

# **Theft of Construction Plant & Equipment**

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## **1. Introduction**

This paper examines the problem of construction plant and equipment theft as it affects various insurance markets in the world and the actions which can be taken by those plant operators who wish to reduce their exposure to theft.

The contents will be of most interest to underwriters in those countries where construction plant theft is perceived to be a significant issue for insurers and the construction industry. This paper provides an overview of the issue in various countries around the world.

Theft of plant is perceived by criminals to be a low risk and profitable crime because of the ease with which plant can be stolen and sold on, low detection and prosecution rates and high cash rewards. The annual cost of theft for the construction industry and its insurers is likely to be billions of USDs.

A large proportion of plant is not insured or, if it is, significant deductibles may be carried. Also there are considerable consequential losses, such as hire charges, payment for additional security measures, contractual penalties and lost revenue, which are usually not insured.

Additionally, plant theft results in substantial costs for society as a whole. It is believed that in many cases it is an organised crime and proceeds may fund distribution of illegal drugs and terrorist activities.

For engineering insurers, theft of plant often represents a significant contributor to claims and insurers will not achieve planned returns if they have not adequately underwritten the plant theft risk.

Those responsible for securing plant and the sites at which it is located often have a low perception of duty of care, not taking even basic precautions. Some plant operators are contributing to the theft problem through knowingly acquiring stolen plant or at least carrying out insufficient pre-purchase checks to establish ownership.

It is likely that the incidence and cost of theft and malicious damage could be reduced significantly by the exercise of greater levels of care by plant operators through better risk management. They have available to them numerous techniques that can be employed to assist. These are described in this paper and include procedures for plant purchase, hire and movement, depot security, site security, fitting of anti-theft systems and registration with an external agency.

All of these incur forethought and in most cases the spending of money, but expense incurred in risk management must of course be set against the substantial material and consequential losses which often follow from theft of plant as well as potential insurance premium and deductible reductions.

Whilst prime responsibility for reducing theft must lie with plant operators, plant manufacturers and insurers have roles to play also. Manufacturers could increase the availability of security systems for plant as well as adopting standard identification numbering. Insurers should actively encourage better risk management by plant operators through provision of security advice, incentives and as appropriate application of minimum security standards.

## **2. Definition of Construction Plant & Equipment**

Construction plant and equipment is defined for the purposes of this paper as meaning all types of plant and equipment used on construction sites, including mobile and static, powered and non-powered, owned or hired plant. Construction sites refers to those sites at which building, erection or civil engineering works are undertaken. Construction plant and equipment includes:

- large tracked and wheeled machines – such as mobile cranes, excavators, dump trucks, loaders, compactors, crushing plant, screening plant, pile drivers and draglines
- small driven equipment – such as mini-excavators, skidsteer loaders, site dumpers, access equipment, vibratory rollers and quad bikes
- non-driven equipment – such as rammers, lighting towers, compressors, generators, welders, pumps, winches, heaters, dehumidifiers and power washers
- portable tools and equipment – such as power tools, breakers, drills and transformers
- attachments – such as hydraulic breakers, pulverisers, cutters, grabs, balls, augers, sprayers, spreaders and trailers
- non-powered items – such as ladders, scaffolding, staging, shuttering, fencing, site accommodation and hand tools.

In this paper, the term “plant” will be used as a shortened form of “construction plant and equipment”.

## **3. The Nature of Plant Theft**

### **3.1 Types of theft**

Most plant theft, especially where it involves high value items, is a highly organised activity. Professional thieves may steal “to order”, targeting specific plant items in advance. They will often remove stolen plant to remote locations within hours of the theft. It is believed that in Europe organised criminal gangs are involved with plant theft as part of a range of other activities such as the smuggling of people, fuel, drugs, alcohol and tobacco, vehicle crime and money laundering. Plant theft, because it is a ready source of cash, has also been linked to those involved in terrorist activities as in Northern Ireland.

Some theft is opportunistic. For example, plant may be stolen by “joyriders”, who simply take it away for “fun”, or by amateur thieves, who may not fully appreciate the nature or value of the stolen plant.

Another form of theft, which may not be insured in all countries, is fraudulent conversion (theft by deception). This occurs for example where a person hires plant from a plant hire company, providing false identification, and does not return it.

Collusion or actual involvement of site workers in plant theft may often be a factor. The construction workforce, given the nature of the work, is highly mobile. At any one site there may be many sub-contractors and self-employed workers making adequate vetting of those entering the site difficult.

Criminal activity associated with plant includes acts of malicious damage as well as theft and to some extent measures taken to reduce theft will also serve to reduce the occurrence of malicious damage.

### **3.2 Why plant is stolen**

Plant is stolen primarily for re-sale. Thieves utilise trucks, trailers, low loaders and containers to transport stolen plant or if self-propelled it may be simply driven off site and along the highway. The services of legitimate hauliers, freight forwarders and shippers may be employed to export plant.

Theft of plant is perceived by criminals to be a low risk and profitable crime because:

- high demand in the country where the theft occurs and also in export markets, particularly in areas where there are high levels of development or re-construction such as Eastern Europe, means there is a ready market for stolen plant
- lack of due diligence by buyers in the used plant market means that thieves are able to sell stolen plant relatively easily and at or near the market value for cash
- lack of care by plant operators with regard to plant, depot and site security measures means that plant is relatively easy to steal
- the risk for the thief of detection, recovery of stolen plant and prosecution is low because:
  - a) the discovery and reporting of theft to police is often subject to delay especially where plant has been stolen at weekends or other times of site inactivity or where there is inadequate inventory control
  - b) relatively low priority is afforded to plant theft by police in many countries, due to lack of resources or officers trained in plant detection and identification
  - c) the complexity or lack of standard identification markings and lack of registration records available leads to the inability to positively identify that plant has been stolen and establish ownership even where plant is found
  - d) plant is often broken up into component parts, making the tracing and identification of stolen plant even more difficult
  - e) plant is rapidly moved out of the country in which it was stolen; movement within Europe is made easier because of lack of border controls.

Police may recover plant where there is some form of indicator such as plant in an unusual location, unusual type or timing of transport, missing decals, altered paint or missing identification, false or cloned serial number plates.

There are agencies providing recovery services. Such agencies often have close links with police forces and employ investigators who have experience in plant business. They may be employed by insurers or directly by plant operators. It is normal for such agencies to obtain their income by charging a fee representing a percentage of the value of the recovered plant.

## **4. The Cost of Plant Theft**

It is impossible to ascertain the true financial cost of plant theft. The European Confederation of Equipment Distributors quotes a figure equivalent to USD 9bn. for the cost in Europe. The UK government refers to USD 750m. for the cost of losses in the UK (<http://www.crimereduction.gov.uk/site.htm>), although sometimes USD 1.8bn. is quoted. American sources refer to USD 1bn. for the USA. These are of course very much estimates, because (a) much of the cost of plant theft is not insured and (b) there are consequential losses which are not readily measurable. Even insurance costs are hard to come by as only in a few countries are national statistics available.

Whatever the actual figures, it is reasonable to assume that, at least in Europe and the USA, plant theft represents a considerable expense for the construction industry. A substantial proportion of plant is not insured. Even where it is, the insured party will be liable for the deductible, the levels of which are generally increasing.

There are considerable consequential expenses for plant operators, most of which are not insured, in the form of:

- liabilities under hiring agreements for continuing hire charges
- hiring charges for alternative plant
- higher replacement costs for new plant
- payment for additional security measures
- idle time wages to employees who cannot work without the missing plant
- contractual penalties
- lost revenue in the form of hiring fees or lost contracts
- increased insurance premiums
- higher deductible levels at next renewal.

Plant hirers incur losses even though hiring conditions may make their customers responsible for lost plant. Where the plant hirer is able to obtain reimbursement from his customer for the plant, the amount may represent less than its replacement value and lost hire fees may not be fully compensated. In some cases the customer will have no insurance and no resources and so will be unable to comply with the hiring conditions. Alternatively the customer may argue that he never accepted the conditions or that the plant was off-hire at the time of the theft and therefore does not accept responsibility. In other cases, the customer will have given false information to the plant hirer and has absconded with the plant.

Plant theft also results in substantial costs for society as a whole. Proceeds from the sale of stolen plant may fund distribution of illegal drugs and terrorist activities. Time spent by police on investigating plant theft means less time devoted to solving other crime.

## **5. Experience by Country**

International and national statistics for plant theft are not readily available. Comparison of information from different countries is made difficult because of factors such as differences in definitions of what constitutes plant, different levels of insurance and different mixes of plant types dependent on national economies, climate and geography.

Levels of insurance deductible applicable to plant vary considerably. It is possible that in many countries the level of self-insurance is such that theft is not an issue for insurers, although it may of course be so for plant operators.

Theft may be less common in some countries because for example of generally higher security standards, lack of market for stolen plant or difficulties in getting plant out of the country.

Studies on the subject of plant theft have been undertaken in certain countries such as the UK, France and Belgium reflecting a greater level of concern in those countries.

### **5.1 General findings**

Views and information from each country have been obtained from insurer responses, reports and publicly available sources.

NB Because of the lack of hard data, much of the comment from different countries is based on individual subjective views, so may not accurately reflect the national situation. In many cases, comments have been provided by one insurer only.

1. Insurers in most countries of Europe, USA, Mexico, South Africa, Australia, Hong Kong, Taiwan and Malaysia regard plant theft as a common occurrence.
2. Insurers in most of the above countries are concerned at the level of plant theft, but relatively high levels of deductible often mitigate this concern.
3. Plant theft appears not to be regarded as a common occurrence, and therefore of no particular concern to insurers, in Japan, Indonesia, Morocco, Argentina and Venezuela.
4. Plant is usually insured on an "all risks" basis including theft and malicious damage cover.
5. Deductible levels vary widely. Reported minimum levels vary between nil (Japan) and USD 10,000+. In many countries it is common to apply a deductible as a percentage of the plant value / sum insured or of the loss (reported levels range from 1% to 20%).
6. In most countries, plant operators are required to provide insurers with a list of plant to be insured together with individual values.
7. Insurers do not usually insist on minimum levels of security, unless there is a theft history, although site fencing and security guarding is often requested.
8. Insurers do not generally provide advice on plant security.
9. In many countries plant is hired-in and hiring conditions usually make the hirer-in responsible for loss of the plant.
10. There appear to be no government-backed initiatives to combat plant theft, other than in the UK.
11. In most countries investigation of plant theft is a low priority for police forces.
12. There is no compulsory registration of plant, other than for vehicles to be driven on public roads.
13. Only a few countries have organisations responsible for testing and certifying anti-theft systems.

The following provides some feedback on the issue of plant theft as it impacts different countries or regions:

### **5.2 Europe**

The value of plant stolen each year in Europe could be as high as USD 9bn. Most frequently stolen are lighter plant items such as breakers, generators and compressors, but theft of heavy plant is rising, especially that of backhoes, bulldozers and excavators. In spite of law enforcement efforts, recovery rates of stolen plant are only about 10%. Reasons for this include the ease of falsifying serial number plates, the lack of standard product identification numbers, the liberalisation of border controls, particularly in the European Union, and the absence of an international database of stolen plant.

(Source: European Confederation of Equipment Distributors)

### **5.3 Belgium**

La Confederation Construction, which represents the construction sector in Belgium, carried out a survey of its members in 2000. It found that:

- plant theft and malicious damage have increased considerably in recent years; an increase of 30% between 1998 and 2000
- acts of malicious damage are rarely declared to the police
- thefts usually take place at weekends or at night
- civil engineering sites and roadworks are the most affected

- construction firms take few preventative measures even after being victims of theft
- security is often limited to a few elementary precautions.

(Source: CNPP report Vol des Engins de Chantier, Etude No. EP 02-16, 2003)

A survey by La Confederation Construction in 2001 reported the percentage of respondents who had suffered thefts of various plant types as follows:

- 68% small plant items
- 30% compressors or generators
- 16% vehicles
- 15% office equipment
- 10% cranes or loaders

79% of the 374 respondents had been victims of theft in previous 3 years. 92% of stolen plant was not recovered. Plant theft losses in 2000 cost an estimated USD 38m.

(Source: La Confederation Construction)

A joint insurer / construction industry working group on security standards for plant is due to report in June 2005.

#### **5.4 France**

According to independent experts, DOMex, the cost of plant theft to French businesses and insurers amounts to the equivalent of USD 76m. annually. According to another source, DLR, plant theft in France represents between 2% and 3% of the turnover of its members (450 in 2002). This equates to USD 144m.

It is reported by construction insurer, SMABTP that:

- 60% \* of stolen plant is recovered within 1 month, particularly where the theft is reported within 24 hours, and 20% enters the black market or is the subject of insurance fraud
- stolen plant is recovered at auction sales, as a result of bank or insurer checks, at time of sale and by police checks on the roadside or at ports
- plant is often exported to developing countries through organised criminal networks
- the average value of stolen plant is estimated between USD 9,500 and USD 15,000
- thieves primarily target smaller plant items such as generators and compressors, but larger items such as road rollers and loading shovels are also taken
- theft of fuel and vandalism is common
- most thefts take place at weekends and public holidays
- nearly 50% of plant is not insured.

(\* The high recovery rate may be due to the fact that this refers to insured plant, which is usually only the larger heavier plant and therefore more likely to be recovered.)

According to Le Moniteur in 2000, plant stolen in France may be exported to Eastern Europe (particularly countries of former Yugoslavia, Romania, Poland and Russia), Spain, Portugal and Africa.

The Federation Nationale des Travaux Publics (FNTP) in conjunction with DLR have created a database for stolen plant. This allows for the recording, via the internet, of the type of plant, make and model, year of manufacture, identification numbers, etc. The FNTP database indicates that compressors are the most commonly stolen plant type as follows:



<b>Plant Type</b>	<b>Proportion of Items Stolen 1999</b>
Compressors	40%
Loading shovels	16%
Mini-excavators	15%
Forklift trucks	11%
Dumpers	9%
Hydraulic excavators	3%
Other plant	6%

(Source: CNPP report Vol des Engins de Chantier, Etude No. EP 02-16, 2003)

### **5.5 Netherlands**

According to BMWT, between 2,200 and 2,500 items of plant were stolen in the Netherlands in 2000. This corresponds to a value of between USD 70m. and USD 90m.

BMWT estimate that between 40% and 60% of plant stolen in the Netherlands, Germany and Belgium remains in circulation in the markets of those countries. A significant proportion of stolen plant is therefore exported; it is believed that much plant from the Netherlands finds its way to Eastern Europe, especially Poland.

BMWT has, in association with SCM, classified plant in different categories and recommended minimum levels of protection. Dutch insurers have agreed to offer reduced insurance premiums, where plant is protected by security systems certified by SCM.

(Source: CNPP report Vol des Engins de Chantier, Etude No. EP 02-16, 2003)

### **5.6 UK**

Plant theft in the UK is considered to be a major issue by plant operators, insurers and the government. This has led to government sponsored initiatives such as the Plant Theft Action Group and the publication of material providing security advice to plant users.

A feature of plant insurance in the UK is that, for ease of administration, plant is often insured on a "blanket" basis with pricing based on a total fleet value provided by the insured. Frequently no check is made of the validity of the value given, nor is a list of plant items provided to the insurer.

Insurers may advise or insist on higher levels of plant security in the form of physical devices attached to plant, registration with the National Plant & Equipment Register (TER) and better depot and site security. They may offer premium discounts for such security measures and even contribute towards their cost.

Estimates of the value of plant stolen in the UK annually range from USD 90m. to USD 125m. However the total cost of plant theft, including consequential losses, has been estimated at USD 750m. according to the UK government Web site (<http://www.crimereduction.gov.uk/site.htm>). Other estimates put the cost at more than double this amount.

Much of the cost is uninsured. A typical deductible level would be USD 920 per claim. It is estimated that 40% to 50% of plant used in the UK is self-insured.

The UK Police National Computer's plant index records between 8,500 and 9,500 reported thefts per annum, although this is likely to be a considerable under-estimate.

Based on information from members of the British Machinery Insurers Association, plant theft and malicious damage claims account for 50% of the cost of all plant claims. The average plant theft claim is USD 10,000 to USD 12,000. Reported plant theft and malicious damage claims account for 63% of all plant claims.

Research by the police in 1999 estimated that over 24,000 items of plant were stolen each year and that the risk of theft was on average 26 per 1,000 in any one year. Most stolen plant, accounting for 74% by number and 46% by value, was categorised as "non-driven" plant and had a theft risk as high as 60 per 1,000. Small driven plant had a theft risk of 22 per 1,000 and accounted for 14% by number and 28% of value. Large driven plant had a much lower theft risk of 6 per 1,000 but accounted for 26% of value (12% of numbers). Disturbingly, it was reported that at 20% of the sites no security measures were in place at the time of the theft.

(Source: The Nature and Extent of Construction Plant Theft published by the UK Home Office 1999)

A survey in 2004 carried out by Hilti tools revealed that 4 out of 5 contractors had tools stolen in the last year, with an average replacement cost of USD 3,400. 1 in 3 firms said they had no security and over 50% said downtime had a bigger impact than actual replacement cost.

Refer to Appendix 1 for additional information on the UK experience of plant theft provided by TER.

### **5.7 Australia**

Theft, particularly from working sites, is perceived as a major exposure associated with plant and is of concern to insurers.

Currently there are no government-backed initiatives aimed at reducing plant theft, although the matter has been flagged for consideration by the National Motor Vehicle Theft Reduction Council. There is no system for registering plant on a national database.

A typical deductible level would be 1% of the sum insured, subject to a minimum of USD 400.

Insurers do not, as a rule, impose specific conditions or insist on security levels provided the experience is acceptable, other than for certain types of plant. For example, one insurer excludes theft of skid steer loaders in certain areas of Australia unless fitted with an engine immobiliser or vehicle tracking / GPS system and subject to a deductible of USD 2,300.

One particular area of concern is that of depots, such as those of local government bodies, and work sites in isolated, rural or semi-rural areas. Criminals are undeterred by security measures such as locks, alarms and visits by security patrols. Even where police have received a call, it can be 30 minutes before they can reach the site, allowing plenty of time for thieves to overcome defences and make their escape.

One insurer has reported that theft accounts for about 15% of reported plant claims and 20% of the cost of plant claims. The same insurer estimated the average cost of a plant theft claim at USD 19,000.

### **5.8 South Africa**

Plant theft in South Africa is not perceived to be a major issue for insurers. Incidence of plant theft appears to be relatively low, although cost of individual theft claims can be high. Generally only larger items of plant are insured, whilst it tends to be smaller items which are stolen.

Typical items insured on specific plant policies include cranes, earthmoving equipment, compactors and plant used for road construction and transportation. Smaller items such as tools may be insured under business “all risks” sections of commercial policies.

In addition to “normal” theft, insured losses include the hi-jacking of plant. Cover for fraudulent conversion of hired out plant is not provided.

The South African insurance industry is involved with business in initiatives against crime, but there are no government-backed initiatives aimed at reducing the incidence of plant theft. The police are taking a pro-active role in targeting crime syndicates as well as developing and maintaining a database of stolen items.

Road-going plant is registered on the National Traffic Information System. Otherwise there is no national database for registering plant.

Police will investigate plant theft “where they come across it”, but insurers tend to employ tracing agents to locate stolen plant. This tends to be most successful where the agent is put on the case immediately after the theft.

Very few plant operators make use of security devices such as alarms, immobilisers, anti-theft and hi-jack devices on plant, although post-theft tracking services are available.

Generally, insurers do not impose specific conditions or insist on certain levels of security for plant. Deductible levels are normally 10% of loss typically subject to a minimum of USD 1,600. 30% of reported plant claims relate to theft and 40% of the cost of plant claims are for theft. The average plant theft claim is given as USD 80,000.

(Source: South African Engineering Insurers Association)

### **5.9 USA**

Plant theft is a common occurrence in the US and is of concern to insurers. In 2002, theft of plant (described as “contractors’ equipment”) cost insurers USD 102m., representing 33% of the overall cost of plant claims and 15% of earned premium. Nearly 15,000 theft claims were reported (56% of the total for plant). The average plant theft claim was USD 6,914. In 2002, 32% of theft losses occurred at insureds’ premises and 67% at “other” premises such as working sites. The remaining 1% of losses occurred in transit.

(Source: Insurance Services Office, Inc – Commercial Inland Marine Experience: Contractors’ Equipment)

Theft is most prevalent for plant of small to medium size and value, as evidenced by the fact that whilst the majority of reported claims are caused by theft, the cost is only one third of the total.

Insurers generally insist on sites being fenced and 24 hour security guarding. A typical minimum deductible level may be USD 5,000 or, for high value plant, 1% of value.

According to the National Insurance Crime Bureau, in 2001 approximately 5,500 "heavy equipment" thefts were reported to the National Crime Information Center.

The total cost of plant theft including indirect costs is said to be over USD 1bn.

As little as 10% to 15% of stolen plant is recovered, compared with an automobile recovery rate of 60%.

The National Equipment Register provides a registration service for plant at time of acquisition and for stolen plant.

### **5.10 Japan**

Based on the information provided via one insurer, it is apparent that plant theft is not a major concern in Japan. Reported plant theft claims form only a very small percentage of the total. Although some insurers may have a minimum deductible of USD 1,000, frequently there is no deductible.

### **5.11 Taiwan**

Plant insurance is often not purchased in Taiwan. However theft of certain types of plant such as excavators, forklifts and transformers is a common occurrence and such plant types are usually insured. Plant theft is a matter of concern for insurers. In the last ten years theft was the second most costly cause of loss after "man-made errors".

A typical deductible would be 20% of the loss subject to a minimum of USD 6,400 and maximum of USD 16,000.

Generally insurers do not insist on security measures, other than where there are concentrations of high value plant. They will usually advise insureds to keep plant locked and in fenced areas during periods of site inactivity and may request 24-hour security patrols.

The majority of plant, especially larger items, is hired from plant-hire companies. Hiring conditions make the hirer-in responsible for loss of or damage to the plant.

The police tend to treat more seriously those thefts believed to have been committed by criminal gangs. It is reported that stolen plant such as excavators is illegally shipped to mainland China for sale.

In the ten year period 1995 to 2004, there were 445 plant theft claims costing USD 5m., an average per claim of USD 11,240. Theft accounted for 30% of reported plant claims and 20% of the cost. The cost of theft claims represented 14% of the plant insurance premiums for the period.

(Source: Engineering Insurance Association, Taiwan)

## **6. Responsibility for Security**

Responsibility for security rests primarily with the plant operator. Plant may be owned outright, held under the terms of a finance agreement, leased or hired. The

plant may be hired out and this is a significant feature of the construction industry around the world, with a large volume of plant being owned by hire companies. All types of plant may be hired, from domestic tools to mobile cranes with values of USD 100,000s.

Plant operators range from “one-man” businesses to global construction companies with turnovers in excess of USD 1bn. and the nature of their work varies enormously. Consequently, the approach taken to risk and the resources available to prevent theft will vary considerably.

Typical hiring conditions make the hirer-in of the plant responsible for its loss, so he must compensate the hire company in event of theft. Where the operator owns the plant, he can specify the fitting of anti-theft systems, but he has no such control over hired-in plant.

In all cases the plant operator must consider proper site security. It is a fact of construction life that items of plant which may be worth in excess of USD 20,000 are often left overnight in, at best, semi-secured sites or compounds or, at worst, unsecured on the side of a road. Often the plant operator may be dependent on the main contractor for general site security.

Depot security must also be considered. Large accumulations of plant can occur at depots particularly when the construction industry is on holiday for example over the Christmas / New Year period.

It is of course a basic condition of insurance that the insured party takes reasonable precautions to prevent loss and is expected to act to protect his property as though uninsured. Arguably, plant operators do not always comply with the condition, although it is unlikely that insurers will consider this on its own to be sufficiently strong grounds for declination. Insurers may of course be far more willing to decline claims in those cases where there is proven non-compliance with specific security measures endorsed on to the policy.

## **7. Security Measures**

Effective security for plant is the combination of a number of measures which taken together can be considered as good risk management. The prime aim must be to prevent theft or malicious damage occurring, but post-theft measures such as use of tracking devices also have a part to play.

Security should embrace procedures for purchase and hire of plant, procedures for moving plant, recording and registration of plant details, depot and site security and the fitting of anti-theft systems. Actions to be taken following theft must be understood. Contingency planning should consider the impact of losing key plant.

A company’s philosophy towards plant security should be set at the top of the organisation and, to be taken seriously, given a high level of priority by senior management, site management and those actually using the plant. Security also requires allocation of sufficient resources.

It is advisable that plant operators regularly review their security procedures and develop a plant security policy outlining their approach to theft prevention.

### **7.1 Depot & site security**

Plant depots are frequently located on isolated poorly maintained sites, typically low cost industrial, waste or transport sites such as railway yards, and security is often poor or non-existent.

Security of working sites is even more difficult than for depots because they are temporary and may be exposed and ill-defined, preventing use of perimeter fencing. Often the plant user will be a sub-contractor who will be working on someone else's site with no control over site security or the areas to be used for plant storage.

A considerable amount of plant theft is perpetrated with the collusion or active involvement of site staff. This makes site supervision particularly important. Theft of plant from sites can occur because no one person is responsible for the plant.

Responsibility for security on site should rest primarily with site supervisors. If they take a strong line on security by making company policy clear to everyone, this can significantly contribute towards reducing theft. It is important that security measures are discussed at top level and that all senior staff fully understand the implications of poor security. Good control of staff and vehicles on site is essential.

### **7.2 Contingency planning**

Loss or unavailability of a crucial item of plant can have a major impact on the timetable of work on the site at which the loss occurred and at other sites at which it was planned to use the plant. Disruption can be mitigated by:

- assessing the consequences of the loss of plant items on site and the likelihood of them being stolen
- considering the action to be taken if a major plant item goes missing
- identifying, where necessary, alternative methods of working
- recording details of hire companies or suppliers of alternative plant.

### **7.3 Security advice**

Detailed security advice is shown in Appendices 2, 3, 4 and 5. This has been collated from a variety of information sources available in the form of documentation or from Web sites and has been categorised under the headings of:

- Appendix 2 - Security Procedures
- Appendix 3 - Depot Security
- Appendix 4 - Site Security; and
- Appendix 5 - Security of Plant on Site.

NB The statements made in the Appendices represent general statements of good practice rather than minimum security standards to be stipulated by insurers.

## **8. Anti-theft Systems**

This section describes anti-theft systems available for plant comprising identification markings, physical restraints, immobilisers, alarms and tracking systems.

### **8.1 Plant identification markings**

To discourage theft, items of plant should carry permanent identification markings. Markings may be applied by techniques such as stamping, etching, engraving, sandblasting, use of acid pens or ultraviolet lacquer. They should be in as many places as possible, both visible and hidden. If the plant is stolen and stripped this will assist the identification of the parts. Markings must be unique to the plant item such as the Vehicle Identification Number (VIN) or Product Identification Number (PIN).

Visible marking reduces the attractiveness of plant to thieves by making it more difficult to sell the plant on. It also assists in identification of recovered plant. A secure plate, bearing the owner's details and 24 hour telephone number, should be fitted to the plant so that police can make contact with the owner.

Plant should be painted in corporate colours and carry company logos. Special paints, which contain additives to distinguish them from other paints, can be applied. Decals should be applied warning that plant is protected.

Hidden marking of plant should be applied so that plant and component parts are identifiable even where thieves have managed to remove or obliterate visible markings.

Microdots are laser-etched "dots", each one the size of a pinhead, which can carry information such as company name, telephone number and postcode. Several thousand dots may be applied to an item of plant.

Proprietary marking systems are available, providing for a combination of visible and hidden markings with a unique reference number, which is recorded on the marking company's database. When police or investigating agents find stolen plant, it should be possible to verify the owner's identity by reference to the database. Markings may be in say 50 different locations on the plant with some on electronic tags and microdots readable by a scanner. Clearly displayed warning notices on plant protected by these proprietary systems can act as a significant deterrent to thieves.

## **8.2 Physical restraints**

These consist of numerous forms of mechanical locking devices, often designed for specific plant types. They will stop the operation of the plant by locking important parts of the machine to prevent it being towed away. To be practicable in use they must be capable of being fitted quickly and easily. Examples include:

- leg locks that immobilise the plant by raising one wheel above the ground in a locked position and are suitable for plant that utilises stabilising legs, such as backhoe loaders
- breaker locks which lock hydraulic breakers, buckets and the like to mini-excavators or backhoe loaders when left on site out of working hours
- boom locks used to immobilise mini-excavators by locking the boom in the extended position
- track locks that secure the rubber or metal tracks of crawling plant
- trailer locks that prevent plant such as compressors being towed away
- wheel clamps
- ram locks that lock the steering ram of machines such as tractors, backhoe loaders and dumpers in full-lock position
- security posts and ground anchors to which plant such as compressors and trailers can be secured
- hydro locks used to fix articulated plant in a curved position, preventing it from travelling in a straight line.

These devices are practical and effective for small driven and non-driven plant, because their visibility acts as a deterrent and their removal requires physical effort, time and tools, often accompanied by noise. They offer an effective way of slowing down thieves.

### **8.3 Immobilisation systems**

Immobilisation systems are likely to be the most practical method of preventing self-propelled plant from being stolen. The principle these systems work on is to isolate all, or a combination of, hydraulic, electrical and fuel systems. They may be part of the original equipment manufacture (OEM) or added by after-market fitting. They allow only authorised users to start the plant by use of a code or transponder or special key that is unique to the vehicle and aim to prevent unauthorised moving or use of the plant.

Examples include:

- immobilisation of diesel engines by shutting off the fuel supply and locking hydraulic and electrical circuits with an electronically coded valve
- immobilisation of hydraulic systems operating cabin rotation, boom operation, steering systems or the track drive
- immobilisers that disable key circuits to prevent the engine starting or disable movement functions.

Much plant is relatively simple in construction and does not have electronic management systems that can be immobilised, although such systems are likely to become more common in line with the need to comply with emissions regulations.

Electronic immobilisation should not be used in isolation for non-driven plant, because these items can be towed away or lifted on to a truck for removal to a secure place for modification.

### **8.4 Alarms**

Audible alarms have a function but only if for example fitted to vehicles on a suburban site with people within earshot. Portable alarms may be fitted to non-mobile plant and on some sites alarms on compounds may be applicable. Alarms should be armed / disarmed using high quality key switches (remote fob-type switches as used for cars are not recommended). Alarm pagers may be practical on large sites having permanent security guards.

For alarms to be effective, they should be used in conjunction with other anti-theft systems.

### **8.5 Tracking systems**

Tracking systems come into play after the theft has occurred and, if functioning correctly, pinpoint the location of stolen plant and enable subsequent recovery. They operate using communication signals between a unit fitted on the plant and a base station, allowing the position of the plant to be determined accurately. Information can be directed to an internet-connected computer or mobile telephone.

Systems using the GPS (Global Positioning System) satellite network provide the widest coverage globally, but may be used in conjunction with the GSM (Global System for Mobile Communications) mobile telephone network and radio waves.

Tracking systems have been used for motor vehicles for many years and have proved successful. However systems used on plant should be specifically designed for the purpose and be robust in construction, because of the harsh working environment to which plant is exposed. Specialist installation is required. Fitting of the tracking device must be in a concealed position either internally or externally in a weatherproof box.



The system should, preferably, provide constant monitoring of the protected plant. This type of system is armed and set automatically when the plant is left and triggers when the plant is moved unless the movement is validated by a combination of electronic tags, keys or codes.

Some simpler systems require that the tracking company be first notified that the plant is missing, so that the system can be activated. This method is less effective for plant, because it may be many hours or days before the operator is aware that the plant has been stolen and the delay will significantly reduce the chances of recovery.

Tracking systems can be used for all forms of powered plant, but the cost, which usually consists of an up-front payment plus regular fees, may be prohibitive for lower value items. Types of plant recovered using tracking systems include excavators, mini-excavators, loaders, dumpers, rollers, generators, telehandlers, quad bikes, compressors and trailers.

Some systems can also be used for perimeter protection (geo-fence) to detect if non-mobile plant, such as traffic lights or generators, is moved outside a defined area.

Other issues for plant operators to consider before purchasing a tracking system are whether the system has a direct link to the police, the extent of its coverage and the financial viability of the service provider.

One of the consequences of improved security systems fitted to motor vehicles has been the theft of the vehicle keys. New tracking systems seek to overcome this problem by requiring that the tracking device be disarmed, by means of an electronic key, each time that the vehicle is moved. Failure to do so causes the tracking device to send a signal to the tracking company's operating centre, which can then check whether the vehicle is being moved legitimately. Such systems have been developed for plant. These new systems are in the UK subject to certification by the Thatcham organisation and classified as Category (CAT) 5 systems.

Tracking systems are also promoted for their fleet management benefits, being able to monitor engine hours and battery condition for example as well as movement.

One concern with tracking devices is their possible susceptibility to "jamming" (blocking) of the signal from the transponder on the plant. Jamming devices are legal in some countries, but even in those where they are illegal, it is likely that professional thieves will be able to acquire such devices.

### **8.6 Testing & certification of anti-theft systems by independent organisations**

A number of organisations provide a testing and certification service for manufacturers of plant security products. The fact that a product is certified to meet a pre-determined standard greatly improves buyer confidence and promotes the purchase of (a) new plant from manufacturers and dealers with added security and (b) security systems for after-market fitting.

Testing organisations have devoted resources primarily to motor vehicles, but some work is now being carried out on anti-theft devices suitable for plant. Examples of such organisations include Thatcham in the UK and SCM in the Netherlands.

Minimum standards are set to ensure that a device is effective in deterring a potential thief or aiding recovery of stolen plant. These involve establishing minimum attack resistance times or the time taken to overcome a device by a thief. Attack trials are undertaken from a position of detailed knowledge of the plant and its security

systems approximating the knowledge a thief may have once the security device had been available in the market for say a year. Tools used in the attack are those which are commonly available to thieves.

In the UK, the Plant Theft Action Group (PTAG) has published minimum security standards in the form of attack test times, which it expects plant manufacturers to progressively build in to their products. These standards, which are voluntary, refer to immobilisers, physical restraints, tracking and alarm systems and visible and covert marking. (In the case of marking, the test time refers to the time taken to find and remove.) The standards also refer to the auditing of registration systems. PTAG has launched an initiative, whereby plant manufacturers can apply a "PTAG logo" to those products that meet PTAG's minimum security standards.

## **9. National & International Plant Registers**

There is a legal requirement to register road-going vehicles with government agencies, but there is no such requirement for other plant items acquired. However in some countries there are recognised voluntary national plant registers and where available all relevant plant items should be registered by plant operators on these. Registration by insurers, plant manufacturers selling new or used plant and banks providing finance may also be possible.

Registration assists:

- police by providing a reference point when they find plant believed stolen
- buyers of second-hand plant, dealers, auctioneers and banks by verifying ownership
- insurers by verifying declared valuations.

There is the added benefit for insurers providing cover to those customers who register plant, because those customers are likely to have a genuine insurable interest in the plant. Conversely those who have deliberately acquired stolen plant or bought plant from disreputable sources are unlikely to register their acquisitions.

There also databases for recording details of stolen plant. These assist operators, insurers and police to identify stolen plant and facilitate its recovery. They are populated by information from insurers or operators who have lost plant and police records.

Police computers record stolen plant, but these are often inaccurate. Analysis by TER of data held by UK police has shown that of 56,000 records of plant thefts between 1999 and 2003, 60% required amendment to make the data useable or did not have sufficient data to amend. There were also a large number of stolen plant items on a separate vehicle index for those items registered for use on the road.

In the UK/Europe and USA respectively, the National Plant and Equipment Register (TER) and the National Equipment Register (NER) provide registration services for both plant acquired and stolen plant. Stolen plant databases are also operated by the European Confederation of Equipment Distributors (ECED) for its members and in France the Federation Nationale des Travaux Publics (FNTP).

## **10. The Way Forward**

### **10.1 Comparison with motor vehicle theft**

It is interesting to compare plant theft with motor vehicle theft. In recent years theft of motor vehicles, especially private cars, has been significantly reduced in many countries due to the introduction of much improved security by manufacturers on new vehicles in the form of locks, immobilisers and alarms. This has been as a result of pressure from government and the insurance industry and, significantly, consumer demand for better protection. Security is now a feature of manufacturers' marketing campaigns.

Private motor vehicles may be seen by their owners as treasured possessions and most will do all they can to prevent theft. Plant is not seen in the same way, although the value at risk will often be much greater than that of motor vehicles.

Motor vehicles require registration with a government agency and have unique and widely understood identification markings. This is not true of plant.

Motor vehicles have unique keys; this is not always the case for plant.

In the UK at least, motor vehicle insurers now commonly exclude theft if the ignition key is left in the vehicle. The removal of keys from a vehicle when it is unattended would appear to be a very sensible precaution. Interestingly, opposition to the imposition of this exclusion has been voiced by construction businesses on the grounds of inconvenience.

Further, the rate of recovery of stolen plant is in most countries far lower than it is for motor vehicles. UK Home Office statistics (1997/8) show a recovery rate as high as 70%\* for cars and even 41% for light commercial vehicles, whereas the rate for plant was estimated to be no more than 10%. (\*However it has to be acknowledged that in many cases recovered cars are insurance "write-offs" having been badly damaged by arson or collision.)

The comments above point to some possible ways forward for plant with regard to demand and supply of anti-theft systems, adoption of internationally recognised identification marks and registration of plant on national or international databases which can be accessed by police forces and others.

### **10.2 What should plant operators do?**

Responsibility for plant security lies in the main with plant operators. Most important is their approach to risk management. The incidence and cost of plant theft is likely to be significantly reduced if theft prevention is given high priority and sensible precautions are undertaken as outlined elsewhere in this paper.

More attention to risk management by plant operators should result in the implementation of better security for plant and for the environment in which it is situated. This includes both physical protections, in the form of anti-theft systems, depot and site security, and procedures, in the form of staff supervision and training, plant acquisition, moving plant and registration.

Take-up by plant buyers of security options where made available by manufacturers is often very low. For example, French manufacturer Mecalac provided an anti-theft option for its loaders. In the first 6 months of 2002, it sold 700 loaders, but only 10 customers requested the option. (Source: CNPP report 2003). Other reports from

manufacturers put the take-up rate for security options as only 1%. Greater demand from plant operators for better plant security is likely to lead to a greater supply by manufacturers and dealers of new plant fitted with anti-theft systems and the availability of quality after-market systems.

As outlined elsewhere, although there is no legal requirement to register plant (other than road-going plant), plant operators should where possible record their plant details on a plant register with an external agency.

### **10.3 How can manufacturers assist?**

Ideally all new plant would have anti-theft systems built in during the manufacturing process, but plant manufacturers operate in a highly competitive market and are reluctant to increase cost of production without perceiving there to be a sales advantage or a legal requirement. Marketing literature from plant manufacturers has much to say about performance, user comfort and reliability but rarely security. Even if not fitted as standard, quality security systems should at least be available as options and included in their marketing literature.

It has been traditional practice to have a manufacturer specific single key system. These keys are generally simple in design and allow all plant on site of a certain type, such as excavators, tractors, compressors or rollers, to be operated by the use of one generic key. Manufacturers could assist by providing a unique key - which could be the immobiliser key - for the driving function of each item of plant.

If plant becomes more difficult to steal it is likely that thieves will turn to the fraudulent procurement of keys, codes or transponders. Manufacturers will need to have systems in place to ensure that replacements are issued only to legitimate users.

In the UK, the Plant Theft Action Group has recommended that all self-propelled and larger non-driven plant should be marked by manufacturers with a 17 character alphanumeric VIN (as described by the World Manufacturers Identification Scheme). Where this is not possible a product identification number (PIN) should be used. PINs may also be used for smaller plant items. The VIN or PIN should be in a visible position and securely fixed and also located in a concealed area. VINs or PINs should be indelibly marked or stamped to prevent easy erasure or alteration and in addition to any manufacturer's build plate, which should also bear the VIN or PIN.

### **10.4 What can insurers do?**

The response of insurers around the world to plant theft will necessarily be determined by the level of theft and extent to which plant is insured in the country concerned. It is apparent that these factors vary considerably. However in many cases, for insurers of plant, theft represents a significant contributor to attritional losses. Typically the risk accepted by the insurer is mitigated by the imposition of higher premiums, higher deductibles and rigorous risk selection. The effect of these actions is that more risk is transferred back to the plant operator.

Insurers have a role in promoting and incentivising good risk management practices. Implementation of such practices may be a prerequisite of the provision of insurance. For example, insurers may consider applying minimum security standards to plant risks submitted to them. These standards would refer to the quality of risk management including depot and site security, fitting and use of anti-theft systems to certain plant types and registration.

In any case the reduction of the incidences of theft, through application of sound risk management, should lead to more affordable premiums. Insurers can provide

incentives by offering rate discounts and/or lower deductibles in return for implementation of risk management measures or, alternatively, rate loadings and/or increased deductibles where risk management does not meet the highest standard.

Risk selection by insurers should favour those customers who employ high risk management standards and are consequently likely to enjoy a better loss experience. By the same token, those plant users who are not interested in improving plant security should find it increasingly difficult to obtain insurance.

Given the extent of plant theft in certain countries, it is likely that insurers are unwittingly covering stolen plant acquired knowingly or otherwise by their insured customers and for which they do not therefore have a legitimate insurable interest. This risk could be considerably reduced if plant ownership could be verified by the insurer against a registration database. As stated previously, plant registers do exist in some countries and registration could be made a condition of the insurance.

Insurers can employ their risk engineering functions to carry out security audits and surveys of depots and sites in order to identify shortcomings in security, proffer advice or recommendations and identify breaches of agreed policy conditions.

#### Example of what insurers can do

An insurer had been providing insurance to a plant operator whose experience had been very poor over a number of years. The insurer had reacted by increasing rates and deductibles. There was a change of management at the plant operator and it was more receptive to external advice. At renewal the insurer insisted that immobilisers be fitted to every item of self-propelled plant and security markings applied. Additionally all plant was registered with TER, the insurer paying 50% of the fee. Better site security was introduced. In the 5 years since these actions were taken, only one loss has occurred.

## **11. Conclusion**

Plant theft is a significant issue for the construction industry and insurers in many parts of the world. Plant theft also results in substantial costs for society as a whole.

Much of the risk is held by plant operators, either because they choose not to insure or in the form of large deductibles. Also there are considerable consequential losses which are usually not insured.

Levels of care exhibited by those responsible for securing plant and the sites at which it is located are often very low. Some plant operators are contributing to the theft problem through knowingly acquiring stolen plant or at least carrying out insufficient pre-purchase checks to establish ownership.

It is likely that the incidence and cost of theft and malicious damage could be reduced significantly by the exercise of greater care by plant operators through better risk management. They have available to them numerous techniques that can be employed to assist. These techniques are described in this paper and include:

- procedures for plant purchase, hire and movement
- depot security
- site security
- fitting of anti-theft systems
- registration with an external agency.

All of these incur forethought and in most cases expenditure, but expense incurred in risk management must of course be set against the substantial material and consequential losses which often follow from theft of plant as well as potential insurance premium and deductible reductions.

Whilst prime responsibility for reducing plant theft must lie with plant operators, plant manufacturers and insurers have roles to play also. Manufacturers could increase the availability of security systems for plant as well as adopting standard identification numbering. Insurers should actively encourage better risk management by plant operators through provision of security advice, incentives and as appropriate application of minimum security standards.

## **12. Glossary**

Bouwmachines Magazijninrichtingen Wegenbouwmachines en Transportmiddelen (BMWT) - the Dutch association of plant distributors. <http://www.bmwt.nl/>

Centre National et de Prevention (CNPP) - a professional body in France, recognised by insurance companies, which develops, disseminates and assesses knowledge in the areas such as risk management, fire, environmental issues, technological risks, burglary and health and safety. [http://www.cnpp.com/index\\_uk.htm](http://www.cnpp.com/index_uk.htm)

La Confédération Construction - the Belgian construction confederation representing over 14,000 firms. <http://www.confederationconstruction.be/>

DOMex - providers of insurance-linked services to construction and other firms in France. <http://www.domex.gp/>

European Confederation of Equipment Distributors (ECED) - the European federation of national professional associations representing companies in the field of distribution, rental, maintenance and repair, equipment security for construction, mining, forestry and handling industries. <http://www.eced-association.org/>

Fédération Nationale des Distributeurs, Loueurs et Réparateurs de Matériels de Bâtiment, Travaux Publics et Manutention (DLR) - the French association of plant distributors. <http://www.dlr.fr/>

Federation Nationale des Travaux Publics (FNTP) - represents firms involved in public works in France. <http://www.fnfp.fr/>

Insurance Services Office, Inc (ISO) - supplies data and other services for the insurance industry in the USA. <http://www.iso.com/>

National Equipment Register, Inc (NER) - launched in 2001, provides a registration and recovery service for plant operators in the USA as well as information services to law enforcement, insurers and the plant industry. NER operates databases of stolen plant and plant ownership. <http://www.nerusa.com/>

National Insurance Crime Bureau (NICB) - a not-for-profit organisation which receives support from insurers in the USA. The NICB partners with insurers and law enforcement agencies to facilitate the identification, detection and prosecution of insurance criminals. <http://www.nicb.org/>

National Motor Vehicle Theft Reduction Council Inc. - a joint initiative between the Australian government and insurance industry to reduce vehicle theft, working with police, insurers, the motor trades, vehicle manufacturers, registration authorities and justice agencies. <http://www.carsafe.com.au/>

National Plant & Equipment Register (TER) - launched in 1995 in UK, provides for:

- registration of owned plant by plant operators, insurers, manufacturers, auctioneers and banks
- registration of stolen plant by plant operators, insurers, banks and from police records
- recovery of plant
- pre-purchase ownership checks and valuation service.

<http://www.ter-europe.org>

Plant Theft Action Group (PTAG) - formed in 1996 as a UK Home Office advisory body, a group of representatives from plant operators, hirers and users, insurers, plant manufacturers, trade associations and police sponsored by the UK Government, which recommends and publishes best practice for plant security.

Plant Theft Solutions Group (PTSG) - a group of insurers and security equipment suppliers formed to consider effective theft prevention measures for plant in the UK.

Stichting Certificering Motorrijtuigbeveiliging (SCM) - the Dutch Institute for Certification of Vehicle Security Systems founded in the early 1990s by the Dutch Insurance Association in order to maintain the quality control of anti-theft systems for passenger cars. In 2002 work expanded to include plant and earth moving machinery. <http://www.scm.nl/english/index.htm>

Thatcham - established by the British insurance industry in 1969 as the Motor Insurance Repair Research Centre, an independent, non-profit making accident repair research centre and leader in vehicle security testing; it is jointly owned by members of the ABI (Association of British Insurers) and LMUA (Lloyd's Motor Underwriters Association). <http://www.thatcham.org/>

UK Government (Home Office) - produces various publications aimed at informing on and reducing plant theft including:

- advice on construction site security <http://www.crimereduction.gov.uk/site.htm>
- The Nature and Extent of Construction Plant Theft (Police Research Series No. 117) 1999 <http://www.homeoffice.gov.uk/rds/prgpdfs/fprs117.pdf>
- "Steer Clear of Plant Theft" plant security guidance (2002) <http://www.homeoffice.gov.uk/docs3/SteerClearPLANT-print.pdf>
- Security Guidance Document for Agricultural and Construction Plant (2002).

### **13. Acknowledgement**

The following were the prime sources of information used for this paper:

- UK Home Office publications
- The National Plant & Equipment Register (TER)
- CNPP report Vol des Engins de Chantier, Etude No. EP 02-16, 2003
- information provided by insurers - Zurich, HSB, Allianz Cornhill and the South African Engineering Insurers Association.



## **Appendix 1 - TER Theft Report (2004)**

In the UK the National Plant & Equipment Register (TER) records plant items worth more than USD 2,800 each and which have a unique serial number. Its database lists over 30,000 stolen items reported by police, insurers and their loss adjusters, banks and plant operators.

3,595 thefts were reported to TER in 2004, with a total cost of USD 70m. The average value of stolen plant was USD 18,800.

TER records that the most frequently stolen category of plant is excavators, especially mini-excavators, accounting in 2004 for 29% of the items stolen and 44% by value. Perhaps not surprisingly, excavators were also the most commonly recovered item (31% of total).

<b>Plant Type</b>	<b>Proportion of Items Stolen 2004 (by number)</b>	<b>Proportion of Items Stolen 2004 (by value)</b>
Excavators, including mini and midi-excavators, backhoe loaders	28.6%	44.1%
Trailers	24.6%	6.8%
Dumpers	5.8%	7.2%
Telehandlers	4.3%	9.6%
Quad bikes	4.3%	1.6%
Rollers	4.0%	4.4%
Breakers	3.8%	1.9%
Generators	3.6%	2.8%
Caravans	3.5%	3.8%
Compressors	2.8%	1.4%
Tractors	1.6%	2.9%
Forklifts	1.4%	2.1%
Other including compaction equipment, small tools, pumps, hammers, welders, etc.	11.7%	11.4%

Most thefts are reported to police in London and the South East of England, reflecting the area of greatest construction activity. The density of plant usage in this area provides both a ready source of used plant and a sizeable market for those willing to purchase used plant without conducting proper due diligence.

TER comment that plant theft is given a relatively low priority by the police forces given responsibility for this crime as these forces are also charged with investigating other serious and organised crimes such as drug smuggling and human trafficking.

Plant stolen in the UK has been recovered from Western and Eastern Europe, the Middle East, Cyprus and Africa. Much of the plant is moved to Ireland either for use there or onward transportation. Stolen plant may be out of the UK within 48 hours of the theft taking place.

Recovered plant has shown that criminals have become more adept at applying false identification markings to plant with high quality serial number stamping, good quality plates. Identifications have often been cloned from plant exported out of the UK.

(Source: The National Plant & Equipment Register)

## **Appendix 2 – Security Procedures**

### **Recording plant details**

1. Record all plant and attachments bought or disposed of in a company plant asset register, to include vehicle identification numbers (VINs), product identification numbers (PINs), year of manufacture, manufacturer and model number and other serial numbers as well as photographs of plant items.
2. Undertake audits at random intervals or if theft is suspected.
3. Register plant with a recognised national plant register where one is available.

### **Plant purchase**

1. Obtain a full description of the plant, including attachments, identification marks and serial numbers from the seller and check against the item.
2. Ask the seller for proof of ownership.
3. Ask the seller to provide a plant identification document containing unique identification numbers and serial numbers of parts.
4. If buying second-hand plant, check with registration agencies before purchase to determine current ownership and whether plant is stolen.
5. Ensure security devices are available for plant that will not be constantly supervised.
6. Apply identification markings to plant (refer to Anti-theft Systems)
7. Purchase spare parts from reputable dealers and check the number and specification on delivery.

### **Hiring of plant**

1. Obtain a hire agreement.
2. Find out what to do if plant is stolen.
3. Ask for full description of the plant, including serial numbers.
4. Do not leave documents in or on the plant.
5. Ensure a responsible person is on site to accept delivery.

### **Despatching plant to sites**

1. A conveyance note should be given to the driver transporting the plant with full instructions and a contact telephone number.
2. A responsible employee should be appointed to look after plant on site.
3. The person delivering plant to the site should be given proper instructions on who should receive the plant and sign the conveyance note.
4. The company plant asset register should be updated with details of where plant is being sent and the name of the person who will be responsible for looking after it.

5. All plant movements from site to site should be recorded.
6. A copy of the plant identification document should be sent with the plant.
7. The police should be informed about the movement of abnormally large items of plant such as large mobile cranes.
8. Transportation should be planned so as to avoid overnight stops wherever possible or, if unavoidable, to use only secure temporary storage facilities.

#### **Recovering plant from sites**

1. Plant should be collected and returned to stores, depot or plant hire company when it is no longer needed on site.
2. The person collecting the plant must be authorised to do so. The conveyance note should be checked.
3. When plant leaves site the numbers and identity of the items should be checked.
4. Returned plant should be recorded in the company plant asset register and any changes such as repairs, replacement parts and damage recorded on the plant identification document.
5. The person responsible for plant security should constantly monitor where plant is regardless of how much it is worth. If the plant is stolen it should be possible to record what has been stolen, where from, the time of day or night, how it was secured and who was responsible for the item at the time.

#### **Post-theft procedures**

1. The police, and if insured the insurer, should be advised as soon as possible after the occurrence of theft or malicious damage.
2. If there is a stolen plant register in the country concerned, details should be provided to the owners of the register. Additionally, some manufacturers have a registration programme and provide their dealers with serial numbers of plant reported stolen so that, when a machine is brought to a dealer for service or repair, the dealer can verify whether it is stolen.
3. Evidence should be retained for examination by police and insurance investigators.
4. If available, details of witnesses should be obtained.
5. The date, time and place of theft or when item was last seen and by whom should be recorded.
6. The plant identification document should be provided to the police to ensure that correct information is entered on their records. If no plant identification document is available, the police should be provided with details of make, model and type of plant, colour, registration number, VIN, PIN or serial number, engine number, plant hire or fleet number, description of any attachments and approximate value.
7. The police crime report number or other reference should be retained; the police and insurer must be told if the plant is retrieved.

### **Appendix 3 – Depot Security**

1. Perimeter fencing should be of metallic construction, preferably 2.5 metres high with posts set in concrete protected by barbed or razor wire or with spiked rungs.
2. Electric fencing can be used to protect yards and plant in the open. It is installed inside the outer fence and is designed to administer a non-lethal shock.
3. Gates should be installed at all entrances and regarded as a continuation of the fence being of equivalent strength, security and height. They should be no wider than usage demands and fitted with heavy-duty closed shackle padlocks, protected against bolt cutters by lock shields. Open padlocks should not be left on gates during daytime as thieves may substitute their own padlocks.
4. Security guards should be employed at all large depots to provide a continuous site presence, regular patrol visits or remote surveillance by CCTV. NB particular care should be exercised in choosing the security firm; such firms often have no contractual responsibility for loss even where due to employee negligence.
5. Flood lighting can be used, preferably linked to movement detectors. Night lighting assists security patrols and closed circuit television if installed. Lights should be mounted as high up as practicable to prevent sabotage.
6. Intruder alarms, linked to alarm receiving centres or site security office, can be fitted to perimeter fencing and gates, plant stores or buildings. NB each person authorised to disarm the alarm should have his own non-generic code.
7. External beam or passive infrared (PIR) motion detectors can be installed inside the fence to detect anyone climbing over it or cutting through it.
8. Closed circuit television (CCTV) systems can deliver live or recorded video direct to computer, mobile phone or monitoring station. The CCTV should be overt to act as a deterrent and signs should warn that the area is under surveillance. The VCR should be concealed inside a building to prevent intruders taking the tapes.
9. Building windows should have heavy-duty bars and grilles that will slow intruders down and, if removed by thieves, indicate a break-in to passing patrols. The heads of retaining bolts should be spot-welded or burred.
10. Building entry doors should be secured by key operated dead locks.
11. Roller shutters should be padlocked on the inside with bottom of shutters fixed to floor in the middle with hasps and staples and heavy duty padlocks. Electricity to any roller shutter motors could be turned off inside a padlocked distribution board.
12. High value items can be retained inside a securely padlocked container inside the building as far from entrances as possible to provide another line of defence. Forklift trucks could be parked and immobilised in front of the door.
13. Keys for buildings and plant should be subject to a tight control. Key tags should be coded and not identifiable to the plant or building concerned. Lock cylinders and keys should be changed promptly if they are lost. Plant keys should be kept inside a locked steel cabinet inside the building. Electronic access (keypad) key cabinets and key tracking systems are available.

## **Appendix 4 – Site Security**

### **Site supervision**

1. Security staff should regularly check and search all employees, lockers and contractors' vehicles.
2. Employees' private vehicles should be kept off the site.
3. Site supervisors should know which of their staff are trained and authorised to operate specialist plant and should challenge anyone else driving or attempting to operate the plant.
4. Particular care should be undertaken when assigning responsibility for expensive plant items to casual labour.
5. Maintenance and servicing should only be undertaken by the suppliers, their agents, reputable dealers or trained in-house personnel.
6. Plant should not be lent to unknown staff of other contractors working on the site.
7. Building schedules should show when new contractors are expected and when plant and materials are arriving. This should assist in identifying those who are legitimately on site and challenging any unfamiliar person.
8. Site managers should be wary of unknown persons visiting the site to sell items of second-hand plant.
9. Plant deliveries on Friday afternoons should be avoided if the plant is not required until Monday.

### **Local security advice and co-operation**

1. When commencing work on a site, it may be worthwhile contacting the local police who should be able to advise on the history of plant thefts in the area.
2. There may be opportunities to co-operate and co-ordinate with other local businesses to pool knowledge and resources if practicable.
3. The local police should be made aware of possible high-risk projects and they could be asked to carry out drive-by checks of the site during non-working hours.
4. There may be scope for "Watch" schemes, which involve the local community in deterring theft. These can promote awareness of the theft problem and usually include use of helplines and reward schemes for information leading to arrests.

### **Staff recruitment, training and awareness**

1. Staff should be vetted before being employed on site, including identity checks.
2. All staff should understand that plant theft and malicious damage are serious problems and that the resulting disruption and financial loss to the company could lead to job losses.
3. Staff should be involved in the development of the active security plan.

4. All staff should be made aware of company policy on plant security and be familiar with procedures and responsibilities.
5. Individual staff should be made personally responsible for company plant they use and advised that if plant is lost through negligence or carelessness disciplinary action could ensue.
6. Staff should be encouraged to report any thefts or suspicious behaviour immediately to the site supervisor. They could be offered incentives for assisting prevention of theft and be offered confidential rewards for information leading to recovery of stolen plant and/or arrest of thieves.

**Site perimeter protection**

1. The site perimeter should be completely fenced with secure fencing, typically 2.5 metres high, which should be robust enough to make theft of large items very difficult.
2. Exits / entrances should be kept to a minimum, preferably only one, with well-secured gate(s).
3. The reception should be sited near the main gate.
4. In addition to fences or when fences are not feasible, use could be made of barriers made of low walls, posts, dirt berms or ditches.
5. Sites should be well lit, preferably by floodlights operated by sensors and positioned close to the site perimeter, but far enough away to prevent disablement by an intruder.
6. Closed circuit television (CCTV) and alarm systems should be used if possible, either standalone or integrated, to protect compounds and offices.
7. Warning notices should be positioned around the perimeter stating that security precautions are in force, without providing details.
8. Consideration should be given to employing security guards.

## **Appendix 5 – Security of Plant on Site**

1. A responsible employee on site should have a copy of the identification documents for all plant on site and they should be stored securely.
2. Where possible, plant should be returned to secure depots at the end of each day.
3. Secure storage areas should be provided for plant left on site overnight. Parking of plant at the roadside overnight or at weekends should be avoided.
4. Vehicles and self-propelled plant should be locked whenever they are not in use. Lockable steel cabins should be installed on vulnerable plant items if possible. Fuel tank caps should be locked.
5. Blades, buckets or arms of plant should be lowered to the ground.
6. Precautions should be taken to ensure that plant cannot be started when not in use. Ignition keys should be removed from plant when unattended. Plant with power units may be disabled by removing small parts at the end of the period of work.
7. All security devices including immobilisers and physical restraints provided for the plant should be used to secure it overnight (refer to Anti-theft Systems).
8. Extra security can be applied by using high security chains to fasten plant to objects that cannot be moved. Small items can be chained together.
9. Plant should be made difficult to move overnight by not leaving on trailers and clustering plant in a “wagon circle” with more easily transported plant, such as compressors, in the middle surrounded by larger items.
10. When storing unused plant it should be arranged in such a manner that it is obvious to an observer that an item of plant has been removed.
11. Regular checks should be undertaken on plant that must be left at a site for an extended period of time.
12. Spares and accessories that are unlikely to be needed should be stored securely and not carried on the plant.
13. Tools should be stored in buildings or high security containers and not left in the back of trucks or on trailers.
14. Site offices should be positioned in an area with limited access for the opportunist thief.
15. Office equipment such as fax machines, computers and telephones should be indelibly marked by, for example, branding on the company logo and postcode.

## **Appendix 6 - Loss Examples**

### **Welding contractor: theft of 16 welding machines USD 720,000**

The machines were in a van parked overnight in a hotel car park. Thieves gained access via a side cargo door, forcing the lock. The vehicle alarm was silenced by taping the alarm sensor. The machines had no visual serial or manufacturer identification numbers. The National Plant & Equipment Register was notified. The theft was reported to the police, but officers did not attend the site, because of the distance from the police station. The machines have not been recovered and the thieves have not been apprehended.

### **Crane hirer: theft and arson damage to mobile crane USD 185,000**

A mobile crane was being driven back to its depot and was off-hire. A fault developed in the braking system and the crane was parked overnight in a lay-by alongside an industrial estate in city suburbs. The cab was locked and keys removed. The crane was stolen during the night, driven a few hundred metres on to a field where it was abandoned and set on fire. Police and fire services attended the scene. After the loss the crane was only worth scrap value.

### **Plant hirers: thefts by deception costing in total USD 1,850,000.**

These thefts involved a person hiring-in items of plant, including excavators, breakers, trailers, backhoe loaders and dumpers, and paying the initial hire charges only. No further payments would be made and the plant was not returned. It is believed that the fraudster sold the plant shortly after taking possession. When initially advised, police took no action, believing it to be a "commercial" claim, but they did start to investigate when evidence of fraud was presented in the form of a false cheque.

The missing plant items were notified to TER. The fraudster was eventually prosecuted and jailed for 4 years, but most of the plant has not been recovered. It was apparent that the plant hirers were carrying out insufficient checks to ensure that they were hiring to bone-fide companies.

### **Plant hirer: theft of 2 diggers leading to death of a woman**

A woman was crushed to death trying to shut a barrier to a plant hirer's yard as thieves were escaping with 2 mechanical diggers loaded on to a flat-bed truck. Police subsequently advised that rather than try to stop the thieves directly, it would have been safer to take details, such as the registration number, colour and model of vehicle and direction, and let them know as soon as possible. (Source: Construction News November 2004)

### **Earthmoving contractor: theft and abandonment of 2 excavators USD 275,000**

2 excavators were taken from a site whilst the drivers were taking a break. Because of the large area of the site, the drivers had to travel a considerable distance to have their break and by the time they returned the excavators had gone. However the thieves tried to take them across an estuary embankment, where they sank into mud and were abandoned. Subsequent recovery was hampered not only by the ground conditions but also by local hoodlums who demanded money from the recovery contractor for the right to get on to the estuary. (Source: Construction News August 2004)



Drilling contractor: theft of drilling rig USD 157,000

A contractor en route to a contract site stopped in a motorway service area. The drilling rig was secured to the trailer unit with chain and closed shackle padlocks. The driver had stopped for breakfast and to have a shower. He was away from his vehicle for no more than 40 minutes during which time thieves used croppers and grinders to remove the chains and lift the rig on to a second flat trailer, which they drove away.

Waste facility: malicious damage to 2 compactors USD 166,000

Vandals broke into the compound of a waste facility during a weekend and introduced sand, iron filings and grit into the oil reservoirs of 2 compactors. On the following Monday, workers arrived to find the gates open but otherwise nothing amiss. The machines were started and put to work but severe damage to the transmissions, hydraulic systems and engines of both units soon resulted.

Supplier of temporary flooring: theft of portable roadway panels USD 185,000

Aluminium panels formed to make temporary roads, paths or hard standings were laid at a sports facility where a rock concert was due to be held. The panels were laid a few days before the main equipment was due and before site security was at an increased level. The area covered by the panels was roughly the size of a football pitch. Two security guards were on site but when the perpetrators arrived with 3 flat back trucks complete with loading cranes, the guards were threatened with violence and locked in their cabin. Telephone cables were cut, mobile phones and radios smashed. The thieves proceeded to use the loading cranes to pick up the edges of the panels and "fold" them several layers thick before loading them for removal. Whilst the folding process rendered the panels useless for their original purpose, they still had considerable scrap value.

Plant hirer: suspicious theft of mobile crane USD 220,000

A plant hire company allegedly suffered a break-in at its yard and a large crane was taken. This was not reported to the police or insurer for 4 days. The insured went into receivership shortly after reporting the crane missing, but the receivers managed to trace only 50% of the insured's cranes. It was later discovered that the insured had started a new plant hire business in another part of the country using cranes that appeared very similar to those used in his previous business.

Forestry: malicious damage to tree logger USD 51,000

A tree logger was stored in a forest ready for movement to a new location when required. The operator failed to check the oil level before starting, resulting in considerable damage to the engine. All the oil seals were intact and were relatively new. It was apparent that vandals had drained the oil.

Earthmoving contractor: malicious damage to excavator USD 88,000

The contractor was asked by people near the site at which he was working if they could look after the excavator overnight to ensure it came to no harm. The contractor declined as he had his own security man. During the night, the security man was scared off and the excavator set alight.

Plant hirer: fraudulent claim for theft of stone crusher USD 120,000

At the end of a hire period, the owner of a stone crusher arranged for a driver to collect it from a quarry and deliver it to docks for onward transit to Portugal. The owner made a false claim for theft against his insurer. Fortunately, the crusher was traced before it left the country.