hydraulic stability" refers to the point at which it would no longer be possible to hydraulically level the transporter bed to compensate for a transverse angle of heel or list to which the transporter was exposed. Thus, the Malin Report's reference to hydraulic failure does not pertain to an actual failure of the hydraulics, but rather to the maximum available compensatory tilt of the transporters.

[236] Smith also testified that the cause of the loss had to do with the "stability of the system and the barge". The lack of a swept pathway allowed the transporters to go off the barge centreline causing the barge to list. This, to Smith, was the initial factor. As he described it, the barge heel caused the centre of gravity of the load to move off centre. There was then further movement of the transporters and the barge remained heeled. The transporter hydraulics were then manipulated "which may have further accentuated the projection of that centre of gravity one side or the other, causing the barge to heel a bit more. And, eventually, there has been a point where the combination possibly of barge heel and the projection of the tilt of the trailer bed is sufficient to put the stability of the trailer out with its own boundary".

[237] Smith explained at trial that a barge with a higher GM would have been able to withstand a greater excursion of the cargo off the centreline and would not have heeled as much. The heeling of the barge impacted the stability of the transporters, as small deviations off centre with a loaded transporter caused a small resultant barge list that "used up" the transporters' stability.

Further hydraulic manipulation of the transporter deck could "use up" more of its remaining stability, until the transporter's maximum angle of heel had been reached and it became unstable.

[238] Although the theory that the loss was caused by malfunction or mal-operation of the transporters was not addressed in the Malin Report, Smith testified that he agreed to a point. While he did not necessarily agree that there had been a hydraulic malfunction, manipulating the trailer hydraulics thereby "using up" their remaining stability would cause them to tilt which, in turn, would cause the barge to rapidly heel and this would be have been enough to send the transporters over.

[239] As to the contributory factors listed in the Malin Report, as contributing to the loss, Smith testified these were all small elements in and of themselves, but when taken together they tended to exaggerate or accentuate the reduction in the barge stability as well as having effect on the stability of the transporters.

[240] In essence, what Smith is saying is that although the "SPM 125" had sufficient stability, it was susceptible to a list caused by small deviations off the centreline. Such a list, in and of itself, did not cause either the barge or the transporters to exceed their respective transverse stability limits. However, every degree of barge list reduced or "used up" the transporters' transverse stability by the same amount. However, Smith also accepted that prior to T2 toppling, the "SPM 125" had not listed to 6 degrees thereby exceeding T2's transverse stability limit. Therefore, there had to be other contributing factors that led to the remaining transporter stability being overcome.

[241] In my view, what differentiates Smith's cause of loss analysis from the other experts is, essentially, the role that he ascribes to a barge list caused by an off centre load. Smith was of the opinion that the barge had a port list that should have been apparent and, at that point, the persons involved should have stopped the loadout, discussed the situation and worked out the best course of action. Failing to stop and do so ran the risk of the barge heeling sufficiently that the transporters would topple and fall into the sea.

[242] However, as I have found, a discernable port barge list was not noticed until T2 was fully on board. Thus, in response to Siemens' and Malin's allegations that JDI personnel should have stopped the loadout, the question is whether JDI personnel and Bremner knew, once T2 was on board, that the cargo was at risk to such a degree that it would probably be lost but decided to proceed in any event.

[243] In this regard, I refer to the BMT Report. This was based on notes made by Hamilton contemporaneously with the loadout and was issued on November 6, 2008. In his report, Hamilton recorded the time of the commencement of the loading of T1 and the time that each axle was loaded on. He did the same for T2 which he noted as on board at 1110 hrs. He recorded that at approximately 1115 to 1120 hours the deck of T2 was being manipulated, as described above, and the incident occurred. The report makes no reference to a prior barge list.

[244] In his October 15, 2008 email to Siemens (Exhibit 19), Hamilton stated that at approximately 1120 hrs T2 was being adjusted by the JDI senior rigging engineer when it began to tilt the load to the port side "Very quickly (within seconds) the turbine wheel and transporter

began to roll to port and went overboard. The barge took a heavy list to port and the unit on the bow went overboard which apparently caused the unit on the stern to topple. The turbine wheel went overboard, but the Scheuerle transporter remained on the deck on its side". There was no reference in that email to a pre-existing barge heel. Hamilton also stated that, while at the time of writing it was not possible to be categorical about the cause of the failure, given the way that T2 appeared to lift rapidly on one side, he was inclined to think that a hydraulic valve/switch stuck in some manner, "The loading had proceeded in a normal manner with nothing untoward noted. From the first visible indication that something was not going well to the unit tipping over and off the barge took maybe 10 seconds".

[245] The testimony of McLaughlin, Malcolm and Jeff Mazerolle confirms the account provided in Hamilton's report. They all recall a very short time period, from the time that T2 was fully on the barge and McLaughlin making adjustments, to the uncontrolled heeling of T2 which led to loss of the cargo.

[246] Two things arise from this. First, this description of events is consistent with what all of the experts, including Smith, ultimately concluded. That is, the sequence of events leading to the loss was that the barge was and remained stable, but a number of factors contributed to the transverse stability of T2 being overcome. When that happened, it caused T2 to tilt to port. The starboard side wheels of T2 then lifted off the barge causing the centre of gravity of T2 and its cargo to instantly shift from a few inches off centre to 3' off centre. At this point, the situation was irretrievable. T2 then toppled causing the barge to list which, in turn, caused T1 to follow.

[247] Secondly, there was not a great deal of time between the barge assuming a port list and the loss and, during what time there was, efforts were being made to deal with T2's tilt and any resultant barge list. McLaughlin took measurements while T2 was coming on board, he made adjustments to T2 to address a port lean of that transporter. T2 then moved forward 6' to 8' and further adjustments were made. The loss occurred during that process.

[248] In conclusion, I agree with Smith that there were a number of contributing factors which, in and of themselves, were minimal. These included a somewhat offset cargo load, which, in the worst case scenario, resulted in a 3" starboard offset. Even if the disputed Malin figures are applied, would result in a list of 1.61 degrees. This was not enough to overcome the barge or transporters' transverse stability. Additionally, there was a reduction in the stability of the barge due to the free surface effect caused by the unsealed aft peak tank which served to reduce the barge's GM, but not to the extent of making it unstable. And, most significantly, the hydraulic manipulation of T2's deck which had the effect of raising and moving T2's centre of gravity off centre. I have determined that some combination of these, and possibly other factors, caused the loss of the cargo.

[249] Thus, it is true that if a larger barge had been selected, there would have been a greater margin for deviation off the centreline with a lesser resultant barge heel, and in turn, reduction in the available transporter transverse stability. However, this is insufficient to establish that the "SPM 125" was itself unsuitable for the intended operation. It has been established, and admitted by Smith, that the barge was stable. While a larger barge may have withstood the combination of factors that ultimately caused the loss, the question is whether JDI and/or

Bremner acted recklessly and with the knowledge that by proceeding with this barge the loss of the LP Rotors would probably result.

[250] As to the suggestion of a possible transporter malfunction, I agree with Siemens that the evidence does not support such a finding. However, for purposes of a determination of whether JDI or MMC and Bremner were reckless, it is of no significance. Whether there was operational error in the manipulation of T2, or a malfunction, is not of concern in the context of the Article 4 analysis. Both would be unexpected events.

[251] On one last point as to causation. While other theories and factors were suggested at trial, such as the barge becoming hung up on the wharf or an excess trim of the barge during loading, these were either not supported by the balance of the evidence or were minor contributing factors to the cause of loss that I have identified. I have therefore not included them in my analysis.

[252] Finally, while counsel for Siemens urges me to place more weight on the evidence of its expert, Smith, I decline to do so.

[253] I accept Siemens' submission that the fact that Smith did not execute the required Certificate Concerning Code of Conduct for Expert Witnesses until the day before he gave evidence, and therefore subsequent to the preparation of the Malin Report, does not alone establish that he failed to prepare an impartial report. And I find that, when giving testimony, Smith did so in a straight forward manner.

[254] However, I afford the Malin Report less weight than I do the other expert reports for other reasons. For example, the report states that, based on a statement given by Bremner, only a "quick and dirty" stability check was done to see if the "SPM 125" was capable of carrying both LP Rotors on one voyage. The report states "JDI considered the 'quick and dirty' check as sufficient and this appropriate". However, in preparing the Malin Report, Smith would have been aware that this was MMC's preliminary and qualified email response and that it subsequently generated the stability calculations for its Conditions 1-13. Further, and more significantly, the Malin Report did not attempt to review and assess MMC's stability calculations. And, although it states that a key component in determining suitability of a barge for loading and transporting cargo is calculating how far off centre the cargo may safely deviate without the barge becoming unstable, the Malin Report did not include such a calculation.

[255] The Malin Report also concluded that JDI knowingly selected an unsuitable barge. On cross-examination, Smith stated that the sole basis for this statement was the email from Malcolm stating that he did not have confidence in either the "SPM 125" or the 60' x 90' barge. This again ignores the subsequent stability calculations prepared by MMC.

[256] The Malin Report further states "As McLaughlin acknowledged in discovery, he was coming on blind". On cross-examination, McLaughlin's actual discovery evidence was put to Smith who agreed that McLaughlin, in fact, did not acknowledge that he "was coming on blind". Ultimately, Smith agreed that if, as Jeff Mazerolle testified, T1 was on the centreline and they lined up the centre of the transporter to the centre of the barge, that, from Jeff Mazerolle's point of view, he was not coming on blind as he was aware of the transporter's position.

[257] The Malin Report also states in its assumption section that JDI's crew recognized that the "SPM 125" was small for the job once they arrived at the port and saw it. In this regard, it stated that Jeff Mazerolle believed that the barge was "undersized, small, narrow" and could not handle it and that in his view, if the "SPM 125" was to be used, it "should have been one turbine only". Further, that Adam Shannon, the Dredge Shovel Master for the Harbour Developments, believed the barge was small for the job. However, at trial Smith acknowledged that these references were in fact to the interview notes taken by Harquail, and not transcripts of actual evidence, which Smith had not appreciated until cross-examination at trial. It must also be recalled that the Harquail interviews were conducted after the loss, although that would not be obvious from the Malin Report.

[258] More significantly, in its conclusion the Malin Report states that by ignoring the barge's lack of stability and deciding to proceed without a swept pathway, the personnel involved chose to run the risk of the load moving off the centreline "on a barge that was recognized as too small to begin with" knowing that the cargo could become extremely unstable. However, this conclusion as to the barge size was based on statements made after-the-fact and is not supported by the evidence.

[259] It is for these and other reasons that I afford the Malin Report less weight than those produced by the other experts.

## VIII. Application of Facts to Law

[260] International conventions, as well as the legislation implementing them in Canada such as the MLA, are to be construed in accordance with the *Vienna Convention on the Law of Treaties*, Can TS 1980 No 37 (*Peracomo FCA* citing *Yugraneft Corp v Rexx Management Corp*, 2010 SCC 19 at para 19; *Pushpanathan v Canada (Minister of Employment and Immigration)*, [1998] 1 SCR 982 at para 51) and, when interpreting international conventions, the Court should not be controlled by domestic precedents, but rather by broad principles of general acceptance (*Peracomo FCA* at para 53; *Stag Line Limited v Foscolo, Mango & Company, Limited*, [1932] AC 328; *Goldman v Thai Airways International Ltd*, [1983] 3 All ER 693 [*Goldman*] at 9). This was clearly the approach adopted by the Supreme Court in *Peracomo SCC* and, given that Canada is but one of the signatories to the *Limitation Convention*, by this Court in interpreting Article 4.

[261] A party seeking to break limitation must establish that the loss resulted from:

i. The personal act or omission of the person seeking to limit his liability;
ii. committed recklessly and
iii. with knowledge;
iv. that such loss;
v. would probably result.

[262] Courts in various member state jurisdictions have interpreted these elements of Article 4, and their conclusions help to inform those of this Court.

[263] There is a presumptive right of limitation (*JDI FC* at paras 88, 94 and *JDI FCA* at para 110). This is clear from the wording of Article 2, which states that subject to Articles 3 and 4, the claims listed, whatever the basis of liability may be, "shall be subject to limitation of liability". The creation of a presumption by statute often is in aid of achieving a policy aim and may have the effect of reversing the evidential burden on to the party seeking to rebut the presumption. With respect to Article 4 of the *Limitation Convention*, the jurisprudence interpreting and applying it is consistent in finding that for policy reasons the burden was intentionally placed on the party seeking to break limitation (*The Sheena M* at para 7; *MSC Mediterranean Shipping Co SA v Delumar BVBA and others*, [2000] 2 All ER (Comm) 458 at para 11 [*Rosa M*]; *Daina Shipping* at para 26; *Saint Jacques II* at para 16) and that it is intended to be a very high burden (*Rosa M* at para 13; *Daina Shipping* at para 28; *Saint Jacques II* at para 16; *The Sheena M* at para 8; *Peracomo SCC* at para 23; *Schiffahrtgesellschaft MS 'Merkur Sky' mbH & Co KG v MS Leerort NTH Schiffahrts GmbH & Co KG 'The Leerort'*, [2001] EWCA Civ 1055 at para 18).

[264] The concept of recklessness does not appear to be contentious. Justice Harrington in *Société Telus Communications v Peracomo Inc*, 2011 FC 494 [*Peracomo FC*], overturned on other grounds, stated:

> [85] Recklessness connotes a mental attitude or indifference to the existence of the risk (*Goldman* and *The Rosa M*, above, *Schiffahrtsgeseelschaft MS "Merkur Sky" mbH & Co KG v MS Leerort NTH Schiffahrts GmbH & Co KG (The "Leerort")*, [2001] 2 Lloyd's Rep 291, and *Margolle and Another v Delta Maritime Co Ltd and Others (The "Saint Jacques II" and "Gudermes"*, [2003] 1 Lloyd's Rep 203).

[265] In *Goldman*, as referenced by Justice Harrington, the English Court of Appeal stated "When a person acts recklessly he acts in a manner which indicates a decision to run the risk or a mental attitude of indifference to its existence" (p 10). Recklessness is more than mere negligence or inadvertence and, while it is not necessarily a criminal or even a morally culpable matter, it does mean the deliberate running of an unjustified risk (*Bayside Towing Ltd v Canadian Pacific Railway*, [2000] 3 FC 127 at para 19, citing *Reed & Co Ltd v London & Rochester Trading Company, Ltd*, [1954] 2 Lloyd's Rep 463 (QB); also see *SS Pharmaceutical v Qantas Airways Ltd*, [1991] 1 Lloyd's Rep 288 (Aust CA) at p 291 [*Qantas*].

[266] And as noted by the Supreme Court of Canada at paragraph 24 of *Peracomo SCC*, the contracting states to the *Limitation Convention* expressly rejected the inclusion of gross negligence as a sufficient level of fault to bar limitation of liability.

[267] Recklessness is assessed on a subjective standard (*Connaught Laboratories Ltd v British Airways*,(2002) 61 OR (3d) 204 (ONSC) at para 56 [*Connaught*]; *Goldman* at 699; *Rosa M* at para 14; *Nugent v Michael Goss Aviation Ltd*, [2000] 2 Lloyd's Rep 222 at 227 [*Nugent*], *Peracomo SCC* at para 24). However, as stated in *Rosa M*, absent any allegation of intent, the person challenging the right to limit must establish both reckless conduct and knowledge that the relevant loss would probably result (at para 14). While the two are closely related, they "are separate and cumulative; a challenge to the right to limit will fail if (for instance) only recklessness but not knowledge is established" (*Saint Jacques II* at para 16; *Nugent* at 227).

[268] In reliance on *Goldman*, which concerned the interpretation of s 25 of the Warsaw Convention for the Unification of Certain Rules Relating to International Carriage by Air, 1929, ("*Warsaw Convention*"), the Court in *Rosa M* held that knowledge means actual and not constructive knowledge (at para 15). The Court then went on to discuss the interconnection between material supporting an allegation of recklessness and material supporting knowledge that damage would probably result as addressed in *Nugent*, which also concerned s 25 of the *Warsaw Convention*, quoting the following from that decision:

> I take for the purpose of analysis Lord Diplock's *Caldwell* (*R v Caldwell* [1981] 1 All ER 961. [1982] AC 341) and *Lawrence* (*R v Lawrence* [1981] 1 All ER 974, [1982]AC 510) definition of recklessness, an obvious risk of damage and failure to give any thought to the possibility of it or recognition of the risk and going on to take it. Adding a further ingredient, as in art 25, of knowledge of the probability of damage may or may not, depending on the obviousness of the risk, add much to the task of inferring that a carrier recognized the risk and went on to take it. The greater the obviousness of the risk the more likely the tribunal is to infer recklessness and that the defendant, in so doing, knew that he would probably cause the damage. As a matter of proof the two will often stand or fall together…

[269] The Court in *Rosa M* went on to state that while it was accepted in *Nugent* that *Goldman* had established that knowledge does not include constructive knowledge, that is, something that the relevant person ought to have known, at the trial level it had been suggested that some form of background knowledge could be relied upon. However, that was rejected by the Court of Appeal, Auld LJ stating for the majority that "… the additional ingredient is actual knowledge, in the sense of appreciation or awareness at the time of the conduct in question, that it will probably result in the type of damage caused. Nothing less will do".

A. *Recklessness and knowledge*

[270] Based on the evidence described above, I have concluded that JDI and MMC personnel did not act recklessly and with the knowledge that, by either conducting the cargo move using the "SPM 125" or continuing with the loadout after determining that the aft peak tank was not longitudinally divided and in the absence of a swept path plan, the loss of the LP Rotors would probably result.

[271] The selection of the "SPM 125" was not reckless as its suitability and stability were established by MMC's calculations and, therefore, JDI and MMC did not know that undertaking the movement of the LP Rotors using that barge would probably cause the loss of the cargo. The AMA calculations also establish that the "SPM 125" was stable when the GM was corrected to reflect the increased free surface effect resulting from the undivided and not pressed up aft peak tank. Nor did the JDI and MMC personnel know that a combination of factors, including: a slight cargo offset off the centreline; a reduced GM due to the free surface effect caused by the open aft peak tank manhole covers; and, most significantly, the mis-operation or malfunction of T2's deck, would, in combination, result in a circumstance from which the loss of the cargo would probably result.

[272] Further, during the course of the loadout, the participants took steps that they believed would ensure the safe loading of the cargo. Such steps included use of the longitudinal under deck structure as references to centreline; taking measurements to confirm that the transporters were being loaded on the barge centreline; and, stopping T2 twice and making adjustments to

address tilting of that transporter. The participants did not notice a barge list until immediately prior to the loss and the immediacy of the loss after the final manipulations to T2's deck precluded any further actions in that regard.

B. *Inferences*

[273] Siemens acknowledges that it bears the legal onus of proving recklessness and knowledge. However, it submits that both recklessness and knowledge can and should be inferred based on circumstantial evidence. Siemens also takes the position that JDI bears an evidentiary burden to explain what caused the loss of the cargo. This is premised on the assertion that, in this case, the evidence was exclusively in the possession and control of JDI.

[274] According to Siemens, this evidentiary burden is reflected in JDI corporate policies. It points to the JDI Project Safety Management Plan prepared for the Siemens project. Section 8.0 of that plan states that all incidents and accidents are to be reported, documented and investigated with a focus on root cause, not blame, so that steps can be taken to prevent reoccurrence. Yet, the JDI Accident/Incident Report Form, marked "Prepared at the Direction of and For Legal Counsel", does not identify a root cause. Siemens asserts that, because the Harquail Notes reflect a "cognitive awareness" on the part of JDI employees that the barge was too small and because the barge had listed and had been observed to have listed throughout the loadout, the Court should infer that JDI called a halt to its investigation because it did not like the early findings.

(1) *Inference of knowledge that barge was too small*

[275] Siemens argues that this Court may properly infer that Malcolm, McLaughlin and Bremner recognized that the "SPM 125" was small for the job, given the reactions of Hamilton, J.K. Irving, Singleton and Jeff Mazerolle, all of whom formed the impression that the barge was too small, as evidenced by statements recorded in the Harquail Notes. Siemens submits that, given these reactions, it is likely that Malcolm, McLaughlin and Bremner had "similar misgivings".

[276] In my view, the idea that the barge was known to be too small is effectively disposed of by my earlier finding that the barge's stability was sufficient for the intended operation. However, to determine if an inference should be drawn that JDI and MMC personnel knew that the barge was too small prior to the loadout, it is necessary to first consider the evidence concerning the size of the barge.

[277] In his testimony, Malcolm acknowledged that he had not been involved with a roll-on operation with a load of the same characteristics as the LP Rotors on a barge the size of the "SPM 125". However, he stated that each load is unique and, for the most part, the loads that Irving Equipment had handled were much bigger and heavier than the rotors. He also acknowledged that the margin of error in moving the generator off the centreline of the "Pugwash" was not a concern, which was a function of the size and weight of that barge as compared to the weight of its cargo, the generator. Further, that the ratio of cargo weight to lightship was much higher when utilizing the "SPM 125" to move the LP Rotors.

[278] However, Malcolm also testified that leading up to October 15, 2008 he had no concerns about the "SPM 125" as to size. He further testified that prior to, and on October 15, 2008 before the incident, no one expressed any reservations to him as to the size, suitability or condition of the "SPM 125", this included Bremner, Hamilton, McLaughlin, the Mazerolles and Singleton.

[279] Bremner testified that he was satisfied that the "SPM 125" was suitable for the planned move, he had no concerns about the size of the "SPM 125" with regard to the intended load and he knew that JDI relied on his advice as to suitability.

[280] McLaughlin testified that he had no concerns with the size of the "SPM 125" for the intended cargo or about carrying two rotors at once. Further, that he had no concerns about the appearance of the "SPM 125" when he saw it for the first time on October 14, 2008. He testified that Ron Mazerolle, Jeff Mazerolle, Singleton and Arsenault were in attendance at a tool box meeting held on the morning of October 15, 2008 to discuss the sequence of events for the move. No concerns were expressed at that time about the move nor were any comments made about the size or condition of the barge or the way it looked. McLaughlin testified that he had no concerns other than those normal to any work plan.

[281] Singleton testified that on the morning of the loadout he attended the tool box meeting to discuss the move of the LP Rotors. No issues or concerns were raised at that meeting and he felt good about the move, nor were there any concerns when T1 was driven on to the barge. As T2 started to come on he had a "bit of an uneasy feeling, the barge shifted a bit towards the tug".

When asked on cross-examination about his interview with Harquail including the entry in the interview notes "felt like barge could not handle it - past moves, it felt more stable", and if he recalled telling Harquail that, in his experience, it felt like the barge couldn't handle the load, Singleton testified that he didn't know if he used those exact words but that he had commented to Harquail that the barge looked small compared to prior moves. However, when asked whether he thought the barge was too small and whether the size had caused the cargo loss, he testified that he was "not an expert with loading stuff on barges" nor a "marine expert". At the time he had the "feeling" that the barge was too small.

[282] I note that Singleton is by trade a master mechanic. And, as he himself pointed out, he has no expertise in loadouts or maritime matters. It must be recalled that what he expressed after the incident was his feeling which, although it may have based on other loadouts, he has no seagoing experience or expertise in ship stability. Thus, while I accept that he expressed what he felt immediately after the incident, I give it little weight when determining if, in fact, the barge was too small. Moreover, as Singleton did not express any such concern prior to the loss, this feeling was not known to the other JDI personnel or to Bremner. An after the fact reaction cannot form the basis of an inference that JDI and MMC or Bremner knew the barge was "too small".

[283] On cross-examination, Jeff Mazerolle testified that he felt confident about the move before it started. The Harquail Notes of his interview were put to him. He recalled being interviewed but when asked if the notes accurately recorded what he said to Harquail, he testified that he did not remember a lot as he was still in shock when he was interviewed. He did not

recall, one way or the other, telling Harquail that the barge was narrow and could not handle the load or that it was undersized, small, narrow, nor that there should have only been one rotor on the barge, but agreed that the list to port was fast. He stated that the interview was right after the incident and he was pretty wound up at the time.

[284] Thus, as to Jeff Mazerolle's evidence, he could not recall the content of the Harquail interview and, in any event, his comments were made immediately after the incident. Further, Jeff Mazerolle is a crane operator by trade and has no maritime expertise. Therefore, I place little weight on this evidence for purposes of establishing that the barge was too small and that this was known to JDI or MMC and Bremner, nor can it support an inference to that effect.

[285] Hamilton testified that prior to October 15, 2008 he had no concerns about the planning for the move. On the morning of October 15, 2008 he attended in Saint John and recalled speaking with Malcolm and Bremner generally about the move, he did not recall any issue or concerns. No one raised any concerns with him prior to the move nor did he have or express any concerns about its planning. On cross-examination, he testified that if anything had been going on that was going to jeopardize the cargo, he would have spoken up.

[286] He also agreed that when he saw the "SPM 125" and the loaded transporters he thought that this was a big load for a barge of that size, informed by the beam of the barge and the height and weight of the cargo. When it was put to him that this was his "gut impression", based on his experience, he also agreed. When asked if, based on his experience and these factors, his "gut

impression" on the morning of October 15, 2008 was that the barge was pretty small for the load, he stated that "It was smaller than one would have hoped, yes".

[287] Thus, while Hamilton may have had a "gut feeling" that the barge was small for the intended purpose, I find that he did not express that concern to anyone prior to the loss. As he described his role on October 15, 2008, it was to be the eyes and ears of AXA and Siemens, he was on site to look out for cargo interests. Hamilton had 33 years of experience as a marine surveyor when he took on this assignment. His mandate from AXA specifically included approving the "SPM 125", prior to the loading, for suitability. When he inspected the "SPM 125" he issued recommendations for the tow which included that the loading of the LP Rotors was to be approved by the attending surveyor, which was him. I have absolutely no doubt that if Hamilton had any real concern as to the size of the "SPM 125" for the job he would have expressed this and required JDI to satisfy him that his concerns were unwarranted. Indeed, his evidence was that he would have spoken up if he thought the cargo was being jeopardized.

[288] As I have found, based on the evidence previously discussed in these reasons, there is no doubt that JDI would have preferred and would have used a larger barge if a suitable one had been available. But this does not establish that the "SPM 125" was too small for the intended purpose. And, importantly, there is simply no evidence that anyone involved in the move expressed any concern that the barge was too small for the intended move prior to the loss. Rather, the evidence of all of the witnesses is consistent that no concerns were expressed as to the size or suitability of the "SPM 125" prior to the incident. In fact, MMC had provided stability condition calculations to JDI prior to the commencement of the loadout which did not

indicate any stability concerns nor that the "SPM 125" was not suitable for the intended cargo move. Nor does the evidence support Siemens' suggestion that lists of the barge were observed throughout the loadout.

[289] I would also note that while Siemens suggests that the ratio of lightship to cargo weight, or perhaps the appearance of the size of the cargo in comparison to the "SPM 125", is indicative of the "SPM 125" being too small, its expert, Malin, was not asked to opine on this. And, as discussed above, Smith acknowledged at trial that the barge would not be unstable as loaded.

[290] For these reasons, I do not accept that the Harquail Notes or the direct evidence of the witnesses reflect an awareness by JDI or MMC personnel that the barge was too small. And, because inferences must arise from proven facts and go beyond speculation or conjecture (*Caswell v Powell Duffryn Association Collieries Ltd*, [1940] AC 152 at 169-170; *R v Morrissey*,(1995) 22 OR (3d) 514 (ONCA) at para 52; *R v White*, (1994) 130 NSR (2d) 143 (Nfld CA)), I therefore decline to infer that Malcolm, McLaughlin and Bremner had concerns that the "SPM 125" was too small for the intended purpose.

[291] As to JDI's investigation, the evidence of Wayne Power, Vice-President of the transportation and logistics group of JDI, was that JDI did not conduct a formal investigation. Because Transport Canada was conducting an investigation, the matter was immediately referred to JDI's legal department which then took over the investigation. However, JDI also engaged Martin Ottaway after the incident to investigate the cause of the loss. It is true, as Siemens asserts, that Martin Ottaway did not interview the personnel involved in the incident and instead relied on the documents provided to it, including the Transport Canada Report and the transcripts

of discoveries which were conducted after 2014. And, clearly, JDI could have done more to document its own investigative efforts. However, in my view, the evidence does not support the making of an inference that JDI called a halt to its investigation because it did not like its early findings.

(2) *Inference of recklessness and knowledge based on evidentiary gap*

[292] Siemens also submits that because a root cause investigation was not conducted, an evidentiary gap exists. And, in situations where information to explain why and how a loss occurred is solely within the control of the party seeking to limit its liability, that party has an onus to make that evidence available. Should it fail to do so, then the Court should make good use of its power to infer and rely on circumstantial evidence. Further, Siemens argues that where a risk is obvious or known to the individual in question, the Court is more likely to infer that the individual knew that the risk would result in damage. For these reasons, Siemens submits that both recklessness and knowledge can and should be inferred based on the circumstantial evidence.

[293] Siemens relies primarily on *Connaught* and *Nugent* to support its position that the Court should infer the requisite levels of recklessness and knowledge. For the reasons that follow, in my view these cases are distinguishable from the present case.

[294] *Connaught* concerned the carriage by air of four cartons of perishable vaccine which were damaged as a result of a lack of refrigeration by the carrier. The carrier sought to limit its

liability pursuant to Article 25 of the *Warsaw Convention*, the wording of which is similar but not identical to Article 4 of the *Limitation Convention*.

[295] The Court in that case concluded that the relevant authorities overwhelmingly led to the conclusion that a subjective test must be applied in determining the applicability of Article 25 (at para 56).

[296] It then went on to apply the test to the facts and held that:

> [58] The onus is on Connaught to prove that the failure of British Airways to refrigerate the cartons in London went beyond carelessness or negligence, and amounted to recklessness. Further, Connaught must prove that British Airways had actual knowledge that the failure to refrigerate the cartons would probably result in damage. (See *S.S. Pharmaceuticals v. Qantas, supra*, at p. 291.)
>
> [59] Connaught has established the cartons were clearly marked with a warning that their contents were perishable and required storage at temperatures between 2 degrees and 8 degrees C. Connaught has also established that British Airways failed to refrigerate the cartons in London, that they were exposed to temperatures in excess of 8 degrees C, and that damage resulted. Clearly Connaught has established negligence by British Airways. The question, however, is not whether there was negligence, but, rather, whether the conduct of British Airways was reckless. **Did British Airways direct its mind to the requirement of refrigeration and decide to leave the cartons unrefrigerated anyway? Further, in making that decision, did British Airways have actual knowledge that the goods were likely to be damaged as a result?** Connaught has not presented any direct evidence in answer to either of these two questions. **However, its difficulty in doing so is a direct consequence of the failure of British Airways to identify the person or persons who handled the goods in London or to present any explanation as to why they were placed in the warehouse rather than in the available refrigeration unit.**
>
> [60] Connaught gave notice of its claim to British Airways within a matter of days. British Airways took no steps to investigate or preserve evidence until two years later when the

statement of claim in this action was delivered. Given the large volume of cargo that moves through London's Heathrow airport, it is perhaps not surprising **that British Airways was unable to find the relevant information two years after the fact.** Connaught gave timely notice. **If British Airways had made the appropriate inquiries in a timely manner, there is good reason to believe that directly relevant information as to what happened would have been forthcoming.** There is no reason to believe anything to the contrary as British Airways had a sophisticated computer system for tracking cargo. No evidence was presented at trial to suggest the relevant information could not have been obtained if British Airways had looked for it earlier.

[61] In my opinion**, it is appropriate in these circumstances to draw an adverse inference from the failure of British Airways to call any evidence as to why the cargo came to be stored in the manner it was.** This was information solely within the power of British Airways to obtain, and it has not put forward any acceptable reason to explain its absence. The protection afforded to air carriers under Article 25 of the Convention is considerable. In the face of prompt notice of a claim in respect of this cargo, and bearing in mind the provisions of Article 25, it is not acceptable for British Airways to have done nothing to obtain the information relevant to Article 25 and then take the position that the plaintiff has failed to meet the Article 25 test.

[62] It must also be noted that the requirement of proving actual knowledge under a subjective test does not carry with it a requirement that the knowledge be proven by direct evidence. **In some cases, the risk of damage is so obvious that it can be inferred.** This point was made by the United States Circuit Court of Appeals in *Saba v. Compagnie Nationale Air France*, *supra*. Silberman J. writing for the majority, held at p. 669 (referring to an earlier decision of the court in *SEC v. Steadman*, 967 F.2d 636, 641 (D.C. Cir. 1992)):

> Steadman, instead, required that the actor also know of the danger to buyers or sellers or that the danger was so obvious "the actor must have been aware of it." In other words, if it can be shown that a defendant gazed upon a specific and obvious danger, a court can infer that the defendant was cognitively aware of the danger and therefore had the requisite subjective intent. Intent can, of course, always be proved through circumstantial evidence. That is by no means the same as saying the defendant should have known the danger . . .

> [63] **In the case before me, there is no direct evidence available as to the state of mind of the persons who handled the cargo in London.** However, the requirement of refrigeration was clearly marked on the packages and on the waybills, and they were labelled as perishable. Refrigeration was available in London but not used. It is obvious that perishable goods requiring refrigeration will probably be damaged if they are not refrigerated. In my view, this gives rise to the inference that British Airways personnel **deliberately** took the risk of the damage. **At the very least, it gives rise to circumstances requiring some response from British Airways and no explanation has been provided. This supports the drawing of an adverse inference against British Airways**.
>
> [emphasis in bold added]

[297] The Court in *Connaught* went on to state that the evidence required to demonstrate either scenario would have been within the knowledge of the defendant (through its employees), not the plaintiff. In those circumstances, it was entitled to and did draw the inference of greater fault (at para 66). The decision was upheld on appeal (*Connaught Laboratories Ltd v British Airways*, (2005) 77 OR (3d) 34 (ONCA)).

[298] In my view *Connaught* is distinguishable from the matter now before me. This is not a situation where JDI has failed to present direct evidence. Rather, JDI called as witnesses most of the persons directly involved in the loadout: Malcolm, the project manager; McLaughlin, the senior rigging engineer; Singleton, the transporter mechanic who assisted Jeff Mazerolle, who operated T1; and, Jeff Mazerolle. JDI also explained that Ron Mazerolle was not called due to illness. JDI tendered the expert report of Martin Ottaway and called van Hemmen to give expert testimony. JDI tendered the expert report of AMA and called Poulson and Murphy to testify. Even though BMT and Siemens had reached a settlement prior to trial, JDI called Hamilton, AXA and Siemens' on site marine surveyor, and tendered the Randall Report and called its

author, Randall, as an expert witness. For its part, MMC called Bremner as a witness. These witnesses spoke to the issue of the selection, suitability, size and/or stability of the "SPM 125", the events leading up to the loss and their state of mind. In addition, there were thousands of pages of document disclosure. JDI explained why it selected the "SPM 125" and its experts, as well as BMT's, gave opinions as to the cause of the loss. The wealth of direct evidence put forward by JDI in this case distinguishes it from the evidentiary vacuum faced by the Court in *Connaught*.

[299] Given this, my role is primarily to assess the credibility of those witnesses and to weigh that evidence when determining if there was recklessness with actual knowledge that the loss of the cargo would probably result. Given the availability of direct evidence for that purpose, it is not necessary to draw the adverse inferences that Siemens requests.

[300] And, although Siemens argues that JDI failed to pursue an incident investigation and that the evidence was solely within its control, I am satisfied that through witness and document discovery and the trial processes Siemens was able to pursue the evidence that it required to attempt to prove its case. Indeed, based on the information available to it prior to trial, it instructed Malin, who generated a lengthy report which included conclusions as to cause. Malin does not identify any informational gaps that hindered its analysis. Thus, it was not an unavailability of evidence that precluded Siemens from establishing that limitation should be broken. And, while JDI's internal investigation could, no doubt, have been more comprehensive, in these circumstances the failure to identify a root cause does not result in an evidentiary gap. Indeed, as seen from all of the expert reports and as heard in their testimony, there was no

singular cause of the loss. As is likely the case in many casualty investigations, here there were a number of factors which individually would not have caused the loss but, together, in some combination, were sufficient to do so.

[301] The Court in *Connaught* referred to *Saba v Compagnie Nationale Air France*, (1996) 78 F 3d 664 (USCA, DC Circ) [*Saba*] which, in turn referred to a prior decision of the same Court (*SEC v Steadman*, (1992) 967 F 2d 636 (USCA, DC Circ)) that dealt with the Court's ability to infer "cognitive awareness", and therefore subjective intent, in a defendant who "gazed upon a specific and obvious danger" (at 669).

[302] It is notable, however, that *Saba* overturned the lower Court's decision, finding that there was insufficient evidence to justify an inference of "subjective awareness". The Court found:

> We think our dissenting colleague both misreads precedent — particularly *Steadman*— and our opinion to conclude that the concept of reckless disregard which meets the subjective standard is satisfied by merely showing an extreme departure from standards of ordinary care. Dissent at 672-673. That would be nothing more than gross negligence. *Steadman*, instead, required that the actor also *know* of the danger to buyers or sellers or that the danger was so obvious "the actor must have been aware of it." In other words, if it can be shown that a defendant gazed upon a specific and obvious danger, a court can infer that the defendant was cognitively aware of the danger and therefore had the requisite subjective intent. **Intent can, of course, always be proved through circumstantial evidence. That is by no means the same thing as saying the defendant *should* have known about the danger which is the essential difference between the district court and the dissent's analysis and our own.** In this regard, the dissent is exactly correct that we read the Warsaw Convention to limit liability in "situations where a 670*670 reasonable employee should have but did not understand that her actions posed a substantial risk of harm to a shipper's goods." Dissent at 674.
>
> There was no evidence presented in this case that could meet the test of willful misconduct or its equivalent, reckless disregard.

> There was no showing that either Air France or Dynair employees were subjectively aware of serious risks attending packaging the carpets inadequately in violation of regulations or leaving the carpets outside. Saba did show that Air France's packers in Linz failed to pack the carpets according to Air France's regulations. But he offered no evidence that the packers knew that the cargo was likely to be left outside in inclement weather and that the packaging provided would not adequately protect it. **And no evidence was presented that Dynair employees actually expected rain, or knew that if it rained, the packaging provided by Air France, in combination with the heavy-gauge plastic added by Dynair employees (and overlooked by the district court and mentioned only in passing by our colleague), created a grave risk of water damage. Without any such evidence, the inference that Air France or Dynair intended (or recklessly disregarded the high risk of) bad consequences is entirely unwarranted**, and willful misconduct, as a matter of law, is not established
>
> (emphasis in bold added)

[303] In my view, *Saba* is applicable to the present case to the extent that it establishes that, without evidence demonstrating that JDI employees and/or Bremner knew that their actions would probably lead to the loss of the LP Rotors, the inference that Siemens requests this Court to make is unwarranted.

[304] The Court in *Connaught* also referred to *Qantas* in support of its conclusion. That case concerned the carriage by air of cartons of pharmaceutical products which were left on a runway and damaged by rain. The cause of the damage was not in dispute but the carrier sought to limit its liability pursuant to s 25 of the *Warsaw Convention*. The question before that Court was whether the proved facts, the admission of deplorably bad handling of the cargo and the failure of the defendant to call evidence, enabled the requisite inferences to be drawn to bring the case within Article 25. Specifically, that the damage was the result of reckless acts or omissions with

knowledge that damage would probably result, rather than either recklessness without such knowledge or mere gross negligence.

[305] The Court stated that where the inference of greater fault is open on the evidence, it saw no difficulty in drawing that more adverse inference where the defendant failed to call evidence. It cited *Insurance Commissioner v Joyce*, (1948) 77 CLR 39 at 61 for the proposition that where an inference is open and the defendant elects not to give evidence "the Court is entitled to be bold".

[306] In *Qantas*, although the carrier conceded that the damage was the result of acts or omissions of its servants, it called no evidence to explain what happened to the cargo or to account for the way in which it was handled. As stated by the majority, the carrier was content to allow the claimant to do their best to prove what happened to the cargo while it was in their possession and then to argue that, while negligence was proved, the higher degree of fault required by Article 25 was not.

[307] In that regard, the claimant called as a witness one of the carrier's employees whose evidence established that the cartons were clearly marked denoting that they would be damaged by water and that a thunderstorm was forecast. The Court noted that his evidence on cargo handling practice and procedures was far from clear and the opportunity to clarify it was not taken on cross-examination by counsel for the carrier. His evidence did establish, however, that the carrier had an almost invariable practice of leaving cargo, including cargo marked as susceptible to water damage, on the open tarmac. The Court also noted the carrier's leading

hand, who was directly in charge of the cargo, was present in court but was not called as a witness by the carrier.

[308] Based on this, the majority found that it had been open to the trial judge to make the adverse knowledge inference. The carrier's servants and agents unloaded the cargo, moved it to its intended location. They observed the marks, the poor state of the plastic wrapping, that it was raining and that a thunderstorm was likely, but left the cargo in the open without taking the steps that they knew would be needed to protect it. On that basis, they must have known that such deplorably bad handling of the cargo would probably result in damage to it.

[309] As noted by the Court in *Connaught*, in *Qantas* the carrier called no evidence at trial to explain why the cargo had been left on the runway and the adverse inference was drawn from the failure to call this crucial evidence. Again, this is not the circumstance before this Court. JDI did call evidence to explain virtually every aspect of the loadout and its actions before and after, including: why it selected the "SPM 125" and why it viewed it as suitable for the intended operation; why it proceeded with the loadout after the undivided aft peak ballast tank was discovered; the measures it took to keep the transporters on the centreline and describing the manipulations of the deck of T2 prior to its toppling; and, why it conducted its post-incident investigation as it did. On this basis *Qantas* is distinguishable.

[310] Siemens also relies on *Nugent*. That was an appeal from a judgment which, pursuant to Article 25 of the *Warsaw Convention*, limited the liability of the carrier in a fatal helicopter crash. There Auld J. found that neither imputed knowledge nor background knowledge were

sufficient to satisfy the test in article 25 which required nothing less than actual knowledge, in the sense of appreciation or awareness at the time of the reckless conduct that the conduct would probably result in the type of damage caused.

[311] *Nugent* addressed the effect of Article 25 in coupling recklessness with actual knowledge of probable damage (p 7):

> ….Adding a further ingredient, as in art. 25, of knowledge of the probability of damage may or may not, depending on the obviousness of the risk, add much to the task of inferring that a carrier recognized the risk and went on to take it. The greater the obviousness of the risk the more likely the tribunal is to infer recklessness and that the defendant, in so doing, knew that he would probably cause damage. As a matter of proof the two will often stand or fall together, as happened in Goldman…. As so often, practical considerations of what a tribunal is prepared to infer as to a defendant's state of mind may be more determinative than fine matters of principle of what one legal concept adds to another…

[312] Further, at page 9:

> …In my judgment, the additional ingredient is actual knowledge, in the sense of appreciation or awareness at the time of the conduct in question, that it will probably result in the type of damage caused. Nothing less will do.

[313] Dyson J. agreed with this, stating that it is clearly established that knowledge in Article 25 is not imputed knowledge:

> ...It is not sufficient to show that, by reason of his training and experience, the pilot ought to have known that damage would probably result from his act or omission. The test is subjective: see, for example Goldman. Actual knowledge is required, and the question that has been debated before us is whether that is limited to actual conscious knowledge, or whether it also includes background knowledge.

> …
>
> I do not believe that those who drafted art. 25 intended that anything less than actual conscious knowledge would suffice. That is a mental state that is clear and simple to understand. Once one moves away from actual conscious knowledge, uncertainty is introduced, and difficulties of classification will arise…

[314] Siemens, however, relies on the concurring judgment of Pill LJ. He agreed that it is only in an extreme case that a claimant will be able to establish the requirements of Article 25 of the *Warsaw Convention*. However, he took a different approach to knowledge than did his colleagues, stating:

> The court must not impute to the actor knowledge he does not have but neither is it entitled to ignore his fund of knowledge and experience in assessing his knowledge at the material time

[315] Regardless, this did not affect his conclusion and he agreed with Auld LJ that, whichever test of knowledge was applied, it was not possible on the pleadings and other materials before the court to draw an inference that the pilot or his employers knew that damage would probably result from their conduct.

[316] In the context of Article 4 of the *Limitation Convention*, I am inclined to agree with Auld LJ that it is actual, conscious knowledge that is required, and not a background "fund of knowledge". In that regard, I note that the Supreme Court of Canada in *Peracomo SCC* found that because the shipowner in that case did not "actually know" his action would probably result in damaging someone else's property, thus requiring repair, that it was an error to conclude that he intended to cause the loss or was reckless knowing that such loss would probably occur, within the meaning of Article 4 (at para 34). However, in this case, as in *Nugent*, the question is

of no consequence. That is because in this case, as addressed above, it has not been established that any JDI or MMC personnel had subjective knowledge that the loss of the cargo would probably result from their acts or omissions, either in the selection of the barge or at any point during the loadout prior to the loss.

[317] Siemens also refers to the *Saint Jacques II* as an example of a Court refusing summary judgment, holding that it was possible to infer recklessness and knowledge. However, it is important to note that in that case it was conceded that the captain had been reckless in navigating the Dover Straits in contravention of the Collision Regulations, and, that this was sufficient to show knowledge that a collision, either with the particular tanker or some other vessel, would probably result.

[318] What was argued in that case was that the requirements of Article 4 of the *Limitation Convention* were not made out because, as the captain had not been on the bridge in the minutes before the collision, there could be no personal act or omission. Further, although recklessness was conceded, because it was the practice of the fishing vessel to navigate in that fashion then, the more times the captain did so, the less there was any real prospect of inferring actual knowledge that a collision would occur.

[319] The Court noted that only truly exceptional cases would give rise to any real prospect of defeating a shipowner's right to limit liability, however, it found that this was such a case and, for that reason, it should go to trial. The Court noted that this was a navigational practice, in

flagrant breach of the Collision Regulations, directed personally by the captain for commercial reasons and which was conceded to be reckless.

[320] As to the connection between recklessness and knowledge, the Court referred to *Nugent* and its finding that, depending on the obviousness of the risk, the two will often stand or fall together. It found that this was such a case:

> The Claimants' concession, involves a realistic acceptance of the fact that the First Defendants have a real prospect of succeeding in establishing recklessness at trial; underlying this concession is the obviousness of the risk of collision. To my mind, on the facts of the appalling navigational practice here (admittedly) conducted under the personal direction of the First Claimant, coupled with the obviousness of the risk of collision, it would be permissible and open to the court at trial to infer that the First Claimant had, at the time in question, the relevant and actual knowledge that a collision would probably result. It will be recollected that Mr. Saunders accepted (rightly in my judgment) that knowledge of the probability of a collision, whether with the "GUDERMES" or with some other vessel would suffice for Art. 4, at least for the purposes of CPR Part 24. Whether or not a Court would in fact come to such a conclusion as to the First Claimants' knowledge, seems to me to be classically a matter to be resolved at trial.

[321] In this matter Siemens argues that an adverse inference as to recklessness and knowledge should be drawn because the risk was obvious. In my view this position cannot succeed. In that regard, I would note that this is not a simplistic factual circumstance such as *Connaught, Qantas* or *Nugent* where the cause of loss was obvious nor is there an admission of "deplorably bad handling", as in *Qantas,* or recklessness, as in *Saint Jacques II*.

[322] It was not obvious that that the "SPM 125" was unsuitable or too small for the intended purpose; indeed, the MMC stability calculations demonstrated otherwise. While it was known to

all concerned that it was important for the transporters to load on the centreline of the barge and it was obvious that, eventually, if they were driven off centre far enough the barge would list sufficiently to cause the transporters to topple, it was not obvious that a deviation of less than 6" would have that effect and, as I have found, it did not. It was not obvious that a number of factors would act in combination to cause the loss, including a small centreline offset, the reduction of the GM of the barge caused by the increased free surface effect due to failure to seal the manhole covers, and, most significantly, the unanticipated tilting of T2's deck moving the T2's centre of gravity off the centre of the barge.

[323] I also agree with JDI that an inference of knowledge under Article 4 is unwarranted given that, at the time of the incident, JDI and MMC personnel were on the barge working in the immediate vicinity of the transporters. If they had known that the loss was probable, it is unlikely in the extreme that they would have put themselves in harm's way (*Nugent* at 229; *Saint Jacques II* at para 23). As Hamilton reported in his email to Siemens of October 15, 2008, it was a "minor miracle" that no one was injured or killed when the transporters suddenly toppled.

## IX. Conclusion

[324] To succeed in breaking limitation, Siemens was required to prove that the loss resulted from the personal act or omission of JDI and/or MMC, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result. This is a heavy burden that will be met only in exceptional cases. This is not such a case.

[325] Based on the evidence before me, I have concluded that Siemens has failed to prove that any act or omission made by any of JDI's or MMC's personnel was reckless. The evidence does not support a finding that they knew that the "SPM 125" was unsuitable and that they decided to proceed regardless of the risk. And, while Bremner may well have been negligent in failing to consider GZ in his stability calculations and in failing to require the manhole covers to be sealed when he decided to proceed with the loadout by pressing up the undivided aft peak ballast tank, in the circumstances of this case, these omissions were not reckless, nor did they alone cause the loss or create awareness of a risk. Similarly, JDI should have clearly marked the centreline of the barge, but the failure to do so was not reckless given that its personnel took measurements during the loadout and used the barge longitudinals as a pathway. Nor did an off centre load, of the magnitude described by the evidence, alone cause the loss or indicate to JDI personnel that they were running a risk.

[326] And, in any event, Siemens has not established that JDI's personnel or Bremner possessed actual knowledge that the loss of the LP Rotors would probably result. Siemens has not established that the barge was too small for the intended purpose. And, as JDI's personnel and Bremner planned and proceeded with the loadout, the evidence demonstrates that the participants took steps that they believed, rightly or wrongly, would permit its safe and successful completion. JDI and MMC and their personnel did not have actual knowledge that a combination of factors, including the unanticipated manner in which T2 was manipulated, would probably cause T2 to exceed its transverse stability limit and topple, thereby listing the barge to such an extent that the transverse stability of T1 was also exceeded and causing it too to topple and fall into the sea.

[327] Because I have reached these conclusions it is unnecessary to consider the question of whether the loss resulted from JDI or MMC's personal acts or omissions.

[328] Further, as discussed above, there is no dispute that JDI is a "shipowner" as defined by Article 1(2) of the *Limitation Convention* and, thereby, is presumptively entitled to limit its liability for the loss of the LP Rotors. Because Siemens has not established the required reckless and with knowledge element of the Article 4 bar to limitation, I find that JDI is entitled to limit its liability.

[329] As to the question of whether MMC and Bremner, as subcontractors to JDI, are entitled to benefit from the limitation pursuant to Article 1(4), as persons for whose acts, neglect or default JDI, as the shipowner, is responsible, at the commencement of the trial, counsel for MMC and Bremner advised the Court that an agreement between those parties and Siemens had been reached but that a declaration as to the right to limit was sought in any event. Counsel for MMC subsequently advised that, in the event that the Court found that no party was reckless, a finding on MMC's status under Article 1(4) was not necessary. Counsel for Siemens and JDI did not assert otherwise. Although counsel for Siemens argued that Bremner should be considered an agent of JDI for the purposes of Article 4, it made no submissions on MMC's status under Article 1(4). Similarly, although JDI refuted that Bremner was a JDI employee, it made no submissions on MMC's entitlement under Article 1(4). Accordingly, I make no finding in this regard. However, I remain seized of the matter and, should the parties require a decision on that ground, supplementary reasons will be provided.

## JUDGMENT

**THIS COURT'S JUDGMENT is that**

1. J.D. Irving, Limited is, pursuant to the *Marine Liability Act*, SC 2001, c 6, entitled to limit its liability, including with respect to any of its affiliates and any person in its employment for whose act, neglect or default J.D. Irving Limited is responsible, arising from the loss or damage to cargo on October 15, 2008 up to the amount of CND $500,000.00 plus interest to the date of the constitution of the limitation fund.

2. J.D. Irving, Limited shall have its costs.

"Cecily Y. Strickland"

Judge

**FEDERAL COURT**

**SOLICITORS OF RECORD**

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| **DOCKET:** | T-520-10 |
| **STYLE OF CAUSE:** | J.D. IRVING, LIMITED v SIEMENS CANADA LIMITED, MARITIME MARINE CONSULTANTS (2003) INC., SUPERPORT MARINE SERVICES LTD. AND NEW BRUNSWICK POWER NUCLEAR CORPORATION |
| **PLACE OF HEARING:** | TORONTO, ONTARIO |
| **DATE OF HEARING:** | OCTOBER 5-8, 13-16, 19, 22, 2015 |
| **JUDGMENT AND REASONS:** | STRICKLAND J. |
| **DATED:** | JANUARY 22, 2016 |

**APPEARANCES:**

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