IN THE HIGH COURT OF THE REPUBLIC OF SINGAPORE

[1998] SGHC 95

MA No 315 of 1997

Between

GROUNDS OF DECISION

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SML SHIPYARD PTE. LTD. v THE OWNERS OF THE SHIP OR VESSEL â€˜WILSON RUBYâ€™& ANOR

[1998] SGHC 95

MA No 315 of 1997
Warren Khoo L H J
31 March 1998

Judgment:

Cur Adv Vult

1. For the purpose of this trial, two actions, namely, Admiralty in Rem No. 426 of 1996 and Suit No. 1196 of 1996, were consolidated. In the first action, the plaintiffs, who are ship repairers, claimed from the defendants the cost of services and materials provided at their shipyard in Jurong with respect to the defendants' vessel, *The Wilson Ruby*. In Suit No. 1196 of 1996, the defendants in the first action sued the plaintiffs in the first action for loss or damage arising from a fire on the vessel while she was at the plaintiffs' shipyard. The defendants in the first action claimed to have suffered losses amounting to US$4,322,426.14. They also sought a declaration that the plaintiffs in the first action are to indemnify them against any liability for salvage incurred by them in connection with the said fire on the vessel as well as any liability incurred by them to, *inter alia*, the Port of Singapore Authority and the owners of *The Donna Christina*, a vessel which wa s beside *The Wilson Ruby* at the time of the fire. For convenience, the plaintiffs in the first action will be referred to as the

"plaintiffs" throughout this judgment although they are the defendants in Suit No. 1196 of 1996. For the same reason, the defendants in the first action will be referred to as the "defendants" throughout this judgment even though they are the plaintiffs in Suit No. 1196 of 1996.

2. On 18 January 1996, the defendants sent *The Wilson Ruby* to the plaintiffs' shipyard for repairs to be effected. The vessel, an LPG carrier, was then out of class and repairs were intended to put her back into class. In the main, the plaintiffs were asked to undertake the task of steel renewal, overhaul the cargo pumps, cargo tank safety valves, condensers and deep-well cargo pumps, and handle some other mechanical engineering work with respect to, *inter alia*, the tail shaft and propellers. For the work which was done, the plaintiffs submitted an invoice for $786,620.28. To date, this amount has not been paid and the plaintiffs are claiming this sum as well as interest at the rate of 18% per annum on the basis that this was the agreed contractual rate of interest. Apart from this sum, the plaintiffs are also claiming the sum of $350,050.00 with respect to general services rendered after *The Wilson Ruby* was badly damaged by fire on 25 February 1996.

3. During the trial, counsel for the defendants accepted that the sums of $786,620.28 and $350,050.00 claimed by the plaintiffs were due to them. He submitted that the defendants were not obliged to pay the sums claimed because the plaintiffs were liable to the defendants for a much larger amount for the damage and losses incurred as a result of the fire on their vessel. In view of this clarification of the defendants' position, all that is left to be considered, apart from the issue of interest, is whether the plaintiffs are in any way liable to the defendants for the fire which occurred on *The Wilson Ruby* on 25 February 1996.

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Bailment and onus of proof

4. At the outset, the defendants contended that their rights and liabilities and those of the plaintiffs should be determined on the basis that the plaintiffs were the bailees of *The Wilson Ruby* while she was at the shipyard. The advantage sought by the defendants in asserting that the plaintiffs were bailees who failed and/or neglected to take reasonable care of *The Wilson Ruby* is obvious for the position of a bailee was summed up by Atkin L.J. in *The Ruapehu* (1925) Ll.L.Rep. 311, 315 in the following terms:

This bailee has to show that the loss was not occasioned by the absence of reasonable care and skill. This he may do by showing that he took all reasonable precautions, but if he has to admit or is convicted of some act of negligence, then the rule necessarily requires him to show that the loss was not caused by that act or negligence.

5. The plaintiffs countered that for the purpose of considering the question of bailment, it must be noted that while the vessel was at the plaintiffs' shipyard, the defendants had a number of officers and crew on the vessel and they carried out maintenance and repair work. Furthermore, the defendants employed other contractors to carry out specified repairs on the vessel while she was in the shipyard. These other contractors were involved in repairing, among other things, the vessel's auxiliary engines and inert gas system. In the circumstances, the plaintiffs contended that the duty imposed on them with respect to the care of the vessel had been modified. The plaintiffs' contentions are not without merit. After all, in *The Ruapehu* (1925) Ll.L.Rep. 311, 315, Atkin L.J., whose views were relied upon by the defendants, went on to say as follows:

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How far is the position altered by the presence of the owners' servants? I do not think that the rights reserved to the owners to retain the use of the vessel for certain purposes prevents the transaction from being one of bailment; but I think that the principle of onus of proof must in such a case be modified though not destroyed.

In similar vein, in a Canadian case, *The Queen* v. *Halifax Shipyards Ltd.,* D.L.R. (4th) 566, 575, Thorson J. pointed out:

Where a ship has been delivered to a ship repairer for the making of repairs to her, and the ship repairer's possession of her is not exclusive by reason of the fact that the ship's crew remains on board during the course of the repairs as a matter of right and the ship is damaged while undergoing the repairs, the ordinary rule that the onus of proof that the damage was not due to negligence on the part of the ship repairer's employees lies on the ship repairer applies only in cases where the damage originated during the period of working hours when the ship repairer's employees were in charge and does not apply in cases where the damage originated during the period when the only persons on the ship were members of the ship's crew.

6. Although the plaintiffs' approach is preferred, I need not, for reasons which will be evident later on, consider the question of bailment at length. All that needs to be said here is that the question of bailment will be referred to again after the cause of the fire on *The Wilson Ruby* has been determined.

Events on the day of the fire

7. For a better picture of the conflicting views as to what caused the fire on *The Wilson Ruby* on 25 February 1996, the events that took place on board the vessel

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on the day of the fire ought to be mentioned. Evidently, some hot work, which involved the use of an oxy-acetylene cutting torch, was done on board the vessel by the defendants themselves on that day. This was not denied by the defendants, who said that all such hot work ceased by 2.30 p.m. It also cannot be disputed that the defendants' oxy-acetylene cutting torch was defective in that there was no flashback arrestor at the inlet of the cutting torch. This was a serious violation of the Factories (Shipbuilding and Ship-repairing) Regulations. Equally disturbing is the fact that the defendants' hot work was done without authority because under the safety rules in place at the shipyard, hot work, which includes welding, flame-cutting or burning and any other work involving the use or generation of heat or the production of sparks, cannot be done without a permit. No such permit was applied for. The purpose of requiring such a permit is to enable all parties concerned to take adequate safety measures during the duration of the hot work. The defendants must thus, at the outset, be taken to task for failing to apply for a permit for the hot work done by them on the day of the fire and for using a gas cutting torch without a flashback arrestor at its inlet.

Place where the fire started

8. Both the plaintiffs and defendants agreed that the fire started in the gas cylinder room (hereinafter referred to as the "bottle room") of *The Wilson Ruby* and that it spread rapidly from that room to the entire superstructure of the vessel. However, they disagreed on the cause of the fire.

9. Before the different views as to how the fire began are considered, a few words ought to be said about the vessel's bottle room. This is a small storage room where cylinders of gas, including oxygen and acetylene, were kept.

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Oxygen and acetylene were fed from the bottle room to the engine room through fixed pipes in the engine room. The pipe passed from the aft of the bottle room and into the engine room. The bottle room had a door and a port hole. It also had an ordinary air vent as well as a mechanical ventilator. The cowling of the mechanical ventilator was slightly damaged while the vessel was undergoing an inclining or stability test on 16 February 1996. Whether the mechanical ventilator was in a working condition before it was damaged is an unanswered question. What is clear is that the cowling of the mechanical ventilator had not been repaired on the day of the fire.

The plaintiffs' view on the cause of the fire

10. The plaintiffs contended that they were not liable to the defendants for the fire on *The Wilson Ruby* on 25 February 1996 because the fire would not have occurred if the defendants had not undertaken any unauthorised hot work just before the fire started. They pointed out that the cause of the fire may be traced to the defendants' defective cutting torch, which should, as was required by law, have had a flashback arrestor at the inlet. In their view, the defective cutting torch permitted a flashback to occur when it was used just before the fire which badly damaged *The Wilson Ruby* broke out. A "flashback" refers to the movement of a flame backwards through the cutting torch and into one of its gas hoses. In such a case, the flame may even enter the gas cylinder if the flashback arrestor is missing. The plaintiffs submitted that the flashback in question took place in the oxygen gas supply line of the oxy-acetylene cutting torch and that the explosion and fire in the bottle room occurred as a result of the formation and ignition of a flammable mixture of acetylene and oxygen in the oxygen pipeline and in an oxygen cylinder in the bottle room.

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11. The plaintiffs' view on how the fire started is supported by the Ministry of Labour Investigation Report on the fire and explosion at the shipyard. The relevant part of the report, which was issued on 30 August 1996, stated as follows:

Based on the results obtained from the experiment conducted on the oxy-acetylene gas cutting torch and the flashback arrestors ..., it can be concluded that a flashback had taken place inside the oxygen gas supply line of the oxy-acetylene gas cutting torch..... [T]he back fire burnt rapidly back in the oxygen gas supply line. The back fire generated an intensive back pressure inside the oxygen gas supply line and subsequently broke the sinter material and jammed the valve inside the oxygen gas flashback arrestor fitted at the outlet of the gas manifolds located at the wall of the engine room. The back fire also created a blow hole on the gas tubing at the inlet side of the oxygen gas flashback arrestor. The flashback was believed to proceed all the way through the entire oxygen gas supply line and subsequently shattered the oxygen gas cylinder. The powerful explosion had damaged the adjacent gas cylinders inside the gas cylinder storage room. A fire broke out and spread rapidly throughout the entire superstructure area of the vessel.

12. A few words ought to be said about the experiment conducted on the oxy-acetylene cutting torch. This test revealed that the acetylene gas regulating valve and the oxygen gas regulating valve were leaking. Furthermore, the flame of the cutting torch was not smooth and the flame could not be throttled by the regulating valves. These findings helped Mr. Pang Suh Ju, the engineer charged with the task of investigating the fire and explosion in question, to ascertain the cause of the fire. The defendants sought to discredit these test results by pointing to a Det Norske Veritas report in June 1997 on the results of a test on the cutting

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torch, which was conducted at their request. This test showed that the flame torch functioned satisfactorily without any leakage. It must be noted that this test was conducted many months after the fire and, as the plaintiffs' counsel pointed out, there is no guarantee that the equipment was not cleaned before it was sent to Det Norske Veritas. In contrast, the test initiated by Mr. Pang was an independent test on the cutting torch. Admittedly, Mr. Pang could have provided clearer answers to questions asked during cross-examination. All the same, the thrust of his report was not undermined.

13. The conclusions reached in the Ministry of Labour Investigation Report were supported by the plaintiffs' expert witness, Mr. David Robbins, who specialises in the scientific investigation of fires and explosions. He had no doubt that the explosion in the bottle room was due to the ignition of a mixture of acetylene and oxygen within the oxy-acetylene cutting equipment. He stated in his affidavit that there were a number of features in the physical evidence which were significant in this regard. These were the holes present in the oxygen hose in the engine room, the shattered flashback arrestor in the oxygen line, and the fragmented oxygen cylinder. In his view, the first two features indicated that there was a powerful flashback in the oxygen side of the equipment in the engine room while the numerous holes along the oxygen hose indicated that the combustion event within it was close to, or at, detonation speeds. In Mr. Robbins' view, the flashback could only have occurred due to the presence of acetylene in the oxygen line. As for how acetylene got into the oxygen cylinder, he explained that it was relevant that the valves on the blow pipe of the cutting torch were found to be leaking when they were tested. The blow pipe nozzle was partially blocked and the oxygen regulator was found to allow a back flow of gas. If the main valves at the manifold were not closed after the last job, acetylene gas could have passed from the acetylene side of the equipment

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through the leaking valves into the oxygen side of the equipment, and eventually into the oxygen cylinder in the bottle room through the defective regulator. As for how the flammable mixture of acetylene and oxygen was ignited, Mr. Robbins said that there was only one plausible means of ignition. As the oxy-acetylene equipment comprised, in effect, a closed system with only one opening at the nozzle of the blow pipe, ignition could only have occurred at that point when someone attempted to light the blow pipe, prior to commencing further hot work.

14. As for the third feature referred to, namely, the fact that the first oxygen cylinder in the bottle room to explode (hereinafter referred to as "cylinder A") was broken into a large number of small pieces, Mr. Robbins said that this was evidence that the explosion was the result of a flashback which propagated to the oxygen cylinder in question. In contrast, two other gas cylinders in the bottle room had fish-mouth opening fractures while a fourth gas cylinder in the bottle room buckled in and fractured near the bottom section. Referring to cylinder A, Mr. Robbins explained in his affidavit:

The pattern of damage to the fragmented oxygen cylinder is unique amongst the cylinders in the bottle store, and is in any case a most unusual pattern of damage to an oxygen cylinder involved in a fire. The fragmentation into small pieces and the deformation of the two end sections which were recovered is typical of that caused by a detonation type explosion within the cylinder. The manner in which the cylinder exploded cannot, I consider, be satisfactorily accounted for as a result of it rupturing due to external fire attack. In such cases where cylinders are heated and ruptured due to the increase in internal pressure caused by an external fire, the cylinders usually show less destructive, burst-type damage (as that shown by two of the other oxygen cylinders in the bottle store)

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or they may fragment into a small number of large pieces as the internal over-pressure is relieved (as shown by a third oxygen cylinder). The fragmentation of the oxygen cylinder into a large number of small pieces also suggests that the event occurred at a low temperature which cannot be readily explained as an effect of the fire. The pattern of explosion damage to the cylinder cannot, therefore, readily be attributed to an explosion occurring elsewhere in the bottle store.

The defendants' view on the cause of the fire

15. The defendants, who denied that the cause of the fire on *The Wilson Ruby* on 25 February 1996 may be traced to their use of a defective oxy-acetylene torch for unauthorised hot work and to a flashback which reached cylinder A and caused it to explode, took an entirely different view as to how the fire in the bottle room occurred. While the plaintiffs submitted that the damage to the cowling of the mechanical ventilator of the bottle room had nothing to do with the fire, the defendants contended that an investigation into the cause of the fire ought to take into account the fact that the said mechanical ventilator was damaged during an inclining/stability test on the vessel on 16 February 1996. They submitted that after the mechanical ventilator was damaged, the plaintiffs failed to provide proper and adequate alternative ventilation for the bottle room and/or failed to repair the mechanical ventilator in the bottle room in good time. This failure allowed leaking acetylene to accumulate in the bottle room to such an extent that it ignited. To the defendants, it was this fire in the bottle room which heated cylinder A and caused it to explode. As such, they took the view that the plaintiffs were liable to them for the consequences of the fire.

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16. An analysis of the defendants' case will reveal that the defendants alleged the following:

(a) that there was an accumulation of acetylene gas in the bottle room;

(b) that the plaintiffs failed to avert the accumulation of the acetylene gas; and

(c) that there was an ignition of the acetylene gas, which caused the oxygen cylinder to explode.

The defendants' case, in so far as it is based on an accumulation of acetylene in the bottle room, a failure on the part of the plaintiffs to prevent the accumulation of the gas and an ignition of the accumulated gas, is flawed for a number of reasons. To begin with, it has not been established that there had been an accumulation of acetylene in the bottle room as a result of a leakage of the gas. Mr. M. Sivasamy, the chief engineer of *The Wilson Ruby* and its most senior officer, testified that he kept the bottle room door open. Another of the defendants' witnesses, Mr. Deepak Pandit, the defendants' superintendent, said that on a number of occasions, he noticed that the bottle room door was not closed. If the door had been left open and the fact that the room has a natural air vent is taken into account, the probability of an accumulation of acetylene gas would have been rather remote. In any case, if there had been an accumulation of acetylene gas in the bottle room, this would have been noticed by anyone going into the room, and certainly by Mr. Shetty, the fitter who undertook the hot work on the day of the fire. He must have gone into the bottle room on that day to release the relevant valves before he could do any hot work. Mr Shetty did not allege that he noticed an accumulation of acetylene gas in the bottle room on the day of the fire.

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17. Even if there had been an accumulation of gas, it has not been established that the plaintiffs were responsible in any way for the accumulation. The defendants blamed the plaintiffs for the alleged accumulation of gas because the plaintiffs had not repaired the cowling of the mechanical ventilator, which could have got rid of accumulated gas. To begin with, a question arises as to whether the mechanical ventilator was in a working condition before it was slightly damaged on 16 February 1996. The plaintiffs' witnesses, Mr. Ng Ban Kang, an electrical supervisor at the shipyard, and Mr. Mathalikannu James, a ship-repair supervisor at the shipyard, said that although they passed by the bottle room frequently, they had never heard the motor of the mechanical ventilator running. Mr. Mathalikannu James' evidence was as follows:

Q. Did you test whether the fan was working after the damage?

A. No. I was told by Chiang [the project leader] to look first. It was slightly tilted. Since it was a small dent, do we need to repair? Chief engineer of the ship told me to just fare it. I did not see that the fan was working at that time.

Q. How did you know that it was not working?

A. Because I did not hear any noise. The chief engineer went with me to see it together. I told him it could not be repaired on the site. He said you leave it as it is and I will talk to Pandit [the superintendent] whether it needs to be repaired or leave it as it is.

18. Furthermore, Mr. Ng Ban Kang said that it was evident from the photographs of the mechanical ventilator that it was in a poor condition. In fact, he was not sure if it could have worked before it was damaged. Another witness, Mr. Chiang Cher Moh, who went on board the vessel daily as he was the project

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leader in charge of the repair project, also shed some light on the condition of the mechanical ventilator. He explained that the delay in repairing the mechanical ventilator was due to the fact that the internal parts were so very badly corroded that he waited for confirmation on whether it should be repaired or renewed. The following paragraph from his affidavit shows just how much Mr. M. Sivasamy, the defendants' chief engineer, knew about the working of the mechanical ventilator:

On 17 February 1996 morning, I called the chief engineer to determine whether the fan motor was working before the damage as I was concerned that the Owner may make a claim against the yard. The chief engineer himself was not sure. I asked him to switch on the fan motor to check but he was unable to find the switch.

19. Apart from the fact that it is not clear whether the mechanical ventilator was in a working condition before it was damaged, a question arises as to whether the defendants were indeed concerned about a possible accumulation of acetylene gas in the bottle room either before or after the cowling of the mechanical ventilator had been damaged. The facts prove the contrary. To begin with, the defendants' chief engineer, Mr. M. Sivasamy, who was the most senior officer on board the vessel, failed to declare that there were cylinders of flammable gas in the bottle room when he submitted a ship's flammable declaration form to the shipyard's safety department on 18 January 1996. More cylinders of gas were brought into the bottle room while the vessel was in the shipyard and the defendants missed yet another opportunity to put the shipyard on notice that there was flammable gas in the bottle room. Having not alerted the plaintiffs in the manner required, Mr. M. Sivasamy nonetheless tried to shift some blame to the plaintiffs when he stated in his affidavit that at a meeting of

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the Vessel Safety Co-ordinating Committee (hereinafter referred to as "VSCC") on 18 February 1996, he emphasised to Mr. Chiang Cher Moh, the project leader in charge of the repair project, "that the flammable nature of the gas in the room made it necessary for the mechanical ventilator to be functional at the earliest". He also said that he reminded Mr. Chiang Cher Moh at a meeting on 19 February 1996 to fix the mechanical ventilator. His evidence is clearly flawed. Apart from the fact that Mr. Chiang Cher Moh denied that the said conversations took place, there was no VSCC meeting on 18 February 1996. Furthermore, Mr. Chiang Cher Moh was already on leave on 18 February 1996 and he did not return to the shipyard until 23 February 1996. As such, Mr. M. Sivasamy could not have reminded Mr. Chiang Cher Moh to have the mechanical ventilator repaired on 19 February 1996.

20. If all the facts are closely examined, it is clear that if there was negligence on the part of anyone, it was negligence on the part of the defendants themselves. If Mr. M. Sivasamy was, as he claimed, very worried about the problem of accumulation of acetylene gas in the bottle room, he certainly failed to take steps to organise the equipment in the bottle room properly or to have the room properly ventilated. Apart from the fact that there were instances of a mixture of left and right-handed threaded fittings for the oxy-acetylene equipment, there was an acetylene cylinder which was painted in the colour usually associated with oxygen cylinders. As for the ventilation of the bottle room, Mr. M. Sivasamy, who claimed that he kept the bottle room door open, did not know that the bottle room had a port hole which could also have been opened. It is evident that if the bottle room door and the port hole had been left open, then cross ventilation and the natural air vent in the bottle room would have prevented an accumulation of acetylene or ensured that it would not have accumulated to the extent alleged by the defendants.

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21. Mr. M. Sivasamy also admitted that he failed to inform Mr. Ravi, the gas engineer, to whom he handed over his duties when he went on leave on 22 February 1996, about the danger posed by a possible accumulation of acetylene gas in the bottle room because the mechanical ventilator had not been repaired. Mr. M. Sivasamy's answers during cross-examination certainly did not help the defendants' case. When questioned, he said:

Q. When you left the ship on 22 February, did you ask the gas engineer to continue to monitor the bottle room for accumulation of gas?

A. Nothing specific about the bottle room except that the shipyard has to repair the mechanical ventilator.

Q. You failed to appoint a safety co-ordinator. You failed to tell anyone about the bottle room when you went on leave. You failed to ensure proper ventilation. If there was an accumulation of gases, you and the persons who took over from you after you went on leave could have prevented it. You accept that.

A. Yes.

22. It must also be noted that if there had been a leakage of acetylene, the defendants were negligent in failing to notice it. Mr. M. Sivasamy conceded that if there was an acetylene leak, any person who went into the bottle room to release the valves so that the cutting torch could be used would have detected it. Another witness, Mr. Jude Illango, the third engineer of *The Wilson Ruby*, who supervised the cutting work by Mr. Shetty, the fitter on the day of the fire, also accepted that he should have checked the bottle room for leakage of acetylene on the day of the fire. When cross-examined, his answers were as follows:

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Q. Having decided to do an illegal act, what steps did you take to ensure that everything was safe; go to the bottle room to check?

A. There was a fire extinguisher nearby and I kept a bucket of water.

Q. Did you go to the bottle room to check if there were leaks?

A. Fitters were cutting regularly.

Q. Should you have checked the bottle room?

A. I should have done that.

Q. You should have ensured proper ventilation in the room. Did you know that the mechanical ventilator was not working?

A. No.

In the circumstances, even if there had been an accumulation of acetylene gas in the bottle room as a result of leakage, the plaintiffs are not responsible for the said accumulation.

23. The third reason why the defendants' case with respect to the cause of the fire is flawed is that even if there had been an accumulation of gas in the bottle room, it has not been established that the cause of the fire which damaged the vessel was the ignition of the accumulated gas. The defendants' expert witness, Dr. Abraham Koshy, who considered and ruled out the possibility of a flashback causing the explosion in the bottle room, said that the key evidence that a fire occurred prior to any explosion in the bottle room was obtained from the results of metallurgical tests conducted on the damaged cylinders from the bottle room.

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He asserted that these tests showed that all the damaged oxygen cylinders had undergone significant changes in their microstructures. In his view, the cause for these changes was a high intensity fire from an external source. Dr. Koshy also relied on hardness tests conducted on fragments of the shattered gas cylinders in the bottle room. According to him, these tests showed that the hardness values of the damaged cylinders were high in comparison to a new unaffected cylinder. The highest value observed on a fragment of cylinder A was 319 Hv on the Vickers scale whereas the average value for a new unaffected cylinder was only 245 Hv. He pointed out that as it was the presence of martensite that significantly increased the hardness of the shattered cylinder fragments, the presence of large amounts of martensite in the oxygen cylinder which first exploded, namely, cylinder A, indicated that it was subjected to heat of at least 840 degrees Celsius and then subjected to rapid cooling and quenching after the explosion. He thus concluded that there must have been a leakage and build-up of acetylene gas before the explosion. As acetylene is a very unstable gas, he suggested that the heat from the sun's rays on the day of the fire could have raised the temperature of the bulkheads of the bottle room to such an extent that the acetylene gas was ignited.

24. Dr. Koshy's evidence is not convincing. To begin with, he submitted two reports on the metallurgical phase changes in the nature of fragments of cylinder A. The first, a report by Det Norske Veritas, did not appear to support his case. When this was pointed out to him, Dr. Koshy sought to rely on the other report by a Dr. Manoj Gupta from the Department of Mechanical and Production Engineering at the National University of Singapore. However, this report does not lend credence to Dr. Koshy's assertions as its thrust was rebutted by the plaintiffs' other expert witness, Dr. Thomas Parry, a metallurgist, who pointed out that the metallurgical evidence from the microstructures of the metal

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samples recovered from the scene of the incident does not support the hypothesis that a fire occurred in the bottle room before the explosion on 25 February 1996. Dr. Parry, who disagreed with Dr. Koshy's assertion that the values of the hardness measured from cylinder remnants were high relative to that of a new unaffected cylinder, said that evidence of the presence of martensite provided no information as to when this phase was formed. All the same, he thought that the most likely explanation for the presence of martensite within the samples examined from, *inter alia*, cylinder A would be that this is an artefact of normal heat treatment received during manufacture. Dr. Parry also pointed out that the principal requirement for the formation of martensite is rapid cooling after it has been heated to the required temperature and he was not sure what was the source of quenching and rapid cooling in Dr. Koshy's scenario. Dr. Koshy replied that the quenching of the fragments occurred when cool air rushed into the bottle room after the explosion. It is difficult to believe that this was the case.

25. Equally damaging to Dr. Koshy's assertions is the fact that the defendants' other expert witness, Mr. Barry Dillon, a metallurgist, supported Dr. Parry's conclusions and disagreed with Dr. Koshy and Dr. Manoj Gupta. Mr. Dillon, who must be commended for his candid and helpful views, pointed out that the microstructure of the fragments of cylinder A that was seen in the reports of Det Norske Veritas and Dr. Manoj Gupta could only have resulted from heating to a high temperature, quenching and tempering. All three processes occurred in that order in a factory and he thought that it was highly unlikely that all these could have occurred by chance during a fire in the bottle room.

26. Dr. Koshy could not explain why there were burn marks in the oxygen hose. In fact, after examining the hose in court, he refused to concede that some of the

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holes in the hose had burn marks even though it was fairly obvious that they did. He explained that heat from the heated cylinders passed into the pipes and softened the oxygen hose. He argued that the holes in the hose were the result of pressure waves travelling down the line, possibly from the exploding cylinders. This argument cannot be countenanced because the first large hole in the hose would have released the pressure and no other holes down the line, or at least not the number found on the hose, would have been created. Equally disturbing is the fact that he could not satisfactorily explain why paint remained on the inside and outside of the neck of the shattered cylinder and why the rubber therein had not melted. If the shattered cylinder had been subjected to heating at 840 degrees Celsius, as alleged by Dr. Koshy, there would have been enough heat at the neck of the cylinder to melt the paint and to char the rubber. Furthermore, the wooden platform, on which the cylinder stood, was quite intact although it was slightly burnt. All these show that there could not have been a fire, and certainly not one of the intensity suggested by Dr. Koshy, in the bottle room before the explosion.

27. As for the argument put forward by the plaintiffs' expert witness, Mr. David Robbins, that cylinder A did not explode as a result of heating from a pre-existing fire in the bottle room because it was broken into a large number of small pieces after it exploded, Dr. Koshy suggested that the fragments of the exploded cylinder A were propelled at very high velocity against the bulkhead of the gas storage room, including the steel door. In his view, the impact from this collision caused a further shattering of the fragments of cylinder A into smaller pieces. That this was the case is most unlikely for as Dr. Parry aptly pointed out, Dr. Koshy overlooked the most obvious effect of heating a pressurised cylinder to a temperature in excess of 840 degrees Celsius. At such a temperature, the steel would be significantly softened and extremely ductile

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and one would, therefore, not expect a cylinder in such a condition to fracture into multiple fragments. In short, the underlying strength of Mr. Robbin's point, namely, that the physical evidence cannot be satisfactorily explained on the basis that there was a deflagration explosion occurring as a result of the accumulation of a flammable gas and air mixture within the bottle store, was in no way diminished by Dr. Koshy's arguments.

28. Reference must now be made to the written report and affidavit of the defendants' other expert witness, Mr. Barry Dillon. Although Mr. Dillon did not agree with Dr. Koshy's views on the significance of the results of the metallurgical tests on the damaged gas cylinders when he was cross-examined, he did say in his report that there was strong evidence that the explosion in the bottle room was that of an oxygen cylinder that had been heated by a pre-existing fire in that room. To be fair to Mr. Dillon, his report must be viewed in its proper context because it had been written without the knowledge that the oxygen hose had burn holes. When the report was written, the hose and the cutting torch were still in the possession of the Ministry of Labour investigators. He accepted, when cross-examined, that had the information regarding the holes in the hose been before him, his conclusion that a fire started first in the bottle room might have been different. He also conceded that having seen the hose and having heard the two conflicting versions as to how the fire started, he thought that the plaintiffs' version, namely, that the fire started as a result of a flashback from the cutting torch was 'possible' if all four mechanisms devised to prevent this from happening, namely, the temperature sensitive valve, the pressure sensitive valve, the sintered metal and the return valve failed.

29. After reading the reports of the respective experts and taking into account their oral evidence as well as the Ministry of Labour Investigation Report on the

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fire and explosion at the shipyard, I have no doubt that the plaintiffs' explanation as to how the fire on *The Wilson Ruby* started is to be preferred. It must follow that someone tried to light the cutting torch just before the fire, which broke out at around 4.15 p.m. No one has admitted that he used the cutting torch at the relevant time and the defendants claimed that the cutting torch could not have been lit because their men completed the repair work which required the use of the cutting torch by 2.30 p.m. All the same, an inference may be drawn from the available evidence that the hot work undertaken by the defendants had not been completed by 2.30 p.m. If the hot work had been completed, the relevant gas valves should have been shut. This was not the case. More significant is the fact that after the fire, the oxy-acetylene gas cutting torch, a spark lighter and a metal plate were found on the floor of the engine room. The cutting torch and spark lighter should have been stored properly if the cutting work had indeed been completed. Under cross-examination, Mr. M. Sivasamy, the chief engineer explained:

Q. Where do you store the ignitor?

A. Put in drawer of the work bench.

Q. Cutting torch?

A. Kept on shelf.

Q. This system was understood by the crew?

A. A technical person like Shetty, the fitter, knows the procedure.

Q. Is it your evidence that Shetty does cutting work and knows the procedure?

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A. Yes.

30. Another witness, Mr. Jude Illango, the third engineer of *The Wilson Ruby*, under whose supervision the fitter, Shetty, carried out the work involving the use of the oxy-acetylene torch on the day of the fire, also claimed in his affidavit that the cutting work had been completed by 2.30 p.m. but his evidence left much to be desired. When cross-examined, his answers were as follows:

Q. On that day, did Shetty tell you he has finished cutting?

A. No.

Q. Why did you say that the cutting work was completed?

A. He did not tell me but I told him he can finish.

Q. Why did he not put the torch back, intermittent valves were open, ignitor there, gas bottle valves were open?

A. I don’t know.

It is thus reasonable to suppose that the hot work undertaken on the day of the fire had not been completed by 2.30 p.m. and that someone lit the oxy-acetylene torch just before the fire occurred.

Whether the plaintiffs’ fire-fighting system was adequate

31. A question arises as to whether the plaintiffs were responsible in any way for the spread of the fire as the defendants complained at length about the fire-fighting arrangements with respect to their vessel. The defendants claimed that

the plaintiffs' fire-fighting arrangements failed to meet contractual requirements because paragraph 2.1.7 of the "conditions of tender", which were handed over to them by the plaintiffs, required the plaintiffs to provide a shore connection to the ship's fire main. That this was not done is not in doubt. The plaintiffs had a system of fire-fighting which is, in their view, superior to a system which is dependent on the flow of water from the shore fire main into a vessel's own fire main. They ran a hose from the shore fire line and left it pressurised all the time on mid-ship. This hose had a Y-breeching, which enabled other hoses to be connected in the event of a fire. Besides this hose, there was another hose which was lapped up at the ship's side near the gangway.

32. The so-called "conditions of tender" referred to by the defendants must be viewed in their proper context. It was prepared by Star Gas Italy on behalf of the former owners of *The Wilson Ruby,* who were then interested in having the vessel repaired. After the defendants purchased the vessel, they asked the plaintiffs to hand them a copy of the document, presumably to see the extent of repairs contemplated by the vessel's former owners. This is the main role of this document. It follows that this document cannot have the effect of requiring the plaintiffs to put into place a system of fire-fighting which was not adopted by them. In any case, if the defendants believed that they had a contractual right to the benefit of another fire-fighting system, it is strange that they did not insist on their rights at an earlier date. They cannot say that they did not know that the shipyard's own fire-fighting system was in place. When the vessel first arrived at the shipyard, the plaintiffs' personnel conducted a thorough safety briefing session with respect to the safety procedures in the yard and its fire-fighting system. The defendants' chief engineer, Mr. M. Sivasamy, admitted that he was aware of the shipyard's fire-fighting system and that he knew that it did not involve connecting water from the shore's main to the ship's fire line. The

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defendants' superintendent, Mr. Deepak Pandit, also testified that he knew from the time he first boarded the vessel in the shipyard that the ship's fire main was not charged by the shipyard's fire line.

33. The defendants also complained that their men tried to connect their hoses to the ship's own fire main and found that it did not work. Why they did this and why they failed to use the shipyard's fire-fighting equipment in the proper manner cannot be understood. Mr. M. Sivasamy, the chief engineer of *The Wilson Ruby*, admitted that he had no fire plan and that he did not have any fire drills. Evidently, he had failed to communicate to his own crew the proper procedures to fight a fire and the plaintiffs cannot be held responsible for the crew's confusion about the fire-fighting system in the shipyard.

Conclusions

34. I now return to the question of bailment, which was referred to earlier on. In view of my findings, I do not have to consider the question of bailment at length. The plaintiffs are right in asserting that for the purpose of considering their duties with regard to the safety of the vessel, account must be taken of the fact that while the vessel was in the shipyard, a large number of her crew were on board for maintenance and repair work and that other contractors had been engaged by the defendants to do repair work. However, even if the defendants are right in asserting that this fact is irrelevant, the plaintiffs have satisfied me that the defendants' loss which resulted from the fire on *The Wilson Ruby* was not occasioned by the absence of reasonable care and skill on their part. A bailee is not an insurer for as Holt C.J. explained in *Coggs* v. *Bernard* (1703) 2 Ld. Raym. 909, 918:

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He is only to do the best he can. And if he is robbed it is a good account. If he receives money and keeps it locked up with reasonable care he shall not be answerable for it though it be stolen.

In this case, the plaintiffs took reasonable precautions and had proper safety procedures in place. Their fire-fighting equipment was in good order. There can be no doubt that the plaintiffs had done the best they could with respect to the safety of vessel while she was in their shipyard. It was the defendants' own personnel who undertook hot work without a permit or proper tools or any regard for safety rules. To allow the defendants to succeed in claiming damages from the plaintiffs would be clearly unjust.

35. It follows that the defendants' claim for damages against the plaintiffs fails and they are not entitled to the declarations sought. As for the plaintiffs, they are entitled to judgment for the sum of $786,620.28 claimed with respect to repairs and for the sum of $350,050.00 claimed with respect to services rendered after the fire.

36. As far as the claim for $350,050.00 is concerned, the plaintiffs are entitled to interest at the rate of 6% from the date of the writ. As for the sum of $786,620.28 claimed with respect to the repairs at the shipyard, the plaintiffs submitted that their standard conditions of contract applied and that they were entitled to interest at the rate of 1.5% per month, or 18 per cent per annum, by virtue of clause 6 of the said standard conditions, which provided as follows:

Unless alternative credit arrangements have been agreed, full payment for work done shall become due on completion of work. Interest at 1 1/2% per month will be charged on accounts overdue for payment.

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The defendants did not successfully challenge the plaintiffs' assertion that the said standard conditions of contract were handed over to them and that these conditions were terms of the contract. Admittedly, the plaintiffs were subsequently prepared to negotiate the terms of payment and to give the defendants credit for 60 days but they insisted that these negotiations, which did not result in any agreement between the parties on credit arrangements, did not affect their right to the contractual rate of interest for any delayed payment. The plaintiffs rightly pointed out that clause 6 of their standard conditions of contract made it clear that unless alternative credit arrangements had been agreed upon, interest was to be paid at the rate of 1.5% per month. The defendants contended that the offer of delayed payment terms by the plaintiffs could be construed as a waiver by the plaintiffs of their right to the contractual rate of interest. However, the question of waiver was not pleaded. Taking all circumstances into account, the plaintiffs are entitled to the contractual rate of interest of 1.5% per month in the case of their claim for $786,620.28.

37. As for costs, the plaintiffs are entitled to taxed costs.

TAN LEE MENG

JUDGE

Warren Khoo L H J

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