Pacific Chemicals Pte Ltd *v* MSIG Insurance (Singapore) Pte Ltd and another [2012] SGHC 198

Case Number : Suit No 285 of 2010 (Summons No 805 of 2012)

Decision Date : 02 October 2012

Tribunal/Court : High Court

Coram : Choo Han Teck J

Counsel Name(s) : Philip Ling (Wong Tan & Molly Lim LLC) for the plaintiff; Elaine Tay Ling Yan and Wong Ying Shuang (Rajah & Tann LLP) for the defendants

Parties : Pacific Chemicals Pte Ltd — MSIG Insurance (Singapore) Pte Ltd and another

Insurance – Property Insurance

Contract

Words and Phrases

2 October 2012 Judgment reserved.

Choo Han Teck J:

1 The Plaintiff is a company incorporated in Singapore. It manufactures and trades in petrochemical and related products including phthalic acid ("PA") which it manufactures at a plant at 36 Tuas Road ("the Plant"). PA is an industrial chemical needed in the manufacture of flexible PVC products, alkyd resin, dyes, pigments and unsaturated polyester resin. The Plaintiff sells PA in both its molten and solid forms. The 1st Defendant is a Singapore-incorporated insurance company while the 2nd Defendant is a company incorporated in Japan that is registered as a general insurer in Singapore under the Insurance Act (Cap 142, 2002 Rev Ed). The Plaintiff entered into a Fire Industrial All Risks Insurance Policy (Policy No MSD/FIAR/06-001865) ("the Policy") with the 1st and 2nd Defendants (collectively referred to as "the Defendants") as co-insurers. The 1st and 2nd Defendants were liable under the Policy in the proportion of 70% to 30% respectively. The Policy was issued on 3 May 2006 and covered, *inter alia*, loss and damage to property of the Plaintiff. The period of coverage was from 1 April 2006 to 31 March 2007. An endorsement to the Policy (Endorsement No MSD/FIAR/06-001865-02) ("the Endorsement") dated 7 June 2006 was also issued and applied with effect from 1 April 2006 to 31 March 2007.

2 The hearing before me concerned a trial on preliminary issues of law. The Plaintiff filed its Writ of Summons on 23 April 2010 to claim an indemnity under the Policy for two incidents which occurred at the Plant. On 21 February 2012, the Plaintiff applied by Summons No 805 of 2012 ("Sum 805/2012") for a trial on preliminary issues of law under O 33 r 2 of the Rules of Court (Cap 322, R 5, 2006 Rev Ed). The Defendants consented to Sum 805/2012. The preliminary issues to be tried before me are set out verbatim as follows:

> (a) Whether, on a proper construction of item 2(ii) of [the Endorsement] under the [the Policy], both issued by the 1st and 2nd Defendants on 7 June 2006 and 3 May 2006 respectively, the Defendants are not liable to indemnify the Plaintiff for any loss or damage to the catalysts in

the reactor tubes of the Plaintiff's [PA] Reactor D-14, under the circumstances pleaded at paragraphs 8 to 13 of the Statement of Claim (Amendment No 1) filed on 1 March 2012;

(b) Whether, in the circumstances of the present case in which a cold shut down of the Plaintiff's PA plant was implemented and having regard to:-

(i) the factual observations made in the reports rendered by the experts and/or consultants and/or advisors engaged by the Defendants;

(ii) the agreed facts as set out in Schedule I annexed [to Sum 805/2012]; and

(iii) the agreed factual assumptions as set out in Schedule II annexed [to Sum 805/2012]:

(A) the loss, destruction and/or damage arising from the solidification of the molten PA which was in the PA storage tank T-501 on 7 June 2006 ("the Residual PA") can be said to:

(I) constitute "unforeseen and sudden physical loss or damage", so as to be covered under Section I of the Policy; and/or

(II) be caused by or arise from "change in temperature" or "inadequate operation of...heating system", so as to be excluded from coverage by virtue of General Exclusion 4(d) of the Policy.

(B) the loss, destruction and/or damage arising from the implosion of the Tank can be said to:

(I) constitute "unforeseen and sudden physical loss or damage", so as to be covered under Section I of the Policy; and/or

(II) be caused by or arise from "change in temperature" or "inadequate operation of...heating system", so as to be excluded from coverage by virtue of General Exclusion 4(d) of the Policy.

(c) Whether the PA in the Tank constitutes "property being worked on", so that the loss, destruction and/or damage caused by the solidification of the Residual PA is excluded from coverage under the Policy by virtue of sub-clause (k) under the heading "Property Excluded Under Section I" of the Policy.

3 Two incidents occurred at the Plant that became the subject of this Suit. I now refer to the first incident. Crude PA is manufactured in the Plaintiff's PA Reactor D-14 ("the Reactor") in the Plant. After the crude PA is purified and distilled, it is transferred and stored in the PA storage tank T-501 ("the Tank") which is heated at 150ºC to keep the PA in a molten state. Dr J H Burgoyne & Partners (International) Ltd ("Burgoynes"), a firm instructed by the Defendants' loss adjusters, Cunningham Lindsey (Singapore) Pte Ltd ("Cunningham"), to investigate the two incidents, observed in a report dated 1 August 2006 that nitrogen gas was continuously introduced into the Tank to displace the oxygen moisture in the Tank and prevent formation of acids. The nitrogen gas left the Tank through a vent line (which was a steel pipe of about 2" in diameter at the roof of the Tank) and it was then ventilated into the atmosphere. On 8 May 2006, a cooling circuit control valve in the Plant malfunctioned. The Reactor overheated and shut down automatically. The Reactor contained 9,733

tubes filled with catalysts, specifically aluminium carriers containing vanadium pentoxide. The catalysts were exposed to excessive heat, melted and were damaged. According to the Plaintiff, investigations were carried out on the Reactor and the Plant with the assistance of PA Consultants GmbH, a company specialising in PA operations. The Plaintiff claimed that on 22 June 2006, Dr Supot Kalanon (the Plaintiff's representative), PA Consultants GmbH, Cunningham and Burgoynes agreed that the tubes should be drained of catalysts and refilled. The Plaintiff entered into an agreement dated 18 September 2006 with Hudson Delphi Engineering & Construction Pte Ltd ("Hudson") to drain and refill the tubes. The Plaintiff paid Hudson S$1,952,116.90 for this work. The Plaintiff now claims an indemnity for the amount paid to Hudson and business interruption costs, less US$600,000 (being an interim payment made by the Defendants to the Plaintiff without admission of liability).

4 I turn now to the second incident. Although production of the crude PA ceased after the first incident, the Plaintiff continued to purify and distil the crude PA that was already produced. The purification and distillation process was completed and most of the purified molten PA was transported out of the Plant by 31 May 2006. The Plaintiff then decided to implement a cold shut down of the Plant. Before doing so, the Plaintiff had to transfer the molten PA in the Tank to a tank truck with a heating facility to keep the molten PA from solidifying. It was not disputed that the molten PA could not be discharged completely from the Tank because of the location of the outlet from the Tank, and it was expected that some molten PA would be left in the Tank (*ie* the Residual PA). The maximum amount of Residual PA was expected to be no more than 100 metric tonnes. The parties agreed that the Residual PA could only be removed by lowering the temperature in the Tank to below 131ºC to solidify the molten PA. The PA flakes would then be dug out manually from the Tank and sold. The equipment gauge reflected the amount of Residual PA in the Tank as 100 metric tonnes. The Plaintiff relied on the reading on the equipment gauge and turned off the heating system of the Tank on 4 June 2006. However the equipment gauge malfunctioned and the actual amount of Residual PA was 476 metric tonnes instead of 100 metric tonnes. The solidified Residual PA was dug out and sold. The Plaintiff now claims, *inter alia*, the difference in the proceeds it could have obtained if the additional 376 metric tonnes of Residual PA was extracted before the cold shut down and sold in molten form rather than solid form. Molten PA fetches a higher price per unit than solidified PA.

5 The Tank was also damaged. On 7 June 2006, the Plaintiff turned off the entire heating system of Tank including the heating system for the vent line in implementing the cold shut down. It is assumed for present purposes that the heating system of the Tank could not be shut down partially so as to keep the heating system for the vent line operating. The gases within the Tank contracted as they cooled. Under normal circumstances, the vent line would have allowed gas to be drawn into the Tank to prevent negative pressure from being generated within the Tank during the cooling process. However, due to the shutting down of the heating system of the Tank, the temperature in the vent line dropped below the melting temperature of PA vapour. PA vapour in the Tank and vent line solidified and blocked the vent line. Excessive negative pressure thus built up inside the Tank and it buckled inwards. The Plaintiff now claims the costs of dismantling and repairing the Tank.

6 The Defendants claim that they are not liable to indemnify the Plaintiff for loss and/or damage to the catalysts in the 9,733 tubes because such loss and/or damage is excluded under item 2(ii) of the Endorsement. The Endorsement provides that:

> The Policy is extended to include any unforeseen and sudden physical loss destruction or damage (hereinafter called Damaged or Damage) to Property Insured necessitating repair or replacement due to causes such as defects in casting material, faulty design... or any other cause not specifically excluded hereinafter.

Item 2(ii) of the Endorsement states:

2. The Insurer(s) will not indemnify the Insured for:

...

ii) loss of/or damage to belt, ropes, wires, chains, rubber tyres, dies or exchangeable tools, engraved cylinders, objects made of glass, felts, sieves or fabrics, operating media eg lubricants, fuels catalysts.

Other than a bare denial at paragraph 5 of the Plaintiff's Reply and Defence to Counterclaim (Amendment No 2) filed on 26 March 2012, the Plaintiff did not dispute the Defendants' argument that damage to the catalysts was excluded by item 2(ii) of the Endorsement. Before me, Mr Ling submitted that the Endorsement did not apply because it was issued after the first incident occurred. Ms Tay argued that although the Endorsement was dated 7 June 2006, the Endorsement declared the parties' agreement at the time the Policy was issued that loss and/or damage arising from breakdown of machinery would be covered under the Policy. Mr Ling did not dispute this nor did he argue that the catalysts in question were not "fuel catalysts". In the absence of submissions to the contrary, I find that loss and/or damage to the catalysts was excluded by item 2(ii) of the Endorsement.

7 As for the loss, destruction and/or damage arising from the solidification of the Residual PA, the Defendants claim that they are not liable to indemnify the Plaintiff for three reasons. The first argument was that such loss and/or damage was not unforeseen and sudden within the meaning of Section I of the Policy. Section I of the Policy provides that:

If during the Period of Insurance the Property Insured or any part thereof shall be lost destroyed or damaged by unforeseen and sudden physical loss or damage other than those specified in the Exclusions the Company will pay to the Insured the value of the property at the time of the happening of the los or destruction or the amount of such damage or at its option reinstate or repair such property or any part thereof.

The Plaintiff contends that the phrase "unforeseen and sudden physical loss or damage" refers to a "loss and damage of something else (not specified) which in turn causes the loss and damage of the subject matter insured". Mr Ling argued that it was the cause rather than the physical loss or damage that must be unforeseen and sudden. Mr Ling argued that but for the breakdown or malfunction of the equipment gauge, 376 metric tonnes of molten PA would have been extracted from the storage tank before the cold shut down was implemented and only 100 metric tonnes would have solidified. The malfunction of the equipment gauge was an unforeseen and sudden cause of the Plaintiff's loss. Ms Tay, in contrast, submitted that it is the physical loss or damage itself rather than the cause that must be sudden and unforeseen.

8 I agree with Ms Tay. The words of Section I of the Policy state that it is the loss or damage that must be sudden and unforeseen, rather than the cause thereof. Loss or damage which results from an unforeseen cause may (more often than not) be also unforeseen, but the nature of the loss or damage that results may itself not be sudden. It is the nature of the physical loss or damage that is the focus of the inquiry in this case. I agree with the view of the Supreme Court of the Australian Capital Territory in *Vee H Aviation Pty Ltd v Australian Aviation Underwriting Pool Pty Ltd* (No SC 61 of 1995) ("*Vee H Aviation*") in which it drew a distinction between the nature and cause of the loss or damage. In *Vee H Aviation*, the policy provided that the defendant would indemnify the plaintiff for the costs of rectification arising from a "Breakdown" of the plaintiff's aircraft engine. Breakdown was defined as "sudden and unforeseen damage resulting from (a) Breaking seizing or burning out of Aircraft Engine parts, vibration, ... excessive electrical current or voltage, failure of insulation, short circuit or arcing... (b) Failure of protecting, measuring or regulative devices or failure of or failing in

connected equipment of any Aircraft Engine." The Supreme Court of the Australian Capital Territory noted (at [17]) that:

> In the present policy, it is the damage that must be sudden. The definition clearly contemplates that the cause of the damage may be something that has been taking place over a period of time, such as the wearing out or loosening of a part, or fatigue. ... The definition of Breakdown used in this particular policy required that the damage, as distinct from the cause of it, should be both sudden and unforeseen. ...

(a) The High Court (Kuala Lumpur) in *Bina Puri Sdn Bhd v MUI Continental Insurance Bhd (formerly known as MUI Continental Insurance Sdn Bhd)* [2010] 1 MLJ 347 ("*Bina Puri*") at [88]–[92] and the Supreme Court of Appeal of South Africa in *African Products (Pty) Ltd v AIG South Africa Limited* [2009] ZASCA 27 ("*African Products*") at [24]–[25] were also of the view that where the words "sudden and unforeseen physical loss or damage ... from any cause" are used, the court examines the nature of the loss or damage separately from its cause. The Plaintiff relied on the Supreme Court of Washington's decision in *Anderson & Middleton Lumber Company v Lumbermen's Mutual Casualty Company* 333 Pacific Report (2d) 938 (1959) ("*Anderson*") in arguing that there was nothing in the Policy to suggest that it was not intended to cover loss or damage resulting from a gradual cause. I am of the view that *Anderson* does not support and in fact undermines the Plaintiff's argument. The policy in *Anderson* protected the insured against loss occasioned by an accident, "defined as sudden and accidental breaking of the bandsaw wheel, or any part thereof...". The Supreme Court of Washington focused on the nature of the breaking and cracking of the wheel and considered whether it was "sudden" rather than the cause of the breakage. The insured in that case also argued that the contract was concerned with "the result, and not... the cause of the accident". Mr Ling contends that "deductibles applicable to Section 1 of the Policy set out in the Policy Schedule include loss in respect of 'Fraudulent or Dishonest Act of Employees'... which can hardly be considered to be an instantaneous event". This argument does not detract from fact that coverage under Section I of the Policy pertains to unforeseen and sudden physical loss or damage.

9 The word "unforeseen" is commonly understood to mean "unexpected" or "unanticipated". The parties agreed that the inquiry is a subjective one, *ie* whether the loss or damage was foreseen by the insured. Although courts in some cases appear to use "unforeseen" and "unforeseeable" interchangeably (see example, *Bina Puri* at [20]), this can be misleading as "unforeseeable", unlike "unforeseen", is an objective term. The New South Wales Court of Appeal drew a distinction between "unforeseen" and "unforeseeable" in *L'Union Assurances de Paris IARD v Sun Alliance Insurance Ltd* [1995] NSWCA 539:

> "Unforeseen" does not mean "unforeseeable" either as a matter of language or law. The former is subjective and speaks of the mind of the insured. The latter is objective and speaks of the object of perception or thought. ...

As for "sudden", Mr Ling argued that "sudden" should be interpreted as having the same meaning as "unforeseen". In *Anderson*, the breaking and cracking of the bandsaw wheel was gradual rather than instantaneous. The defendant thus argued such loss or damage was not covered under the policy. The Supreme Court of Washington considered whether "sudden" should be interpreted as meaning "instantaneous" or "unforeseen and unexpected" and chose the latter (at [2]–[4]):

> The word "sudden" was, of course, placed in the contract for a purpose. Is it more reasonable to assume that it was placed there to show an intent to exclude coverage of a break which did not happen instantaneously, or to exclude coverage of a break which was unforeseen and therefore

> unavoidable? ... A contract of insurance should be construed to effectuate its purpose... The cause [of the loss or damage] is not, nor is the result, one which not is claimed is excluded. It is only contended that the result in order to be within the coverage of the policy, must have happened instantaneously. We do not so construe the word "sudden," when its primary meaning, in common usage, is not "instantaneous" but rather "unforeseen and unexpected."

In contrast, the courts in *Vee H Aviation* and *African Products* took the view that "sudden" should not be construed as having the same meaning as "unforeseen". The Supreme Court of the Australian Capital Territory in *Vee H Aviation* held:

> "Sudden", to my mind, is to be contrasted with "gradual. Synonyms are "abrupt" and "quick". It is often a connotation of the word that the event it describes should be "unforeseen" or "unexpected", or "without warning" but those words, alone or in conjunction, do not express its denotation. An event may be sudden even though it is foreseen and expected. ... The definition of Breakdown used in this particular policy required that the damage, as distinct from the cause of it, should be both sudden and unforeseen. That requirement is not tautologous. The words have different meanings, and the requirements that they express are cumulative.

The Supreme Court of Appeal of South Africa in *African Products* took a similar interpretation to "sudden", affirming that courts should "be slow to conclude that words in a single document are tautologous and superfluous" (*African Products* at [13] and [19]). I agree with the courts' views in *Vee H Aviation* and *African Products*. I would add that the question whether damage is sudden is one to be determined from an objective viewpoint rather than the subjective one of the insured (see also *African Products at* [22]).

10 The Defendants argued that the solidification of the Residual PA was not unforeseen and that the Plaintiff knew and intended to solidify the Residual PA in the Tank by implementing a cold shut down (and thus lowering the temperature in Tank). As for the presence of the additional 376 metric tonnes of Residual PA, Ms Tay argued that it is the type of damage or loss that must be "unforeseen and sudden" rather than the extent of the damage or loss. The 376 metric tonnes of Residual PA only went to the extent of the loss. She relied on *Henry A Kuckenberg, Harriet Kuckenberg and Lawrence Kuckenberg, Doing Business as Kuckenberg Construction Co v Hartford Accident & Indemnity Company* 226 F 2d 225 (9th Cir, 1955) ("*Hartford*") for that proposition. The insured in that case was engaged to construct a highway along a mountainside. The policy protected the insured against liability for damage "caused by accident". As part of the operations, the insured had to carry out extensive blasting of the rocky slope and remove trees, boulders and masses of rubble. Substantial damage to a nearby railroad line was a "normal and anticipated consequence" of the operations. The blasting dislodged much more rock and dirt than the insured calculated. Attempts to scoop up loose material also caused huge boulders to roll down and damage the railroad line. The contractor claimed that the damage that resulted was extraordinary and different from the normal and anticipated damage. The United States Court of Appeal for the Ninth Circuit rejected this argument and held at 226–227 that:

> [It was] at least an unimpeachable finding that substantial damage of the very type which occurred was a normal and probable consequence of such blasting and clearing as the contractor undertook. ... It is true that courts construing insurance contracts have differed in judgment whether the fact that the responsible cause is an intentional act suffices in itself to preclude the resulting injury from being 'accidental' damage... But if, in addition to being intentional, the harmful conduct is reasonably calculated to cause substantial damage of the very sort that occurs, all courts seem to recognise that the damage is outside the insured risk. The fact that the injury is more extensive than had been anticipated does not suffice to make the damage

accidental.

I do not agree that that view in *Hartford* should be taken as a general rule that whenever the loss appears to go to the extent rather than the nature of the loss that such loss would not be regarded as sudden and unforeseen. The court's views in *Hartford* must be read in light of the facts. In that case, substantial damage to the railroad line was a normal and anticipated consequence of the blasting. The fact that more rock and dirt and loose material fell onto the railroad line than expected did not detract from the fact that the damage to the railroad line was within the insured's expectation. The policy in fact provided for the "eventuality" of damage to the railroad line. The court was understandably not persuaded that the loss and damage was damage caused by accident. In the present case, it does not seem to me that it was within the Plaintiff's expectation that the 476 metric tonnes of molten PA would solidify. The Plaintiff did not foresee the presence of the additional 376 metric tonnes of the Residual PA in the Tank because in the normal circumstances (if the equipment gauge was in working order), the Tank would have been drained of Residual PA leaving only 100 metric tonnes of Residual PA. The additional 376 metric tonnes of Residual PA was left in the Tank because the Plaintiff relied on the reading on the equipment gauge, not knowing that it was erroneous. The solidification of the 476 metric tonnes of Residual PA was not a foreseen consequence of the lowering of the temperature in the Tank. However, I agree with the Defendants that the solidification of the Residual PA in the Tank was not sudden. The parties accepted that the solidification took place over a period of time. The Plaintiff did not argue, nor did the evidence before me reveal, that the solidification took place based quickly.

11 As for the damage to the Tank, it was not seriously disputed that the loss and/or damage was unforeseen. The Defendants' arguments were instead focused on the loss and/or damage not being sudden. Cunningham stated in its letter dated 13 June 2006 to the Defendants that "[o]n Wednesday 7th June 2006, at about midday, personnel noticed that [the Tank] was starting to buckle, this occurring quite rapidly, such that partial caving in of the 10 metre diameter [walls of the Tank] resulted. This was arrested by introducing liquid nitrogen, but not before significant damage had occurred...". Cunningham added in its preliminary report of 26 June 2006 that although "liquid nitrogen used for blanketing [the Tank] was increased... [the Tank] continued to sustain structural damage". The Defendants argued that "sudden" connotes a certain degree of instantaneity and the deformation of the Tank, although rapid, took place incrementally and progressively. I do not think that the word "sudden" necessarily requires the damage to be "instantaneous". Although it is not clear whether the Tank continued to buckle over a period of time, it appears that the initial caving in of the Tank happened rapidly. In my view, the Plaintiff has shown that the loss and/or damage to the Tank was "sudden".

12 The Defendants' next argument in relation to the loss or damage arising from the solidification of the Residual PA and the implosion of the Tank was that such loss was caused by or arose from a "change in temperature" or "inadequate operation of heating system" and was thus excluded from coverage by General Exclusion 4(d). General Exclusion 4(d) of the Policy states:

> 4. This Policy does not cover any loss destruction or damage (other than by Fire or Explosion) caused by or arising from:
>
> ...
>
> (d) change in temperature or humidity failure or inadequate operation (or any valation in temperature of an air-conditioning cooling or heating system)

Ms Tay submitted that the loss, destruction or damage concerned here was not caused by "Fire or

Explosion". An implosion is clearly not the same as an explosion. Staughton J in *Commonwealth Smelting Ltd v Guardian Royal Exchange assurance Ltd* [1984] 2 Lloyd's Rep 608 at 612 held that "explosion" meant "an event that is violent, noisy and ... caused by a very rapid chemical or nuclear reaction, or bursting out of gas or vapour under pressure". The court in *Aegis Electrical and Gas International Services Company Ltd v Continental Casualty Company* [2007] EWHC 1762 cited Staughton J's views with approval, and articulated "explosion" as connoting "manifest violence of a kind ... a shattering destruction". In contrast, implosion or buckling inwards in this case was caused by excessive negative pressure within the Tank rather than the bursting of gas or vapour under pressure.

13 The question is whether the loss or damage arising in the case of the Residual PA and the Tank was caused by or arose from a "change in temperature" or "inadequate operation" of the heating system of the Tank. It is established that in the context of insurance contracts, the words "caused by" and "arising from" mean the "proximate" cause (*Leyland Shipping Company, Limited v Norwich Union Fire Insurance Society, Limited* [1918] AC 350 ("*Leyland Shipping*") at 365 and 469). The High Court in *Kin Yuen Co Pte Ltd v Lombard Insurance Co Ltd and others* [1994] SGHC 83 ("*Kin Yuen*") (at [41]) endorsed the following passages by Lord Shaw of Dunfermline in *Leyland Shipping* (at 369):

> To treat proxima causa as the cause which is nearest in time is out of the question. Causes are spoken of as if they were as distinct from one another as beads in a row or links in a chain, but – if this metaphysical topic has to be referred to – it is not wholly so. The chain of causation is a handy expression, but the figure is inadequate. Causation is not a chain, but a net. At each point influences, forces, events, precedent and simultaneous, meet; and the radiation from each point extends infinitely. At the point where these various influences meet it is for the judgment as upon a matter of fact to declare which of the causes thus joined at the point of effect was the proximate and which was the remote cause.
>
> ... The cause which is truly proximate is that which is proximate in efficiency. That efficiency may have been preserved although other causes may meantime have sprung up which have yet not destroyed it, or truly impaired it, and it may culminate in a result of which it still remains the real efficient cause to which the event can be ascribed.

Lawton J in *Miss Jay Jay; JJ Lloyd Instruments Ltd v Northern Star Insurance Co Ltd* [1987] 1 Lloyd's Rep 32 at 37 also noted that "[t]here may be a number of causes, some making a bigger contribution to the loss than others. ... [T]he insurer is only liable for losses proximately caused by a peril insured against". It is possible that there could be two concurrent and proximate causes of a loss, and if one of the proximate causes is an excepted cause, then the insurer will not be liable for the loss (*Kin Yuen* at [43] affirming *Wayne Tank and Pump Co Ltd v Employers Liability Assurance Corporation Ltd* [1974] QB 57 ("*Wayne Tank*") at 67). This is so if there were "two causes equal or nearly equal in their efficiency in bringing about the damage" (*Wayne Tank* at 67 per Lord Denning MR). In *Wayne Tank*, equipment installed by the insured caught fire and destroyed the factory in which it was installed. The court had to determine whether such damage was caused by the nature or condition of goods supplied by the insured and was thus excluded from coverage under the policy. The court identified two causes of the damage: (1) the insured installed a pipeline of plastic material wrapped with heating tape that was a fire hazard when heated up, and (2) the insured's employee switched on the heating tape and left it unattended overnight before the equipment had been tested. Lord Denning MR and Roskill LJ were of the view that the proximate cause was the dangerous nature of the material wrapped around the pipeline. In the alternative, they held that there were two proximate causes of the loss and since loss by one of the causes was excluded, the insured could not claim an indemnity for that loss. Cairns LJ on the other hand was of the view that both causes were approximately equal in effectiveness in bringing about the loss. Here, the Plaintiff attributes the loss

arising from the solidification of the additional 376 metric tonnes of Residual PA to the malfunctioning of the equipment gauge. The Defendants unsurprisingly argue that the solidification of the Residual PA was caused by "inadequate operation" of the heating system or a "change in temperature". Mr Ling argues that although the solidification of the Residual PA was caused by a "change in temperature" or "inadequate operation" of the heating system, General Exclusion 4(d) does not apply because the solidification of the Residual PA was not the damage for which it was claiming an indemnity. It was claiming the difference in the proceeds obtained had the 376 of the 476 metric tonnes of Residual PA been extracted and sold as molten PA instead. The Plaintiff's argument is confusing because it seems to me that the Plaintiff is in fact making a claim for physical loss and damage to property under the Policy which it submits is quantifiable in monetary terms. In any event, I find that the proximate cause of the loss arising from the solidification of the 476 metric tonnes of molten PA was the malfunctioning of the equipment gauge and not a "change in temperature" or the "inadequate operation" of the heating system. In fact, the former led to the Plaintiff's decision to turn off the heating system of the Tank. In that sense, the causes were not concurrent. It was the malfunctioning of the equipment gauge that ultimately resulted in the damage in question. The Defendants' argument that the solidification of the molten PA arose because of a "change in temperature" misses the point. While it may be that the change in physical state of the Residual PA in the Tank was due to a change in temperature, the very reason why an additional 376 metric tonnes of molten PA was left in the Tank was because the Plaintiff relied on an erroneous reading on the equipment gauge and thus the mistaken belief that the Tank only contained 100 metric tonnes of molten PA. On this belief, it proceeded to shut down the heating system of the Tank. The effective cause of the loss was thus the malfunctioning of the equipment gauge rather than the change in temperature.

14 In contrast, I am satisfied that the damage to the Tank was caused by a "change in temperature" and would thus be excluded from coverage by General Exclusion 4(d) of the Policy. Cunningham stated in its preliminary report dated 26 June 2006 that:

> [t]he cooling process [in the Tank] would have been accompanied by venting but the operational error seems to be that when the steam to the steam heated vent line was turned off, this had the effect of causing vapors to pass through a cooler environment. ... [T]his had the effect of allowing PA flakes to accumulate in the vent pipe, eventually blocking it. Internally within the tank, the condensing vapours would have created a strong vacuum, thereby initiating implosion of the tank structure.

The proximate cause of the Tank buckling inwards was the shutting down of the heating system of the Tank and vent line. As stated in Burgoynes' letter to Cunningham dated 12 February 2007, under normal circumstances, negative pressure created by the cooling of gases in the Tank would not have accumulated because gas would have been drawn into the Tank through the vent line to normalise the pressure in the Tank. As the heating system was shut, PA vapour in the Tank and vent line solidified and blocked the vent line. Gas could not be drawn in. Excessive negative pressure was thus generated and caused the Tank to buckle inwards.

15 The Defendants' final argument was that loss and damage arising from the solidification of the Residual PA was excluded because the Residual PA constituted "property being worked on" and coverage was excluded under sub-clause (k) of "Property Excluded Under Section I" of the Policy that states:

> This Policy does not cover loss or destruction of or damage to
>
> ...

(k) property being worked on and directly arising from any process of manufacture repairs alteration or servicing but the Company shall be liable for other damage insured by this Policy and resulting from such cause.

The Defendants argue that the molten PA in the Tank was property that the Plaintiff was "working on". Ms Tay submitted that an "all-risks" policy usually excludes loss caused by a manufacturer's actions in processing raw materials to finished products and sub-clause (k) was thus included in the Policy (see John Hanson and Christopher Henley, *All Risks Property Insurance* (Lloyd's of London Press, 2nd Ed, 1999) at p 137). Given that the Plaintiff intended to lower the temperature of the Tank to solidify the molten PA, the Residual PA was not in the final and eventual state that the Plaintiff envisaged it to be and work was still being done on it. The lowering of the temperature in the Tank altered the physical state of the PA and the solidification of the Residual PA was loss and/or damage arising from a "process of alteration". Mr Ling contends that the molten PA in the Tank was in fact the finished product that the Plaintiff intended to sell to customers once it had been extracted from the Tank. The PA was produced at a separate production facility in the Plant and it was only transferred to the Tank for storage. The purified molten PA in the Tank thus could not be considered to be "property being worked on" but was the final product that the Plaintiff envisaged it to be. I agree with Mr Ling. One had to examine the commercial purpose of sub-clause (k). That clause was, in the Defendants' words, intended to exclude damage to stock undergoing any process of production. The learned authors of *Insurance Disputes* (Informa, 3rd Ed, 2011) at paragraphs 19.36 and 19.47 also noted that insurance policies for commercial property typically exclude "damage resulting from stock or materials undergoing any process of reduction, packing, treatment, commissioning test or testing". The molten PA in Tank was a product in its eventual state as envisaged by the Plaintiff rather than "property being worked on". It was not property undergoing a process of conversion to its eventual state. After the Reactor overheated, the Plaintiff decided to implement the cold shut down and it was inevitable that any molten PA in the Tank that could not be extracted would solidify during the cooling process. The cooling of the Residual PA could not be considered to be part of the process of bringing the PA to its intended eventual state. I am thus of the view that sub-clause (k) of "Property Excluded under Section I" of the Policy would not apply.

16 My determination on the preliminary issues are thus as follows:

(a) [2(a)]: Yes, the Defendants are not liable.

(b) [2(b)(iii)(A)(I)]: The loss, destruction and/or damage was unforeseen but not sudden.

(c) [2(b)(iii)(A)(II)]: No, the loss, destruction and/or damage was not caused by and did not arise from a change in temperature" or "inadequate operation of...heating system".

(d) [2(b)(iii)(B)(I)]: No, the loss, destruction and/or damage was unforeseen and sudden.

(e) [2(b)(iii)(B)(II)]: Yes, the loss, destruction and/or damage was caused by or arose from a change in temperature" or "inadequate operation of...heating system".

(f) [2(c)]: No, the PA in the Tank was not "property being worked on".

Hence, by reason of the above determination, the Plaintiff cannot claim an indemnity for the loss, destruction and/or damage to the catalysts, PA and the Tank arising from the two incidents. I will hear parties on costs at a later date if parties cannot agree on costs.