

Jul-Sep 2018

MII Education Path

Claims in a Digital Era

INSURANCE

The Malaysian Insurance Institute



ISSN 2231-7082



EDUCATION & CAREER

KDN PP 15104/05/2012 (029816)
Price: RM 15.00

Price: RM 15.00

Machinery Breakdown:

Exclusion 9 – Wear and Tear as Prescribed and not Otherwise

By L.F. Ong LL.B (Hons) (London); CLP; ACII; AMII; MCI Arb; MMI Arb, Chartered Insurance Practitioner, Arbitrator and Mediator

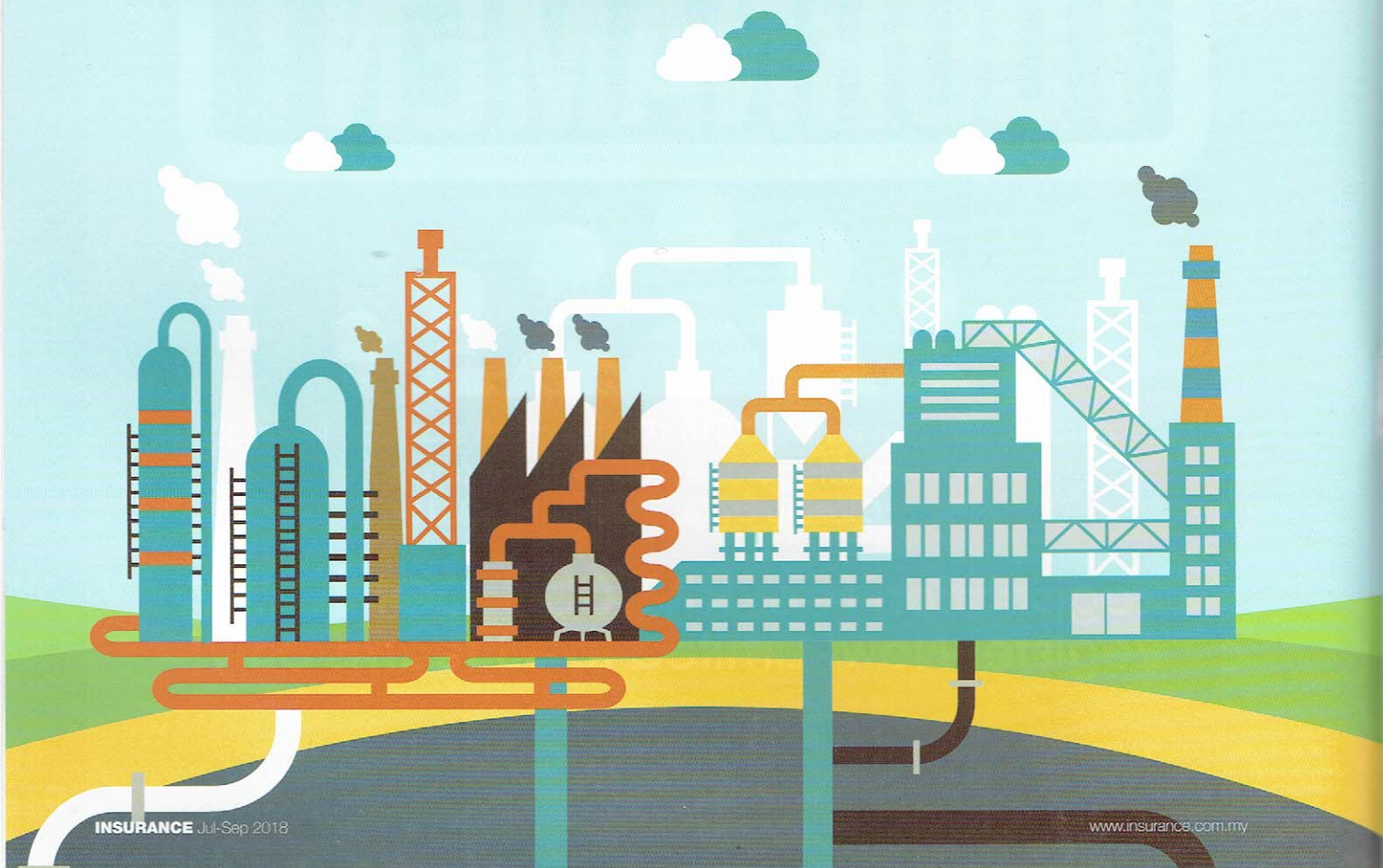
ABSTRACT

The subject of “wear and tear” found, inter alia, in Exclusion 9 (“this Exclusion”) of the Machinery Breakdown policy (“the policy”) has been misconstrued and taken out of context by many in the insurance industry. The widespread perception is that “wear and tear” exclusion is universal in application. This is far from the truth. “Wear and tear” as prescribed in the policy is actually limited in scope. In order to apply this Exclusion, there is an express requirement to ensure the prescribed wording of the policy is adhered to. Any version

outside the prescribed wording of this Exclusion would mean “wear and tear” is covered.

“Wear and tear” as prescribed is a technical subject warranting a detailed analysis of the findings on the pre-damage situation, nature and extent of damage sustained by the machine and the post-damage inspection report.

In summary, the issue relates to an occurrence (“wear and tear”) and its prescribed proximate causation.



INTRODUCTION

This case study paper is based on an actual occurrence which took place at a palm oil mill in 2014. The subject-matter is a steam turbine ("the turbine") which was commissioned in 2005.

The following headings would provide a vivid picture of the case study.

1. The policy;
2. The event;
3. Nature and extent of damage;
4. Suspected causation;
5. Policy liability;
6. Observation.

1. The policy

Extracts of the relevant portions of the policy are cited below.

The turbine is the property insured in the policy schedule.

The Preamble¹ of the policy reads:

"The Insurers hereby agree... *the items (or any part thereof) entered in the Schedule... suffer any unforeseen and sudden physical loss or damage from causes such as defects in casting and material, faulty design, faults at workshop or in erection, bad workmanship, lack of skill, carelessness, shortage of water in boilers, physical explosion, tearing apart on account of centrifugal force, short circuit, storm, or any other causes not specifically excluded hereinafter...*

The Insurers will indemnify the Insured in respect of such loss or damage..."

EXCLUSIONS:

The Insurers shall not be liable for, inter alia, 9. loss or damage as a direct consequence of the continual influence of operation (e.g. wear and tear, cavitation, erosion, corrosion, rust, boiler scale).

Memo 1 – Sum Insured

"It shall be a requirement of this Policy that the sum insured is equal to the cost of replacement of the insured machinery by new machinery of the same kind and capacity....."

Memo 2 – Basis of Settlement

- a) In cases where damage to an insured item can be repaired – the Insurers shall pay expenses necessarily incurred to restore the damaged machine to its former state of serviceability... for the purpose of effecting the repairs ..."

"No deduction shall be made for depreciation in respect of parts replaced..."

"If the costs of repairs as detailed hereinabove equals or exceeds the actual value of the machinery insured immediately before the occurrence of the damage, the item shall be regarded as destroyed and settlement shall be made on the basis provided for in (b) below.

- b) In cases where an insured item is destroyed – the Insurers shall pay the actual value of the item immediately before the occurrence of the loss... such actual value to be calculated by deducting proper depreciation from the replacement value of the item..."

CONDITION 3

"The Insured shall at his own expense take all reasonable precautions and comply with all reasonable recommendations of the Insurers to prevent loss or damage and comply with statutory requirements and manufacturers' recommendations."

Reinstatement Value Clause (RVC)

The policy is subject to RVC which reads as follows:

"In the event of the property insured under the within Policy being destroyed or damaged, the basis upon which the amount payable under the Policy is to be calculated shall be the cost of replacing or reinstating on the same site property of the same kind or type but not superior to or more extensive than the insured property when new), subject to the following Special Provisions and subject also to the terms and conditions of the Policy except insofar as the same may be varied hereby."

SPECIAL PROVISIONS

1. The work of replacement or reinstatement... shall be made".
2. Until expenditure has been incurred... therein".
3. If at the time of replacement or reinstatement... to the foregoing provision.
4. This Memorandum...
 - a) The Insured fails to intimate... or damaged".
 - b) The Insured is unable... another site".
5. No payment... set forth therein.

Comment: None of the Special Provisions concerns the issue of wear and tear.

2. The event

In 2014, a specialist contractor discovered that damage had been occasioned to a turbine at the palm oil mill when they attended to deal with complaints relating to heavy steam consumption and abnormal vibration within the said turbine which had been shut down immediately upon happening.

Heavy steam consumption and abnormal vibration of the turbine are symptoms of a mechanical problem.

The maintenance record indicated the turbine had been in operation free of problems since 2005. ➡

¹ At paragraphs 3 and 4 of page 1 of the policy.

The last maintenance service of the turbine was performed in 2013 and the event occurred some four months shy of the next maintenance service in 2014.

Turbine² is described as:

"Any motor in which a shaft is steadily rotated by the impact or reaction of a current of steam, air, water or other fluid upon blades of a wheel. In the 'impulse' turbine, the fluid is directed from jets or nozzles on the rotor blades. In a 'reaction' turbine, a ring of stationary blades replaces the nozzles and the rotor is driven by reaction between the fluid, the stationary blades and the rotor blades. Many turbines work on a combination of the 'reaction' and 'impulse' principles.

Another description of turbine³ is defined thus:

"A turbine is a machine. Its shaft is connected to a set of curved blades separated by slits. A gas or liquid flows against the blades and through the slits which makes the blades turn, or rotate. This in turn spins the shaft of the turbine. Turbines are used in power stations to produce electricity."

3. Nature and extent of damage

Damage was occasioned to:

- i Rotor wheel c/w wheel shaft - 1 pair;
- ii Stationary blades - 4 sets;
- iii Bearing metals - 4 sets;
- iv Trust Bearing metals - 4 sets.

The total cost of repairs was approximately RM500,000.

4. Suspected causation

There were four expert reports on the causation of the loss or damage, namely,

1. In-house technicians;
2. Specialist contractor;
3. Manufacturer's engineers;
4. Underwriter's appointed Forensic Consultant⁴.

A summary of the respective reports can be set out in the following order.

1. In-house technicians

Immediately following the event, the turbine was dismantled by the in-house technicians and mechanics for an in-depth inspection to ascertain (a) cause and (b) the nature and extent of damage supported by a set of photographs.

The technicians and mechanics are a hands-on crew with experience handling the turbine since it was commissioned.

They reported that *the blades of the first moving wheel had been found twisted inwards, collapsing to form an uneven groove on the blades. The collapse evidently concluded the presence of foreign objects which had caused the irregular shapes and dimensions of the blades.*

Further, the stationary wheel blades were dented and bent while the second moving wheel blade had been chipped off.

In support of their findings, they produced a sketch of the normal flow of steam through the blades and a comparative sketch indicating the irregular flow of steam due to the damaged blades having uneven depths. *The Steam Flow Tests plus the nature and extent of damage sustained are conclusive that causation was attributed to the presence of foreign objects* (emphasis added in italics).

2. Specialist contractor

The contractor submitted their independent preliminary report, commenting on the extent of damage and probable cause as follows:

- a) The damage to the rotor and stationary blades is due to their being hit by unknown object (emphasis added in italics). The object could have been sandwiched between the moving and stationary blades which caused such damage.
- b) The pitting marks on the pinion gear is most likely caused by continuous drain attack.
- c) The damaged bearings (which are charged already) are most likely caused by wear and tear. However, the high vibration could have accelerated the worn-out process.
- d) The erosion on the exhaust casings are caused by water cut.

Subsequently, the contractor re-examined the damaged component parts and the turbine, and concluded a final report as follows:

- i) The rotor wheel blades and stationary blades could be impacted by a foreign object (emphasis added in italics).
- ii) The foreign object could have been lodged and sandwiched in between the tight clearance between the moving blades to the stationary blades.

3. Manufacturer's engineers

A set of photographs was despatched to the overseas manufacturer's engineers for their observation and comments.

The manufacturer's engineers concluded:

² At page 422 of The Penguin Dictionary of Science by E.B. Uvanov and Alan Isaacs.

³ At page 145 of The Illustrated Dictionary of Machines - BLOOMSBURY.

⁴ The Forensic Consultant's Report was not made available but selective extracts were taken out of context from the said Report.

1. *Foreign matters had entered into the turbine steam chest casing and hit the first row of moving blades.* The foreign matter in the form of solid particles such as rust, slags that had been carried over by the boiler water "carry over" into the turbine.
2. Corrosion/erosion of moving blades occurred may to some extent caused by excessive water accumulation and chemical deposition of boiler water.
3. Gear pitting and uneven wear of gear teeth occurred likely by cavitations, oil contamination, high vibration of rotor wheel caused by damaged blades and frequent drain attack.

4. Underwriter's Forensic Consultant (FC).

For reasons best known to themselves, the underwriter declined to provide the forensic consultant's report.

It is trite law that when a party fails or refuses or declines or does not disclose technical report to the other party, this would be tantamount to deem that the former party is withholding some vital information which, if disclosed, would be harmful to their own case.

Instead, selective extracts of the report were quoted out of context as follows:

"The FC's opined that the lack of damage to the steam strainer is compelling evidence that no foreign body had passed through the pipeline.

"In view of the above, FC have established that the damages were due to wear and tear as a result of erosion. There is no evidence to show

that the damage was caused by foreign object."

What is erosion? GE Power & Water provides some clarification⁵:

"Erosion of turbine blades results in rough, uneven surfaces that alter steam flow paths. This reduces turbine efficiency and can also limit capacity. Erosion at the high-pressure end of a turbine is usually caused by solid particles (usually iron oxide) present in the steam. Iron oxide particles are present if they were not removed by steam blows during system start-up. They can also result from exfoliation of superheater or main steam header oxides or can be introduced into the steam by contaminated attemperating water (emphasis added in italics).

Erosion of intermediate and low pressure blades is usually caused by water in the steam. Operation below design inlet steam temperature or at low load can cause condensation in these stages, leading to erosion problems.

Carbon dioxide or other acidic species present in the condensate can accelerate the damage. Some protection against erosion-corrosion can be provided by low distribution ratio amines, which neutralize the acidity and elevate the pH of the condensate."

The damages so sustained by the turbine were:

- blades twisted inwards;
- blades collapsing to form an uneven groove,
- irregular shapes and dimensions of blades,
- blades dented and bent and chipped off,

- rotor wheel blades hit by unknown object,
- rotor wheel blades & stationary blades could be impacted by a foreign object

All of which were not consistent with the attributes of erosion.

MunichRE's Guide

The Guide provide a policy definition of what constitutes "Accident"⁶ quoted as follows:

Accident

"In layman's terms, an 'accident' means a sudden and accidental breakdown of an 'object' resulting in physical damage to the object, that requires that the 'object' be either repaired or replaced (except as it is amended for more restrictive forms of coverage applied to some boilers or turbine risks).

Because the insurance is not intended to cover certain occurrences, especially those of a maintenance nature, the following occurrences are not considered to be "accidents":

- depletion, deterioration, corrosion or erosion of material
- wear and tear.
- leakage at any valve, fitting, shaft seal, gland packing, joint or connection
- vibration or misalignment
- the cracking of any part of a gas turbine exposed to the products of combustion
- breakdown of any structure or foundation supporting the "object"
- operation of any protective device or safety device (which would merely be doing what it was supposed to do). ➡

⁵ Chapter 18 – Steam Turbine Deposition, Erosion and Corrosion. GE Power & Water.
⁶ At pages 7 and 8 of the MunichRE's "A Guide To Equipment Breakdown Insurance".

However, if an excluded occurrence or condition (such as wear and tear) caused a defined "accident" (e.g. a broken shaft in a motor) the latter occurrence would be considered an "accident".

Insofar as the turbine in question is concerned, reference is made to the relevant section of the Guide⁷.

Type of Equipment	Typical Features	Some of the Causes
Centrifugal compressors.	Explosion (centrifugal)	Loss of load; control failure, pumps, metal fatigue, infans, blower element
	Burned bearings	Misalignment; loss of lubrication
	Shaft, blading, impeller breakage.	Misalignment; metal fatigue; foreign material.
		Overload; progressive crack.

Loss or damage is synonymous with the term "occurrence".

Based on the findings above, save for the FC's report, it would be possible that centrifugal force generated within the turbine in operation could well result in impact and collateral damage to the shaft and blades caused by foreign material.

A Summary of Findings on Proximate Causation

Generally speaking, a seasoned forensic expert would explore into all aspects of the possible causation of loss or damage, categorising them into:

- i unlikely,
- ii least likely, and
- iii probable cause or causes, by a process of elimination supported by site investigation and observations.

Apparently, this cross-checking exercise was not seen in these reports. Further, none of these findings had concluded the proximate cause of loss as "a direct consequence of the continual influence of operation". Since the pertinent prescription of this Exclusion has been omitted, policy liability would seem to be apparent.

5. Policy liability

Underwriter repudiated policy liability pursuant to this Exclusion on the ground that "the damages were due to wear and tear as a result of erosion".

6. Observations

This Exclusion reads "loss or damage as a direct consequence of a continual influence of operation (e.g. wear and tear, cavitation, erosion, corrosion, rust, boiler scale)".

The examples as given follow after the wording "as a direct consequence of a continual influence of operation" is somewhat misleading and confusing.

The wording of this Exclusion would be better read as: "loss or damage (e.g. wear and tear, cavitation, erosion, corrosion, rust, boiler scale) as a direct consequence of a continual influence of operation".

Looking at paragraphs 2 and 3 under the heading of "Accident" in the Guide, wear and tear, inter alia, is classified as an occurrence and not an "accident". On this premise, it would not be rational to pontificate "wear and tear as a result of erosion" (as averred by the Underwriter in this case study) as erosion per se is an occurrence too. It is like saying "an occurrence as a direct consequence of an occurrence" without discerning its proximate cause, a proposition of which is rather preposterous.

Next, the policy has neither a definition of "wear and tear" nor an explanatory note of what is meant by "as a direct consequence of a continual influence of operation".

In the absence of policy definition on what constitutes "wear and tear", the ordinary layman's understanding of these words would be best referred to the dictionaries.

The Oxford English Dictionary defines "wear" as "damage sustained from continuous use"⁸ and "tear" as "hole or split caused by tearing"⁹.

The Longman Dictionary of Contemporary English defines "wear" as "damage caused by continuous use"¹⁰ and "wear and tear" as "the amount of damage you expect to be caused to furniture, cars, equipment etc when they are used for a long period of time"¹¹.

In other word, the turbine had been subjected to "wear and tear" since the day (2005) it was commissioned for use, and indeed, "wear and tear" had been "a direct consequence of a continual influence of operation" over a long period of time (approximately nine years).

On the other hand, it may be observed that the Preamble provides cover for, inter alia, "tearing apart on account of centrifugal force".

Moving on to Memo 1 – Sum Insured - requires the sum insured to be "equal to the cost of replacement of the

⁷ At page 19 of the MunichRE's "A Guide To Equipment Breakdown Insurance".

⁸ At page 957;

⁹ At page 859.

¹⁰ At page 1621;

¹¹ At page 1621.

insured machinery by new machinery of the same kind and capacity..."

The policy requirement necessitating the sum insured to be "equal to the cost of replacement of the insured machinery by new machinery..." would mean the allowance for wear and tear has been catered for at the inception of the policy and premium charged accordingly.

Memo 2 is concerned with the two modes of settlement of claim under (a) and (b).

Memos 1 and 2 are compelling indications that the policy intention is to cover ordinary wear and tear.

On the other hand, the RVC merely provides for the settlement of the loss or damage on a replacement (reinstatement) basis subject to the Special Provisions.

Memos 1 and 2 and the RVC deal with the quantum of settlement aspect whereas this Exclusion is concerned with the liability aspect (excluded risk).

This Exclusion is crystal clear that "wear and tear" must be subject to "a direct continuous influence of operation". Otherwise, "wear and tear" would be admissible under the policy.

The wording of this Exclusion per se is an anomaly.

Undoubtedly, wear and tear of the machine would accrue from the commencement of operation of the machine and this occurrence (wear and tear) would continue as "a direct consequence of a continual influence of operation" over a long period of time. Hence, it has been surmised that wear and tear is not covered by virtue of this Exclusion resting on the premise that wear and tear commences ab initio does not cease throughout the duration of the life

span of the machine under review. This would appear to be the prevalent view in the insurance industry. Unfortunately, this hypothesis is somewhat skewed and presumptuous and is contrary to Memos 1 and 2 and the RVC provisions.

The issue is wear and tear due to a proximate cause (for example, a broken shaft in a motor¹²) and not wear and tear due to wear and tear or erosion.

This Exclusion together with Memos 1 and 2 are printed words in the policy jacket, whereas the RVC is a typewritten endorsement attaching to the policy schedule.

The RVC is "subject to the following Special Provisions and subject also to the terms and conditions of the policy except insofar as the same may be varied hereby" (emphasis added in italics). This Exclusion varies with the RVC in term of coverage on wear and tear.

In the Law of Insurance, the learned Professor of Law, Dr Poh Chu Chai, averred:

"... where a policy is partly printed and partly typewritten and there is a conflict between the two, the printed words must be rejected in favour of the typewritten words¹³".

It is crystal clear that this printed Exclusion would have to be rejected in favour of the typewritten RVC.

The learned Professor added "Where the words in the policy are clear, the court has a duty to give effect to those words¹⁴".

In the alternative, in practice, where a component part was already rendered obsolete or useless due to wear and tear and this had resulted in the sudden loss or damage to the machine, then, the claim for that

particular part only would not be admissible in accordance with the Principle of Indemnity. The surrounding affected parts of the machine would be admissible as the cause of damage is fortuitous in origin. On this note, there is no cogent expression to this effect in this Exclusion.

Perhaps, the option is to reword this Exclusion in its entirety as follows: "loss or damage (e.g. wear and tear, cavitation, erosion, corrosion, rust, boiler scale) as a direct consequence of a continual influence of operation following a machinery failure".

In the case under study, heavy steam consumption and abnormal vibration of the turbine were discovered by the attending operator who immediately shut down the turbine. This action prevented the turbine from further damages occurring within.

Had the operator ignored the symptoms of mechanical problem of the turbine and allows it to continue to operate over a prolonged period of time, it would become obvious that there would be a "continual influence of operation" which has consequently aggravated the damages so sustained.

By shutting down the turbine immediately, there is "no continual influence of operation", thus, the loss would be falling outside the meaning of this Exclusion.

As mentioned earlier, the provisions of Memos 1 and 2 as well as the RVC are intended to cover ordinary and normal wear and tear for the dominant purpose of compensation.

It is submitted that this Exclusion is intended to exclude wear and tear due to the failure to mitigate the loss or damage following a machinery problem. There is no Mitigation Condition in the policy. ➡

12 At page 8, para 2, MunichRE's "A Guide to Equipment Breakdown Insurance".

13 Tay Hean Seng v China Insurance Co Ltd [1953] M.L.J. 38.

14 Chiew Swee Chai v British American Insurance Co (M) Bhd [1987] 1 M.L.J. 53; Shankar J.

It is trite law¹⁵ that the property owner is obliged to mitigate the loss or damage upon happening of the occurrence by taking immediate remedial action. This is necessary to prevent the loss or damage from continuing. Thus, failure to do so would mean this Exclusion is invoked.

Unfortunately, many in the insurance industry would succumb to repudiate policy liability by invoking Condition 3 citing failure to take "reasonable precautions" as if it were a Mitigation Condition.

The policy has no definition of the term "reasonable precautions" found in Condition 3. As such, it would be necessary to refer to existing authorities as to what constitutes the term "reasonable precautions".

As far as the property owner is concerned, they have exercised reasonable precautions by engaging an experienced operator to manage the turbine. The turbine is regularly subject to an annual maintenance service. The turbine has no known mechanical defect or any other defect of whatsoever nature. All measures had been undertaken to ensure the compliance of statutory requirements and manufacturers' recommendations. On this note, it is crystal clear that the property owner had indeed taken all reasonable precautions to safeguard the turbine from loss or damage.

In effect, Condition 3 is a Condition Precedent to the liability of Insurer.

In *The Insurance of Commercial Risks: Law and Practice*, Digby C. Jess averred¹⁶ in the matter of "reasonable precautions" that "Condition 7 (c) refers to the Condition of the Vehicle

per se as a Condition Precedent to the liability of the insurer, in particular, the Vehicle is:

1. maintain in efficient condition¹⁷;
2. whilst the vehicle is being driven;
3. unsafe
4. unroadworthy¹⁸.

An analogy can be drawn to the turbine in question.

There is no policy definition of Condition Precedent.

Condition Precedent has been defined as "a Condition which says that a right will not be granted until something is done¹⁹".

Another definition of Condition Precedent is "a provision that does not form part of the contractual obligation but operates either to suspend the contract until a specified event had happened²⁰".

In summary, Condition 3 relates to a pre-loss situation (Condition Precedent), whereas this Exclusion involves an actual loss situation.

Conclusion

The case study has illustrated the need to be cautious when interpreting this Exclusion.

It would be fatal to be overly dependent upon the forensic consultant's report alone. A report is only as good as the Court of Law has endorsed it after undergoing through due process of the law involving examination-in-chief, cross-examination and re-examination.

In all circumstances, the literal meaning of the wording of this Exclusion has to be adhered to. Where there is any doubt or confusion, the benefit of

doubt ought to be considered in favour of the Insured in accordance with the Rule of Contra Preferentum.


For the sake of avoidance of confusion, the suggested specimens of Exclusion 9 and Mitigation Condition are provided below:

Suggested specimen of Exclusion 9

"Loss or damage (e.g. wear and tear, cavitation, erosion, corrosion, rust, boiler scale) as a direct consequence of a continual influence of operation following a machinery failure".

Suggested specimen of Mitigation Condition

"It is hereby agreed that in the event of actual or imminent loss or damage to the Property Insured, the Insured shall take all reasonable mitigating measures immediately necessary in preventing, minimising and reducing the imminent loss or damage or loss or damage so sustained including, but not limited to, the cessation of the operation of the said Property Insured. And the Insured shall bear the burden of proving that this provision has been complied with, as a Condition Precedent to liability."

L.F. Ong is a Chartered Insurance Practitioner. He is an Associate of the Chartered Insurance Institute and the Malaysian Insurance Institute and a Member of the Chartered Institute of Arbitrators and the Malaysian Institute of Arbitrators. He is a practising Arbitrator and Mediator with 45 years of experience in the insurance industry. He was the General Manager of an insurance company and the former Chairman of the Association of Malaysian Loss Adjusters and the Chartered Institute of Arbitrators, Malaysia branch and a Director of the MII. 

15 Bulkhaul Ltd v Rhodia Organique Fine Ltd [2008] EWCA Civ 1452, CA, LJ Sedley, LJ Keene & LJ Smith, 18 Dec 2008.

16 At page 161-164, Chapter 9, "The Insurance of Commercial Risks: Law and Practice" by Digby C. Jess (Butterworths, 1986 edition).

17 McInnes v National Motor and Accident Insurance Union Ltd [1963] 2 Lloyd's Rep 415 at 417.

18 Brown v Zurich General Accident and Liability Insurance Co Ltd [1954] 2 Lloyd's Rep 243 at 246, per Sellers J.

19 At page 55, English Law Dictionary (Peter Collins Publishing, 1987).

20 At page 103, Oxford Dictionary of Law (Oxford University Press, 2002).

This technical paper was presented by the author at the PIAM's General Insurance Knowledge Seminar "Engineering & Construction Risks" held at Connection@Nexus in Bangsar South City, Kuala Lumpur, on 28th June 2018.