IN THE GENERAL DIVISION OF
THE HIGH COURT OF THE REPUBLIC OF SINGAPORE

[2022] SGHC 51

Suit No 1248 of 2019

Between

Sizer Metals Pte Ltd

… *Plaintiff*

And

Chubb Insurance Singapore Limited

… *Defendant*

JUDGMENT

[Insurance — General principles — Claims]
[Insurance — Property insurance — Theft and fraud]

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v
Chubb Insurance Singapore Ltd

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11 March 2022 Judgment reserved.

Tan Siong Thye J:

Introduction

1 The plaintiff, Sizer Metals Pte Ltd, ordered nine shipments of tin concentrate (also referred to as cassiterite) from Excellent Mining Company Ltd ("Excellent Mining"), a company incorporated in Rwanda. The transportation of the first five shipments of tin concentrate was uneventful and these drums of tin concentrate arrived in Penang safely. However, for the sixth to the ninth shipments of tin concentrate, on their arrival in Penang, the contents of the drums were found to have been swapped with iron oxide. The plaintiff had bought insurance coverage for all the shipments from the defendant, Chubb Insurance Singapore Ltd.

2 The present dispute concerns the sole issue of whether the thefts of the plaintiff's tin concentrate in the sixth to the ninth shipments[1] were covered by the insurance policy provided by the defendant. It is undisputed that the thieves swapped the tin concentrate loaded in metal drums with iron oxide for the sixth to the ninth shipments. The plaintiff claims the sum of US$1,154,508.94 or damages to be assessed under the insurance coverage provided by the defendant.[2]

Background to the dispute

3 I shall set out the background facts which are largely uncontroversial.[3]

4 The plaintiff is a company incorporated in Singapore and carries on the business of trading base metals. The defendant is an insurance company incorporated in Singapore.

5 On 16 September 2013, the plaintiff and the defendant entered into Marine Cargo Insurance Policy No 92359646 (the "Policy")[4] under which the defendant would indemnify the plaintiff against any loss, damage or expense arising out of the transit of tin concentrate from Kigali, Rwanda to the port at Dar es Salaam, Tanzania and thereafter to Penang, Malaysia.

6 The salient terms of the Policy were cll 8.1 and 11.1, which I set out below:[5]

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1 Agreed Bundle of Documents ("AB") Vol 1 at pp 54 and 58.

2 Statement of Claim (Amendment No 1) ("SOC") in Set Down Bundle ("SDB") at p 48.

3 Statement of Agreed Facts filed on 16 November 2021 ("ASOF").

4 AB Vol 2 at pp 475 to 498.

5 AB Vol 2 at pp 479 and 480.

> 8.1 This insurance attaches from the time the goods leave the warehouse or place of storage at the place named herein for the *commencement of the transit*, continues during the ordinary course of transit …
>
> …
>
> 11.1 In order to recover under this insurance the Assured must have an insurable interest in the subject-matter insured at the time of the loss.
>
> [emphasis added]

These clauses provide that the plaintiff's tin concentrate would be insured only for the period after the "commencement of the transit" (the "Transit Period").

7 On 15 September 2017 and 30 May 2018, the plaintiff entered into two sale and purchase contracts with Excellent Mining for the purchase of nine shipments of tin concentrate. The contracts referred to the tin concentrate as cassiterite.[6]

8 I pause to set out the various stages involved in the transporting of the tin concentrate from Excellent Mining to the consignee, Malaysian Smelting Corporation Ltd ("MSC") in Penang. This supply chain is undisputed but important to the present case:[7]

> (a) First, approximately 20 to 25 metric tonnes of tin concentrate for each of the affected shipments were procured by Excellent Mining from mines in Rwanda (including its own) and transported to Excellent Mining's premises in plastic bags which were secured with Precintia tags. These bags were then emptied onto the ground and the tin concentrate was mixed. Samples of tin concentrate were collected for

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6 AB Vol 1 at pp 54 and 58.

7 ASOF at paras 8 to 19; Defendant's Opening Statement ("DOS") at para 8; Plaintiff's Opening Statement ("POS") at para 29.

analysis by a representative of Alex Stewart International Rwanda Ltd ("Alex Stewart"). After samples were collected, the tin concentrate was weighed and poured into empty drums through a hole using a funnel in the presence of the Alex Stewart representative. Once the drums were filled up, the holes of every drum (comprising a bung hole and a ventilation hole) were welded shut and sealed with Precintia clips by the Alex Stewart representative, in the presence of a representative from the International Tin Supply Chain Initiative ("ITSCI") and a Mineral Field Officer ("MFO") from the Rwanda Mines, Petroleum and Gas Board ("RMB"). The lids of all drums were then applied with white alkyd paint by Excellent Mining's personnel. The ITSCI shipment number and/or lot number and the addresses of both Excellent Mining and the plaintiff were written on the paint coating. As part of standard procedure, the Alex Stewart representative would take photographs of the sampling, weighing and packing process for record purposes. The sixth to the ninth shipments were sampled and sealed on 17 May 2018, 5 June 2018, 19 June 2018 and 28 June 2018 respectively. While waiting for a report on the samples by Alex Stewart, the sealed drums with the contents were kept in a yard surrounded by a compound wall in Excellent Mining's premises in Kigali, Rwanda. The plaintiff asserts that the compound of Excellent Mining was protected by security guards 24/7 and closed-circuit television ("CCTV") surveillance cameras.

(b) Second, for each shipment, when the drums were ready to proceed to Bolloré Logistics Rwanda Ltd's ("Bolloré Logistics") bonded warehouse (the "Bonded Warehouse") in Kigali, Rwanda, they were loaded into a 40ft container in the presence of the Alex Stewart representative. The loading into the container was done outside the Excellent Mining compound as the compound was not big enough for

the 40ft container. When the drums were loaded into the 40ft container the Alex Stewart representative then affixed temporary seals on the container's doors.

(c) Third, the 40ft container was driven from Excellent Mining's premises to the Bonded Warehouse. This journey took approximately 45 minutes to one hour.

(d) Fourth, at the Bonded Warehouse, the 40ft container containing the drums will clear customs. The temporary seals on the doors of the 40ft container were broken and a further inspection was conducted by representatives from Alex Stewart, Bolloré Logistics and the Rwanda Revenue Authority ("RRA"). After the inspection, the doors of the 40ft container were closed and sealed by the same representatives.

(e) Fifth, after clearing customs, the 40ft container was transported on land from the Bonded Warehouse in Kigali, Rwanda to the port in Dar es Salaam, Tanzania. The journey was 1400km to 1500km long and required overnight stops over several days.

(f) Sixth, the 40ft container arrived at Dar es Salaam and was parked at the Inland Container Depot.

(g) Seventh, in the presence of the representatives of the Tanzania Revenue Authority and Bureau Veritas (Bolloré Logistics' surveyors) the seals of the 40ft container were broken and the drums were inspected by them. Thereafter, the drums were loaded into a 20ft container. The doors of the 20ft container were then sealed in the presence of

representatives of the Tanzania Revenue Authority, Bureau Veritas and the liner shipping company.[8]

(h) Eighth, the 20ft container was loaded on board a ship for a sea journey from Dar es Salaam to a port in Penang, Malaysia.

(i) Ninth, upon arrival in Penang, the seals of the 20ft container were broken in the presence of a receiver who would take delivery of the drums.

9 Under the first sale and purchase contract dated 15 September 2017, the plaintiff was to take delivery of the first six shipments of the tin concentrate at the Excellent Mining premises.[9] This was the point of the "commencement of the transit" within cl 8.1 of the Policy (see [6] above). Thus, it is undisputed that the insurance coverage for the sixth shipment of the 27 drums of tin concentrate weighing 18 metric tonnes started when the tin concentrate left Excellent Mining's premises, *ie*, from the third stage above (at [8(c)]).

10 The second sale and purchase contract dated 30 May 2018 applied to the remaining three shipments of tin concentrate, *ie*, the seventh to ninth shipments. This contract states that the plaintiff was to take delivery as follows:[10]

> Delivery Basis
> FCA Kigali, as per incoterms 2010, customs cleared.

Again, this was the point of the "commencement of the transit" within cl 8.1 of the Policy (see [6] above). From those terms, it is undisputed that the insurance

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8 Defendant's Closing Submissions ("DCS") at para 5(H).

9 AB Vol 1 at p 54.

10 AB Vol 1 at p 59

coverage for the tin concentrate of the seventh to ninth shipments began (on a free carrier basis) upon clearance of customs at the Bonded Warehouse in Kigali, Rwanda. This meant that the Transit Period for the seventh to ninth shipments began from the fifth stage above (at [8(e)]). The details of these shipments are as follows:

(a) For the seventh shipment, there were 30 drums of tin concentrate weighing 20.4 metric tonnes.

(b) For the eighth shipment, there were 36 drums of tin concentrate weighing 22.675 metric tonnes.

(c) For the ninth shipment, there were 40 drums of tin concentrate weighing 25 metric tonnes.

11 In total, under the sixth to the ninth shipments, the plaintiff was to take delivery of 86.075 metric tonnes of tin concentrate in 133 drums. For these shipments, the defendant issued marine cargo insurance certificates.

12 On or around 10 July 2018, the sixth shipment arrived at MSC in Penang, Malaysia. The seventh shipment was delivered to MSC on 25 July 2018. The eighth and ninth shipments were also delivered to the same place in Penang on 6 September 2018.[11] Upon the arrival of the respective shipments, it was discovered that the entire quantity of the tin concentrate had been replaced with iron oxide. Upon inspection by MSC and representatives of both the plaintiff and the defendant, it was revealed that the top portion of the drums had been cut and welded. The welding marks around the rim of each drum was well

[11] ASOF at para 21.

concealed with a thick layer of white alkyd paint. In this way, the welded hole of the drum with the security seal of Precintia clips remained intact.

13 Upon the discovery of the thefts of the tin concentrate, the plaintiff sent notices of claim for the shipments to the defendant by e-mail on 17 July 2018 (sixth shipment), 31 July 2018 (seventh shipment) and 24 September 2018 (eighth and ninth shipments).

14 On or around 3 October 2018, the plaintiff's representative, Mr Tambawala, and the defendant's expert, Dr Luigi Petrone ("Dr Petrone") from AqualisBraemar LOC, travelled to Rwanda. Dr Petrone went to Excellent Mining's premises and the Bonded Warehouse to conduct investigations into the transit of the sixth to the ninth shipments from Kigali to Dar es Salaam.

15 On 7 May 2019, the defendant informed the plaintiff that its claims for the sixth to the ninth shipments regarding the swapped tin concentrate were rejected as the defendant's investigations revealed that the tin concentrate had been swapped with iron oxide at Excellent Mining's premises. Consequently, the defendant alleged that the plaintiff did not have an insurable interest as the loss did not occur during the Transit Period. Thus, the sixth to the ninth shipments were not covered by the insurance policy.[12] On 19 June 2019, the plaintiff made a formal demand for payment of its claims under the Policy by way of a letter, but the defendant has not made such payment to date.[13]

16 On 30 August 2019, the National Public Prosecution Authority of Rwanda (the "NPPA") issued a report after conducting extensive investigations

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12 SOC in SDB at pp 46 to 47 para 13; Defence (Amendment No 2) ("Defence") in SDB at p 83 para 11.

13 SOC in SDB at p 47 para 14; Defence in SDB at p 84 para 12.

(the "NPPA Report"). It concluded that the thefts did not occur in Rwanda. The parties agree that such a report was issued. The defendant's expert, Dr Petrone, however, did not accept the findings of the NPPA Report.

The parties' cases

The plaintiff's case

17 The plaintiff claims that the thefts of the tin concentrate in the sixth to the ninth shipments occurred during the Transit Period from Kigali, Rwanda to Penang, Malaysia, via Dar es Salaam, Tanzania.

18 The plaintiff relies on two important pieces of evidence to establish that the thefts took place when the drums of tin concentrate left the compound of Excellent Mining. These are:[14]

(a) The fact that up till the point of customs clearance at the Bonded Warehouse in Kigali, none of the representatives stated above who had checked the tin concentrate and the sealed drums noticed any tampering with the sealed drums.

(b) The NPPA Report established that the thefts did not happen in Rwanda. The investigations included Excellent Mining's premises, which was in Rwanda.

19 Accordingly, the plaintiff took out this Suit to claim for the full insured value of the sixth to the ninth shipments less a deduction of 0.5%, which

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[14] SOC in SDB at p 47 para 15.

amounts after deduction to US$1,154,508.94.[15] In the alternative, the plaintiff claims for damages to be assessed.

The defendant's case

20 The defendant denies that the thefts occurred during the Transit Period, *ie*, the thefts did not take place during the journey that was covered by the insurance policy. The defendant claims that the thefts of the tin concentrate occurred at Excellent Mining's premises instead, *ie*, before the drums of tin concentrate began their long journey which was covered by the insurance policy. The defendant relies on the following evidence:[16]

(a) Forensic evidence indicates the concomitant presence of cassiterite (tin oxide), coltan (columbite-tantalite) and wolframite (iron manganese tungstate) minerals (the "3Ts minerals") in the iron oxide that was swapped for the tin concentrate. The 3Ts minerals are termed as such because they refer to tin, tantalum and tungsten. The presence of 3Ts minerals is significant because of the following reasons:[17]

(i) Based on forensic analysis and the defendant's investigations, it is very likely these 3Ts minerals originated from mines in Rwanda as Rwanda is an exporter of these minerals. Tanzania produces only a very small amount of cassiterite (*ie*, a mineral containing tin) and does not produce coltan (*ie*, a mineral containing tantalum) and wolframite (*ie*, a mineral containing tungsten).

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15 SOC in SDB at p 48 para 17.

16 Defence in SDB at pp 84 to 86 para 13(a)–(c).

17 Defence in SDB at pp 84 and 85 para 13(a).

(ii) Iron oxide is a typical product of soil weathering and is available in tropical regions such as Rwanda, Tanzania and many parts of Africa. Alternatively, the iron oxide which was swapped for the tin concentrate may have been a by-product of the mineral beneficiation process of the 3Ts minerals. Hence, the defendant claims that there would have been no major difficulty in obtaining the requisite amount of iron oxide for the thefts in Rwanda.

(iii) It is likely that grains of the 3Ts minerals would be present in Excellent Mining's premises because Excellent Mining as an exporter would purchase 3Ts minerals from various mines in Rwanda. The grains of all 3Ts minerals would have been admixed with the pile of iron oxide at Excellent Mining's premises in the process of the pilferers filling the drums with the iron oxide to effect the swap of the tin concentrate.

(b) Forensic evidence also indicates that there was a very strong correlation between the white alkyd paint applied on the top and the rim of the drum lids. The paint applied by Excellent Mining's personnel on the top of the drums was manufactured and commercially available only in Rwanda. It is likely that the same paint was applied by the persons who opened the drums and swapped their contents. The lids were welded back onto the drums, and the paint was applied thickly on the rims to hide the welding marks.

(c) There were windows of opportunity to swap the tin concentrate with iron oxide at the Excellent Mining premises. The sealed drums containing the tin concentrate were stored at Excellent Mining's

premises for a period of four to eight days, depending on the shipment, before the sealed drums were loaded into the 40ft container for transportation by Bolloré Logistics from Excellent Mining's premises to Bolloré Logistics' Bonded Warehouse. There were welding equipment and forklifts at Excellent Mining's premises that could have been used to carry out the thefts. Dr Petrone, the defendant's expert, alleged that the thefts could only have taken place at Excellent Mining's premises as the latter was involved.

21 The defendant also claims that it was unlikely that the thefts occurred during the journey from Kigali, Rwanda to the port in Dar es Salaam, Tanzania and during the journey from Dar es Salaam, Tanzania to Penang, Malaysia. The defendant relies on the following evidence:[18]

(a) The distance between Kigali and Dar es Salaam is about 1500km by land. The journey takes about three to five days depending on traffic conditions, refuelling stops and stops at government designated stopover points. Container trucks on long haulage from Rwanda to Dar es Salaam are not permitted to travel during the night for security reasons.

(b) Checks by customs at the Rwanda-Tanzania border are stringent. Any discrepancy between the actual container seal numbers and the seal numbers stated in the cargo documents would result in the container trucks (and their cargo) being seized by the relevant authorities.

(c) Container seals documented by Alex Stewart, Bolloré Logistics and the RRA in respect of the respective 40ft containers (containing the drums of purported tin concentrate and used for the land carriage) were

[18] Defence in SDB at pp 86 to 88 para 13(d).

found to be intact when the drums of tin concentrate were offloaded from the 40ft containers into the 20ft containers at Dar es Salaam.

(d) The doors of the 20ft container for each shipment were sealed by Tanzanian Customs, Bureau Veritas and the representative of the ocean carrier at Dar es Salaam. At MSC's premises, the 20ft containers were inspected to be in good condition and the seal numbers tallied with those indicated in the respective bills of lading. Precintia wire clip seals spot-welded on the bung holes of the drum lids were observed to be intact at MSC's premises.

22 The defendant also disputes the findings of the NPPA Report, citing the following reasons:[19]

(a) No evidence was tendered on the composition of the iron oxide (containing 3Ts minerals) which was swapped for the tin concentrate.

(b) No evidence was tendered to show that the lids of the drums containing the tin concentrate were welded, and that thick paint was used to hide this. Further, no evidence was tendered to show that the paint used is only manufactured and commercially available in Rwanda.

(c) No evidence was tendered to show that the drums containing the tin concentrate were left at Excellent Mining's premises for a period of four to eight days prior to being loaded into the respective containers for transportation by Bolloré Logistics from Excellent Mining's premises. The fact that the drums were left at Excellent Mining's premises for a period of time would have presented an opportunity for the pilferers to

[19] Defence in SDB at pp 88 to 91 para 16.

swap the tin concentrate. Further, welding equipment and forklifts were available at Excellent Mining's premises to facilitate the thefts.

(d) No evidence was tendered to set out the circumstances of the land carriage of the tin concentrate from Kigali to Dar es Salaam, or of the offloading of the drums of tin concentrate at Dar es Salaam before they were loaded onto the respective vessels for delivery to MSC in Penang.

(e) The findings of the NPPA Report are inconclusive.

23 While the defendant denies its liability to pay the plaintiff, it does not dispute the quantum of full insured value in the plaintiff's claim.[20]

The sole issue to be determined from the agreed facts

24 At the conclusion of the trial, the following important facts were undisputed:

(a) In respect of the sixth to the ninth shipments, tin concentrate contained in the drums were stolen and were swapped with iron oxide.

(b) The thefts took place *after* the tin concentrate was loaded into the drums and the holes on the drums' lids were welded and sealed with Precintia clips.[21] Hence, the thefts took place at some point starting from the time the tin concentrate was stored at Excellent Mining's premises in Rwanda to the time it arrived at MSC in Penang.

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20 Defence in SDB at p 91 para 17.

21 SOC in SDB at p 45 para 10; Defence in SDB at pp 85 to 86 para 13(b); POS at para 49(a); DOS at para 12; Transcript (9 November 2021) at p 115 lines 16 to 23; Transcript (10 November 2021) at p 51 line 10 to p 52 line 1; Transcript (11 November 2021) at p 71 lines 8 to 19; Transcript (16 November 2021) at p 69 lines 6 to 15.

(c) There is no direct evidence to show who committed the thefts and where the thefts were committed. No relevant person suspected that anything was amiss until the tin concentrate arrived in Penang.[22]

(d) If the thefts took place during the Transit Period, the defendant would be liable to indemnify the plaintiff's loss.

25 These agreed facts are crucial, and I shall refer to them in the course of my analysis below.

26 Hence, in the present dispute, there is only *one* issue to be determined: *where* did the thefts of the tin concentrate in the sixth to the ninth shipments occur?[23]

27 I shall turn now to my analysis and findings.

My decision

The applicable law

28 The parties agree that the burden of proof lies with the plaintiff to show that its loss, *ie*, the thefts of the tin concentrate, occurred during the Transit Period.[24] This is simply a matter of trite law as he who asserts must prove.

29 However, the defendant takes a nuanced approach to the above position. The defendant submits that it is not required to prove on a balance of probabilities that the thefts occurred at Excellent Mining's premises. Even if the

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22 ASOF at paras 18 and 19.

23 ASOF at p 8 at (a).

24 ASOF at p 8 at (b); POS at para 18; DOS at para 29.

defendant fails to convince the court that the thefts had occurred there, it does *not* immediately follow that the thefts occurred during the Transit Period. In other words, the court is not compelled to choose between the plaintiff's and the defendant's competing accounts. The court can hold instead that the plaintiff has failed to prove on a balance of probabilities that the thefts occurred after the commencement of the Transit Period.[25]

30 For its position above, the defendant relies on the authority of *Rhesa Shipping Company SA v Edmunds (The Popi M)* [1985] 1 WLR 948 ("*The Popi M*"), affirmed locally in *Clarke Beryl Claire (personal representative of the estate of Eugene Francis Clarke, deceased) and others v SilkAir (Singapore) Pte Ltd* [2002] 1 SLR(R) 1136 ("*Clarke Beryl Claire*") at [63], *Surender Singh s/o Jagdish Singh and another (administrators of the estate of Narindar Kaur d/o Sarwan Singh, deceased) v Li Man Kay and others* [2010] 1 SLR 428 ("*Surender Singh*") at [121] and *Wartsila Singapore Pte Ltd v Lau Yew Choong and another suit* [2017] 5 SLR 268 ("*Wartsila*") at [87].[26]

31 In *The Popi M*, a ship sank in calm waters in the Mediterranean Sea. The owners of the ship sued the hull underwriters for the total loss of the ship arising from the sinking. For this loss to be covered by the insurance policy, the shipowners had to show that the ship sank as a result of the "perils of the sea" which would be covered by the policy. At first instance, the trial judge found that there was a collision with the ship which resulted in water entering through an aperture in the ship's shell plating. The shipowners' case was that this was because an underwater submerged submarine had collided with the ship. The hull insurer alleged that the aperture of the ship was due to the prolonged wear

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25 DCS at para 12.

26 DCS at para 13.

and tear of the ship's hull over many years, *ie*, there was no collision involved. Having examined the relevant expert evidence, the trial judge rejected the hull insurer's theory. In the circumstances, although he regarded the shipowners' theory as "improbable", he held that he was left with only the shipowners' theory and accordingly allowed the shipowners' claim. The hull insurer appealed and the Court of Appeal dismissed the appeal. The hull insurer further appealed to the House of Lords and it was held that the trial judge should not have regarded himself as being compelled to choose between the two theories by the parties. Rather, "[h]e should have borne in mind, and considered carefully in his judgment, the third alternative which was open to him, namely, that the evidence left him in doubt as to the cause of the aperture in the ship's hull, and that, in these circumstances, the shipowners had failed to discharge the burden of proof which was on them" (at 956E). Hence, the House of Lords allowed the hull insurer's appeal.

32 As stated in *Surender Singh* at [121], the principle in *The Popi M* was adopted by the Singapore Court of Appeal in *Clarke Beryl Claire*. Succinctly restated, the principle is that a claimant bears the burden of proof and if he fails to persuade the court that his case has been proven on the balance of probabilities, then judgment should be given for the defendant. The test is not whether the claimant's case is more probable than the defendant's, but whether the claimant's evidence (and not hypothesis) has been proven *on a balance of probabilities*.

33 Generally, the above position undoubtedly applies to the present case. In this regard, I shall analyse the evidence that the parties relied on to ascertain whether the plaintiff has discharged its burden of proof. I should also add that I agree with the House of Lords that the trial judge had erred in his reasoning.

Having regarded the shipowners' reasoning as "improbable", the trial judge should not have felt compelled to accept this theory.

34 However, there are important salient differences between *The Popi M* and the present case. In *The Popi M*, the cause of loss, *viz*, the cause of the aperture in the ship's plating, was disputed. In the present case, the cause of loss is *not disputed*: the thieves cut open the drums' lids and swapped the tin concentrate with iron oxide. What is disputed is the time (and location) that the thefts occurred. Conversely, in *The Popi M*, it was undisputed that the ship sank at sea.

35 Similar differences are also present between the rest of the cases the defendant relied on and the present case. In all the cases cited by the defendant above (at [30]), the cause of the loss suffered by the plaintiff was unknown. In *Clarke Beryl Claire,* the Court of Appeal held that "[t]he cause of the [aircraft's] crash was not conclusively revealed by the technical evidence."

36 In *Wartsila,* the cause of a vessel's engine breakdown was disputed. While the plaintiffs maintained that the engine breakdown was due to Wartsila's poor workmanship and/or negligence in carrying out the repairs to the vessel's main engine, Wartsila averred that the engine breakdown was caused by the vessel's operation and the crew's maintenance of the main engine and/or supply and use of defective equipment and parts in the operation of the main engine.

37 In *Surender Singh,* the cause of the deceased's death was disputed. The plaintiffs were required to prove on a balance of probabilities that the third defendant's breach of duty in exercising post-operative monitoring of the deceased had caused or materially contributed to the deceased's death from or substantially from blood loss.

38 Therefore, the facts of the above cases differ materially from the present case. In this case, the cause of the plaintiff's loss is known *and* undisputed, *ie*, the plaintiff suffered loss due to theft.

39 Since the thefts of the tin concentrate are not disputed, the issue is simply where did the thefts occur. The resolution of this issue involves an *almost binary choice* for my consideration: either the thefts took place during the Transit Period or did not. For the sixth shipment the theft either took place at the Excellent Mining premises or elsewhere during the Transit Period. If the theft could not have occurred at the Excellent Mining premises, then the theft must have occurred during the Transit Period. For the seventh to the ninth shipments, the thefts either took place at the Excellent Mining premises or along the 45 minutes to one hour journey from Excellent Mining's premises to the Bonded Warehouse (see [10] above), or it took place elsewhere during the Transit Period. However, once it is both shown that the thefts were unlikely to have occurred at Excellent Mining's premises and this short journey thereafter, then it follows that the thefts had occurred during the Transit Period. After all, the parties agreed that the thefts *did* occur and that the thefts must have occurred at some point during the whole journey from Excellent Mining's premises in Rwanda to MSC in Penang (see [24(b)] above).

40 My view above is supported by Lord Brandon's reasons for rejecting the trial judge's reasoning in *The Popi M*. He stated as follows (at 955G to 956D):

> My Lords, the late Sir Arthur Conan Doyle in his book *The Sign of Four*, describes his hero, Mr. Sherlock Holmes, as saying to the latter's friend, Dr. Watson: "*How often have I said to you that,* ***when you have eliminated the impossible, whatever remains, however improbable, must be the truth****?*" It is, no doubt, on the basis of this well-known but unjudicial dictum that Bingham J. decided to accept the shipowners' submarine theory, even though he regarded it, for seven cogent reasons, as extremely improbable.

> In my view *there are three reasons why it is* ***inappropriate*** *to apply the dictum of Mr. Sherlock Holmes*, to which I have just referred, to the process of fact-finding which a judge of first instance has to perform at the conclusion of a case of the kind here concerned.
>
> The first reason is one which I have already sought to emphasise as being of great importance, namely, that the judge is not bound always to make a finding one way or the other with regard to the facts averred by the parties. He has open to him the third alternative of saying that the party on whom the burden of proof lies in relation to any averment made by him has failed to discharge that burden. No judge likes to decide cases on burden of proof if he can legitimately avoid having to do so. There are cases, however, in which, owing to the unsatisfactory state of the evidence or otherwise, deciding on the burden of proof is the only just course for him to take.
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> *The second reason is that* ***the dictum can only apply when all relevant facts are known, so that all possible explanations, except a single extremely improbable one, can properly be eliminated****. That state of affairs does not exist in the present case: to take but one example, the ship sank in such deep water that a diver's examination of the nature of the aperture, which might well have thrown light on its cause, could not be carried out.*
>
> The third reason is that the legal concept of proof of a case on a balance of probabilities must be applied with common sense. It requires a judge of first instance, before he finds that a particular event occurred, to be satisfied on the evidence that it is more likely to have occurred than not. If such a judge concludes, on a whole series of cogent grounds, that the occurrence of an event is extremely improbable, a finding by him that it is nevertheless more likely to have occurred than not, does not accord with common sense. This is especially so *when it is open to the judge to say simply that* ***the evidence leaves him in doubt whether the event occurred or not***, and that the party on whom the burden of proving that the event occurred lies has therefore failed to discharge such burden.
>
> [emphasis added in italics and bold italics]

41 In respect of the first reason, I accept that I am generally not always bound to make a finding one way or the other with regard to the facts averred by the parties.

42 In respect of the second reason, Lord Brandon disapproved of the method of eliminating possibilities to determine the true state of affairs (*ie*, a "process of elimination"), coined by the fictional character, Mr Sherlock Holmes, and adopted by the trial judge. His Lordship stated that a process of elimination could not be used where there are possible unexplored explanations for the cause of loss. Indeed, as stated above, "the ship sank in such deep water that a diver's examination of the nature of the aperture, which might well have thrown light on its cause, could not be carried out". Hence, in *The Popi M*, the cause of loss was indeterminate. In fact, although the trial judge in *The Popi M* accepted the shipowners' submarine theory, he regarded it as extremely improbable. In other words, a submarine collision and prolonged wear and tear were not the only possible causes that could explain the presence of the aperture which sank the ship. The ship could have, for instance, been deliberately sabotaged for some nefarious reason. This is why Lord Brandon placed much weight on the fact that a diver's examination could not be carried out: such an examination could have suggested *other causes* for the aperture leading to the ship's sinking.

43 In the present case, however, the cause of loss and the *modus operandi* of the thefts were agreed, *ie*, the thefts occurred by swapping the tin concentrate with iron oxide. Although the time and location of the thefts were disputed, the fact remains that the thefts had occurred at some point in the whole journey. As stated above (at [24(b)]), the parties agreed that the thefts must have occurred at some point from the time the tin concentrate was loaded into the drums and sealed at Excellent Mining's premises in Rwanda to the time it arrived at MSC in Penang. Accordingly, the various stages in this journey agreed by the parties represent a self-contained set of possibilities. In other words, the thefts must have occurred at some point within this circumscribed period of time. Where one option is shown to be unlikely, the likelihood of the other option goes up

significantly. Hence, it is precisely the case here that all relevant facts are known such that all possible explanations, except an extremely improbable one, can properly be eliminated. In this way, on the authority of *The Popi M* itself, the process of elimination is permitted in the present situation.

44 In respect of the third reason, I agree that the legal concept of proof of a case on a balance of probabilities must be applied with common sense. However, *ex facie*, the present case does not involve evidence which would "leave [me] in doubt whether the event occurred or not". The parties agreed that the thefts had occurred at some point from the time the tin concentrate was loaded into the drums and sealed at Excellent Mining's premises in Rwanda to the time it arrived at MSC in Penang. It is undisputed that the thefts had occurred. The central issue is where did the thefts take place.

45 Hence, Lord Brandon's reasons for rejecting the trial judge's method of using a process of elimination to determine the true state of affairs do not apply in the present case as the facts here are materially different.

46 However, I wish to explain how the process of elimination would operate in the present case. This is important because the defendant submits that: (a) a process of elimination entails reversing the standard of proof from a balance of probabilities to a balance of improbabilities (see *Hua Seng Sawmill Co Bhd v QBE Insurance (Malaysia) Bhd* [2003] 4 SLR(R) 449 at [68]); and (b) a process of elimination would arrogate the burden to the defendant to prove the truth of an alternative cause (see *Hub Warrior Sdn Bhd v QBE Insurance (Malaysia) Bhd* [2004] SGHC 279 at [52]).[27]

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[27] Defendant's Reply Submissions ("DRS") at paras 3 to 6.

47 In *The Popi M*, the House of Lords noted (at 954F) that "[the trial judge] had before him a mass of expert evidence relating to the possibilities that the proximate cause of the ship's loss was a collision with a submerged submarine on the one hand or wear and tear of the shell plating on the other." However, although such expert evidence was adduced, the trial judge was not convinced by either party's case theory.

48 Here, the plaintiff has adduced evidence (direct, circumstantial and forensic evidence) in support of its submission that: (a) it was unlikely that the thefts occurred at Excellent Mining's premises (and the immediate journey after); and (b) it was probable that the thefts had occurred during the Transit Period. Given that it is undisputed that the thefts had to have taken place at *some point* in the whole journey of the transportation of the tin concentrate, I would consider that the plaintiff's evidence on both points, *ie*, (a) and (b) above, goes towards discharging its burden to prove its case on a balance of probabilities. The plaintiff referred the court to credible evidence such as the NPPA Report and the evidence of tight and layered security at Excellent Mining's premises to show that it was highly unlikely for the thefts to have occurred at the Excellent Mining premises. This evidence serves to diminish the defendant's case theory that the thefts took place in the premises of Excellent Mining and at the same time the evidence bolsters the plaintiff's case that the thefts *must have occurred* at some point during the Transit Period. This case is unlike the facts of *The Popi M* where there could have been an unknown cause for the aperture in the ship's hull beyond those postulated by the parties that the parties may not have considered, such as sabotage (see [42] above).

49 Hence, the present inquiry is significantly different from that in *The Popi M*. The court is not compelled to choose one party's theory over another by a simple comparison of their relative likelihood, however improbable that theory

may be. It is not a case where the burden has shifted to the defendant to prove the truth of an alternative cause. Rather, I have to consider whether the plaintiff's submissions and supporting evidence have proven its case on a balance of probabilities. There is, therefore, no departure from the established trite principles governing the plaintiff's burden and standard of proof in the present case.

50 Also, I should add that in this case, there is no direct evidence of the thefts. Thus, I have to rely on indirect, circumstantial and forensic evidence to ascertain whether the plaintiff has proven its case on a balance of probabilities.

51 I shall now refer to my analysis.

The level of security during various points in the transport of the tin concentrate

52 I have set out the various stages in the transport of the tin concentrate above (at [8]).

Excellent Mining's premises

53 I shall first turn to the security at Excellent Mining's premises. To recapitulate, the defendant claims that the thefts had occurred there.

54 The plaintiff submits essentially that since Excellent Mining's premises were under tight security, it was unlikely that the thefts had occurred there.[28]

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[28] POS at paras 27 and 31.

55 Mr Theodore Sindikubwadbo ("Mr Sindikubwadbo") was Excellent Mining's director at the material time.[29] He testified that the level of security at Excellent Mining's premises was very high.[30]

56 Mr Sindikubwadbo stated that the premises were secured by compound walls and fences. The compound walls were fitted with thorn fences to prevent unauthorised entry. There was also a metal gate at the entrance which would be locked at the end of every day. There were also CCTV cameras at Excellent Mining. Each recording would remain for ten days before it was overwritten by new footage.[31]

57 At the time when the drums of tin concentrate were stored on Excellent Mining's premises, four security guards were deployed. The guards had to, *inter alia*, patrol the premises around the clock in shifts to ensure that: (a) there was no unauthorised entry; and (b) the drums of tin concentrate were securely stored on the premises. If there were any signs of tampering with, or theft of, the drums of tin concentrate, the guards were required to immediately report such an incident to Excellent Mining's management. There were no such reports during the relevant period. Moreover, at the material time, Mr Sindikubwadbo and his family were staying at a house adjacent to the premises. In that way, he could easily ensure that the guards were working.[32] Further, according to Mr Sindikubwadbo, because Excellent Mining's premises are not large

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29 Affidavit of Evidence-in-Chief of Theodore Sindikubwadbo ("TS") at para 1.

30 TS at paras 12 to 15.

31 Plaintiff's Closing Submissions ("PCS") at para 5(m).

32 Transcript (5 November 2021) at p 87 lines 12 to 22; TS at para 13.

(measuring approximately 569m^2), it would be very unlikely that unauthorised entry would go unnoticed, so four guards were sufficient to guard it.[33]

58 Mr Sindikubwadbo further stated that after the bags of tin concentrate which were sealed with Precintia clips arrived at Excellent Mining's premises, they were emptied onto the ground. The MFO stationed at Excellent Mining, who was a representative of the RMB (see [8(a)] above), would check to ensure that the Precintia clips on the sealed bags match the contents of those bags.[34] These clips stated, *inter alia*, the weight, source and origin of the tin concentrate. The MFO collected all the clips from the bags of tin concentrate and placed them into the metal box which was welded to the top of one of the drums that contained the tin concentrate. It was after the bags of tin concentrate were emptied and mixed that a representative of Alex Stewart would collect a sample of the tin concentrate for analysis. Thereafter, it would take about 16 men and seven hours, *ie*, one full day, to fill the drums with the tin concentrate.

59 The MFO, who was stationed at Excellent Mining, along with representatives from ITSCI, conducted routine spot checks throughout the day on the drums of tin concentrate.[35] The MFO would inspect the drums of tin concentrate before they left Excellent Mining's premises for the day. When they returned the following morning, they checked the sealed drums of tin concentrate again to ensure that no thefts had occurred during the night.[36]

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33 TS at para 14.

34 TS at para 17.

35 TS at para 19.

36 TS at para 20.

60 The evidence of Mr Felicien Nkomeje ("Mr Nkomeje"), a Certification Specialist at the RMB, corroborates the above evidence.[37] According to Mr Nkomeje, at the material time, the MFO was Ms Campire Laurence ("Ms Laurence"),[38] and she was stationed at Excellent Mining's premises permanently.[39] In other words, Ms Laurence was at Excellent Mining's premises from 7.00am to 5.00pm every day.[40] Mr Nkomeje also testified that Excellent Mining's activities relating to minerals could not continue without Ms Laurence's supervision.[41] Part of Ms Laurence's duties was to check for signs of tampering of the sealed drums containing the tin concentrate, and she had to do so *daily*.[42] Therefore, if the lids of the drums were cut and the contents of the drums were replaced, Ms Laurence would have noticed such tampering.[43] Ms Laurence would then be required to raise this concern immediately to the RMB's office and to ITSCI.[44] However, no such issues were raised during the material time.[45]

61 According to Mr Sindikubwadbo, during the period when the sealed drums of tin concentrate were stored at Excellent Mining's premises, there were no signs of tampering or theft observed.[46]

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37 Affidavit of Evidence-in-Chief of Felicien Nkomeje ("FN") at para 1.

38 Transcript (3 November 2021) at p 29 lines 9 to 12.

39 Transcript (3 November 2021) at p 67 lines 15 to 21.

40 Transcript (3 November 2021) at p 60 lines 6 to 17.

41 Transcript (3 November 2021) at p 60 lines 13 to 18; p 67 line 22 to p 68 line 20.

42 Transcript (3 November 2021) at p 54 lines 10 to 14.

43 Transcript (3 November 2021) at p 71 line 24 to p 72 line 4.

44 FN at para 16; Transcript (3 November 2021) at p 69 line 3 to p 72 line 4.

45 FN at para 16.

46 TS at para 25.

62 The evidence of Mr Norman Mwashi ("Mr Mwashi"), the Managing Director and Chief Chemist of Alex Stewart,[47] largely corroborates Mr Sindikubwadbo's evidence of the above.[48] Mr Mwashi also testified that all the requisite inspections were done before and after the sealed drums of tin concentrate were transported from Excellent Mining's premises to the Bonded Warehouse. No signs of tampering were observed.[49] Indeed, the defendant's expert, Dr Petrone, opined that the people involved in checking the seal of the drums were not involved in the thefts.[50]

63 From the above evidence, it is clear that the drums of tin concentrate were under tight security while it was in Excellent Mining's premises.

64 I do note, however, that Mr Mwashi gave evidence that the loading of the drums into the 40ft container occurred *outside* Excellent Mining's premises.[51] This was because the truck was too large to enter the premises. The loaded container would remain outside till the clearance papers were ready. Nevertheless, the container would still be under surveillance.

65 Dr Petrone, however, opined that Excellent Mining's premises was "the best place" to carry out the thefts because it had the facilities to carry out the swapping, such as cutting/welding equipment, excavators, manpower and white paint.[52] He even suggested that for such a massive operation to take place,

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47 Affidavit of Evidence-in-Chief of Norman Mwashi ("NM") at paras 1 and 7.

48 NM at paras 4 to 31.

49 NM at paras 32 to 36.

50 Transcript (17 November 2021) at p 154 lines 4 to 9.

51 Transcript (8 November 2021) at p 164 line 9 to p 170 line 17.

52 DOS at para 28.

Excellent Mining must have been complicit in the thefts. Yet, these were merely Dr Petrone's bare assertions without any supporting evidence or proof.

66 In contrast, the plaintiff's expert, Mr Howard Nathan Wheeler ("Mr Wheeler"), came to a completely different conclusion. He mentioned in his report the extensive difficulties that the thief would have encountered to swap the tin concentrate with iron oxide at Excellent Mining's premises:[53]

> **Logistics of a swap at Excellent Mining's premises**
>
> The logical process of a swap would require the following actions:
>
> 1. Remove lids
> 2. Empty out contents
> 3. Fill with material
> 4. Reseal lids
> 5. Fill and paint lids
> 6. Reposition drums
>
> In addition to the above there are logistics to consider, specifically the space required and the means of transporting the tin concentrate out of the location and the replacement substance into the location.
>
> The location for the swap to occur in would require an area large enough to discharge the tin concentrate into, and an area to store the substitute cargo ready for stuffing into the drums (assuming it was undertaken at the same location). The tin concentrate would need to be carried away at some point – presumably by the same method that the substitute cargo had been brought in.
>
> In order to swap the tin concentrate for the iron rich substance a total of 18,000 kgs (in the case of shipment 6 as an example) of the iron rich substance would have been required. The iron rich material weighs 18 tonnes per shipment and is equivalent to approximately 6.25 to 7 cubic metres.
>
> …

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53 Affidavit of Evidence-in-Chief of Howard Nathan Wheeler ("HNW") at pp 9 to 11 of 2nd Report dated 4 August 2021.

In order to carry such a quantity of substitute material in one load then a sizeable vehicle is required – an example of such a vehicle is provided below:

Heavy Duty 15m cube load volume 20 ton[ne] tipper truck source: Alibaba

A vehicle would require maneuvering [*sic*] space and, assuming it carried away the tin after the swap, a place to park without causing suspicion.

As has been previously stated, the area of Excellent Mining's loading facility is located in a residential area of Kigali and the road access is limited. Indeed, we note that the container transport lorries that took the laden drums to the Bollore bonded facility were unable to access the facility directly and the drums had to be moved by forklift to a more open area.

We have been presented with two documents named Excellent Mining Valuation Reports 1 and 2. The photographs of access points, the configuration of buildings behind the exterior boundaries and the types of buildings contained therein does not make it appear plausible that a large lorry carrying 18 tonnes of iron ore could access, deposit and then load 18 tonnes of tin concentrate at all.

There are many ways for the lids of the drum to be removed, using power tools or manually. The specific tool for such an activity is called a drum de-header and come in powered or manual versions. The cut is clean and there is minimal deformation, making the task of resealing the lids of the drums easier.

> Once the tops had been removed from the drums then there is the question of removing the tin. It's conceivable that 2 or 3 strong men could tip a loaded drum over but that runs the risk of deforming the drum itself. A powered vehicle would assist greatly with speed and precision and would be needed to return the drums to their previous location in any event. Indeed, this element of the operation presents major difficulties without powered assistance.
>
> Loading of the substitute cargo could be achieved with shovels and several willing workers.
>
> Resealing of the drums could take some time and would entail some noise, bright lights and smells. The application of the thick paint would require that the paint is given time to dry prior to further examination by quality / quantity officials and may therefore be best applied at time as far distant from the next inspection as possible.
>
> The re-stacking of the drums in their original positions would need powered assistance.
>
> The stolen tin concentrate would need to be loaded onto powered transport for extraction to its next destination.
>
> In summary, in order to act expeditiously, the site of the swap would require a relatively large area where off-loaded concentrate and the swap cargo could be stored at the same time. The site would also require easy access for a relatively large vehicle and an area for it to wait (assuming it carried away the tin concentrate in one go and immediately it had been offloaded). Our understanding of Excellent Mining's site is that it is a relatively small consolidation facility and the tin concentrate is received in bags.
>
> Powered load-handling plant (such as a fork-lift) would be required to quickly and carefully up-end the drums and to replace in-situ the re-filled drums.
>
> The above actions would cause noise, smell, dust and bright lights. It would also involve several participants and take considerable time to achieve. We have received no indication of such events unfolding at Excellent Mining's premises.

67 In addition to the above considerations, I also note that there are CCTV cameras in Excellent Mining's premises. Mr Nkomeje testified that he saw such surveillance cameras there.[54] The defendant also produced a photograph

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[54] Transcript (3 November 2021) at p 52 line 2 to p 56 line 18.

showing one such camera at the premises.[55] However, I note that Mr Nkomeje did not know which particular areas were being monitored by the CCTV surveillance cameras.[56]

68 Having carefully considered the evidence above, even if the necessary equipment were available, it was clearly logistically impossible for the thefts to have taken place at Excellent Mining's premises, especially with the several layers of checks and surveillance at Excellent Mining. Dr Petrone knew this. At the trial, he acknowledged that his theory that the thefts took place at Excellent Mining was fundamentally premised on Excellent Mining's staff being complicit in the thefts. Otherwise, his theory would collapse. I set out his testimony in court below:[57]

Court:	… You came to the conclusion that Excellent Mining is complicit in this theft, is because there are quite a number of people there, and it is quite unimaginable to you that all this can be done without them -- without Excellent Mining knowing it.
A:	Exactly, Your Honour.
…	
Court:	I'm going into another assumption. Your assumption is premised on the fact that this theft is difficult to go away unnoticed, unless you are complicit. That is --
A:	Yes.
Court:	-- Excellent Mining.
A:	Yes, your Honour.
Court:	Now, just leave your theory on the side.
A:	Okay.

55 DOS at para 25.

56 Transcript (3 November 2021) at p 56 lines 16 to 18.

57 Transcript (17 November 2021) at p 154 lines 10 to 15; p 159 line 10 to p 160 line 21.

Court: Okay? So the assumption is that Excellent Mining wasn't part of this so-called conspiracy to steal, okay?

A: Okay, your Honour.

Court: Now, if I changed this material fact to say that Excellent Mining is not part of this conspiracy, will it affect your theory? Your theory that theft took place within Excellent Mining?

Maybe I give you additional facts which I'm not quite sure whether you are aware of or not, because it came out in the course of the trial.

A: Yes, please.

Court: The gentleman that you spoke to, Mr Theodore, is actually the director of the mine, of Excellent Mining. And he and his family actually stay within the compound at Excellent Mining.

A: Okay.

Court: Are you aware of that?

A: I wasn't aware of it, this information.

Court: You were not aware of it?

A: No, I wasn't aware that he lived in the compound.

Court: Yeah. That's what he told us.

A: Okay.

Court: That's why I say, *if the assumption is that the Excellent Mining is not complicit in this theft, will your theory still hold that the theft took place at Excellent Mining?*

A: No, your Honour. On that point --

Court: It's not possible, right?

A: *It's not possible, correct.*

[emphasis added]

69 The sheer amount of manpower and time needed, the truck load of iron oxide required, the additional truck needed to take away the tin concentrate, the substantial amount of noise that would have been generated, and the high level

of security in the premises make such a plan unfeasible without the involvement of Excellent Mining.

From Excellent Mining's premises to the Bonded Warehouse

70 As previously noted (see [8(c)] above), the journey from Excellent Mining's premises to the Bonded Warehouse takes about 45 minutes to one hour. Even if there was inadequate security along this journey, there was plainly insufficient time and space for thefts of the present magnitude to occur. The parties did not suggest that the thefts took place during this short stretch of the journey.

71 Relevant personnel had also inspected the sealed drums at the Bonded Warehouse (see [8(d)] above). According to Mr Nkomeje, the inspection at the Bonded Warehouse would have had to be carried out on the same day as the delivery.[58]

From the Bonded Warehouse to the port in Dar es Salaam

72 Dr Petrone discounted any possibility of the thefts having occurred during the journey from the Bonded Warehouse to Dar es Salaam.[59] His opinion in relation to security focused on the fact that the seals on the container doors were intact:

> Furthermore, photographs in the provided Alex Stewart report for the stuffing of the container CMAU4868686 at Excellent Mining and those taken by Bureau Veritas for the opening of the same container in Dar Es Salaam show that the seals on the container had not been broken at Bollorè. The available photographs for the 8th shipment show that the red freight seal

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58 FN at para 23.

59 Transcript (17 November 2021) at p 2 lines 16 to 19; Affidavit of Evidence-in-Chief of Luigi Petrone ("LP") at p 54 para 5.4.1 to p 55 para 5.4.5.

> no. 00530031, the RRA Custom seal no. B683037 and the Precintia seal no. 047844 were all present at Excellent Mining (see Appendix 29) and at the port of Dar Es Salaam (see Appendix 22). Therefore, *this container had not been opened at Bollorè in Kigali.*
>
> [emphasis in original removed; emphasis added]

73 However, Mr Wheeler disagreed with Dr Petrone's reasoning that no one gained access into the sealed container because the seals of the container's doors were intact. Mr Wheeler stated as follows:[60]

> The fact that customs seals are not tampered with does not prove that the container has not been accessed. Theft from containers is rife and there are many ways that this can be achieved by taking off customs seals without leaving any apparent marks, taking [out] bolts holding the securing flanges for the customs seals to go into and opening the door without touching the seals themselves or levering open the retaining plate on the right hand door that overlaps the left hand door thereby allowing that door to fully open.

74 At the trial, Mr Wheeler was questioned on this portion of his report, and he testified as follows:[61]

> Court: You look at the second sentence which starts with: "Theft from containers is rife and there are many ways that this can be achieved by taking off the customs seals without leaving any apparent marks ..."
>
> I don't understand what is this. What do you mean by "by taking off the customs seals without leaving and apparent marks"?
>
> A: Yes, there are different types of seals and each can be attacked in a different way in order to access or open the seal leaving minimal or no evidence.
>
> Court: In our case, the 40-foot container has got three seals, right?

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60 HNW at p 10 of 1st Report dated 16 November 2020.

61 Transcript (10 November 2021) at p 83 line 18 to p 87 line 18.

A: Correct.

Court: Before it left Excellent Mining to Dar es Salaam.

A: Correct, yes.

Court: So are you saying that the three seals can be removed and re-attached back without apparent marks?

A: Some of them can. The bolt ones are more difficult but certainly the ones with the wire they're relatively easy. You put down a little metal implement and manoeuvre it and then pull it out, which shouldn't leave anything behind. The bolt ones either can be, I suppose, cut and then stuck back together again. You can -- there are instances, I understand, where you can put acid down between the lug and the bolts and corrode the sealing ring inside and then pull it off. And instances where you clamp hold of the bolt end so it doesn't move and then attach a drill with a large chuck to the lug at the bottom and spin it, and then eventually -- whilst pulling, and then eventually it comes away.

Court: What you're telling us is that the three different seals on the 40-foot container can actually be removed and re-attached without any apparent suspicion that it was tampered with, is that what you're trying to tell us?

A: I'm trying to tell you that, yes, but close inspection of the bolt one will, in most instances, show some tampering.

Court: Sorry, come again?

A: The bolt ones are more difficult to undo without evidence of tampering. If you look closely, in most instances, there should be evidence of tampering with the bolt one.

Court: In other words, the other two seals are relatively easy, that's what you're saying?

A: They are easier, yes.

Court: Yes. So that the bolt seal is more difficult?

A: Yes.

Court: But is it possible or is it impossible to be tampered with, without suspicion that it has been tempered with?

A: *It is possible to tamper with them* but close inspection should reveal it by a competent surveyor or somebody taking the time to have a look.

Court: So what does that mean? It is not possible to be tampered with, is that what you're trying to say?

A: *I think it is possible to be tampered with.*

Court: Then you give another example in that same sentence of how the drums can be removed from the container and you said -- I believe it's "out" not "our":

"... taking out bolts holding the securing flanges for the custom seals to go into and opening the door without touching the seals themselves or levering open the retaining plate on the right hand door that overlaps the left hand door thereby allowing that door to fully open."

So this another method you're suggesting that a container, that the contents in the container can be tampered with. Is that what you're trying to tell us, by not touching the seal but doing something to the doors of the container.

A: Indeed, yes. If you look at the container doors, if you recall the photos with the one door open, the one door closed, the door that was open is not closed first, so if you look at it that's the left-hand door, and then the right hand door comes over and there is a retaining plate that overlaps the already closed left-hand door. And then the locking mechanism on the right is the one that has the seals put on it. So what you could do is get a jimmy, for want of a better -- a crowbar, and bend back the sealing plates, which would allow the left-hand door to open, but that would, for sure, leave damage to the retaining plate's coating because it would have to be bent maybe sort of 30 or 90 degrees. Is that --

Court: Below that, can you scroll down to the next page, 75. Yes, thank you. You give certain references here.

A: Mm-hm.

> Court: Can I assume these are reference to show that *the container can be tampered without raising suspicions that it has been tampered with*?
>
> A: *Yes, your Honour*. There are sort of YouTube videos that show means by which these different seals can be opened without leaving much of a trace.
>
> [emphasis added]

75 In my view, Mr Wheeler's opinion is reasonable and credible. The parties agree that the thefts were committed by circumventing the seals on the top of the drums' lids, leaving the sealed holes of the drums untouched. There was hardly any sign of tampering at the cut and welded portion of the drums' top as well. The thefts were therefore professionally and skilfully done. When the sealed drums arrived at MSC in Penang, the defendant's experts, namely Mr Desmond Sim Kok Whye ("Mr Sim"), the General Manager of Zama Marine Services and Consultancy Sdn Bhd ("Zama"), and Mr Yeoh Oon Huat ("Mr Yeoh"), an ad-hoc surveyor with Zama, inspected the drums. Mr Yeoh and his assistant, Mr Mohan a/l Govindasamy, who were Mr Sim's surveyors on site, could not even spot the tampering. Mr Sim and Mr Yeoh concluded that the sealed drums were untampered. In this regard, Mr Sim testified as follows:[62]

> A: Based on my surveyors' physical inspection of the drums, and based on my own observation of the photographs depicting all the drums from the time it left Excellent Mining until the time it arrived at the consignee's premises, MSC in Penang, I saw *no evidence that the drums were subjected to any form of tampering*.
>
> …
>
> Q: You were asked by the judge, okay, about what you were investigating, okay. And you say your finding is you don't accept the position that the drum lids were cut, okay? Can I ask you now, okay, what was your task, what was your purpose -- forget about the word

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62 Transcript (11 November 2021) at p 46 lines 11 to 17; p 74 line 8 to p 76 line 7; p 77 lines 6 to 16.

"investigation", okay? Why were you doing what you were doing?

A: I suppose let's say a loss had occurred, and in this case, in the -- the erroneous cargo was delivered instead of the actual cargo, I would, of course, look into the possibility of theft, okay? In this case, since the cargo, they were all packed into steel drums and all the steel drums are also affixed with all the necessary seals provided from the point of origin, and we look into the aspect of whether these drums had been tampered with in order for the cargo to be removed from these drums. *Our findings showed that there was no tampering of the drums* and again -- and also the -- there was no tampering of the containers in which all these drums were stored in. I have looked into photographs from the time it left Kigali, photographs provided by the Alex Stewart surveyors. I compared that condition of storage, the location of the drums in which -- and how they were positioned in the container, and I compared that to the photographs and the survey report of Bureau Veritas in Tanzania, and the photographs showed us that the drums were in their very original position in which they were stowed in -- in -- in -- at Excellent Mining and in -- in Kigali. So that to us, that point, there was no -- there was no tampering of any sort that could lead me -- lead us to believe that theft has occurred. We have looked into all that possibility.

And adding to that, the same photograph provided by Bureau Veritas in Dar es Salaam, Tanzania, on the completion of loading after they're transferred into the shipping container, the condition of these drums, the position of these drums, again, when we compared to the photos we had to what we have seen when they arrived in MSC, Penang, the consignee, they were in exactly the same position. There was no evidence, there was no -- nothing to point, you know, to -- to any tampering of the container -- of the drums inside the container. No tampering of the seals of the container. The photos, to us, is quite strong to suggest that there was no tampering which could have led to the theft of the goods in our investigation, in our survey.

…

Court: Okay. What you are trying to tell us a few moments ago was that the drums for the sixth to the ninth shipments, from your investigation, *they were not tampered with*, right?

A: *Yes.*

Court: And the containers that arrived in Penang, they were also not tampered with.

A: Yes.

Court: Right? Therefore, your conclusion was that there was no theft, correct?

A: There's *no tampering*, therefore, there's no theft.

[emphasis added]

Mr Yeoh testified as follows:[63]

Q: … Just taking you back to your survey after the sixth shipment. When it was discovered that the cargo had been swapped, were there any additional instructions given to you by Mr Sim for the seventh, eighth and ninth shipments in terms of your survey?

A: I was instructed to inspect the container on arrival, check the seals, which need to be tallied with all the documents presented, and to also check the containers whether they are tampered or not and to witness the opening of the lid of the container -- sorry, of the drums and to witness the sampling of the cargo in everybody's presence at that time.

…

Q: Obviously at the time, the drums had already been cut open at MSC and you say that your inspection of it, you found that *there were no signs of tampering or re-welding*?

A: *Yes.*

…

Q: So essentially, from your affidavit you're saying that your findings were that *there was no tampering of the drums?*

A: *Yes.*

[emphasis added]

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63 Transcript (12 November 2021) at p 13 lines 1 to 24; p 14 line 24 to p 15 line 2.

76 Clearly, the swaps were not done by amateur thieves but by a professional and well-organised gang of thieves. If such professional thieves could cut and weld the top of the drums to circumvent the security seals to gain access to the tin concentrate without leaving any visible trace of tampering, they would have no problem in using the same *modus operandi* to gain access to the sealed drums in the sealed container without tampering with the seals of the container's doors. Dr Petrone's expert report does not indicate that he had examined the state of the 40ft containers.

77 More importantly, as noted above (at [8(e)]), the parties agreed that the 40ft container with the drums of tin concentrate travelled overland from the Bonded Warehouse in Kigali, Rwanda to the port in Dar es Salaam, Tanzania. This journey was about 1400km to 1500km and it required several overnight stops.

78 The defendant appointed Mr Sim to investigate the loss of the tin concentrate in the present matter. Mr Sim claimed that he had a telephone conversation with one Mr Alphonce Emmanuel ("Mr Emmanuel"), the Operations Officer of Bolloré Transport and Logistics Tanzania Ltd.[64] Mr Sim claimed that Mr Emmanuel told him the following details about the supply chain:[65]

> (a) Travel was only during the day with no intermittent halt at any point except for refuelling. Container trucks on long haulage from Rwanda to Dar es Salaam are not permitted to travel during the night for security reasons.

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64 Affidavit of Evidence-in-Chief of Desmond Sim Kok Whye ("DSKW") at para 16.

65 DSKW at para 16.

(b) Overnight halts were only allowed at government-designated stopover points. These stopover points were manned by security personnel who carried out checks on all container trucks that passed.

(c) Should there be any discrepancy found between the seal number on the container's doors and the travel documents, or if any tampering of the container or seals is noted, the container truck and its cargo would be seized.

79 In my view, even assuming that the above details are true, they do not imply that the security measures were watertight as the security measures were only at the designated spots. The thefts could have occurred along any place during the long stretch of the Transit Period which would be away from anybody's notice. The nefarious operation only had to compromise the container's driver and his assistant, if any. Indeed, Mr Sim acknowledged that "no security was provided to the conveyance vehicle or the drivers".[66] Moreover, as Mr Wheeler states in his report, "the 6 to 17 days transit time [from] Kigali to Dar [e]s Salaam appears to offer less supervision [*ie*, as compared to that in Excellent Mining's premises] and as much, if not more, time and within its 1,400 km it seems reasonable to presume that there would be many areas that would allow a truck to stop and cargo operations to be undertaken without raising suspicion."[67]

80 As regards the port in Dar es Salaam itself, Mr Wheeler opined that it was possible for the thefts to occur there too. He testified that port areas are generally chaotic places, which suggests that thefts would be difficult to spot.[68]

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66 Transcript (11 November 2021) at p 68 lines 21 to 22.

67 HNW at p 18 of 1st Report dated 16 November 2020.

68 Transcript (10 November 2021) at p 89 lines 9 to 18.

Also, according to him, graft was commonplace in Tanzania, such that 10% of goods there are "under peril of theft".[69] I find that such evidence is speculative and I place little weight on it. Compared to the journey to the port, the port itself would naturally have the presence of more people in the vicinity. Indeed, according to the defendant, there were CCTV cameras and security guards at the port in Dar es Salaam.[70]

From Dar es Salaam to Penang

81 The parties' experts, especially the plaintiff's, did not opine that it was likely for the thefts to have occurred in the remaining stages of the Transit Period. Hence, it is unnecessary for me to analyse them. I note briefly that it would have been very difficult for the thefts to have occurred on the voyage to Penang and at the port in Penang itself. As a matter of common sense, there would have been too many people around for thefts of such magnitude and sophistication to take place unnoticed.

82 Finally, to dispel the notion that the determination of where the thefts took place involves a binary consideration, as I have alluded to above at [39], the defendant raised in oral submissions that it was possible for the thefts to have occurred at MSC in Penang. I note that this suggestion is contrary to Dr Petrone's evidence, where he agreed it was not his case that the thefts could have occurred at MSC in Penang (see [137] below).[71]

83 I, therefore, find that the defendant's belated suggestion that the thefts could have occurred at MSC in Penang was of no significance.

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69 Transcript (10 November 2021) at p 89 lines 9 to 18.

70 Transcript (11 November 2021) at p 64 lines 12 to 18.

71 Transcript (16 November 2021) at p 69 lines 16 to 22.

Conclusion on the level of security

84 Examining the above evidence in totality, from a comparison of the level of security at different stages, the weakest link in the entire journey of transporting the tin concentrate must have been the journey from the Bonded Warehouse to the port in Dar es Salaam. The immediate logical observation is that the weakest link exposes numerous opportunities to the thieves to perpetuate the thefts without being detected as compared to the Excellent Mining premises and the locations in the rest of the Transit Period. Furthermore, the six to 17 days' road journey offers more space and time for the necessary logistics to be carried out skilfully.

85 I also note that, at the trial, Mr Sim could not provide an adequate counterargument to the above analysis. For clarity and completeness, I reproduce his long explanation below:[72]

Court:	Mr Sim, I'm going to frame my question to you. Unfortunately, my question is going to be quite long so I seek your indulgence, pay attention to my question.
A:	Okay.
Court:	I am going to relate to you, and I stand correct by the parties if I've got my facts wrong, please interrupt my question, I'm going to relate to you the whole sequence of the movement of the cargo from Excellent Mining all the way to Dar es Salaam. Okay, Mr Sim?
A:	Yes.
Court:	When the cargo was at Excellent Mining, the focus of my question is really the degree of surveillance or security. At Excellent Mining warehouse, as you heard my exchange with counsel, you have official from the Rwanda Mining Board, who is a mineral field officer, and she was designated to be at the Excellent Mining

[72] Transcript (11 November 2021) at p 62 line 10 to p 69 line 22.

literally the whole day, okay? Then you have the representative from Alex Stewart and you have the ITSCI, which is the International Tin Supply Chain Institute representative also there.

Mr Yee: Sorry, your Honour, it's ITSCI. When you say MFO is there the whole day, do you mean the whole working day or --

…

Court: During the office hours. Then in addition to that, I don't know whether you're aware, within the premises of Excellent Mining, they have got security guards, and they have got CCTV cameras and the compound in walled. In other words, Excellent Mining has a wall that encompasses the compound. Okay? That is the degree of security they have at that stage. Then the cargo moved on to Bollore bonded warehouse. At Bollore bonded warehouse, there is a custom house there or near there and then the cargo will then be inspected by the revenue, Rwanda Revenue Authority. In addition to that, there is an Alex Stewart representative there too, okay? Then after that, the cargo will take a long journey of about 1,400, 1,500 kilometres to Dar es Salaam. Dar es Salaam, at the port area, the cargo will then have another surveillance which is the BV surveyor, you have got Bollore supervisor there, you have a Tanzanian officer there. Have you got it?

A: Yes.

Court: So I'm so sorry, it is a long question. This is really the entire supply chain from Excellent Mining all the way to Dar es Salaam, okay? I have explained to you the security aspect of it. Now --

Mr Yee: Sir, before you ask your question, you have missed out CCTV cameras and security guards at Bollore in Tanzania, in Dar es Salaam.

Court: CCTV cameras and?

Mr Yee: And security guards.

Court: At the port area.

Mr Yee: At the port area, yes.

Court: So now you've got this information. There are CCTV cameras at the port area too and there are security guards at the port area. Now, if you look at this entire supply chain from Excellent Mining all the way to Dar es Salaam, you tell me which is the weakest link.

A: In my opinion, *your Honour, the weakest link is the area within Excellent Mining before the -- before the cargo left for its onward journey and voyage*.

Court: Why do you say that the weakest link is at Excellent Mining?

A: *Because it's their private premises, okay, it is always in full control of the Excellent Mining people*, that's how I see it.

Court: You look at the security features at Excellent Mining, how can it possibly be the weakest link? No, I've already told you that there are security guards, there's a wall compound, there's CCTV cameras and then you have got mineral field officer that is stationed there during the office hours, then you have the Excellent Mining officer who stayed there, and then you have got the Alex Stewart people there, you have got the international tin supply chain representative there. How could it possibly be the weakest link?

A: Your Honour, the security would be most, utmost when everyone is there, as you mentioned, all the officials and surveyors, but I do not think they were there for the duration of the 24 hours, I believe they were only there during the working hours. So any -- any -- any time this -- that facility within Excellent Mining is not attended by these officers I think -- I think that there is a -- there is a -- there is a possible, you know, weakness, as you put it in the security.

…

Court: Can you tell me where is the strongest link?

…

A: The strongest link, in my opinion, would be in the -- the Dar es Salaam container terminal, or sometimes they will refer to as the container depot, that would be the strongest link.

Court: Please, that is the strongest link for you? Right. Then what do you consider the long journey from Rwanda to Tanzania, Dar es Salaam, you say that is not the strongest, it is not the weakest, is that what you're trying to tell me then, because your weakest is, according to you, Excellent Mining, the strongest link is at Dar es Salaam. So the long journey is not the weakest, it is not the strongest link?

A: Yes, it is not the weakest, it is not the strongest.

Court: Would you like to explain to me what are the security features that you have in this long journey?

A: From the information I gathered from Bollore -- Bollore has informed, it is a straight on journey with not much security provided, that's what I can gather.

…

Court: Would you like to explain to me why? There are hardly any security features there.

A: Yes.

…

A: Despite it not -- despite no security was provided to the conveyance vehicle or the drivers --

Court: … So what I'm saying here is that this long journey has hardly any security features. You're saying it is not the strongest link. I want to hear from you why. And you chose Excellent Mining which has so many layers of security and you say that that is the weakest link. So I'm trying to understand your opinion.

A: *I know it sounds bizarre* but I --

Court: It is, Mr Sim and that's what I want to hear from you, what is in your analysis, what is in your mind.

A: I have mentioned this earlier to the -- I think, the plaintiff's lawyer, despite the long journey, there just appeared to be no reported incident, no records of anything untoward, and this is -- this is -- this is a journey, although a very long distance journey, right, we have a situation where, I think, during all these, sixth to ninth

> shipments, they were all different drivers that were assigned to the delivery. They were all different -- so it is -- for me, I don't see anything having occurred that tantamount to, you know, a lack of security, your Honour.
>
> [emphasis added]

Evidently, even Mr Sim himself thought that it sounded "bizarre" for him to claim that the weakest link in the whole journey was Excellent Mining's premises, given the tight security there.

86 From Mr Sim's opinion he appears to be partial and lacks objectivity in his support of the defendant's case.

87 To begin with, Mr Sim was made aware of the insurance coverage by the defendant for the sixth to the ninth shipments as early as 2018.[73] He knew that if the thefts took place at Excellent Mining's premises the defendant would not be liable. The thefts of these shipments occurred in 2018. Why was Mr Sim informed of the insurance coverage? If he was commissioned to do an independent investigation into the thefts, there was no need for him to be apprised of such a fact which would likely have affected the impartial conduct of his investigation.

88 Moreover, Mr Sim claimed that he did not know the lids of the drums were cut.[74] This opinion goes against what the parties had agreed on, *ie*, the lids of the drums were cut to swap the tin concentrate with iron oxide. This called into question the very purpose of his investigation, which was then posed to him:[75]

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73 Transcript (11 November 2021) at p 55 line 23 to p 59 line 9.

74 Transcript (11 November 2021) at p 70 line 4 to p 71 line 22.

75 Transcript (11 November 2021) at p 71 line 23 to p 72 line 15.

> Court: … My question to you is: you didn't know that the drums were cut, you are not investigating into the theft of the cargo, then I'm asking you what are you investigating now, at that time, in 2018, because those are the things that troubled the insurance [company] and you're not investigating those things, what are you investigating?
>
> A: We have investigated, I -- we -- on our part here, we found no cutting of the drums.
>
> Court: No, no, please, my question is: what are you investigating?
>
> A: I was going on the probability that there was no cutting of the drum, there was no theft, okay, there -- something must have gone wrong from the point of origin based on all the evidence that I had before me.

I find Mr Sim's explanation to be plainly illogical. He opined that there were no thefts and that the drums were not cut. These findings are against the very crux of the parties' agreed facts, *ie*, it is undisputed that there were thefts of the tin concentrate and that the thieves cut the top of the drums to gain access to the tin concentrate and swapped it with iron oxide. It seems that Mr Sim was trying to tailor his evidence in the defendant's favour, to the extent that it would – in his own view – sound "bizarre" to a reasonable person (see [85] above).

89 Hence, from the above considerations and in the absence of credible evidence or explanation from the defendant, I find that the weakest link in the whole journey must have been the journey from the Bonded Warehouse to the port in Dar es Salaam for the thefts to have occurred for the sixth to the ninth shipments.

The NPPA Report

90 The NPPA Report dated 30 August 2019 was released after investigations by the Rwanda Investigation Bureau ("RIB"). The NPPA was

satisfied that the thefts had not been committed in Rwanda and decided to close the case.[76] In the NPPA Report, Excellent Mining, represented by Mr Sindikubwadbo, and Bolloré Logistics, represented by Mr Bisangwa François, were identified as suspects for the charges of breach of trust and theft. As noted above (at [16]), the parties agree that such a report was issued.

91 In brief, the findings of the NPPA Report are as follows:[77]

(a) The investigations showed that the tin concentrate was genuine, and it was loaded into drums and sealed in the presence of staff from the RRA, Alex Stewart, and the RMB.

(b) The plaintiff produced a report from Bureau Veritas, which conducted the inspection on the containers loaded with the drums of tin concentrate. The report clarified that no sabotage was done to the containers and the drums from Kigali to Dar es Salaam, as the drums, containers and tags were in "good condition". Hence, it "prove[s] that no crime of breach of trust or theft has been committed in Rwanda."

(c) The plaintiff produced a report made by Alex Stewart, which was obligated to conduct "professional inspection and analysis of minerals, to confirm their nature, quantity and quality and to confirm the nature of exported minerals as well as their quantity." At the time of loading the tin concentrate into the drums, a representative of Alex Stewart was present and confirmed the nature, quality and quantity of the minerals to be in conformity with those agreed by Excellent Mining and the

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76 AB Vol 1 at pp 71 to 73.

77 AB Vol 1 at pp 72 and 73.

plaintiff. Consequently, on the basis of this report, "there is no doubt that no crime of breach of trust or theft was committed in Rwanda".

(d) All the parties that were interrogated, *viz*, Excellent Mining, the plaintiff and Bolloré Logistics, did not "confirm" that the minerals were stolen in Rwanda.

92 I pause to emphasise that the findings of the Report are expressly limited to Rwanda only (see [91(c)] above), *ie*, whether Excellent Mining and Bolloré Logistics were complicit in the thefts in Rwanda. The Report does not cover other stages in the transport of the tin concentrate thereafter, *ie*, the journey from the Bonded Warehouse in Kigali, Rwanda to the port in Dar es Salaam, Tanzania. In this regard, the defendant submitted erroneously that the NPPA "made a finding" that "there was no 'sabotage' on the drums and containers from Kigali to Dar [e]s Salaam."[78] As stated above (at [91(b)]), that was a finding by Bureau Veritas based on which the NPPA made a finding that "no crime of breach of trust or theft has been committed *in Rwanda*" [emphasis added].

93 However, the defendant claims that the above findings are inconclusive for the following reasons:[79]

(a) The checks performed by the various authorities and Alex Stewart to ensure that the tin concentrate loaded into the drums was genuine are effective only in so far as the drums were not subsequently opened after sealing but prior to delivery to MSC.

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78 DRS at para 21.

79 Defence in SDB at pp 90 and 91 para 16(e).

(b) Sampling and testing of the contents in the drums were not likely to have been carried out by Bureau Veritas during the loading into the 20ft container at Dar es Salaam as the Precintia clip seals spot-welded on the bung holes of the drum lids were observed to be intact at MSC's premises. The defendant claims that Bureau Veritas would have limited its checks to "checking that the Precintia wire clip seals were intact and/or counting/weighing the drums and/or checking the Certificate of Assay and/or Sampling, Weighing and Packing certificates."

(c) Although Excellent Mining, Bolloré Logistics and the plaintiff did not confirm that the tin concentrate was stolen in Rwanda, it does not necessarily follow that the swap of tin concentrate did not in fact happen in Rwanda.

94 The defendant and its expert, Dr Petrone, do not accept the NPPA's findings and the above opinions were a rebuttal to the NPPA Report's findings. However, the substance of the defendant's dispute with the NPPA's findings is that, in its view, the NPPA had simply conducted a "desktop review of reports by different surveyors" and it did not discover the method of thefts. In particular, the defendant argues that the NPPA Report relied on the report of Bureau Veritas and its "suspect" finding of fact that the drums were not tampered with, in order to conclude that there was no evidence to prove that a crime of breach of trust or theft had been committed in Rwanda. This is consistent with the defendant's pleaded criticism in its Defence (see [22(a)]–[22(d)] above). In cross-examination, Dr Petrone explained as follows:[80]

> Q: … Would you agree that the RIB, on behalf of NPPA, has conducted a thorough, on-the-ground investigation?
>
> A: I don't agree with that.

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80 Transcript (17 November 2021) at p 56 line 21 to p 57 line 5.

> Q: Your basis, please?
>
> A: Because they were not even aware of the method of theft. As they said here that they only reviewed the reports, and I also reviewed the same reports, so this is not really an investigation. This is a desktop review of reports by different surveyors.

95 To begin with, the NPPA is *Rwanda's* prosecution authority. The NPPA clearly mentioned in the Report that the investigations were conducted by the RIB and the NPPA upon the complaint lodged by the plaintiff's representative, Mr Tambawala.[81] The ambit of the NPPA's investigations would, as a matter of logic, be limited to whether the thefts had occurred in Rwanda. If the NPPA found that there were no thefts in Rwanda, it would not have been necessary for it to further investigate the method of thefts, which would have happened elsewhere.

96 Moreover, Dr Petrone had no basis to allege that the NPPA had conducted an improper investigation as he did not know the extent of investigation into this case that was performed by the NPPA and the RIB. In cross-examination, Dr Petrone gave the following unsatisfactory answers:[82]

> Q: I put it to you, Dr Petrone, that this report by the National Public Prosecution Authority of Rwanda carries great weight. Do you agree with me?
>
> A: I completely disagree. This is just a desktop job. It is not an investigation. I would say quite honestly, it's an amateur job done to investigate this case. It's just a desktop review of surveyor's report, then some people with obvious conflict of interest in this matter have been asked if they have stolen the cargo or whether the cargo was stolen, and they have no basis for their statements here. They have done no investigation, no *independent* investigation was done. So I say this is not really -- this is not an investigation. This is just a summary of statement from people with interests in this matter.

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81 AB Vol 1 at p 72 para 9.

82 Transcript (17 November 2021) at p 58 line 3 to p 59 line 17, and at p 60 lines 3 to 12.

Q: You have read this report, which is a final decision, and it is three pages. And you have come to many, many conclusions and assumptions, Dr Petrone. You agree?

A: Can you elaborate on my assumptions, please?

Q: Yes. You are saying, essentially, that they didn't conduct a proper investigation. You are saying they conducted a desktop investigation. On what basis do you say that? Did you speak to RIB about this investigation?

A: Well, at the time when I was in Kigali --

Q: Did you speak to RIB about this investigation that concludes with the final decision on the case?

A: Okay, now that your question is completed, no, I didn't speak to them at the completion of the investigation. No.

Q: I put it to you also, Dr Petrone, that in actual fact the NPPA does not need to state in great detail the evidence and investigations that it has carried out when reporting on the decision to close the case. You agree with me?

A: I'm not aware of this.

Q: In actual fact, Dr Petrone, *you are not aware at all of what investigations and the extent of the investigations actually carried out*. Isn't it, Dr Petrone?

A: Counsel, I'm aware of what is written in this report.

…

[Q]: … In actual fact, Dr Petrone, you are not aware at all of what investigations were carried out, and the extent of those investigations carried out by RIB. Isn't it so?

A: *I'm not aware of other facts beside this document*. Yes.

Court: No, can you please answer the question.

A: I'm not aware if there was any other investigation done.

[Q]: But you very boldly dismissed this report. Isn't it so?

A: Yes, correct. I dismissed it. Yes.

[emphasis added]

As can be seen from the above, Dr Petrone essentially admitted that his basis for claiming that the NPPA had done no "independent" investigation on this matter was confined to the NPPA Report itself. Dr Petrone was not aware of

what investigations were carried out apart from the brief summary in the NPPA Report. Ironically then, it was Dr Petrone who had no independent basis for his criticism. From Dr Petrone's testimony, it is clear that he completely rejected the NPPA Report without any reasonable and persuasive basis. Dr Petrone's purported investigation into this case when he was in Rwanda with Mr Tambawala was highly unsatisfactory, inadequate, biased and lacked objectivity. I shall elaborate on his investigation when he was in Rwanda below.

97 It is unfortunate that the plaintiff did not call the official from the NPPA in charge of the investigation into this case to testify in court. Therefore, some caution is warranted when relying on the NPPA Report. Although the defendant did not object to the admissibility of the NPPA Report, I am aware that the defendant had serious criticisms of the NPPA Report. However, the defendant has not produced reasonable or credible evidence for me to jettison the findings of the NPPA Report. It is, therefore, inappropriate and unreasonable for me to ignore the findings made by the NPPA on the basis of Dr Petrone's unjustified opinion. I also reiterate that the findings of the NPPA are limited to whether Excellent Mining and Bolloré Logistics were complicit in the thefts *in Rwanda* (see [92] above). The defendant's counsel in his oral submissions accepted that the jurisdiction of the NPPA is limited to Rwanda. The findings, therefore, do not preclude the possibility of the thefts occurring during the journey from beyond Rwanda to Dar es Salaam, Tanzania, and the other stages in the transport of the tin concentrate.

The 3Ts minerals and the swapped iron oxide

98 The defendant claims that there is forensic evidence which indicates the concomitant presence of cassiterite (tin oxide), coltan (columbite-tantalite) and

wolframite (iron manganese tungstate) minerals (*ie*, the 3Ts minerals) in the iron oxide that was swapped for the tin concentrate (see [20(a)] above).

99 According to the defendant, through Dr Petrone, the presence of 3Ts minerals in the swapped iron oxide weighs in favour of the finding that the thefts occurred at Excellent Mining's premises. It submits that the replacement iron oxide was kept in a place that processes the 3Ts minerals before it was loaded into the drums. As a result, the 3Ts minerals were eventually found together with the iron oxide in the drums. In this regard, the defendant claims the following:[83]

(a) Excellent Mining processes the 3Ts minerals, so the above forensic evidence shows that it is likely that the iron oxide was stored at Excellent Mining's premises. By extension, the thefts would have happened there.

(b) The iron oxide could not have been stored in Tanzania. While Tanzania has some mines with cassiterite (*ie*, a mineral containing tin, one of the 3Ts minerals), it does not have mines with wolframite (*ie*, a mineral containing tungsten, one of the 3Ts minerals) and coltan (*ie*, a mineral containing tantalum, one of the 3Ts minerals).

100 The defendant's experts are Dr Hans-Eike Gäbler ("Dr Gäbler"), a chemist at the Federal Institute for Geosciences and Natural Resources in Germany, and Dr Petrone, who is a Principal Scientist at AqualiasBraemar LOC.[84] When Dr Petrone went to Penang from 12 to 13 September 2018, he took four samples of the materials in the drums that arrived in Penang in the

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83 DOS at paras 21 and 22.

84 Affidavit of Evidence-in-Chief of Hans-Eike Gäbler ("HG") at para 1; LP at para 1.

presence of Mr Tambawala, the Managing Director of the plaintiff,[85] and a surveyor from Alex Stewart International (Malaysia).[86] He then sent these samples to Dr Gäbler on 20 February 2019 and these samples were tested on 28 February 2019, 1 March 2019 and 4 March 2019.[87]

101 Dr Gäbler was instructed by Dr Petrone to check: (a) whether the cassiterite found in the four samples came solely from two mine sites in Nyaruvumu and Gituntu; and (b) if all four samples came from the same source.[88] Dr Gäbler prepared two reports, in which he concluded as follows:

(a) It was improbable that the cassiterite grains in one sample originated from the two mine sites in Nyaruvumu and Gituntu.[89]

(b) Instead, the age estimation of the cassiterite grains in the aforementioned sample showed that the Kibara Belt (which is in east-central Africa) and some other locations of the same age may be the origin of the cassiterite while many other locations worldwide can be excluded as they are different in age.[90]

(c) It is "very plausible" that the cassiterite grains in all four samples originate from the same source.[91]

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85 Affidavit of Evidence-in-Chief of Abizer Shabbir Tambawala ("AST") at para 1.

86 LP at para 12(a).

87 LP at para 14; HG at paras 6 and 8.

88 Transcript (16 November 2021) at p 21 lines 1 to p 25 line 22.

89 Transcript (16 November 2021) at p 29 lines 12 to 18; HG at para 8(a) and p 19.

90 HG at para 8(a) and pp 19 to 21.

91 HG at p 29.

102 With regard to (a) and (b), these two provinces in Rwanda were near Kigali. Dr Petrone explained that he identified these two regions because he was informed by the defendant that the origin of the materials sampled was from these two mines.[92]

103 With regard to (c), Dr Gäbler clarified that a source did not mean a specific geographical region or a specific mine.[93] Rather, his method of analysis, the Analytical Fingerprint (AFP) method, relies on comparing the geochemical signature of the samples with that of a reference material. Different mines would have different signatures. However, where material from one mine is combined with material from another, that mixture has its own signature, which is in his view also a source.

104 Dr Gäbler also clarified that he was not instructed to ascertain the origin of the other materials in the samples given to him.[94] He explained that this was because he did not have a database to compare the samples to. Dr Petrone confirmed that Dr Gäbler told him that it was not possible to ascertain the origin of the coltan (columbite-tantalite), wolframite (iron manganese tungstate) and iron oxide.[95]

105 I find it difficult to accept that Dr Gäbler's report assists the defendant's case. It is undisputed that the origin of the cassiterite, *ie*, the tin concentrate, was from Excellent Mining's premises. Dr Gäbler did not analyse where the other two 3Ts minerals and the iron oxide originated from, which would have been pertinent to the present issue.

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92 Transcript (17 November 2021) at p 143 line 9 to p 144 line 4.

93 Transcript (16 November 2021) at p 40 line 4 to p 43 line 14.

94 Transcript (16 November 2021) at p 45 lines 2 to 16.

95 Transcript (17 November 2021) at p 149 line 18 to p 150 line 13.

106 On the basis of Dr Gäbler's report, Dr Petrone makes the following findings in his report:[96]

> 5.3.17 For the 6th shipment, the chemical analysis shows the presence of cassiterite and wolframite, but not coltan. The certificates for other three shipments only show the presence of cassiterite (see Appendix 7). The quality certificates thus show that the 3T minerals are not found concomitantly in any of the four shipments in question.
>
> 5.3.18 As per my discussions with Dr. Hans Gäbler, BGR have mineralogical data from several 3T mine sites in Rwanda, Burundi, DRC and Uganda. I understand that a *combination of the 3T minerals from the same mine site is rare*.
>
> 5.3.19 Therefore, on the basis of the BGR's results and of my discussions with Dr. Hans Gäbler, the *contemporaneous presence of 3T minerals from the same mine is unlikely*. Therefore, it follows that the grains of 3T minerals found within the iron oxide material in the drums at MSC in Malaysia were *likely from a mixture* and not from a single deposit.
>
> 5.3.20 In other words, *the 3T minerals were not originally part of the iron oxide material placed in the drums*, but they had been admixed at some stage with the iron oxide material and among them *prior to the drums being filled*.
>
> 5.3.21 Therefore, the main question was where in the chain of events of this matter the grains of all 3T minerals have found their way into the iron oxide material in the drums of the four shipments of this matter.
>
> 5.3.22 The grains of all 3T minerals would have had to be admixed with the pile of iron oxide material in a place where all 3T minerals are routinely stored and handled, since they likely did not originate from the same mine site.
>
> 5.3.23 As previously concluded in this report, it can be reasonably concluded that it is *unlikely that the cassiterite grains found in the iron oxide material in the drums had originated from Tanzania*. The concomitant presence of all 3T minerals admixed to the iron oxide material in the drums of the four shipments *could have*

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[96] LP at pp 53 and 59.

occurred only in Rwanda, which has mines of all 3T minerals.

5.3.24 Having excluded Tanzania from the likely country where the theft had occurred, the origin of the iron oxide material admixed with all 3T minerals was likely a trader, exporter or comptoir of these minerals in Rwanda. *Excellent Mining is a trader of these 3T minerals*.

5.3.25 On the basis of the above comments, in my opinion it was *likely that iron oxide material had been brought at Excellent Mining and placed in a large pile on the floor of the open yard, in the same fashion as the Tin Concentrate cargo had been mixed for the four shipment of this matte*r. The pile of iron oxide would have been then shovelled into open drums after having cut open their lids and emptied them of their contents. *During this operation, grains of 3T minerals present on the floor of the open yard or on other equipment/tools used at Excellent Mining to fill the drums would have been admixed to the iron oxide material*.

…

8.5 Laboratory analyses carried out by BGR concluded that the probability that the cassiterite grains found admixed with iron oxide material in the drums *have not originated from Nyaruvumu and Gituntu mines*. All cassiterite grains in the four shipments in question had originated from the same source, with the likely origin being the Kibara belt, geological unit that extends across Rwanda, Burundi, parts of Uganda and the Democratic Republic of the Congo (DRC).

8.6 In consideration of the route of the drums, Burundi, Uganda and DRC have been ruled out as potential places where the theft had occurred, and thus *Tanzania and Malaysia are also excluded*. This *leaves only Rwanda as the only place where the cassiterite grains found in the drum mixed with iron oxide could have originated from*.

8.7 Furthermore, the BGR laboratory detected the presence of all 3T minerals in the tested samples. The contemporaneous presence of 3T minerals from the same mine is unlikely, as per information obtained from the database of samples at the BGR. Therefore, the 3T minerals found within the iron oxide material were likely from a *mixture of mine sites and not from a single deposit. The 3T minerals were not originally together but*

> *had been mixed with the iron oxide material prior to ending up in the drums of the four shipments in question.*
>
> 8.8 *The origin of the material in the drums comprising the 3T minerals and iron oxide was therefore likely a trader of these minerals in Rwanda*, since evidence presented in this report has ruled out Tanzania as a potential country where the theft had occurred. *Excellent Mining is a trader of these 3T minerals and, in my opinion, it was the likely site where the iron oxide material had been mixed with the 3T minerals and then transferred into the drums of the four shipments.*
>
> [emphasis in original omitted; emphasis added in italics]

While Dr Gäbler's report concerned only cassiterite, Dr Petrone's findings concern the 3Ts minerals as a whole. Essentially, he claimed that since (a) the 3Ts minerals are rarely found together in the same mine, (b) Excellent Mining trades in the 3Ts minerals, and (c) the samples did contain the 3Ts minerals, it means that it was likely that the 3Ts minerals were from Excellent Mining's premises. Hence, he inferred that the 3Ts minerals which were "present on the floor of the open yard or on other equipment/tools used at Excellent Mining" were admixed with the iron oxide *prior to the drums being filled*. Dr Petrone also referred to a photograph he took which showed a red substance in Excellent Mining's premises. On this basis, he claimed that Excellent Mining had iron oxide at its premises.[97] Hence, the iron oxide was mixed with the 3Ts minerals at Excellent Mining's premises prior to loading into the drums. He therefore concluded that the thefts occurred at Excellent Mining's premises.

107 I shall first address Dr Petrone's claim that iron oxide was present at Excellent Mining's premises. Dr Petrone did not take a sample of the red substance for testing. When questioned, he conceded that there could be other

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[97] Transcript (17 November 2021) at p 139 line 19 to p 141 line 11.

red substances that are *not* iron oxide.[98] Hence, the photograph he referred to is inconclusive evidence. Yet, Dr Petrone was so quick to conclude assertively that the red colour in the photograph shown at the compound outside Excellent Mining is iron oxide. He agreed that to be certain that it was iron oxide an analysis of the red substance is necessary. But, nevertheless, he continued to insist that it was iron oxide.

108 I turn next to Dr Petrone's theory that the presence of the 3Ts minerals in the drums meant that the swap took place at Excellent Mining's premises. His theory is premised on the admixing of iron oxide with the 3Ts minerals prior to the swap of the tin concentrate with iron oxide.

109 Dr Petrone's theory is not the only possible explanation for the presence of the 3Ts minerals. If the 3Ts minerals were found on the ground of Excellent Mining's premises, it is possible that they were admixed with the tin concentrate when the tin concentrate was unloaded onto the ground before being loaded into the drums (see [8(a)] above). After the swap with iron oxide, there could be remnants of the tin concentrate and the 3Ts minerals left in the drums. When Dr Petrone was questioned at the trial, he conceded this point:[99]

> Court: Now, you have told us that there is a -- there is a possibility that the iron ore could have been contaminated by the original cargo of tin ore. Right? This afternoon --
>
> A: We discussed about that, yes.
>
> Court: … Now, when the test took place -- I don't care where the test took place, all right?
>
> A: Okay, your Honour.

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98 Transcript (17 November 2021) at p 140 lines 4 to 25.

99 Transcript (17 November 2021) at p 153 lines 2 to 24; Plaintiff's Reply Submissions ("PRS") at para 19(g).

> Court: You have to first unload the tin ore. I mean, it's common sense.
>
> A: Yes, correct.
>
> Court: You offload the tin ore, and then after that you fill it up with iron ore. Okay? Now, in the process, there is another possibility of contamination. Because there is tin ore and iron ore at the same place when you are offloading and loading a different substance.
>
> A: Yes, your Honour. Yes.
>
> Court: Correct?
>
> A: It is correct. You are correct, yes.
>
> Court: So it doesn't -- in other words, there is two possibilities of contamination of the iron ore, with the tin ore.
>
> A: Yes.

Similarly, the plaintiff's expert, Dr Mirjana Küzma ("Dr Küzma"), a material scientist,[100] testified that the presence of the 3Ts minerals could be explained by the *remnants of the tin concentrate* in the drums after the swap:[101]

> A: Yes, it appears so with the method [the defendant's expert] used, the 3T minerals were detected. Then further the conclusion says:
>
> "The contemporaneous presence of 3T minerals from the same mine is unlikely, as per information obtained from the database of samples at the BGR."
>
> Now, you were showing here previously the table. *There is a small probability that they could also originate from the same site, we could see there. It was not zero*, it was showing some number of --
>
> Q: Slow down. Slow down. Slow down. Go ahead.
>
> A: So, therefore, the 3T minerals found within the iron oxide material were likely from a mixture of mine sites and not from a single deposit. I do not understand this conclusion, I have to say, because, first, they are stating that all four samples appears to be from the same source that, in my opinion, would be probably from the

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100 Affidavit of Evidence-in-Chief of Mirjana Küzma ("MK") at para 1.

101 Transcript (9 November 2021) at p 128 line 19 to p 130 line 7.

> same mine site, according to their database. But then they say that it is actually very unlikely that these 3T minerals, tungsten, tantalum and tin, would actually originate from the same single deposit. Maybe Dr [Gäbler] would be more in a position to further elaborate this conclusion. I think it is contradictory to how I understand his conclusion:
>
> Further:
>
> "The 3T minerals were not originally together but had mean mixed doubt [*sic*] prior to ending up in the drums of the four shipments in question."
>
> This is again debatable whether they were mixed or not. I think as the judge said earlier, and this is also *my opinion, if initially there was a cassiterite concentrate in those drums and it was swapped, my logic tells me that cassiterite from the original shipment should be there and cassiterite can also come with the tantalum, with like traces of tantalum, I think this is also not disputed, and it could also then come with the tungsten.*

[emphasis added]

Furthermore, the drums used were not new: they were reused drums which might have contained the 3Ts minerals. Therefore, it does not matter where the swap took place as the 3Ts minerals could have been present in the drums in any case. Hence, Dr Petrone's inference that the swap took place at Excellent Mining's premises due to the presence of the 3Ts minerals is not conclusive but speculative.

110 However, Dr Petrone made an argument in support of his claim above that the 3Ts minerals must have been mixed with the iron oxide, instead of being admixed with remnants of the tin concentrate.[102] He argued that the iron oxide filled the whole of the drums and thus there was little room for thorough mixing of the iron oxide in the drums. The remaining tin concentrate (after the swap) would be found mostly at the bottom of the drums. When Dr Petrone took the

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102 Transcript (17 November 2021) at p 97 line 7 to p 103 line 17.

samples of the iron oxide in Penang, he did not take them from the drums' bottom. Hence, he claimed that what he sampled was purely the iron oxide that was swapped, without the remaining tin concentrate that was originally in the drums. However, the iron oxide in the drums must have been subjected to considerable shaking and vibration during the long journey on land, when they were removed from the 40ft container to the 20ft container, and during the long sea voyage. Moreover, as Mr Wheeler testified, cassiterite is a "dusty and free-flowing" material.[103] Thus, Dr Petrone's explanation is not convincing. I therefore do not agree with Dr Petrone's theory that the swap must have taken place at Excellent Mining's premises because of the presence of the 3Ts minerals in the iron oxide.

111 In addition, I note that Dr Küzma initially concluded that the iron oxide "had not originated from the Kigali area where the Excellent Mining loading facility is located".[104] At the trial, she qualified this statement to say that the iron oxide had not originated only from the two mine sites in Nyaruvumu and Gituntu. I also note that the samples used for her report were only taken on 25 and 27 May 2021 by Alex Stewart,[105] a few years after the thefts had occurred. However, there is no evidence that this has affected the accuracy of her report.

112 Having considered the experts' opinions on both the 3Ts minerals and the iron oxide, I am not convinced by Dr Petrone's opinion and I find Dr Küzma's explanation more plausible.

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103 Transcript (10 November 2021) at p 77 lines 15 and 16.

104 MK at p 18 of report para 3.30.

105 MK at p 8 of report para 3.1.

The paint on the drums' lids

113 The lids of all the drums were painted with white alkyd paint after the tin concentrate was loaded into the drums and the drums were sealed. After the circumference of the drums' lids were cut and the contents replaced, the lids were welded to the top of the drums leaving the welded holes and the Precintia clips that sealed the holes of the drums untouched. This gave the officials who inspected the drums the false impression that the drums were untampered with. The defendant contends that a thick layer of white alkyd paint that was used to cover the welding marks on the drums' lids was the same paint that was originally used to paint the drums.[106]

Laboratory analysis of paint samples

114 At MSC in Penang, Dr Petrone collected some paint flakes from around the rim of a drum's lid. In addition, a section of a drum's lid was also cut out to obtain a 10cm × 10cm sample of the paint layer. These two samples were sent to the laboratory of SOCOTEC UK Ltd ("Socotec") for analysis.[107]

115 During Dr Petrone's inspection at Excellent Mining's premises, he found cans of paint in an open yard which he claimed contained the paint used on the drum's lids.[108] This paint was "Email Brillante, Super Gloss", manufactured by Ameki Color, a paint manufacturer based in Kigali, Rwanda. Dr Petrone claimed that he and Socotec's laboratory tried to contact the paint manufacturer to no avail. Hence, he was unable to obtain a can of the original

106 DOS at paras 12, 15 to 17.

107 LP at p 46 para 3.1.

108 LP at p 46 para 3.2.

paint for comparative purposes.[109] When Dr Petrone was conducting his investigation at Excellent Mining he could have collected some paint for Socotec's analysis. He claimed that he did not do so as paint is a highly flammable substance so he could not bring the can of paint with him when he took a flight back.[110] This is a lame excuse as it is not necessary to have the whole can of paint for analysis. Some small quantity of white paint would be sufficient for analysis just as he had collected some white paint from the lid of the drum at MSC in Penang for analysis.

116 Socotec issued its report on 15 March 2019 (the "Socotec Report").[111] The report states the summary of its findings as follows:[112]

> FTIR results both show an alkyd resin based paint, however when the graphs are overlaid there are *not enough similarities to be considered an exact match*. An FTIR will only determine the resin origin of the sample, the differences in the stretches and peaks could be due to different thickness of samples or the presence of contaminants.
>
> XRD analysis show many matching compounds; however the paint flakes backed with plaster showed a much higher reading of Calcite. It is difficult to determine whether this Calcite is a false reading due to the plaster or if it is filler being used in the paint. The Barite, Talc, and Magnesite found in the sample with the plaster may also be contamination and not a true reading of the paint's composition. *For a more accurate analysis, at least 10g of each sample would be required uncontaminated.*
>
> The heavy (toxic) metal analysis shows much higher concentrations of aluminium and zinc in sample 197256. This would *suggest very different compositions of the two samples*.
>
> However, due to the contamination present and the difficulty in separating the sample from the lid cut out and the plaster, the results may be limited in representation.

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109 LP at p 46 para 3.3.

110 Transcript (17 November 2021) at p 71 line 19 to p 72 line 3.

111 LP at p 32.

112 LP at p 39.

> Under magnification, the two samples *appear visually very alike*. The presence of the same contamination seems very closely matched across the two samples; however it has not been determined as to what this contamination is.
>
> Considering all the results there is a *very strong correlation between the two samples* and it is possible to determine that the two paints share the same resin type, however *due to the samples being contaminated it cannot be identified as a complete match*. Provision of uncontaminated samples for further testing would allow for a more accurate determination.

A plain reading of the above findings indicates that, while there was a very strong correlation between the two samples of paint, the samples were ultimately *not* a complete match. This was mainly due to the fact that the samples were contaminated. Hence, it appears that the Socotec Report is inconclusive.

117 However, the plaintiff's expert, Dr Küzma, and the defendant's expert, Dr Petrone, arrived at diametrically opposed interpretations of the findings in the Socotec Report. Dr Küzma opined that the two white paints were not the same while Dr Petrone opined otherwise.[113]

118 Dr Küzma's interpretation was premised on the Socotec's Fourier Transform Infrared Spectroscopy (FTIR) analysis. According to Socotec, this was used "to examine the top layer of the paint flake sample in order to determine the resin identity."[114] I reproduce the resin identification results (the "Resin ID") below:[115]

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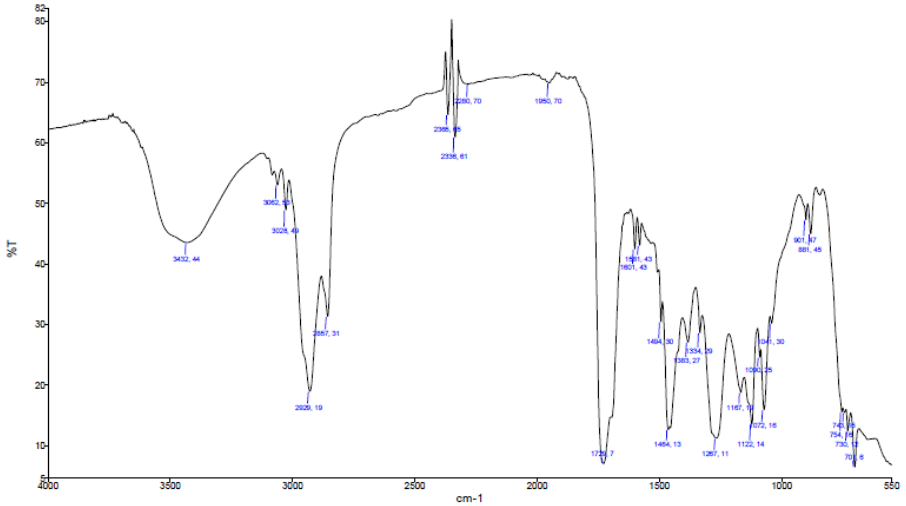
113 Transcript (9 November 2021) at p 137 lines 5 to 13.

114 LP at p 34.

115 LP at pp 34 and 35.

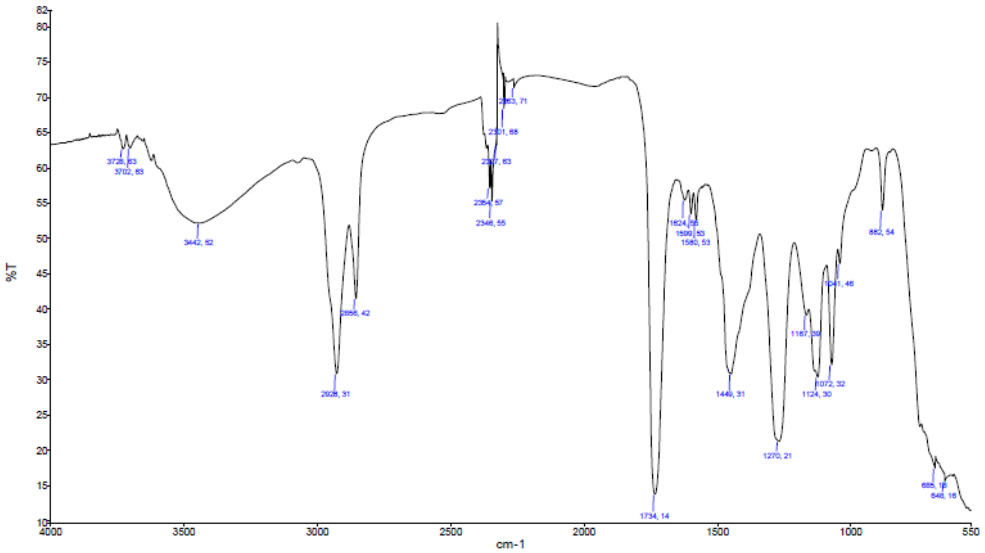
Resin ID Results

Sample Reference: 197256 – Paint Lid
Laboratory Sample Reference: ASC/37787.001

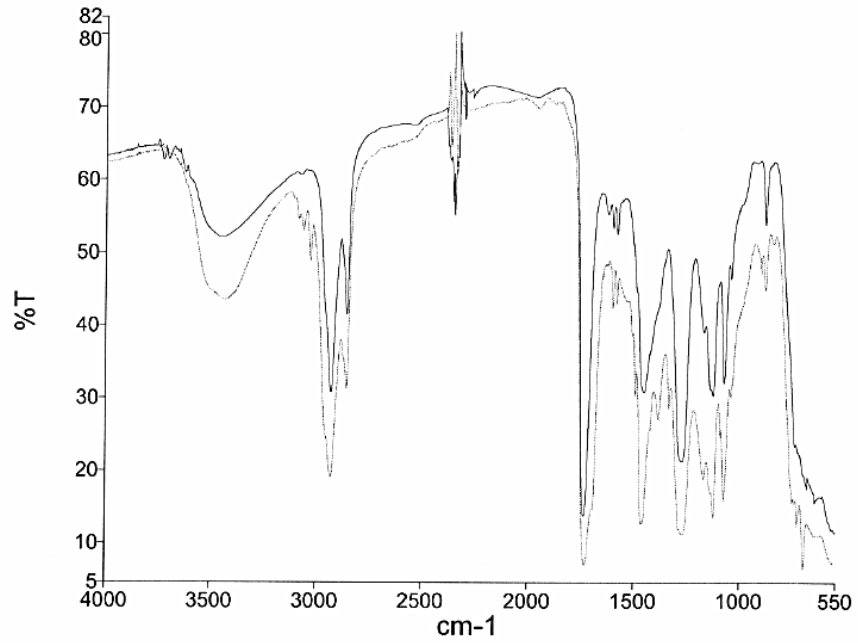


The top layer of the paint sample was analysed for Resin ID by FTIR. The closest match from the FTIR spectrum library was found to be an alkyd.

Sample Reference: 197257 – Paint Flakes
Laboratory Sample Reference: ASC/37787.002



The top layer of the paint sample was analysed for Resin ID by FTIR. The closest match from the FTIR spectrum library was found to be an alkyd.



The above graph shows the FTIR analyses of the samples overlaid for easier comparison. 197256 is the light line.197257 is the bold line.

The first graph shows the Resin ID of the paint flakes at the rim of a drum's lid, and the second graph is a sample of paint from the centre of a drum's lid. The last graph is the overlaying of the two graphs for comparison.

119 According to Dr Küzma, the FTIR analysis basically gives the "fingerprint" of the compound, as FTIR results are unique for each compound.[116] Hence, for the two paint samples to match, all the peaks in the two respective graphs must be identical.[117] However, this was not the case here because there were numerous differences in the peaks of the two graphs. In her expert report, she stated as follows:[118]

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116 Transcript (9 November 2021) at p 138 lines 6 to 20; p 141 lines 8 to 12.

117 Transcript (9 November 2021) at p 138 line 6 to p 140 line 5.

118 MK at p 20 of report para 3.35.

> 3.35 The SOCOTEC paint analysis report clearly evidenced the chemical composition of these two paint samples was markedly different, and therefore the fingerprints of these samples did not match with each other. This meaning, that they were apparently not from the same paint manufacturer or source.

At the trial, she enumerated the many differences between the two graphs:[119]

> A: … So this is the IR spectrum of paint lid sample. There's the sample initially painted, yes. And then on the next page you have paint flake sample. This is the sample taken from the rim of the drum. Now you could see on the Y-axis on the left side, you have the transmitters, and on the X-axis, you have wavelength number. Each -- now, this FTR analysis basically measures sample absorbance of infrared light at various wavelengths, yes, and energy levels of this absorbed IR are actually give you the fingerprint -- basically give you the composition of each of the compounds. And each of the compounds has a unique fingerprint, okay? So in order you would say that something matches, it has to be identical, it has to -- all the peaks need to match, but here clearly there are some peaks present in one sample and some peaks are not present in another sample. So if you go down. So now you have to see because it is transmitters, now you have to look at the peaks which are pointing down, yeah, and let's now go from the left side to the right side. So we are of the region of 3,700 centimetres minus one. Yes. You can see there the two peaks. And now if you go back to each of the individual spectrums, you can see that in the paint flake sample, you have, first, two peaks which are not identified with the paint lid. This is 3728 and 3702. Then further, we go to the area of 3062, there are two peaks that appear in the paint lid and they're not there in the paint flakes. Further, we go to the area of 2336, there are five peaks detected with the paint flakes and three peaks detected with the paint lid. Further, we can go to the 1950, that's one peak with defected in the paint lid, and there's no peak detected in the paint flakes. Further we go to peak of 1734, that's the carbonyl group, you could see that carbonyl group -- I mean this peak has a shoulder in the paint lid, while in the paint flake sample, the peak is very -- yeah, this is basically -- yeah, this peak here. This one peak but then if you scroll up, this area we can see this small

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[119] Transcript (9 November 2021) at p 138 line 6 to p 140 line 5.

> shoulder, like from the tip of the peak, 1 centimetre up on the right side, yeah, this one, yeah. So then we go to the fingerprint area, *there are again differences*, really visible differences, *I can basically go one by one*.
>
> 1581 with the paint lid sample, there are two peaks only detected with the paint flakes, there are three peaks detected, if you scroll down.

[emphasis added]

120 Besides comparing the graphs, Dr Küzma also compared the chemical composition of the two samples. I set out her testimony here in detail:[120]

> Court: So, in other words, besides the two graphs, you need to look at the chemical composition of these two samples before you can come to the conclusion that they are the same?
>
> A: Yes.
>
> Court: Right?
>
> A: Yes. It would be wrong -- scientifically wrong to just conclude based on the FTR analysis and say that white paints are of the same source because, as I said, even if these two FTR spectra would be identical, then we still have -- what about if the pigment was different in both of the paints?
>
> …
>
> A: Okay. So first phase we have rutile, it is titanium dioxide, and you can see in one sample, it is 59 weight per cent and in the other sample it is 3.5 weight per cent. Okay, I am aware that XRD method actually does not detect below 5 weight per cent but with that error we can clearly see that here it is, like, 10 times difference. So this first implies on *different chemical composition*. Further, if we go to the anatase, which is, like, the fifth row -- sorry, if we go to calcite, sorry, it is the fourth row, yes. *Again, the difference in both samples is very obvious*, at least to me. So what I'm saying now here in one paint source, rutile was used as a pigment, a white pigment, and in another paint type, the calcite was used

[120] Transcript (9 November 2021) at p 145 lines 2 to 13; p 149 line 10 to p 150 line 7.

> as a pigment. Then *there are other differences here let's say barite and magnesite* were not actually detected within one paint sample and were detected in another one. So, to a scientist, *this should be like a very clear position that we are clearly not talking about the same paint.* I'm saying that because these results have normalised, the 100 per cent and we're talking about shares.

[emphasis added]

As stated above, she came to the conclusion that the two white alkyd paints were different.

121 Dr Petrone's opinion was that the differences between the two graphs were not sufficiently significant to displace his conclusion that the paint samples were a match. In his expert report, he stated as follows:[121]

> 3.4 The Fourier Transform-Infrared (FT-IR) analysis carried out by SOCOTEC determined that the IR spectra of the flakes from the rim and the centre of the lid were identical. A slight difference in the intensity of signals (% Transmittance or %T) can be seen in the IR spectra. This difference in %T is to be expected for this technique and relates to the quantity, density or thickness of the paint, and the local quantity of chemical functionalities probed by the IR beam. The same sample tested twice will likely show difference in %T. Therefore, differences in %T do not relate to differences in the chemical composition of two samples.
>
> 3.5 The critical aspect to consider is the presence and position of signals, namely whether negative peaks in the IR spectra are found and at which position on the x-axis (wavelength measured in cm^{-1}). Signals related to the stretching vibrations of aliphatic groups ($-CH_2-$ and $-CH_3$) and carbonyl (C=O) in an ester group (COOR) can be found in the IR spectra in the ranges at between approximately 3,100-2,900 cm^{-1} and 1,600-1,800 cm^{-1}, respectively. Therefore, the IR spectra for both samples related to an aliphatic ester paint or resin.

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121 LP at pp 46 and 47.

> 3.6 The IR results from the SOCOTEC laboratory thus concluded that both tested paints were polyester resins, which are more generally known in the industry as alkyd paints or oil-based paints.

At the trial, Dr Petrone sought to undermine Dr Küzma's opinion, stating that her explanation was incorrect:[122]

> A: … The way I say that these paints are exactly the same paint is based on my review of the FTIR data on page 900. So at page 900, you have a picture at the bottom of the page where there is the overlap of the two FTIR spectra.
>
> Let me start by saying that FTIR is not a quantitative technique, which means it is a qualitative in nature. Therefore, look at the intensity of the peaks which are negative in this graph. So negative peaks are signals of chemical groups present in the sample.
>
> So we need to ignore the intensity. We only look at the position, so the X-axis, which are centimetres to the minus 1 units. So this is like an energy of the bonds, how the bonds vibrate of different chemical groups within the samples.
>
> If you look at this, just a quick glance, I would say that *all the major signals -- so* ***the fingerprint -- is the same***. And, in fact, ***this is also confirmed by SOCOTEC***, so these are two alkyd paints. And how can I say that? Simply by looking at alkyd paints are characterised chemically by a bond called ester bonds. And these ester signals can be seen as a prominent, in this case, negative peak, of around 1,700. Then there will be another around 1,270, and then there is another negative peak at around 1,100. So this is so-called the triplet of the ester bond vibration. So one group gives rise to three different signals. That's how we know that this is an alkyd paint, so ester alkyd paint.
>
> Now, if we look now at other signals -- and *I've listened to Dr Kuezma, the position. Of course, I was here at the time. She said that these two spectra do not match 100 per cent, therefore, they are different paints, something on those terms. Yes.*

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122 Transcript (17 November 2021) at p 132 line 3 to p 135 line 24.

And I remember clearly that she focused on one region of this spectra, which is at around 1,600 here, where you have three smaller peaks in one spectrum, and two smaller peaks in the other spectrum. And the conclusion was that because in one spectrum you have three peaks and in another you two have peaks, therefore, these two materials must be different. This was her conclusion.

But as an IR expert, infrared spectroscopy expert, I have seen many, many spectra of complex material. So this is a complex material, it is a paint. If I had only one material, let's say water or glass, these are simple materials. Every time I record an FTIR, I always get the same signals. It is correct.

But once I have a paint, which is a complex material of about 10 to 20 ingredients interacting, what happens is that some of these interactions will impede, or block the freedom of movement of some of the atoms. So if I had, your Honour, the same sample and I carry out one analysis with an infrared beam, which is pretty much the size of a human hair, so it's a small spot. And I record one signal, if then I record another signal on the same sample of this complex material, I know already that I will get slight differences, because the local chemical environment in each point would be different. Because it is such a complex material, it cannot be homogeneous at such a small resolution.

So whenever I analyse different points on the same material, *I expect to see some small differences*. Of course the major signal would be the same, but there would be some vibration, some modes which could be impeded.

Specifically in this case, if I can go into the details, it is the area of so-called aromatic group. So this tells me that there is an aromatic group which has been added, an extra ingredient to modify this polymeric chain, this polymer of the paint. There are some aromatic group like benzene, which are big rings, usually comprising six carbons all linked together without the hydrogen. So this is the region of the aromatic groups. And I don't need to see three signals to say that this is an aromatic group. I only need two signals or one signal, because only aromatic functionalities are found in this region that we are talking about, because these will have different -- carbon and carbon will have different so-called stretching, you can have like symmetric stretching or anti-symmetric stretching, you will have bendy modes. So it will have several modes, some of

> these modes doesn't have this degree of freedom from point to point on the same sample.
>
> Now, when I see two peaks and then three peaks, I know there is an aromatic group in there. That's why I'm saying this is exactly the same compound. Because maybe in that spot, one of these stretching didn't have the freedom to vibrate. That's all it means.
>
> So that's why I'm saying that what Dr Kuezma explained was incorrect, and that's why I'm saying that even though to a layperson they might look different, but to me, *because I know the origin of each peak, I know that this is the same region*, I'm looking at the same compounds, same molecule. ***At all the peaks, there is a match***. That's why I'm saying the two resins match.

[emphasis added in italics and bold italics]

122 In my view, Dr Petrone's testimony showed that he was overly eager to disprove Dr Küzma's opinion and this again reveals his biased opinion to support the defendant.

123 Firstly, he said that the fingerprints of the two samples are "the same" and that Socotec "confirmed" this. Yet, Socotec's report stated clearly that they did not identify the two samples as a complete match (see [116] above). In fact, this was consistent with the conclusion in his expert report on this issue:[123]

> 3.12 SOCOTEC concluded that there was a 'very strong correlation' between the two paint samples. In my opinion, as a coating expert with experience in laboratory analyses of paint, and having worked with and published several peer-reviewed scientific articles by using IR spectroscopy, SEM-EDX, XRD, optical microscopy and ICP, I agree with this SOCOTEC's comment. *Therefore*, in my opinion, the thin paint applied in the centre of the lid and the thicker paint applied over the welds *were the same* and they were likely "Email Brillante, Super Gloss" from Ameki Color in Kigali, Rwanda.

[emphasis in original omitted; emphasis added in italics]

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[123] LP at pp 47 and 48 para 3.12.

Evidently, Dr Petrone was content to simply proceed on the basis of Socotec's finding that there was a "very strong correlation" between the two paint samples, to conclude that the two samples are from the same paint.

124 Secondly, Dr Petrone said that he had listened to Dr Küzma's evidence in court. Yet, his short description of her evidence clearly paled in comparison to the long and detailed explanation that she gave at the trial (see [119]–[120] above). In fact, Dr Küzma was even ready to elaborate on *more* differences between the two graphs.

125 In any case, it is apparent that Dr Küzma's findings cohere with that of the Socotec Report. I find the opinion of Dr Küzma more convincing and reasonable when she opined that the two paint samples do *not* match, despite their strong correlation. On the weight of evidence, I find in favour of the plaintiff on the issue of the source of the paints.

126 Dr Petrone assumed that the same group of people must have applied this paint after the thefts were committed.[124] Yet, Dr Petrone confirmed that the "Email Brillante, Super Gloss" paint is a commercially available one. That must clearly mean that other people in Rwanda or even the neighbouring State of Tanzania would have been able to buy and use this paint at the material time. No evidence was adduced to show that Excellent Mining was the only one using this paint then. In the circumstances, even if the defendant could show that the two paint samples were an exact match, this would not have assisted its case.

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[124] Transcript (17 November 2021) at p 125 line 22 to p 130 line 11.

Photographs of the drums

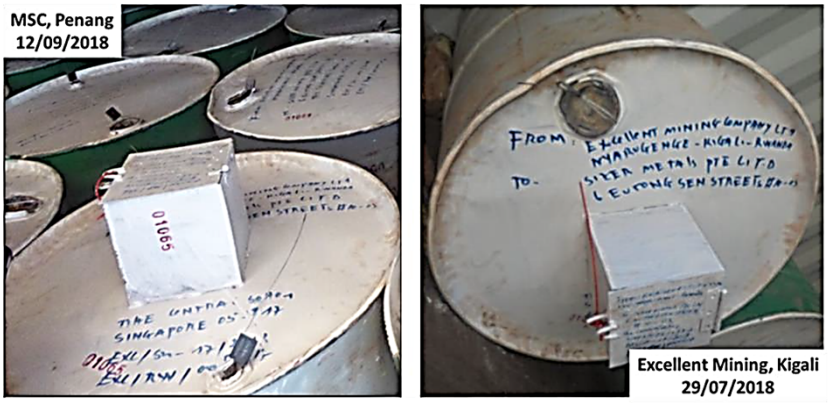
127 Dr Petrone claims that the thick layer of white alkyd paint which was used to cover up the welding marks was present since the drums left Excellent Mining's premises to the time they arrived in Penang.[125] From this, he concludes that the drums' lids had been cut open and rewelded, and the paint applied, by the time the drums left Excellent Mining's premises. Therefore, the thefts had occurred there.

128 In his expert report, Dr Petrone explained the above in detail and referred to a photograph of the drums at Excellent Mining's premises and another in Penang:[126]

> 5.2.6 I took the photograph below on the left-hand side at MSC in Penang on 12 September 2018 for the 9th shipment. The photograph on the right-hand side was provided by Sizer Metal and it coincides with a photograph found in the 'Container Inspection Certificate' dated 3 July 2018, which was prepared by Alex Stewart International Rwanda (see Appendix 18). The photographs show the same white drum with the box containing the tags on it. The layer of paint found on the drum at the arrival at MSC appears the same as that on the same drum at Excellent Mining prior to the closing and sealing of the doors of the container TCNU3309107.

125 Transcript (17 November 2021) at p 157 lines 7 to 21.

126 LP at pp 49 and 50.



5.2.7 In my opinion, the comparison of the photographs above is evidence that *the thick layer of paint had been already applied onto the drum's lid at Excellent Mining in Kigali prior to the completion of the stuffing operations and the closing of the container's door.*

5.2.8 Other photographs provided by Sizer Metals show the presence of a similar paint coverage on the lids of all drums at Excellent Mining, which was the same I have seen at the arrival of the drums at MSC in Penang for 8th and 9th shipments (see photographs provided by Sizer Metals for 6th, 7th, 8th and 9th shipments in Appendices 17, 19, 20 and 21).

5.2.9 Furthermore, all photographs provided by Sizer Metals for the drums in Kigali at the time of stuffing/loading into the respective containers show a strikingly similarity in paint coverage over the lids and rims of the lids as to those observed both in Penang and in the Bureau Veritas ("BV") Stuffing Survey reports from Dar Es Salaam in Tanzania (see all four BV reports in Appendix 22).

5.2.10 No photograph was provided to me for the drums when the seals were applied or when the lids where painted. Therefore, I am not able to directly compare the appearance of the paint coverage over the drums' lids when it had been originally applied with the paint coverage over drums at the time of stuffing/loading into the containers, and subsequently when the drums arrived at Dar Es Salaam in Tanzania.

[emphasis in original omitted; emphasis added in italics]

Dr Petrone's theory was that the swap of the drums' contents had to take place *inside* Excellent Mining's premises.[127] His expert opinion was that the thickness of the paint applied to the drums in both photographs was the same.[128] Hence, the two photographs above show the state of the drums *after* the theft had occurred.

129 In my view, the fact that the photographs above show the same thickness of paint is inconclusive. It could also suggest that the thief was very adept at concealing the welding marks. I wish to reiterate that the parties agree that the swap took place after the tin concentrate was loaded into the drums and the holes were welded and sealed.

130 In court Dr Petrone said his theory was premised on the fact that Excellent Mining's staff was complicit in the thefts.[129] This was because he acknowledged that thefts of this magnitude could not have gone unnoticed at Excellent Mining's premises. At the trial, he conceded that, if Excellent Mining's staff was not complicit in the thefts, his theory that the thefts occurred at Excellent Mining's premises would not hold. Yet, as I have analysed above, there was no evidence to suggest that Excellent Mining's staff was involved. To begin with, the level of security there was the highest compared to the other stages of the Transit Period (see [53]–[69] above). Moreover, there was no reason to impugn the findings of the NPPA Report (see [90]–[97] above). In the circumstances, Dr Petrone's theory cannot stand.

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127 Transcript (17 November 2021) at p 159 lines 3 to 9.

128 Transcript (17 November 2021) at p 157 lines 7 to 21.

129 Transcript (17 November 2021) at p 159 line 5 to p 160 line 21.

Conclusion on the paint on the drums' lids

131 Having considered the evidence in relation to the paint on the drums' lids, I find that they do not show that the thefts had occurred at Excellent Mining's premises.

Dr Petrone's prejudiced and biased investigation

132 I shall now comment on Dr Petrone's investigation into this case. Unfortunately, his investigation is unsatisfactory, superficial and substandard.

133 I begin with his investigation in Rwanda. This is Dr Petrone's account of what he did in Rwanda:[130]

> **2 MY ATTENDANCE IN KIGALI, RWANDA**
>
> 2.1 On 3 October 2018, I travelled to Kigali, Rwanda to investigate the standard operations at Excellent Mining. I also interviewed representatives from Bollorè Logistics in Kigali and met with the Rwanda Investigation Bureau.
>
> 2.2 I attended at Excellent Mining and met with the manager, Mr Theodore Sindikubwabo, and with the person in charge for the supply of minerals, Mr Emmanuel Uwimana. In attendance were also Mr Abizer Tambawala and Mr Jaffer Diwan from Sizer Metals.
>
> 2.3 I inspected an open yard at Excellent Mining where minerals are piled up and mixed on the ground, followed by sampling and then loading into the drums (see photographs in Appendix 11).
>
> 2.4 I enquired about the paint used on the drum's lids and workers at the site explained that only a thin layer of a white paint is always applied by brush on the lids to increase contrast when information on the shipment is handwritten on the lids.

130 LP at p 45.

2.5 During my inspection, I located 1-L cans of paint stored at the open yard. Information visible on the can showed that the paint was "Email Brillante, Super Gloss" manufactured by Ameki Color, which is located in Kigali, Rwanda (see photograph in Appendix 12).

2.6 I have also inspected empty drums found at Excellent Mining's premises, and all drums were intact. No evidence of welds was seen on any of the drums I examined at the site (see photographs in Appendix 13).

2.7 Through my interview with personnel at Excellent Mining and my inspection, I noticed the presence of one CCTV camera, which was not located where the drums with this Tin Concentrate had been reportedly stored prior to being stuffed/loaded into the containers (see photographs in Appendix 14). There were inconsistencies in the information I received from the Excellent Mining personnel in relation to the location of the CCTV cameras and on whether they were functioning properly at the time of my inspection. I requested for any recordings from CCTV cameras at the time of the four shipments of this matter, but I was informed that no CCTV camera was in place or functioning at the time. Furthermore, no invoice or receipt for the purchase of a CCTV camera was reportedly available upon my request, therefore I was not able to obtain evidence as to when the CCTV camera had been purchased in relation to the four shipments in question.

2.8 In essence, I found no evidence that a video surveillance system was in place at the time when the drums of the four shipments in question were stored at Excellent Mining's premises.

2.9 There were other inconsistencies during my interviews with the personnel at Excellent Mining. I was initially informed that the drums' storage location for the four shipments in question had been changed to another location where no CCTV camera was installed. This would have explained the lack of CCTV recordings. However, upon my request, Mr Abizer Tambawala phoned Mr Mwashi from Alex Stewart in Kigali, who stated that in his experience as a surveyor at Excellent Mining over many years the mixing of the material, sampling operations and storage of the drums were conducted always at the same yard. Mr Mwashi's statement thus contradicted the information I received from Excellent Mining's personnel during my interviews.

> 2.10 Subsequently, accompanied by the two Sizer Metals' representatives, on the same day I travelled to the Rwanda Inspection Bureau (RIB) and met with Mr Damian Ndayisaba, the prosecutor in charge of the investigation into this theft. Mr Ndayisaba stated that RIB had no previous experience with such matters and that RIB had no information on who perpetrated the theft or where (see photograph in Appendix 15).
>
> [emphasis in original omitted]

134 Dr Petrone went to Rwanda for only two days[131] and he spent an aggregate of only five to six hours carrying out the investigation.[132] Out of this duration, he spent three hours at Excellent Mining's premises, during which he spoke to Mr Sindikubwadbo and Mr Emmanuel Uwimana, a representative from Excellent Mining who assisted informally with the translations. Dr Petrone spent the remaining two hours at the Bonded Warehouse and the RIB.[133] I note that he omitted many important tasks when he conducted his investigation:

(a) He did not speak with any representative or MFO from the RMB, despite knowing of the RMB's function and being aware that there was an MFO stationed to monitor the drums of tin concentrate at Excellent Mining's premises.[134]

(b) At the trial, he accepted that Excellent Mining had security guards, but he claimed that he did not see any when he was there. His testimony therefore suggests that he did not speak to any security guards

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131 LP at p 45 para 2.1 and Transcript (16 November 2021) at p 89 lines 3 to 8.

132 Transcript (16 November 2021) at p 89 lines 9 to 12.

133 PCS at para 5(e).

134 PCS at para 5(g); Transcript (16 November 2021) at p 112 lines 19 to 23, and p 115 lines 23 to 25.

or ask the people at Excellent Mining's premises whether there were security guards.[135]

(c) He did not speak to any representative from ITSCI to obtain any information regarding the thefts or to find out from ITSCI if there were any similar cases of organised crime of such magnitude occurring in Rwanda.[136]

(d) He did not speak to any representatives from the RRA or Alex Stewart to obtain any information regarding similar thefts of this magnitude.[137]

(e) He did not go to the areas surrounding Excellent Mining's premises to question neighbouring residents of any suspicious activities or to look for CCTV footage of the vicinity.[138]

(f) He did not look for any cutting equipment that could have been used to cut the drums' lids. In this regard, he confirmed that he did not find any welding equipment at Excellent Mining's premises.[139]

(g) He did not take any paint samples from Excellent Mining's premises.[140]

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135 Transcript (16 November 2021) at p 111 line 1 to p 112 line 7.

136 PCS at para 5(i); Transcript (16 November 2021) at p 117 lines 3 to 11.

137 PCS at para 5(j); Transcript (16 November 2021) at p 120 line 22 to p 121 line 5, and p 126 lines 21 to 24.

138 PCS at para 5(l); Transcript (16 November 2021) at p 122 lines 1 to 14.

139 PCS at para 5(n); Transcript (17 November 2021) at p 44 line 13 to p 45 line 6, and p 46 lines 2 to 5.

140 PCS at para 5(bb); Transcript (16 November 2021) at p 127 lines 12 to 13.

(h) He did not open the can of "Email Brillante, Super Gloss" paint he found at Excellent Mining's premises to verify its contents. At the trial, he conceded that because of this omission, it was possible that the can of paint may not have contained white paint. There is nothing in his report which indicates that he questioned Excellent Mining's personnel to confirm that this paint was used at Excellent Mining's premises.[141]

(i) He did not speak to any of the drivers from Bolloré Logistics who delivered the tin concentrate from Kigali to Dar es Salaam.[142]

(j) He did not travel to Dar es Salam to carry out further investigations at the Inland Container Depot or the port.[143] Mr Wheeler gave evidence that "graft in Tanzania is well documented, almost on a regular basis", and a "quick scrutiny of news reports from local newspapers" showed that "over 10 per cent of goods are under peril of theft".[144] Yet, Dr Petrone did not know that the Dar es Salaam port was deemed as having a high risk for criminal activities at the time of his investigation.[145]

(k) In respect of the NPPA Report and its findings, he claimed that he met RIB personnel[146] yet he testified that he did not speak with them about their investigation when he was in Kigali.[147]

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141 PCS at para 5(aa); Transcript (17 November 2021) at p 69 lines 12 to 23.

142 PCS at para 5(r); Transcript (16 November 2021) at p 136 lines 16 to 23.

143 PCS at para 5(s); Transcript (17 November 2021) at p 4 lines 20 to 25; p 5 lines 1 to 24.

144 Transcript (10 November 2021) at p 89 lines 9 to 18.

145 PCS at para 5(s); Transcript (17 November 2021) at p 9 lines 22 to 25.

146 Transcript (17 November 2021) at p 52 lines 10 to 11.

147 PCS at para 5(t); Transcript (17 November 2021) at p 58 line 22 to p 59 line 7.

(l) He did not arrange for the samples of the iron oxide that was swapped for the tin concentrate to be tested for their composition and origin.[148]

(m) He did not take samples of iron oxide at Excellent Mining's premises so that they could be tested for composition and origin as well.[149]

(n) Although his theory that the thefts occurred at Excellent Mining's premises is premised on the presence of the 3Ts minerals at that location (see [106] above), he did not take samples at Excellent Mining's premises to test for the presence of these 3Ts minerals.[150]

135 Ironically, despite the numerous omissions in his *own* investigation set out above, Dr Petrone accused the NPPA and the RIB of having done a lackadaisical and perfunctory investigation just from his mere review of the NPPA Report (see [90]–[97] above).

136 Moreover, Dr Petrone's case at the trial was that Excellent Mining was complicit in the thefts. However, he omitted to mention this highly pertinent point in his expert report.[151] He also did not mention in his affidavit of evidence-in-chief that Excellent Mining was complicit in the thefts. Such a drastic and late shift in position weighs heavily against his credibility as a witness.

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148 PCS at para 5(u); Transcript (17 November 2021) at p 94 lines 13 to 19.

149 PCS at para 5(v); Transcript (16 November 2021) at p 127 line 3 to p 128 line 16.

150 DRS at para 20.

151 PCS at para 13.

137 In the circumstances, I find that Dr Petrone harboured a prejudiced belief and had a preconceived judgment that the thefts took place at Excellent Mining from the very start of his investigation. He testified as follows:[152]

> Q: Very generally, in a very general overview, I am going to ask you what your case theory is about in this case, okay, your findings? Now, would I be right to say that your case theory is that the thefts occurred undetected at the Excellent Mining premises?
>
> A: Sorry, I think I missed a word. You said undetected?
>
> Q: You say it's your case that the thefts occurred undetected at the Excellent Mining premises?
>
> A: The case -- yeah, my case is that the theft --
>
> Q: No, no, answer "yes" or "no", and then you explain. Very clear. I've asked you a very simple question. The beginning of your case theory is that the thefts occurred undetected at Excellent Mining premises. Yes or no?
>
> A: Sorry, counsel. I can't agree on the word "undetected". I don't know what you mean by that. Undetected by who?
>
> Q: I am asking you, then. Who do you think would have detected this crime? Wasn't that part of your investigation? I've looked at the evidence in this case, I've looked at your report. As far as I can see, you say this theft occurred undetected at Excellent Mining premises. If it had been detected, it would have been reported and stopped. Isn't it?
>
> So that's why I'm proposing to you that your case theory must be that the thefts occurred undetected at the Excellent Mining premises?
>
> A: Respectfully, your Honour, I don't understand the word undetected. You mean undetected by police, undetected by guards, undetected by Excellent Mining personnel?
>
> Q: Undetected by everyone. That's what I mean. Dr Petrone, this is a very simple question.
>
> A: Sorry, it's not very simple. You need to be specific on the word "undetected".

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152 Transcript (16 November 2021) at p 67 line 5 to p 69 line 22.

Q: I am telling you specifically what I mean by "undetected" is that no one knew about this theft. No one. Yes or no? Isn't that your case theory?

A: Your Honour, I think no one with the exception of the perpetrators, obviously.

…

Q: Of course, Dr Petrone.

A: Yes.

…

Q: So you agree with me that this theft occurred undetected at the Excellent Mining premises, yes? Only the thieves knew about it, of course.

A: If that is your definition of "undetected", yes, I agree.

Q: Thank you.

A: Yes.

Q: And you say that the swap must have taken place inside Excellent Mining's premises, and before the drums were loaded into the 40-foot containers. Yes?

A: Yes, that is correct.

Q: You say the tin ore had already been placed in the drums and sealed. And, therefore, the drums had to be cut, the lids of the drums had to be cut in order to do the replacement without tampering of the seals on top of the drum. Am I right?

A: That is correct.

Q: Good. And, therefore, it is not your case theory that this theft could have occurred at the Bollore warehouse. Yes?

A: That is correct.

Q: And, therefore, it is not your case that the theft could have occurred at the MSC premises. Correct?

A: That is correct, too. Mm.

Having a predetermined outcome in his mind, his investigation therefore lacked objectivity, and this resulted in the numerous glaring omissions in his

investigation above. I have therefore treated Dr Petrone's evidence with utmost caution in coming to my decision.

The plaintiff has proven its case on a balance of probabilities

138 It is undisputed that the burden of proof is on the plaintiff to prove its case on a balance of probabilities. I am satisfied that the plaintiff has discharged its burden of proving that the thefts took place during the Transit Period and thus the Policy covers the thefts of the tin concentrate, for the following reasons:

(a) With regard to the level of security at various points, I find that security was at its weakest when the 40ft containers were transported from the Bonded Warehouse in Kigali to the port in Dar es Salaam. In contrast, security was at its highest at Excellent Mining's premises. Hence, the weakest link in the whole journey must have been the former (see [52]–[89]).

(b) With regard to the NPPA Report, there is no credible evidence for me to doubt its findings that the thefts did not occur at Excellent Mining's premises. I therefore accord weight to these findings in favour of the plaintiff (see [90]–[97]).

(c) With regard to the presence of the 3Ts minerals in the swapped iron oxide, I am unable to accept Dr Petrone's theory that this suggests that the thefts took place at Excellent Mining's premises (see [98]–[112]).

(d) With regard to the paint on the drums' lids, I find that the laboratory analysis of the paint samples and the photographs of the drums do not show that the thefts had occurred in Excellent Mining's premises (see [113]–[131]).

Conclusion

139 In view of my findings above, it is highly unlikely that the thefts had occurred at Excellent Mining's premises. Rather, the thefts had most likely occurred during the journey from the Bonded Warehouse in Kigali to the port in Dar es Salaam. I therefore hold that the plaintiff has discharged its burden of proving, on a balance of probabilities, that the thefts had occurred during the Transit Period. Hence, I allow the plaintiff's claim for the undisputed sum of US$1,154,508.94.

140 The defendant is to pay costs to the plaintiff, to be agreed or taxed.

Tan Siong Thye
Judge of the High Court

Ramachandran Doraisamy Raghunath, Lee Weiming Andrew and Kieran Martin Singh Dhaliwal (PDLegal LLC) for the plaintiff;
Yee Mun Howe Gerald and Prakash Nair (Premier Law LLC) for the defendant.