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Construction Plant & Equipment

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1. Executive Summary

The drive to construct more complex building and civil infrastructure and the desire to promote larger scale, more efficient process technology within the global Construction and Engineering arena brings greater industry challenges associated with design parameters, workmanship demands and material flexibility. As a consequence, the range and capabilities of the Constructional Plant and Equipment required to assist in facilitating this development continues to evolve.

As such, an understanding of the key risk assessment features is paramount and this will fluctuate according to type of plant and equipment, intended construction method and usage and the environment in which it is designed to operate. Ensuring that established working practices and sustainable inspection and maintenance plans exist, becomes critical for reasons of human safety and for the protection of the plant and equipment itself. This detail needs to be collected and assimilated to ensure that a foundation is established upon which to develop appropriate and fair terms and conditions.

It becomes essential to gain an appreciation of the contract responsibilities between the Owner and the Hirer such that the structure of insurance requirements can be tailored to ensure that complete and adequate policy protection is provided to all parties. The insurance cover effected for Construction Plant and Equipment can be approached in a number of ways whether this be on the basis of an annually renewable arrangement or indeed in support of a specific project policy. In assessing the demands and requirements in this area, the principals associated with integrity of valuation, basis of loss settlement and standard policy exclusions need to be considered.

Finally, it is understood that no technical paper dealing with the insurance of Construction Plant and Equipment would be complete without the provision of an overview of actual claim examples. Therefore, a number of real incidents occurring on contract sites are included for completeness. It is hoped that the content of this Working Paper as developed, by a team of experienced Construction insurance practitioners, covers and achieves the objectives outlined.

2. Definition of Construction Plant and Equipment

Construction Plant & Equipment is equipment either mobile or stationary designed to perform operations related to construction and/or erection on projects sites

Construction Plant & Equipment can be broadly categorized into:

- a) Mobile Equipment – this is equipment designed to move while performing its function. The propulsion is provided by an engine using internal combustion by using fuel such as petrol/diesel or an electric motor or combination of both. Such equipment is wheeled or tracked, examples are loaders, trucks, excavators, forklifts and mobile cranes.
- b) Static or Stationary Equipment – This equipment does not have wheels or tracks and is specifically designed to perform its tasks whilst remaining stationary. These machines are generally operated by using power generated from electric motors or diesel driven engines. Example includes pulley blocks, compressors, wood working machines etc. This category also includes equipment which do not use any form of power but are essential in any project such as portable protection tents, site hoists, jacks, cement silos etc.
- c) Tower Cranes are almost a combination of both, Once erected they remain in that position, although the height will of course increase with the height of the structure. The crane of course comprises several moving parts including the jib, trolley and hoist lines that allow the crane to perform slewing and lifting operations. Similarly, there are other specialist pieces of equipment such as Tunnel Boring Machines, Launching Gantries and very large specialist lifting equipment.
- d) The above categorization is in its broadest form. There could be other classifications made depending on whether they are above ground or underground, lifting equipment versus transportation equipment etc.

2.1 Mobile/Moveable Equipment versus Fixed/Static Equipment

Mobile / Movable Equipment	Static / Fixed Equipment
This type of equipment falls under the category of self-propelled machines.	This equipment is specially designed to work at a fixed location. These machines generally operate by using power generated by an electric motor.
These machines required precision manoeuvrability.	Most of these machines work on rotating axial axis with their expanded arms.
Some of this equipment in certain territories will need to be insured when it is travelling on public highways under its own power	Transported by low loaders etc.
Examples include mobile cranes, trucks, forklifts and excavators.	Example includes pulley blocks, compressors, wood working machines, tower cranes etc.

Equipment used for lifting	Equipment used for Transportation
These machines provide lifting mechanism by hydraulic, electric motors or any type of chemical fuel.	These are self-propelled machines. The propulsion is provided by an engine using internal combustion by using fuel such as petrol / diesel or an electric motor or combination of both.
Examples includes chain block, pulley blocks, cranes, forklift etc.	Example includes trailers, loader, dumpers etc.
Equipment used at surface	Equipment used underground
These operate above ground for activities like construction of buildings, flyovers, erection of any type of project.	Equipment falling under this category is solely used underground. E.g. underground mines, construction of tunnels or any other underground project.
This type of equipment can be used for underground projects also.	This type of equipment can generally not be used for surface projects.
Example includes diesel generator sets, forklifts, vibrators, dumpers etc.	Example includes tunnel boring machines, Jumbo drilling machines etc.

2.2 Construction Plant and Equipment versus Temporary Works

All projects also involve an element of 'Temporary Works'. The differences between this and Construction Plant and Equipment needs to be noted.

Construction Plant and Equipment	Temporary Works
These are used for specific contracts and can be shifted to another project site when project is completed.	Temporary works are generally items set up at the project site to facilitate project operations. Examples could be site office, storage sheds, temporary residences, scaffolding works, protective bunds, cofferdams and breakwaters, propping and sheet piling.
Generally this equipment is owned by contractors and shifted to other project sites once project is completed. However, it may also be hired in by either the contractor or the owner	Most of these items are projects specific and some are demolished once the project is over. However, sometimes sheet piling is incorporated into the permanent works. Exceptions could be mobile site offices owned by contractors, scaffolding material etc.
This equipment is generally not included within the estimated/actual project value, rather, insured as a separate item or even on a separate policy.	Much of this equipment is insured within the project value, however, site offices and facilities are often insured under the project policy as a separate item.

3. Ownership Responsibility and Contractual Implications

The position with regard to ownership and responsibility (to insure) for construction plant and equipment will inevitably vary according to agreement reached between the contract parties involved. Clearly within this working paper it is not possible to entirely cover all variations within specific contracts and it is recognised that many regional differences will exist. However, the intent is to attempt to define the common approaches that are taken to ownership and responsibility and outline the requirements that are more usually taken to cover insurable interest. The situation is of course different in the scenario where the owner of the equipment is also the user.

By way of introduction, the 'Owner' is recognised as the Company, firm or person letting the plant on hire and this would extend to include their successors, assigns or personal representatives in their capacity as 'Owners'. The 'Hirer' is the Company, firm, person, corporation or public authority taking the Owner's plant on hire and includes any party to which their responsibilities under the contract are delegated. From a terminology perspective, the term 'Plant' is intended to cover all classes of machinery, equipment, vehicles and all related accessories which the Owner agrees to hire to the Hirer. Under usual contractual conditions and arrangements, the 'hire period' usually commences from the time when the plant and equipment leaves the Owner's depot (or more specifically defined as leaving the Owner's care, custody and control) or place where last deployed and continues until the plant is received back at the Owner's named depot or other agreed location.

Unless otherwise stipulated to the contrary, the hirer is normally responsible for the unobstructed access and for the loading and unloading of the plant at site. In addition, any personnel supplied for such loading and/or unloading operations are considered to be under the direction and supervision of the Hirer. As such, these personnel shall for all purposes in connection with their employment in the loading and/or unloading shall be regarded as the servants or agents of the Hirer, who shall be responsible for all claims arising in connection with the loading and/or unloading of the plant and equipment by, or with the assistance of, such personnel.

It is assumed that the Hirer accepts that the plant and equipment is received in good working condition unless the subject matter experiences a fault not ascertainable by reasonable examination. The Hirer shall be responsible for the plant's safe keeping, use in a workmanlike manner within the manufacturer's rated capacity and return on the completion of hire in equal good order. Where the plant is hired without the Owner's operator or driver, the Hirer is required to take all reasonable steps to stay acquainted with the condition of the plant. Should the Hirer utilise the plant in an unsafe and unsatisfactory state and environment, the Hirer shall be solely responsible for any damage, loss or accidents directly arising therefrom. It becomes usual for the Owner to provide a current Inspection Report confirming the status of the condition of the plant required under current qualifying legislation at the time of hiring the plant. Naturally, this serves as an accurate record allowing a condition comparison to be made at the conclusion of the hire period.

To maintain the operational condition of the plant, the Owner (with potentially the authorisation of their Insurers) will be permitted to inspect, test, adjust or repair or replace the item. More usually, where a driver or operator is supplied by the Owner with the plant, the Owner is required to supply a person competent in operating the plant for such purpose and such person shall be under the direction and control of the Hirer. Such drivers or operators shall for all purposes in connection with their employment in the working of the plant be regarded as employees of the Hirer. The Hirer will not be permitted to allow any person to operate such plant without the Owner's consent.

As such, the Hirer retains responsibility for loss or damage arising in connection with the operation of the plant by such drivers and operators whilst the construction plant and equipment is in their care, custody and control.

When plant is hired without the Owner's driver or operator, any breakdown or the unsatisfactory working of any part of the plant must be notified immediately to the Owner. Any claim for breakdown time will only be considered from the time and date of notification. Full allowance for the hire charges and for the reasonable cost of repairs that have been authorised by the Owner, will be made to the Hirer for any stoppage due to breakdown of plant caused by the development of an inherent fault or fair wear and tear and all stoppages for normal running repairs in accordance within the terms of the Contract.

It is usual that the Hirer shall be responsible for all expense involved arising from any breakdown and all loss or damage incurred by the Owner due to the Hirer's negligence, misdirection or misuse of the plant, whether by the Hirer, or his employees, and for the payment at an idle time rate for the period the plant is unable to be used following loss or damage. The Hirer is responsible for the cost of spares and/or repairs due to theft, malicious damage or vandalism of the plant. The Owner however, will assume responsibility for the cost of repairs, inclusive of the cost of spares, to the plant involved in breakdown from all other causes.

3.1 Insurance Requirements

In normal circumstances, during the continuance of the hire period, the Hirer shall be responsible (and effect insurance) to indemnify the Owner for all loss or damage to the plant from whatever cause (other than fair wear and tear). The Hirer will also be obliged to fully and completely indemnify the Owner in respect of all claims as a result of death of or bodily injury to third parties or loss of or damage to third party property caused by or in connection with or arising out of the storage, transit, unloading, loading or use of the plant during the continuance of the hire period. In the event of loss or damage, hire charges will be required to be paid to the Owner usually at prescribed idle time rates given an inability for the Owner to hire the plant for future planned contracts to other clients.

It is understood however, that the Hirer will NOT be responsible for insuring for loss, damage or injury due to or arising from:

- Events prior to the delivery of the plant to the contract site where the plant is in transit and transport of the Owner;
- The erection of and/or the dismantling of any plant, where such plant requires to be completely erected/dismantled on site, always provided that such erection/dismantling is under the exclusive control of the Owner or his agent;
- The time the equipment is removed from site and is in transit on a highway maintainable at public expense by transport of the Owner;
- Transit to or from a site on a highway maintainable at the public expense under its own power with a driver supplied by the Owner;

4. Technology and Industry Developments

Design parameters, scale and output expectations are becoming ever more ambitious as the global construction industry strives for greater efficiency and competitive advantage. New and prototypical plant needs to develop and maintain pace with ever evolving construction techniques. Rapid and accelerating technological change mean that the increasing capabilities of constructional plant has assisted in significantly reducing estimated project period timescales and costs.

Interfaced with this trend in terms of technological development brings a need to consider the competence of the operator workforce element and familiarity with process, plant and equipment type and environment. Technological development and the search for greater efficiency and economy will inevitably lead to an increase in automated devices and systems controlling the operation of construction plant (e.g. the construction of underground mining facilities are increasingly being undertaken by construction plant operated from surface service control rooms.

Additionally, 'robotics' will increasingly be used to perform highly sophisticated and repetitive tasks, with very low levels of actual human intervention and attendance; for example in many modern tunnelling projects robots are used to spray the shotcrete lining, this delivers a more uniform covering in a quicker, safer (reducing exposure to falling rock and inhalation of air born silica and dust) and more cost effective way. Many construction plant failures from the past can be attributed to 'human failure' and intelligence systems with apparent fail-safe programming can be viewed as inevitable as industry considerations progress. However, and conversely, will this trend prove an adequate substitute for the well-qualified engineer? The solution is probably one of a question of balance leaving the operators and engineers with the task of the interpretation, reaction and response given the introduction of more advanced construction plant technology and working practices.

Critical risk considerations in this context include: control and performance monitoring; quality of software and compatibility; alarm signalling and cut out devices; shutdown and/or slow down procedures; management and supervisory controls; procedures for use; theoretical and practical training; authority to action i.e. to override control within defined parameters. The degree to which developing construction plant has built in safety tolerances can vary considerably. As a general rule, the fact is that plant historically was built to very robust standards; design and material margins were a feature and manufacturers carried out exhaustive factory works testing before introducing their products to market across all construction plant disciplines. In modern times, the demands for increased margins within a commercially competitive global environment mean these tolerances have become reduced and the development time, from design to commercial supply, far more compressed. In all cases, and dependant on the project discipline and environment, it becomes prudent to investigate the maturity in terms of fleet and longevity operating within a commercial environment to encourage a technical comfort level with regard to the construction plant that is required to be insured.

Specific construction plant, developed for particular project disciplines should be of a standard, proven type with any prototypical, experimental untried features identified and assessed accordingly.

Alongside these developments, financial considerations will continue to dominate. Whilst the initial capital investment costs associated with the design of new construction plant can be considerable, the need to ensure allowance for sums associated with relevant, regular and often bespoke maintenance and inspection practices becomes essential. As design considerations associated with construction plant continue to escalate, the correct level of maintenance appropriate to the plant concerned is vital to ensure safe working, prevention of damage, maximum reliability and longevity in terms of working life. If the construction plant is to be kept in optimum working order, the maintenance schedule should be properly structured, written up and recorded and undertaken by suitably qualified personnel.

In the event that the appropriate maintenance capability does not reside within the Insured's own workforce, all such work should be undertaken by the manufacturer, its recognised agents or independent experts approved by the manufacturer or supplier. Given the challenges with the evolution of design associated with construction plant, the scope of maintenance and the proposed service time intervals should not be less than that prescribed by the manufacturer taking full account of the locality, environmental factors, and type of work application the construction plant is to be involved with.

Maintenance factors would also include the recommended inspection requirements that may change or become more stringent as construction plant technology develops depending on its design characteristics, type of use and location including the obligation to satisfy any local statutory regulations. Equally, growing greater awareness of health and safety issues remains an escalating challenge whether driven by legislative requirements or otherwise.

In addition, technological advancement and unique, built for purpose construction plant can mean that costs associated with repair and replacement of spare parts and consumables can increase significantly, whilst time periods associated with repair and/or replacement requirements can become exacerbated. In certain territories, owing to a lack of skilled repairers, technical resources may need to be brought in to undertake repair work or the construction plant transported to the specialist repairer elsewhere outside region thus leading to inflated claims costs.

When assessing risk associated with highly sophisticated, expensive and specific construction plant, the prospect of developing a clear Business Continuity Plan in the event of loss or damage is deemed essential especially when Delay In Start Up Insurance is in place.

The increase in sophistication and the introduction of software to plant to increase its efficiency and monitor its performance introduces new risk that need to be assessed and addressed by insurers in areas which would have previously be seen as the province of computer insurers. Just like motor cars, motorised plant is increasingly being fitted with engine management systems. Such issues as software failure, derangement and other non-damage events, loss of data or connectivity are more common and Insurers need to consider the provision of covers in these areas as well as more traditional damage related covers

The nature of construction sites is such that each is unique and there does not tend to be conformity between sites and this means that automation without human intervention, with some notable exceptions, is more difficult than in more settled environments. Developments from manufacturers are therefore concentrating on aiding human operation of equipment,

which both aides efficiency and improves safety. An example would be an automatic stability system on mobile cranes or excavators. Whilst these features could very well reduce damage underwriters will need to monitor these developments and the effect they have on damage events and adjust terms and conditions accordingly.

Manufacturers are innovating constantly. An example would be manufacturers who have introduced dual armed excavators and diggers. Here the operator is being aided by software to facilitate operations. Having two arms means that functions such as holding and cutting at the same time can be achieved.

The 21st century has seen the introduction of remote control cranes following on from earlier innovations such as self-erecting tower cranes. One innovation flows from another and many self-erecting cranes are now also remote controlled.

Remote controlled plant is also being used in hazardous environments such as demolition or disaster recovery sites. It remains to be seen whether taking out the human operator sitting in the cab results in more extreme and risky usage of the equipment and a subsequent increase in damage events where there is no thought for the operator's safety.

Another area where complete automation has seen some success is on mining sites where GPS enabled trucks have been introduced over the last decade. These devices are automatic and are designed to reduce incidents caused by driver fatigue and increase usage of the trucks. It may be expected that such technology will become more widespread and insurers will need to understand the effect such technology will have on exposures being insured. GPS is also used extensively in the construction of tunnels.

Such developments introduce new and unknown features to construction plant and machinery.

Security of movable plant has improved dramatically in some territories with such initiatives as the common manufacturer key being replaced with unique start-up measures. Other security improvements include engine immobilisers and GPS tracking. Although these measures have not been adopted in all territories, in countries where these security measures have been introduced the incidence of contractors plant theft has reduced considerably.

One particular development in recent times is the use of Unmanned Aerial Project Specific Vehicles (UAVs), otherwise known as "drones". Consequently, increasingly we are being asked to consider insuring these as plant and equipment. This equipment has several applications in a construction project:

- Site Surveys and planning
- Progress Monitoring
- Inspection of structures
- Safety monitoring

However, we should not be surprised to see proposals for further development of their onsite use, such as the distribution of materials.

“Drones” can also be linked into the concept of Building Information Management (BIM) and the use of sophisticated software to assist in the monitoring of the project against the software generated development of three dimensional images created by the design team. BIM is often referred to as being 5D, 3D refers to the spatial imagery and geometry, the fourth dimension is time and the fifth is cost. “Drones can assist in monitoring all 5 dimensions. In many cases, physical damage to the UAV will be such that it will fall within the deductible. However, the potential for damage to third party property or persons needs to be considered as does the potential for delay in the project as a consequence of loss of the device.

Technological advances are also evident in the safety of tower cranes. These features have contributed to the reduction in the frequency of accidents (caused by human error, incorrect estimation of load and/or distance, material or structural fatigue and poor maintenance) thus improving the safety record of tower cranes.

Supporting statistics showing correlation between individual advances and the reduction in the accident frequency are not yet available.

These technological advances, include:

- Improved operator cabin visibility
- Improved lifting capacity
 - due to the increase in the size and hence weight of machines and pre-cast structures to be lifted and positioned in place.
- Load-limiting sensors
 - which alert the crane operator that the crane is reaching its maximum safe working load. The sensor displays the actual weight of the load being lifted.
- Equipped with camera(s)
 - for improved visual to ensure a safer load-picking and delivery of materials.
- Equipped with Anti-collision System
 - which allows cranes to automatically track other cranes situated in the surrounding proximity, identifies if imminent and calculates in real-time the risk of collision with respect to the breaking capability of the crane.
- Automatic slowdown of the luffing at the end-position
- Fire suppression systems
- Improvement in design of material and structure
 - has reduced metal fatigue as well as the maintenance and repair expenditures including associated downtime.

A further industry development is the use of black box-like devices on cranes in order to gather data on crane activity. This would be a good way to learn how the crane is being operated and help determine what exactly causes issues, such as a collapse. Another possible requirement would be the installation of anemometers. These devices measure wind gusts lasting just three seconds.

In some territories these are already a requirement used to good effect.

5. Risk Assessment of Construction Plant and Equipment

5.1 Exposures

Contractor's plant and machinery is usually covered on an All Risks basis, exposures vary from risk to risk, however the main causes of damage are as follows:

- Impact/Collision
- Toppling
- Collapse
- Overloading
- Fire
- Vandalism/Malicious Damage/Arson
- Falling
- Theft
- Damage as a consequence of breakdown
- Damage as a consequence of poor/no maintenance

When considering the approach to risk assessment for contractor's plant and equipment one should not solely consider the equipment itself, but also the physical environment, exposure to natural hazards, the socio-economic and political aspects, the training and experience of the operator, the usage of the equipment and the maintenance regime.

5.2 The Equipment

Equipment should be used and maintained in accordance with manufacturers recommendations and where required inspected and/or given a thorough examination by an appropriate independent authority to ensure that it is safe and complies with health and safety regulations and laws. In the UK for example, such inspection/examination would be necessary to comply with the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) and or The Provision and Use of Work Equipment Regulations (PUWER).

Any temporary works required for use with plant and equipment, including lifting frames, crane bases/rails should be designed and installed by competent and experienced personnel, and where appropriate should be checked and/or load tested. Regulations such as those mentioned in the preceding paragraph would also apply to this equipment

Automatic fire detection/control systems or manual fire suppression systems installed on the equipment can significantly reduce plant fire risks. Plant and equipment should be subject to a risk assessment to determine the appropriate fire detection/suppression.

The age and condition of the equipment should also be taken into account and its suitability for the conditions of the project as these factors may affect performance and reliability.

Whilst most policies do not provide cover for machinery breakdown often policies contain the provision that damage as a consequence of breakdown is covered. It is therefore in the insurers interest to ensure that the client is addressing maintenance and safety needs. Maintenance logs and safety certificates should be readily available for inspection by the insurer and/or his representatives.

5.3 The Physical Environment

Many construction projects are undertaken in remote areas, in difficult terrain and sometimes congested project sites. The climate and physical environment may impose additional stresses on the equipment. This may introduce the risks of collision, overtopping or falling from height. In mountainous areas or within tunnels the exposure to landslide, tunnel collapse or flooding must be considered. Some projects may be close to tidal waters and there may be the risk of the equipment becoming submerged or stranded. Ground may be poor or unstable creating a difficult environment for the use of large cranes and excavators. In remote areas it may be important to establish to what extent key items of equipment can be repaired on site, what expertise there is to carry out repairs and what spare parts are available locally.

Plant used for enclosed/underground working/tunnelling should be of an appropriate type for the environment, including internal combustion engines with spark-arrestors and flame traps installed and maintained.

Underwriters and risk engineers should establish that appropriate traffic controls are in place and that safe methods of working have been approved, in most countries the local health and safety executive will expect this to be the case. Clearly the intent of health and safety regulation is to protect workers and the general public from injury or death, however, a proactive health and safety culture has a positive effect also on the plant and equipment and the project as a whole. As an example, in a tunnel being constructed by the drilling and blasting method it is common for equipment to be damaged by falling rock, people and equipment should be kept away from the newly blasted face until geotechnical engineers have deemed the area safe to work in.

Plant operators should always ensure that cranes involved in lifting operations are placed on firm ground that is capable of supporting both the weight of the crane and its load and that outriggers are appropriately deployed. Lifting operations should be planned by suitably qualified and experienced personnel.

One aspect often overlooked by underwriters is the risk associated with laid up/parked up plant and equipment or plant and equipment at depots. At the end of the working day it is common for the equipment to be parked up, sometimes in a secure compound. Owners/users should ensure that all measures are employed to protect the equipment from many of the exposures that we have mentioned, however, damage could be exacerbated by, for example, fire spreading from truck to truck. Underwriters will often insure plant hire fleets or fleets of equipment owned by a contractor, again there is the possibility of damage to multiple items of equipment from one event and all measures should be taken to prevent/mitigate this. Underwriters also need to consider the enhanced exposure when setting their line sizes/PML.

5.4 Natural Hazards

In some territories the equipment will be exposed to natural hazards such as Earthquake, Windstorm and Flood. Whilst it is difficult to manage against the risk of earthquake, some preparation can be made against the risk of windstorm and flood. In areas regularly exposed to windstorm, cyclone and monsoon it is common best practice to have for example a hurricane preparedness plan. Such a plan would incorporate measures such as battening/tying down equipment, moving it to higher ground and positioning away from structures which might be susceptible to wind damage.

5.5 Socio-Economic and Political Aspects

Political unrest or a poor socio-economic environment may lead to an increase in riot, strike or civil commotion, vandalism and/or theft for financial gain. A collapsed economy may lead to projects being abandoned and plant left unsecured and unmaintained on site. In such circumstances the client may need to consider removing the equipment to a secure, locked and guarded compound or in lesser risk situations, the use of alarms, immobilisers or similar.

5.6 Operator Training and Experience

Ideally all equipment should be operated by well trained, qualified and experienced operators. Operation of the equipment should be restricted to those who have received the appropriate training. In some poorer countries it is not unusual to find that there is no training or certification of drivers/operators and in some cases they are even children.

On hydroelectric power projects and open cast mines the roads can be narrow, uneven, congested and challenging, with exposure to landslip and falling from height. It is important on such sites that safe working methods and traffic management plans are in place and that roads are suitably engineered to take account of the exposures presented.

Telematics can also be used to monitor driver/operator behaviour. Developments in recent years include such things as on-board alcohol level checking linked to the ignition and a computer chip in the driver/operators boot also linked to the ignition.

5.7 Usage

Construction equipment is used in many different environments in many different ways and this may clearly have an impact on the exposure. In some cases the equipment will be subject to heavy and prolonged usage in dirty or dusty environments. Alternatively, as previously mentioned, equipment may be used on mine or other sites in difficult terrain, or adjacent to water.

On major projects involving the installation of large pieces of equipment or vessels it is necessary to hire very large cranes and in some circumstances these cranes may become involved in multiple lifting operations. In such circumstances the operators and supervisors/banksmen need to be highly skilled and the whole operation needs to be carefully planned and coordinated to prevent damage to the often high value equipment being lifted and the cranes themselves. With these cranes and tower cranes it is essential that the equipment is correctly erected, tested and certified safe before use and that the subsequent operations are carried out in accordance with best international practices. For heavy lift and multiple lifting operations some sites will issue a "permit to lift" and receipt and independent validation of the lifting plan and method statement.

5.8 Maintenance

From the economic consideration, construction equipment should be fully utilized and not left standing idle since plant, whether hired or owned, will have to be paid for even if it is non-productive. Full utilization of plant is usually considered to be in the region of 85% of on-site time, thus making an allowance for routine, daily and planned maintenance which needs to be carried out to avoid as far as practicable plant breakdowns which could disrupt the construction programme.

Any risk assessment of contractor's equipment should consider reliability and availability of the equipment. Unexpected breakdown and repairs could result in extra cost, project period extension and consequential damage to the equipment and or the project. Therefore, it is necessary to assess the risk of failure of the construction equipment with a reasonable degree of accuracy to prevent such losses.

Risk assessment of failure does not only involve assessment of the current condition of the equipment at the time of the assessment. More importantly, it must consider and assess the maintenance programmes and various methods taken by the contractors to protect and repair minor failures in a timely and efficient manner to maximize equipment utilization and minimize equipment failures.

Although different maintenance methods such as preventive maintenance and repairs have been adopted for construction equipment, an unexpected breakdown is usually difficult to predict. According to a survey in the US, approximately 46% of major equipment repairs followed an unexpected failure. Repairs are often easy, but the collateral damage caused by the breakdown is more severe. For example, a \$500 bearing can ruin a \$7,000 transmission; a \$100 hose can cause a \$2,000 loss in production. Collateral costs are extremely difficult to measure because they do not appear in cost reports and they are easily disregarded.

Maintenance actions taken before failure are more cost-effective, less disruptive, and easier to manage than repair actions taken after the machine has broken down.

Risk surveyors should ask for and evaluate, not only previous maintenance records, but more importantly, measures in place such as monitoring and tracking of the condition of equipment to identify signs of failure or near-failure and conducting repairs or replacements of some components based on the manufacturer's recommendations or on industrial benchmarks on the expected life of equipment components.

Traditionally, there are generally three recommended types of maintenance for equipment or plant, which are:

- a. Maintenance improvement,
- b. Corrective maintenance, which deals with the emergency, repair, remedial and unscheduled events.
- c. Preventive maintenance intended to prevent unscheduled downtime and premature equipment damage that would result in corrective or repair activities.

Better maintenance improvement and preventive maintenance can reduce the need for emergency corrections.

Construction equipment, like any other machinery, can be expected to break down during its working life. This may be due to normal wear and tear, or a sudden failure of a component part, as previously stated, whilst the failure itself may not be covered, the consequential damage to the equipment or the project could be.

6. Underwriting Considerations

When underwriting Construction Plant and Equipment exposures there are many elements that an underwriter would need to consider. This will vary according to the nature of the equipment being tendered for insurance, its location and usage. There are many similarities, but also many differences to consider, not least of which is the ever evolving technology which is introducing interesting new challenges for insurers such as driverless vehicles, remotely controlled equipment and drones.

In many territories it has become customary for contractors in particular to purchase annually renewable plant and machinery insurance on a blanket basis (sometimes stand alone, but sometimes as part of an annually renewable contractors all risks policy), however, other parties also purchase plant and machinery insurance on this basis. Project owners and/or other parties may arrange specific insurance as part of a project. Consequently it makes sense to view the underwriting considerations for annual and project policies separately:

6.1 Annually Renewable Construction Plant and Equipment Insurance

This type of policy will usually cover all plant and machinery owned, hired, leased, borrowed or the responsibility of the contractor whilst engaged on any project site (and in transit to or from such site) and whilst in storage/parked up anywhere within the specified territorial limits. The cover will be in respect of “All Risks” unless otherwise excluded. For equipment which is not owned by the contractor, contract conditions or agreements will usually determine the nature of the contractor’s responsibility for the equipment and consequently the extent to which there is a requirement to arrange and maintain insurance. Consequently, it is not uncommon to also insure plant and equipment hired in by the contractor or the party arranging the insurance. Annual policies are usually undertaken on a “blanket” basis, that is to say that the insured does not provide a detailed list of individually valued equipment, rather a total value applying to all plant and equipment to be insured.

In order to arrange cover an underwriter would require the following information:

- 3 to 5 years claims experience
- Deductibles in place for each underwriting year
- Changes in coverage throughout the years
- Changes in risk during the period
- New Replacement Values of plant for each underwriting year (alternatively other arrangements can be made for rating purposes)
- General description of the nature of the plant
- Nature of work undertaken/usage
- Specific details of large losses, including root cause analysis and lessons learned
- Contractor approach to risk management & health and safety
- Territorial limits
- Maximum value of any one item
- Maximum value at any one location (depots/plant yards and on site storage areas should also be a major element considered with special attention being paid to flood, explosion and spread of fire)
- Maintenance regime
- Driver/operator training
- Confirmation that the appropriate safety certificates have been issued in accordance with local legislation (for example in the UK Lifting Operations and Lifting Equipment Regulations 1998)
- In some territories, theft of plant is a particular exposure and underwriters should seek information relating to security
- If appropriate, any natural catastrophe exposure/accumulation

As such policies are most likely to be well established, underwriters will usually be familiar with many of these features and also with the particular contractor.

We often see requests for annual coverage on plant and machinery used at operational mines, ports and terminals etc. In such circumstances, it is particularly prudent to enquire about the experience of drivers, their training, the age and condition of the equipment and details of the maintenance regime.

6.2 Project Related Construction Plant and Equipment

It is common in project insurance that the project policy will also provide insurances for so called “common user” plant and equipment. The various contractors operating on a project site would usually utilise their own equipment, however, the owner or his representatives may provide use/access to certain specialist items of equipment designated for use by all parties, and typically this would include tower cranes, concrete batching plant, large earthmoving equipment, large fixed or mobile cranes, launching gantries and tunnel boring machines.

Generally speaking, the majority of conventional plant and equipment is mobile, either tyred or tracked vehicles, whilst much of the equipment alluded to in the preceding paragraph require considerable assembly, erection installation inspection and testing prior to operation, some specific examples would be:

- Specialist Heavy Lifting Cranes and Gantries
- Tunnel Boring Machines
- Tower Cranes
- Concrete batching plants

These in turn introduce different risks and exposures to those typically associated with conventional plant and machinery.

Without a doubt any underwriter will need to ensure that care is taken to assess these risks by addressing questions such as:

- Are methods of assembly, installation and erection in accordance with manufacturers requirements
- Are user operators fully trained and licensed
- Are user/operators suitably experienced
- Age, condition and maintenance of the equipment if not new
- In the case of tunnel boring machines:
 - What type of machine is being used
 - Is it new or used, if the latter, details of the refurbishment
 - Who specified it
 - Who manufactured it
 - Does it comply with the specification
 - Is it suitable for operating in the project ground conditions
 - Planned interventions
 - Storage arrangements prior to assembly
 - Location of portals and shafts
 - Who will assemble
 - Who will operate
 - What are the ground conditions and what site investigation has been carried out
 - Is the client/contractor complying with the Tunnelling Joint Code of Practice
 - What is the ground monitoring regime
 - Are any obstructions to the alignment expected, if so, how will these be managed
 - What will become of the TBM upon completion

One interesting development is the use of “drones” in relation to construction projects. Due to the level of deductibles, loss or damage to the device is unlikely to have a significant loss impact, however, third party injury or damage either directly or indirectly due to the operation of the device is something to consider. Additionally, the drone may be utilised as part of the overall project monitoring and even as an intrinsic part of Building Information Management. As such, this may introduce an additional DSU exposure and should prompt the underwriter to investigate further the use of the device and the potential impact on the critical path should it become unavailable. Underwriters should be particularly vigilant from a third party perspective when the project is in the vicinity of airports, motorways, railways and overhead transmission lines given the increased third party exposure. In many territories laws and regulations in relation to the use of such devices are unclear or undeveloped, this is also the case in respect to the licensing of operators, and these are also factors that a prudent underwriter should consider. Whilst drones present an additional exposure/risk to be considered, on the positive side they may also be used to monitor and control risk management and health and safety.

6.3 Plant Valuation and Pricing

In an ideal world, plant and machinery should be priced by applying a rate to the new replacement value of the equipment as insurers consider this to be the value which clearly reflects the risk and exposure; total losses are not common, however, some policies allow for replacement as new within specific parameters and partial damage and repairs incur parts and labour costs at current prices. However, this information is often difficult to obtain as clients tend to maintain a record of the written down value/market value of their equipment.

When it comes to pricing, the nature of the equipment, location, loss experience and other underwriting information mentioned above should contribute to the pricing. This applies regardless of whether equipment is being insured on an annual or a project specific basis. On annuals, one of the main elements contributing to the pricing is the loss experience. Many such policies are priced on a “burning cost” basis. In such cases underwriters should ensure that they are comparing like for like;

- What was the valuation of plant for each underwriting year
- Which deductibles were in place for each underwriting year
- What significant changes have been made; risk management, health and safety, maintenance and inspection, operator training etc.

Underwriters should also ensure that a factor has been included for claims inflation. It is also important to ensure that the overall premium takes into account brokerage and internal costs and expenses, thus ensuring that a suitable profit margin is allowed for in the premium calculations.

6.4 Natural Catastrophe

In areas facing such exposure, underwriters should establish whether the client/contractor has a disaster recovery/inclement weather plan to protect the equipment from wind or to quickly remove from areas prone to flooding or generally mitigate the risk of loss.

6.5 Third Party

For most plant and equipment there is also a third party exposure. When mobile equipment is moving around on site in close proximity to other users plant, existing property, the project works, workers and third parties, there is an inherent risk of damage and/or bodily injury. Underwriters should carefully assess the project approach to risk management and health and safety.

In the case of very large specialised heavy lifting equipment and tower cranes there is the additional potential hazard of collapse during assembly, disassembly or normal operation, with the equipment falling onto neighbouring properties or into a street busy with pedestrians and motorists.

Tunnel boring machines are, again, a different proposition from a third party respect. However, damage to third party property is most likely to be deemed to be a consequence of the carrying out of the works rather than being directly due to the operating of the machine and will therefore be covered by the project policy rather than a specific TBM insurance. On occasion however, the TBM is insured separately and the situation could arise whereby the third party claim may be found to be attributable to negligence during the operation of the TBM itself.

6.6 Delay In Start Up

It is not uncommon for project insurances to provide Delay In Start Up Insurance consequent upon damage to plant and machinery. In many cases this risk continues to exist even when the plant is separately covered. In the latter case underwriters should understand which equipment is separately insured, what the impact on the projects critical path is and may consider insisting that they maintain some sort of claims control over separate plant insurance to ensure that all parties are aligned in the event that there is a claim which may have an effect on the critical path.

With conventional equipment the exposure is minimal as replacements can be easily and quickly sourced. However, for specialist equipment underwriters should ascertain the following:

- Lead time for replacement of major parts or entire piece of equipment
- Ability/facilities for onsite/local repair
- Alternative means of working
- Hiring of similar equipment

7. Approach to Loss Settlement



Plant and equipment policies are usually underwritten on an indemnity basis whereby the general principle is to indemnify the insured for the costs of repair or replacement of the damaged item in such manner as to put the Insured in substantially the same position with regard to the item as he was immediately before the damage occurred.

When approaching a loss settlement therefore, careful consideration must be given to the following:

- Age of the item.
- Original condition of the Plant.
- Declared valuation of the Plant if not NRV.
- Causation relating to individual claims.
- Policy limitations relating to the cover offered.

7.1 Valuation, Age and Condition

As has been mentioned above, in an ideal world the premium for a plant and equipment policy should be calculated by applying a rate to the New Replacement Value (NRV) of the items insured. However, as can be seen when observing a typical construction site, much of the plant and equipment is not new and may have been put to considerable use during its lifetime. The age and condition of an item can have a considerable bearing on its actual value at the time of a loss and, under the general principle of indemnity, in the case of total loss it is the actual value of the item immediately prior to a loss that should be considered.

Whilst total losses do occur, most claims involve partial damage and in most cases these days the cost of labour and spare parts for repair are indemnified on an actual cost basis. It is for this reason that NRV is considered the value which most closely reflects the risk and exposure. If however the cost of the repair is likely to exceed the actual value of the plant the policy will usually have provision for the Insurer to limit the indemnity to the actual value of the plant immediately prior to the loss giving due regard to age and condition.

Where the NRV is difficult or impossible to obtain some policies allow the Insured's declared value to be used as the basis for premium calculation, however it is important to remember

that in the event of a claim the principle of indemnity still applies and it is the actual value of the item immediately prior to the loss that should be considered.

Occasionally this principle may be partially overridden for certain items of plant where an agreed value is established in the policy value. An example of this is (a) (i) in the clause below:-

The basis of settlement for claims shall be

(a) where the item of plant and equipment lost or destroyed is:

- (i) less than 12 months old, the cost of replacing the lost or destroyed item by a similar item equal to but not better or more extensive than its condition when new,*
- (ii) 12 or more months old, the cost of replacing the lost or destroyed item by a similar item equal to but not better or more extensive than its condition at the time of loss or destruction.*

A similar approach is sometimes taken by agreeing a formula for calculating the depreciation in value of certain items of specialist plant. An example of this might be a Tunnel Boring Machine (TBM) especially designed for use on one project. It could be argued that, whilst its value is as new at the start of the project, its value at the end of the project is close to zero or equivalent only to its value as scrap. In such circumstances an agreed rate of depreciation during the course of the project has on occasion been agreed.

7.2 Causation

By the nature of the work, construction plant and equipment is often exposed to considerable wear and tear and minor damage may not be repaired where it does not affect the performance of the machine. In the event that a claim is made it is important that the cause of loss is carefully established and that the damage claimed can all be attributed to a single cause or event.

7.3 Exclusions

Careful consideration should also be given to the conditions and exclusions in a policy when approaching loss settlement for construction plant and equipment as these can also have the effect on both the extent and level of indemnity.

In common with other property insurance policies a CPE policy will usually contain some standard exclusions such as War and Nuclear Risks, however in addition there are other more specific exclusions the most common of which are listed as follows:

Electrical and Mechanical Breakdown

Most policies will exclude Electrical and Mechanical Breakdown however the wording of such exclusion may vary. For example some policies will expand this exclusion by mentioning specifically excluded risks such as freezing of coolant fluids, lack of coolant fluids or lack of lubrication. Others will simply state that mechanical or electrical breakdown is excluded. Usually however such exclusions will contain a provision that where as a

consequence of such breakdown or derangement an accident occurs, which in turn causes external damage, such consequential damage shall be indemnifiable.

Replaceable Parts and Attachments

CPE policies will often include an exclusion for replaceable parts and attachments such as drill bits, cutting surfaces, chains, and belts etc.... Such items are anticipated to wear and require replacement in the course of normal maintenance and so are not considered insurable. Some insurers will however rely on wear and tear exclusions and do not include this as a specific clause.

Wear and Tear

By the very nature of their use and function plant and equipment is subject to expected wear and tear and it is not the intention under a CPE policy to cover the loss or damage as a direct consequence of the continual influence of operation (e.g. wear and tear, corrosion, rust, deterioration due to lack of use and normal atmospheric conditions). Some wordings will however include provision that such exclusion shall only apply to that part which has suffered such condition and not apply to the remainder of the Insured Property which is not directly affected by such condition but is damaged as a consequence thereof.

Deductibles or Excesses

Whilst the deductible or excess will be stipulated in the schedule of the policy it is important to make sure that under exclusions it is stated that Insurers are not liable for the deductible stated in the Schedule to be borne by the Insured.

Vehicles Designed and Licensed for Road Use

It is not intended that CPE insurance should replace or be in any way equivalent to cover provided under compulsory motor insurance policies. For this reasons the policy will normally exclude loss of or damage to vehicles designed and licensed for general road use unless these vehicles are being used on construction sites.

Waterborne Vessels or Craft

Waterborne vessels or craft are usually excluded under a CPE policy as more specific insurance would normally be required for such items, however some would contain an exclusion to vessels or craft which exceed a certain overall length. Typically 5 - 8 metres).

Loss or Damage Whilst in Transit

Transit of plant and equipment would normally be excluded unless specifically agreed.

Plant and Equipment Working Underground

Insurance for equipment being utilised underground requires careful consideration and will usually necessitate the application of special conditions and exclusions. For this reason a standard CPE policy will usually contain an exclusion of loss of or damage to plant and/or machinery working underground unless otherwise agreed by endorsement whereby such special conditions and/or exclusions can be imposed.

Consequential Loss or Liability

A CPE policy should normally exclude any loss of use or other Consequential Loss, however on occasion such exclusion may be qualified where the policy contains an extension of coverage relating to continuing hire charges. Such extension is intended to provide indemnity for hire charges which the insured might be liable to pay even though he is unable to use the item hired due to accident or damage for which he is responsible. It is usual however that a suitable monetary limit is imposed for such an extension.

Inventory Losses

Policies should also contain an exclusion of loss or damage discovered only at the time of taking an inventory or during routine servicing.

8. Claim Examples – Lessons Learned

8.1 Case Study 1 – New for Old

The case concerns accidental damage to a 30 year old wood chipper machine whilst out on hire. The wood chipper was manufactured in Sweden. The Plant Owners/Hire Company purchased the machine as used plant in 2014 for EUR 56,000, they then spent EUR 5,000 installing a reconditioned engine into the unit.

The Plant Owner normally hired out its equipment under UK's Contractor Plant Association (CPA) hire conditions. In simple terms, the CPA terms made the Hirer responsible to

- make good all loss of or damage to the plant from whatsoever cause except fair wear and tear for the period of hire (once delivered to site and up to time the plant is delivered back to the Owner's depot or other agreed location).
- fully and completely indemnify the Plant Owner and any personnel supplied by the Plant Owner in respect of all claims for injury to person or property caused by or in connection with or arising out of the storage, transit, transport, unloading or use of the plant during the hire period.
- continue to pay to the Plant Owner continuing hire charges albeit at a reduced 2/3rd idle rate of the hire amount until settlement of the claim is completed.

The Plant Hirer did not have an insurance policy in place that covered the hired-in wood chipper and therefore procured an annual policy for the sole purpose of providing indemnity in the event of loss or damage to forestry plant whilst on hire. The cover was taken out to a Limit of Indemnity of GBP 100,000 any one event.

Importantly, the Operative Clause of the insurance policy stated:

"The underwriters will indemnify the Assured as stated in the schedule by payment or at underwriters option reinstatement or repair in respect of physical loss or physical damage arising from any cause not otherwise excluded and occurring anywhere within the territorial limits during the period of insurance of property which is being used or is intended for use in connection with the works on any contract side which is the subject of this policy. Such property shall include:

Contractors plants tools and equipment and/or other items of a like nature and materials and/or any other property of whatsoever nature used or intended for use in connection with any contract works being undertaken by the Assured and insured under this policy all being

the property of the Assured or hired by the Assured under the Contractors Plant Association (CPA) conditions or conditions no more onerous”.

For reasons known only to the Plant Owner and Hirer, the two parties agreed the hire of the wood chipper under a bespoke hire terms instead of the CPA conditions. The bespoke terms were printed on the back of the hire document issued on the day of the hire. These set out:

Indemnity for lost, stolen or damaged equipment:

“The hirer agrees either to insure the equipment against loss, theft or damage beyond economic repair on a new for old basis or to indemnify the owner fully in a similar amount”.
“Hire charges [GBP 2,000 per week] will continue until such rectification is complete”.

During the course of operating the wood chipper, a steel rod was ingested that caused substantial damage to the drums, knives, clutch assembly and drive shaft. The Plant Owner contacted the Swedish manufacturers who advised that due to the age of the machine, there was a scarcity of parts and elements, if the machine was to be repaired would need to be manufactured from scratch. All of which would take time, potentially weeks. The Plant Owner and manufacturers estimated the cost of repair as GBP 42,000 plus several weeks for the delivery and time to repair.

The Plant Owner informed the Hirer that the cost to replace the machine with the new equivalent model (referring to the terms of the hire agreement) was EUR 250,000.

The assessment of the indemnity value of the machine less salvage per the basis set out by Insurers, was circa no more than GBP 40,000.

Thus based on the terms of the hire document issued when the machine was delivered to the Hirer, the Hirer could be held to be in breach of contract for failing to insure the machine for the value as of “new for old basis” set out in the contract.

Discussions with the Plant Owner took into account, the vast betterment that would accrue arising out of replacing the 30 year old machine with a brand new equivalent machine, and whether this was contrary to the concept of reasonably indemnifying the loss, particularly against the background of the Plant Owner in nearly all other scenarios hiring the machinery out under CPA terms.

In this instance, it was possible to agree a prompt settlement on the basis that the machine was an economic write off, without incurring hire charges on the indemnity value.

8.2 Case Study 2 – Costs Beyond Direct Damage

The case concerns a tower crane originally hired in to erect a seven storey steel framed building in the UK. The hire terms between the Main Contractor erecting the building and the crane hire company were the UK Construction, Plant Hire Association (CPA) Standard Terms and Conditions for Contract Lifting Services.

Relevant was the fact that per the contract agreement with the Client, the Main Contractor was responsible to insure the Temporary and Permanent Works valued at GBP 6.1m, which it felt it had met by ensuring its Annual Contractors All Risks Policy was in excess of the Contract Value. The insurance policy included cover for loss of owned plant up to GBP 100,000 and hired in plant GBP 250,000. The annual Contractors All Risks was in respect of Contract Works and Public Liability.

In the context of the overall contract works, the cost to erect, hire and disassemble the tower crane was GBP 70,000. Per the hire terms, the Crane Hire Company would be responsible in the event of damage or injury to persons or property solely by the Company's negligence in performance of the contract. It did not extend to loss or damage due in whole or in part to any negligence on the part of the Customer or any third party. Per the terms of the hire agreement, the Crane Hire Company's liability was limited to GBP 25,000 in respect of loss of or damage to the contract goods and GBP 5,000 any other loss.

The steel frame building collapsed shortly after topping had been completed.

The damage to the mast sections posed a real threat of the crane collapsing. The value of the crane was estimated at circa GBP 500,000. The potential damage to neighbouring property within the collapse zone was significantly greater.

The Main Contractor was required to liaise with the Crane Hire Company and determine a solution to prevent the crane from toppling whilst the debris was cleared sufficiently enough to allow the crane to be disassembled. The Crane Hire Company supplied a 400 tonne mobile crane to hold the tower crane in position for 12 days whilst the debris was cleared and 250 tonne mobile crane with access basket to enable access to examine the crane, carry out temporary repairs and assist with the removal of steel against the mast.

Suffice to say that the costs in respect of mitigating further losses to the hired in plant and avoiding additional damage and loss which could otherwise have occurred, if the crane collapsed, were considerable.

The case illustrates the need of the Insured to understand the risks and assess the value at risk of plant and hired in plant when arranging insurance cover, as in the event of loss the effects of the damage to the plant can have wider unforeseen consequences.

Consequently, when considering making arrangements for hiring plant and the insurance, the Hirer may need to consider issues extending beyond simply loss or damage to the plant itself, including mitigating measures, logistics of repair and/or replacement and the consequential effects not only to the contract works that the plant is being used on, such as delays caused to the program and increased cost of working but also third party concerns.

Using this case to explore the wider implications, could a helicopter have been hired to remove the crane in-situ rather than mobile plant? In this instance it would have proven uneconomic. But, in the event an aerial platform was necessary, would the insurer's definition of construction plant have extended to the use of a helicopter?

Taking this a step further, the introduction of smaller aerial platforms, for example the growing use of aerial drones for survey and inspection purposes opens up greater issues with regard to the liabilities and risks that these can present beyond simply the responsibility for loss or damage to the plant itself. Cases are arising where such activities are in close proximities to built-up areas, airfields and flight paths.

8.3 Case Study 3 – The Case of the Red and the Blue Tractor

This case shows differences that can arise between a formal hire contract with terms and a basic purchase order with minimal terms. Two near identical large tractors, one red, and the other blue were hired to a civil engineering project to tow fuel bowsers re-supplying the excavation equipment on site.

Due to concerns over security, the Main Contractor arranged for a security firm to patrol the site and during the weekends/night time provide a guard in a site office directly overlooking the plant compound.

The civil engineering project was a joint venture formed by a consortium of two civil engineering companies. These companies had differing procurement arrangements for hiring in plant. Consequently one tractor (the red one) was hired in under a formal hire agreement confirming that the Hirer was responsible to indemnify the Plant Owner in the event of loss or damage. The other Blue tractor was hired in with no formal reference to responsibility in the event of loss or damage or in respect of who was to insure the machine.

Both two tractors were stolen over the same evening. The security company employed by the consortium was present patrolling the site but neither witnessed the theft or realised the plant was missing, until brought to their notice by the Main Contractor.

Per the hire agreements in place, the project policy cover arranged by the Main Contractor – a JV Consortium, settled the claim for the theft of the Red tractor hired under a formal hire agreement. As the JV Consortium was able to demonstrate that it had in place reasonable measures and the theft of the Blue tractor was not through any negligence on the part of JV Consortium, without specific reference to the Main Contractor agreeing to indemnify the Plant Company in the event of loss or precedent of earlier agreements due to the bespoke nature of the project, the Plant Owner did not receive indemnity under the project insurance policy and was required to make a claim under its's own fleet insurance cover.

The biggest question has remained how the security guard did not hear, see or after the tractors were taken notice the theft.

8.4 Case Study 4 – Contractual Responsibility and Consequent Insurance Implications

This case involved various items of plant hired from differing Plant Owners. A fire occurred destroying all items of plant stored in the compound. The question arising, was in which item did the fire originate and was it due to possibly an electrical or mechanical fault with the plant. In this case it was not possible to identify the precise cause or source of the fire.

The hire agreement should be carefully read to determine, whether the supply of an operative with the machine and/or who last serviced the machine may influence who is responsible to indemnify the loss in the event of an incident.

Depending on who owns and/or is responsible for the plant, particularly in situations where responsibilities may not fall to a single party, ascertaining the cause becomes an important factor.

Even if the machine is hired in with an operator, the hirer may be responsible for accidental loss caused by operator error.

Additional Reading:

GP32 EP48 Tower Cranes 2013

EP44 2010 Plant Theft Report UK

WGP – 060/09 Tunnel Boring Machines

WGP 43/05 Theft of Construction Plant and Equipment

CIREG Crane Aide Memoire 2010

UK Fire Joint Code of Practice

Safe Work Australia – Cranes Code of Practice