



INTERNATIONAL UNION
OF RAILWAYS

UIC SECURITY PLATFORM

METAL THEFT ON THE RAILWAYS

Protection and surveillance

Swift detection of theft

Recognition of stolen material

Deterrents

Partnerships

International aspects

Contact with other «victims»

Communication



NOVEMBER 2013



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Executive Summary

“Metal thefts on the railways cause increasing disruption to passengers and freight services, escalating costs to the rail industry and have dramatically killed people within the past years”

Metal theft is a big problem for railway networks as thieves target signalling cables, overhead power lines and even metal fences to sell it for scrap. Railway networks are designed to fail safe, which means that when a cable is cut, trains are brought to a stop. This protects passengers but can lead to long and, frustrating delays while the problem is examined and fixed safely.

This type of crime causes considerable disruptions and the costs that are associated with replacing and repairing the damage often massively exceed the value of the metal stolen. Loss of communication networks and damage to railway tracks also raise public safety concerns. A large proportion of railway networks funds come from the government, so these thefts are, ultimately, at the taxpayer's expense.

It is clear that the stolen metal is often transported across several borders and sold as scrap or for recycling far away from the actual scene of the crime. Thus, both national and international cooperation and collaboration initiatives are needed to raise awareness, provide expertise and best practice to allow the exchange of ideas between all parties involved.

Therefore, only a structured and common approach can provide a wide and extended set of solutions.

The railway community is working collaboratively with its members as well as with the national and international authorities. The UIC Metal Theft WG members are very pleased with the growing level of collaboration in this field between railways, law enforcement security authorities and private sector across Europe.

It is therefore essential that railway companies collectively identify and assess the impact of metal theft on their business, covering the financial, operational and reputational impacts. Metal theft will not vanish in the near future, therefore railways cannot afford to be passive and wait for others to take actions on their behalf. Railways' response must be consistent across Europe towards a single objective, which is to “Mitigate metal theft and its impact on railway users”.

1. Introduction

1.1. What is metal theft?

Metal theft (the general concept) is, "the theft of items for the value of their constituent metals". It usually increases when worldwide prices for scrap metal rise, as has happened dramatically due to rapid industrialisation. The metals most commonly stolen are copper, aluminium, brass and bronze.

One defining characteristic of metal theft is the motivation. Whereas other items are generally stolen for their intrinsic value, items with metal are stolen for their extrinsic value as raw material or products.

1.2. Metal theft, the railway context

Metal theft continues to grow, costing railways hundreds of millions of Euros per year in direct costs and causing tens of thousands of hours of delay to its citizens.

Besides electricity and signalling cables used on railways, the telecommunications industry has also reported rising thefts of copper cables, while railways also report that thieves are dismantling safety fences and selling the metal for scrap.

The rising demand for metal on the international market and the associated significant rise in metal prices has made it a particularly attractive and lucrative enterprise for thieves.

It is believed that the demand will remain strong, and metal prices will continue to attract thieves, who are both opportunist and organised.

Throughout the industrialised world, the stealing of valuable metal has become a serious concern for the police, businesses, public utilities, railways, and the community at large. While we cannot be sure about the exact amount of metal stolen worldwide, the reports of the last year show clearly and in particular an increase in metal theft throughout the European rail transport networks.

Indeed, in recent years, this problem has spilled over from the long-distance railway networks to urban railway networks in Europe, with metro and tram systems being targeted. Urban rail networks are more difficult to target as they are smaller and often closed systems. Tampering with urban rail systems is also comparatively dangerous, with live rails proving a real danger to thieves.

This evolution of metal theft from railways to urban rail shows the extent to which criminals will go to acquire these valuable materials.

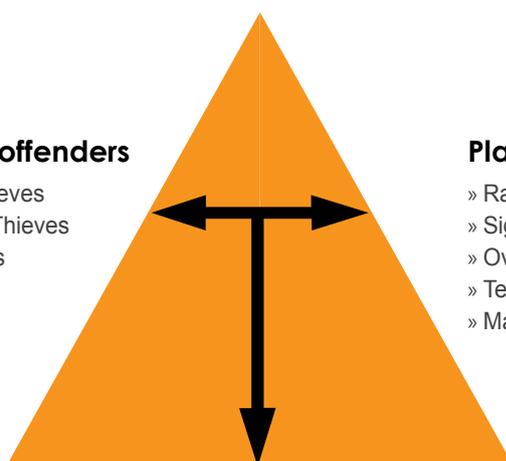
Rail Networks Metal Theft Triangle

Motivated offenders

- » Organised thieves
- » Opportunistic Thieves
- » Scrap Dealers

Places

- » Rail Energy Substations
- » Signalling Boxes
- » Over head lines - Catenaries
- » Telecommunications facilities
- » Maintenance Worksites



Targets

- » Electric Substations cables and utilities
- » Copper and aluminium cables (signalling and telecommunications)
- » Metal scrap (rails, rolling stock, AC equipment, etc)



Railways in particular are constantly exposed to such criminal activity. The reason for so many events of this nature on railway infrastructure is the ease of accessibility to the system.

The European railway networks are spread over many different geographic environments that are difficult to monitor. The network extension and technical complexity increases the difficulty of the challenge regarding security management based on a risk-based approach – particularly for this very specific type of criminal activity as it is not the only core activity of railway operators or infrastructure managers.

1.3. The motivation

Over recent years there have been a number of drivers behind the dramatic rise in metal theft crime including rising commodity prices, the widespread availability of materials, low risk of detection and relatively low sentences if convicted.

The diversity of metal products (e.g. copper) use by the railways is immense. It is commonly found in telecommunication systems, signalling, traction energy, etc. This combines two aspects, quantity and diversity.

The specific features of the railway system “encourage” both the opportunistic and large-scale organised thieves to target railways as “easy prey” to fulfil their appetite for crime.

The economic motivation

The figures show that copper prices rose from €1,800 per metric tonne in 2000 to €7,100 in 2010.

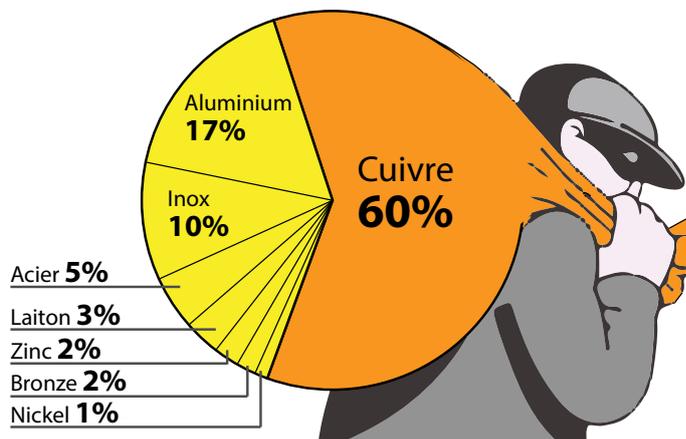
Although there is no evidence that Europe’s economic slowdown has driven the trade, “there is the coincidence of rising copper prices and unemployment levels at a time of growing criminal activity.”

At the same time Asian countries began to rapidly industrialise, in particular China with more than 20 % of global copper consumption.

The demand in Europe and the United States increased in 2003, driven by new construction and impending wars in Iraq and Afghanistan. And since 2003, the four basic nonferrous or base metals, aluminium, copper, nickel and zinc, have been in high demand.

Scrap materials became the second largest American export to China behind electronics. By mid-2006 copper was already \$4 a pound.

The rise in scrap metal theft is driven by offenders' recognition that ample metal supplies remain unguarded, and that the price of return remains historically high based on heavy international demand. Thus scrap metal industry also plays its part in perpetuating this crime; namely that thieves can sell stolen metal to scrap metal dealers without proving personal identification and title to the goods whilst obtaining cash in hand for their stolen metals.





1.4 Scale of the problem

Cable theft has been increasing in frequency since 2007/08. The incidence of cable theft has "accelerated" over the past few years.

Below you will find a few examples that widely demonstrate the operational, structural and geographical impacts of metal theft on some of the European railways networks within the last years.

Italy was the first country in **Europe** where metal theft has been recorded on a large scale. The first complaints date back to the 1990s. In 2010 an increase of 300%, with 1226 cases reported, three thefts per day on average. In total 631 tonnes of cooper were stolen along some of the 16,000 kilometres of rail network, costing more than 3 million Euros for railways.

In January 2011, **the UK** reported 325 incidents. In 2010 the 2770 cases of theft already represented an increase of 65% over the previous year and the phenomenon continued to worsen. "The theft of cables is UK's second priority after the risk of terrorist attacks. The disturbances and the problems they cause are immense," said the British Transport Police.

In **Greece**, the cash-strapped national rail company says cable thefts cost €12 million in recent years. Germany's state rail company reported that metal theft grew 50% from 2010 to 2011.

In **Spain**, as a result of good collaboration of the Spanish Infrastructure Manager ADIF with security forces and judicial services, some achievements in the fight to cable theft can be reported. The most outstanding one was in December 2010 when the police in a special operation recovered 275 tonnes of stolen cable and arrested 108 people.

In **the Netherlands** during 2010 a total of 166 hours of delay disturbed thousands train passengers. In consequence Prorail is investing millions of Euros in preventing copper theft.

In **Portugal** the Portuguese rail infrastructure manager (REFER), suffered around 351 incidents of metal theft, with 1.36M € in direct costs (1.29M € in 2010) and causing over 33,000 minutes of passenger delays.

In **the Czech Republic** during 2011 in less than 10 months metal theft caused damage worth almost 14 million koruna to railway infrastructure tracks and stations. In 2010, the damage exceeded 25 million koruna, rising from almost 20 million koruna in 2009.

In **Germany** the state railway (Deutsche Bahn) is using artificial DNA to mark its infrastructure to make recovered goods easier to trace. Also Deutsche Bahn joined up with leading telecommunications and energy companies to establish an association of German metal traders so that scrap could be more closely monitored.

In **France** the rail operator SNCF uses helicopters to patrol railway lines to deter criminals. In 2010, metal thefts have led to more than 5800 hours of accumulated delays in the movement of trains. Courts in France and the United Kingdom recently convicted individuals involved in metal thefts, though the authorities acknowledged that a larger problem of organised crime remains.

Although traditionally affecting primarily railway networks, also some urban rail systems in Europe are experiencing a surge in metal theft, for example Vienna, Paris, Rome, Hamburg and Lisbon. As prices remain high, the problem is likely to spread to other urban areas.

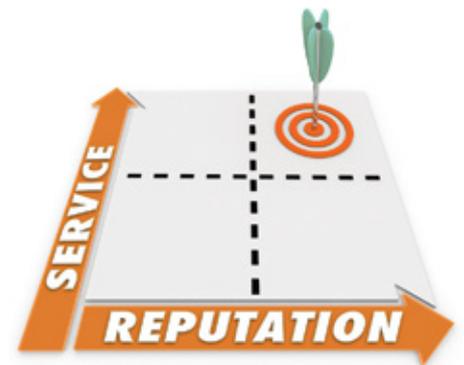
1.5. Effects of metal theft in the railway system

On passenger services

It is estimated that a million passenger journeys were delayed or cancelled as a result of metal thefts having caused thousands of minutes of delay. Rail punctuality is the single biggest driver of overall satisfaction with rail services, and this is undermined by the disruption caused by cable theft. In addition to delaying journeys, disruption also suppresses demand, as passengers switch to other modes of transport. There is a clear link between reliability and rail's ability to attract people to the system.

On freight services

The performance of rail freight services is equally affected by the disruption caused by metal theft. Rail freight undertakings have experienced thousands of minutes of delay due to metal theft over the past years. Such delays may be compounded for freight services by the prioritisation of passenger transport and the additional costs associated with performance penalties to customers or delays in forward distribution. Freight undertakings also claim that there is a reputational cost to their business, as increasing delays make transporting freight by rail seem less reliable.



On safety and security

There are various risks posed to thieves, rail staff and passengers as a result of metal theft. People have been injured on the railways in many member states during the past years as a result of metal theft-related incidents (e.g. On 11 January 2011, an ICE train derailed near the Dutch city of Zevenaar. The cause of the accident was the theft of 300 metres of copper cable.)

Thieves risk their own safety by handling cables, infrastructure, vehicles or equipment which may be live and could prove dangerous. Although metal theft is not a direct safety issue for passenger services, as signals are designed to fail-safe and turn red to stop trains if disruption occurs, there are issues for passenger safety i.e. if passengers attempt to exit stopped trains.

On maintenance

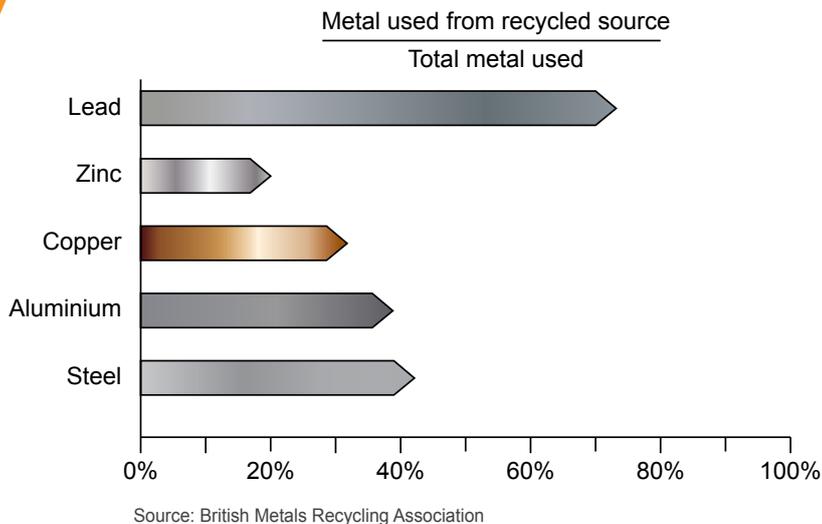
Direct costs of metal theft to the rail industry arise from track maintenance, replacing stolen cable and extra staffing requirements. In addition, if delays attributable to railways infrastructure managers exceed a certain threshold, it is required to compensate train operating companies for the disruption.

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2. The scrap metal industry

The scrap metal industry forms a “pyramid” with metal being moved from dealership to dealership until it reaches a small number of operators who are equipped to process and refine material. Once stolen metal enters the chain, it becomes extremely difficult, if not impossible, to identify.



It is a common belief that the vast majority of stolen metal is sold to the scrap metal recycling industry rather than being directly exported, but the recycling industry is now much more regulated than the ordinary scrap metal industry, which leads one to believe that the exportation is most often used by thieves.

The scrap metal industry plays a vital role in the green economy with the collection, processing, exportation and recycling of all scrap metals.

However they also offer a low risk disposal route for stolen metals, often paying cash in hand with very few questions asked as to the identity of the seller and the ownership of the materials.



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3. Metal theft management

Managing the metal theft consequences is currently one of railway security's main focuses and it is time to set some sustainable solutions. Only a structured common approach can provide a wide and extended set of solutions!

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Metal theft has become a serious security and safety concern for businesses, utility providers, rail transport and members of the public. Therefore the problem **needs to be tackled by a collaborative mitigation effort by all relevant stakeholders** including the general public.

A valuable exchange of best practices, information and cooperation between the different sector players and authorities is indispensable towards efficient crime mitigation.

Within that concept and context, considering that much has been done but much more can be achieved, the development of a stronger and wider railway community answer is now opportune.



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4. A collaborative mitigation effort

Established within the scope of the UIC Metal Theft WG, the Single Rail Forum for Metal Theft is the railway technical Information/Consultation focal point on metal theft. This is considering that the metal theft issue needs to be tackled by a collaborative mitigation effort involving all relevant stakeholders.

4.1. Proposed actions

a) Create a Single Rail Forum for Metal Theft;

1. With the representation of all the railway collective bodies, authorities and its members;
2. Technically support the liaison/lobbying bodies (CER/EIM) activities into European Commission;
3. An information sharing platform for railways/authorities on metal theft issues;
4. The centre for best practice in combating metal theft;

d) Support a harmonisation of the “Metal Theft in the railway context/concept” at a European level that can:

1. Recognise this specific crime and strongly punish those involved;
2. Support/facilitate the control and monitoring of the railways scrap metal;
3. To seek greater compliance with existing regulation of the scrap metal dealer industry, by providing enhanced deterrents and more effective law enforcement.

b) Law enforcement and Security forces involvement in transport activities/training;

1. In the future participate in the conferences promoted by Europol on the growing trend of metal theft. Discuss with law enforcement officers from EU Member States and representatives from the private sector on the framework of the European project on Mobile Organised Crime Groups.

e) Partnerships

1. Develop partnerships with the authorities and the legal institutions to introduce and take into account all the metal theft impacts (repairs and replacement of stolen materials, costs of operational delays, damage the image of railways...) and technical consequences (obstructing trains, endangering the lives of others in some cases ...), in their prosecutions;
2. Collaborate with manufacturers in designing security solutions for the use of copper or alternatives for copper in railways;
3. Mobilise other economic victims of similar phenomena to find common responses;
4. Support the initiative to prohibit scrap metal transaction cash payments by:
 - Push for payment for scrap metal transactions to be made by electronic transfer, direct debits, credit transfers, on-line, phone and mobile banking only as they are made from the payer’s account to the payee’s account.
 - Require identification from all suppliers of scrap metal material.
 - Suitable identification:
 - Passport or original passport of any nationality.

c) Wider Communication strategy (at National and EU levels);

1. Raising awareness of metal theft and effective enforcement responses to all law enforcement organisations/agencies who are concerned with the industry;
2. Awareness campaigns for the public;
3. Information booklets for professionals (e.g. COLPOFER Catalogs, RAILPOL COPPER E-BOOK, Pol-PRIMETT news), and
4. Supporting the development of technical, operational and legal frameworks;



5. Conclusions

Metal theft is largely driven by opportunity, rising prices, ease of disposal and availability of metals making it more attractive in comparison to other crimes being also highly variable when compared to other crime types.

If no actions are taken to tackle metal theft, it is anticipated that incidents will continue to rise, even if at a slower rate reflecting the world market demand. It is therefore critical that railways collectively identify, assess and monitor the impact of metal theft on their business in order to act on the:

- **Financial impact**
 - Direct cost from loss of metals;
 - Fines from regulating bodies/government;
 - Compensation paid to train/freight operating companies;
 - Revenue loss due to loss of customers etc;
- **Operational impact**
 - How metal theft is impacting on operational performance, delay minutes and cancellations / significantly delayed services.
- **Reputation impact**
 - How metal theft is impacting on government, regulating bodies, public, customers and business partners' confidence in how the railway is run and what is being done to combat metal theft.

That process must result in a common statement when communicating to the proper national and international entities aiming for a stronger institutional response to the rising number of metal thefts within the European Railway Network.

Metal theft is far from being mitigated and it is in fact affecting multiple industries and by consequence society. Railways in particular cannot afford to be passive and wait for others to take action on their behalf. Railways' response to this problem can and must be consistent across Europe having as a common and single objective "Mitigate metal theft and its impacts on railway users."

240 members
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The worldwide association of cooperation for railway companies



- 2 500 billion passenger-kilometres
- 9 500 billion tonne-kilometres
- More than 1 000 000 kilometres of lines



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